













# ENTOMOLOGICAL NEWS

AND

PROCEEDINGS

OF THE

ENTOMOLOGICAL SECTION

OF

THE ACADEMY OF NATURAL SCIENCES

OF

PHILADELPHIA

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**VOLUME XXXV, 1924**

PHILIP P. CALVERT, Ph.D., Editor  
E. T. CRESSON, JR., Associate Editor

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**JANUARY, 1924**

# ENTOMOLOGICAL NEWS

Vol. XXXV

No. 1



GEORGE HENRY HORN  
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PHILIP P. CALVERT, Ph. D., Editor.

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## STATED MEETINGS

Of the Entomological Section of The Academy of Natural Sciences of Philadelphia, and of The American Entomological Society will be held at 7.30 o'clock P. M. on the following dates during 1924: January 24, February 28, March 27, April 24, May 22, September 25, October 23, November 20, and Dec. 8.

Communications on observations made in the course of your studies are solicited; also exhibits of any specimens you consider of interest.

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# ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXV

JANUARY, 1924

No. 1

## CONTENTS

Campbell—Notes on Injurious Southwestern Tenebrionidae (Col.).....	1	the Pacific Coast (Lepid.; Nymphalidae).....	22
Barnes and Benjamin—On the Synchrony of <i>Polia nimbosa</i> Guenée (Phalaenidae=Noctuidae, Lepid.).....	7	Entomological Literature.....	23
Brimley—Three Supposed New Species of <i>Ceraturgus</i> (Diptera, Asilidae) from North Carolina.....	8	Cockerell—Review of Handlirsch's Fossil Insects.....	28
Barnes and Benjamin—New Species and Forms of Lepidoptera (Heterocera).....	12	Kinsey—Review of MacGillivray's External Insect Anatomy.....	31
Needham—Entomological Uses for <i>Yucca</i> Stems.....	19	Doings of Societies—Entomological Section, Academy of Natural Sciences of Philadelphia (Myriopods, Lepidoptera, Diptera, Hymenoptera, Orthoptera).....	33
Editorial—Loan of Types.....	22	Obituary—Philip Nell.....	35
Coolidge— <i>Agraulis vanillae</i> Linn. on		"    Edgar Leek Dickerson.....	35

## Notes on Injurious Southwestern Tenebrionidae (Col.).

By ROY E. CAMPBELL, U. S. Bureau of Entomology, Alhambra, California.

Several species of small tenebrionid beetles at various times have been observed causing damage to young plants in California. Every year complaints come from new and widely-separated localities, indicating either that the insects are becoming more injurious, or that the continued increase of cultivated crops has removed the native plants on which the beetles fed, compelling them to seek food on the crops. The damage is invariably caused by the adults feeding on the stems of young seedlings, such as peppers and lima beans as they are coming out of the ground, or by girdling the stems of tomatoes and peppers after they are transplanted.

Most of the species found belong to the genus *Blapstinus*, but the genera *Coniontis* and *Ulus* are also represented.

Wade<sup>1</sup> has observed in the semi-arid regions of the Middle West and West, where the larvae of several genera of Tenebrionidae, among them *Blapstinus*, are destructive to young wheat and other grains, that the insects occur most abundantly in sandy and sandy loam soil. In California, one species, *Ulus crassus* Lec<sup>2</sup> was found exclusively in such locations, usually near the edge of hills, or washes which had in time past been overflowed. *Blapstinus rufipes* Csy. and *B. dilatatus* Lec. have been taken both in sandy loam soil, and also in heavy, cloddy soils, while *Blapstinus coronadensis* Blaisd. and the species of *Coniontis* have been observed only in heavy soils.

In commenting on the work of *B. dilatatus* and *B. coronadensis* on transplanted pepper plants, Dr. F. E. Blaisdell says: "I believe that cloddy ground is favorable to the breeding and hiding of these small tenebrionids. In Contra Costa County, near San Francisco Bay, I have noticed the same thing—there it is *B. elongatus* Csy. that does the mischief."

W. B. Parker observed *Blapstinus* sp. at Perkins and Hamilton City in 1912 damaging young sugar beets. The plants were injured at the surface of the soil, and while they were not cut off, were chewed until many died.

In 1913 Vaile<sup>3</sup> reported that 100 acres of lima beans were severely damaged by *Coniontis subpubescens* Lec.<sup>4</sup> near Ventura. The beetles fed on the young plants just after they came up. He also said that *Blapstinus* sp. had been reported in previous years, but had not done as much damage as *Coniontis*. Poisoned baits, as applied for cutworms, killed many of the beetles, according to his observations, and such control was

<sup>1</sup> Wade, J. S. Notes on Ecology of Injurious Tenebrionidae, Ent. News, Vol. 32, No. 1, 1921.

<sup>2</sup> The writer is indebted to Dr. F. E. Blaisdell for identification of most of the species mentioned herein.

<sup>3</sup> Vaile, R. S. A tenebrionid beetle Injuring Beans, Monthly Bull. Cal. State Com. Hort. Vol. 11, page 591, 1913.

<sup>4</sup> Specimens collected by Graf near Ventura at this time were later identified by Dr. Blaisdell as *Coniontis muscula*, and this probably is the species to which Vaile refers.

recommended. *C. subpubescens* was collected by J. E. Graf in sugar beet fields near Compton in 1915. In 1918 *Coniontis muscula* Blaisd. was taken by H. J. Ryan at Santa Paula, Ventura County, where it was damaging young beans. About the same time *Coniontis globulina* Blaisd. was observed by the writer in a 50-acre tomato field along the coast near Oxnard. The beetles fed mostly on the stems, and to some extent on the foliage. More than half of the plants were killed, necessitating replanting. Feeding was also observed on young beets and lima beans.

During the years 1915 to 1919, C. F. Stahl observed *B. rufipes* in sugar beet fields of San José. Large numbers of beetles fed on young beets just after they came up, and often destroyed fields of ten acres or more. The growers reported successful control by the use of poisoned bait.

In Orange County about 3,000 acres of peppers are raised annually. The various fields are mostly in a well-settled section, surrounded by citrus and walnut orchards, and have been cultivated for a number of years. The soil is a light sandy loam. In 1918 *B. rufipes* and *B. dilatatus* were numerous in many of these pepper fields. The beetles fed on tiny plants and cut them off as they were coming out of the ground. Damage continued until the remaining plants were 3 or 4 inches high. All feeding was done on the stems at the surface. An average of 20 per cent of the plants in the districts was destroyed and several fields required replanting. The beetles had been observed by growers for several previous seasons, but to a much less extent. In the same year *B. rufipes* fed extensively on young sugar beets in several fields in Ventura County. One 60-acre field was so badly damaged that it was plowed up. In 1919 and other years recently, the same species is reported to have caused considerable damage to young tomato plants in the San Francisco Bay region, where in many of these fields considerable replanting was required. In 1921, *B. coronadensis* and *B. dilatatus* were very numerous in several fields of bell peppers in Orange County. These also fed on the stems of the plants after the latter had been transplanted into the field, and

in many cases completely girdled the stem. In the worst infested part of the field, as high as 25 per cent of the plants were finally killed, but the field in general suffered less than 5 per cent.

The pepper field in which the beetles were most numerous was at the mouth of a small valley, and had been farmed to irrigated crops for five years. Adjoining this field was a young lemon orchard which had been kept in clean culture during the summers, and in vegetables during the winters. Between the two fields was a dirt farm road which had not been previously plowed for several years. By far the greatest damage, as well as the most beetles, was in the rows near this old road. The soil was a heavy clay loam. A similar, but less severe infestation was in another field about a half mile distant at the top of a hill 100 feet higher.

Recently reports have been received from San Bernardino County that young potatoes near Colton had been injured by *B. coronadensis*. Over 600 acres were injured, and several fields entirely destroyed. In May, 1922, 90 per cent of the plants in a 7-acre field of tomatoes near Covina (Los Angeles County) were destroyed by this species inside of two days after planting.

In 1918, DeOng<sup>5</sup> reported a series of *Blapstinus* causing serious damage of a similar sort to young castor beans in southern California.

In 1919, Vorhies<sup>6</sup> reported that a small beetle, provisionally classified as *Blapstinus pimalis* Csy., destroyed cotton plants on the Mesa Experiment Farm, Arizona, by feeding just below the surface of the soil on the seedlings as they emerged from the ground. The plot was so badly damaged as to require replanting. It had been fertilized with cottonseed meal, and as the beetles fed so readily on crushed cotton seeds and lint, it appeared probable that they had been attracted to the field by the cottonseed meal. Irrigation of the affected area was

<sup>5</sup> DeOng, E. R., Jr. Econ. Ent. Vol. II, p. 480, 1918.

<sup>6</sup> Vorhies, C. T., 30th Annual Rept. Arizona Agr. Exp. Sta., p. 347, 1919.

effective in preventing damage to the replanting, and was suggested as a proper control measure.

In tests conducted by the writer, many *Blapstinus* after being submerged in water for periods up to 18 hours, were still alive and recovered on being removed from the water.

*Ulus crassus* Lec. was first observed in 1918 associated with and more abundant than the *Blapstinus* species which were feeding on the young peppers as they sprouted. They occurred in Ventura County, feeding on the lima beans as the latter appeared above ground. Also they exhibited similar habits on young melon plants grown on sandy soil near Los Angeles. On the melons, however, they fed on the stems of the plants, leaf stems, and to some extent on the foliage. In March, 1922, Mote<sup>7</sup> reported that practically all the tomato plants were girdled near the soil line in the Salt River Valley of Arizona. When the plant which the beetles girdle falls, they collect in the shade and feed on the remainder. The insects had not been observed in this district before, but were abundant the previous July in another district, where they attacked small seedling melon and pepper plants.

The feeding habits of these beetles are quite similar. They congregate in the soil about the plants, feeding mostly on the stems at the top of the ground, but to some extent, with *Ulus* and *Coniontis*, feeding on the leaves and leaf stems. The amount eaten by an individual beetle is small, but often such numbers feed on a single stem that it is either completely girdled or cut off. Often there will be a regular ring of beetles around one stem, and occasionally rings of several layers of beetles have been observed. As many as 26 *Ulus* were observed feeding on a single lima bean stem. Seventy-five *Blapstinus*, many of which were feeding, were counted in the soil immediately around the stem of a bell pepper plant. On the bell peppers, feeding appeared to be slow, and many times the wound would heal over; but often the girdled place was too large.

Feeding is mostly confined to the tender seedling plants, just as they come out of the ground; or to the tender stems of newly

<sup>7</sup> Mote, Don C. Insect Pest Survey Bulletin, U. S. D. A., Vol. 2, No. 2, May, 1922.

set-out plants. After a week or more, when the stems begin to get tougher and harder, damage to the stems becomes less. Whether the insects breed in the fields where damage by the adults occurs is not known. From the fact that large numbers of beetles are found in the fields, feeding on seedling plants and in a few days, or a week's time, the number is often much lessened, the possibility of migration is suggested.

It has been observed that neglected fields or those in which straw, trash or other debris have accumulated are much more subject to infestation than fields on which clean culture has been practiced.

#### CONTROL MEASURES

An early experiment with poisoned bran bait scattered along the rows in a field of peppers infested with *Blapstinus rufipes*, *B. dilatatus* and *Ulus crassus* was not effective. The weather was dry and the mash quickly became hard, in which condition it did not appear to be attractive to the beetles. During the present season, however, in a squash field infested by *B. coronadensis*, a handful or two of mash placed about each hill infested with from 30 to 75 beetles, killed between 70 to 90 per cent. of them. This mash apparently retained its attractiveness for at least a week. Poisoned bran mash has also been reported by Vaile to have been used successfully in Ventura County and by Stahl in Santa Clara County.

Laboratory tests with *Comiontis globulina* using tomato foliage sprayed with lead arsenate and Paris green killed the beetles in from one to five days, depending on the strength used. The beetles feed fairly freely on the poisoned foliage.

In the San Francisco Bay region, many tomato growers who have suffered damage in previous years, now make it a practice to wrap the stems of the plants just before they are set out. They use a soft paper, such as newspaper or tissue paper, cut in rectangles about 4 by 6 inches and wrap one tightly about the stem of each plant, from the cluster of roots to the lowest leaf. Planted thus, the stem is protected, and the growth is not hindered. In this district the poisoned bran mash has been used with success.

A number of experiments in fields of bell peppers from 6 to 8 inches high showed that if any fine dusty material, such as lime, tobacco dust or kaolin, is placed so as to entirely cover the ground immediately around the stems of the plants, feeding practically ceased. This work was done in fields of heavy soil, where the fine dust was able to penetrate the soil around the stem for a fourth- to a half-inch or more.

The lime was applied with a bellows duster. By using a wide-open feed and holding the discharge pipe close to the stem, it was possible to cover the ground completely on one side of the stem with a single puff of the bellows. By proceeding up a row, giving a puff to each plant, and then coming back along the same row, the circle of dust around the stem could be completed.

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### On the Synonymy of *Polia nimbosa* Guenée (Phalaenidae=Noctuidae, Lepid.).

By WM. BARNES and F. H. BENJAMIN, Decatur, Illinois.

*Polia nimbosa* Guenée.

1852, Gn., Sp. Gen., VI. Noct., II, 77, *Aplecta*.

1857, Walk., Cat. Lep. Het. B. M., XI, 555, *Eurois*.

1873, Grt., Bull. Buff. Soc. Nat. Sci., I, 102, *Mamestra*.

1875, Speyer, Stett. Ent. Zeit., XXXVI, 142, *Mamestra*.

1891, Sm., Proc. U. S. N. M., XIV, 204, pl. VIII, f. 3 valve ♂ genitalia, *Mamestra*.

1893, Sm., Bull. U. S. N. M., XLIV, 114, *Mamestra*.

1905, Hamp., Cat. Lep. Phal. B. M., V, 115, pl. LXXXI, f. 14, *Polia*.  
race *mystica* Smith.

1898, Sm., Ent. News, IX, 242, *Mamestra*.

1905, Hamp., Cat. Lep. Phal. B. M., V, 115, pl. LXXXI, f. 15, *Polia*.

Examination of the male genitalia shows *nimbosa* and *mystica* to apparently represent a single species. In Manitoba and Alberta this species has the primaries more heavily powdered with brownish and brownish-fuscous than typical eastern *nimbosa*. To this race Dr. Smith applied the name *mystica*. Specimens from the mainland of British Columbia show a tendency to become paler; thus approaching eastern *nimbosa*.

race *mysticoides* nov.

Vancouver Island produces very pale specimens with the

primaries only slightly powdered with fuscous; appearing whitish. There is also a tendency for the t. a. and t. p. lines to become obsolescent below the median vein; whereas in typical *nimbosa* and race *mystica* the lines are usually well marked. The genitalia appear the same as those of *nimbosa* and *mystica*.

*Type locality*: Duncans, Vancouver Island, B. C., (Hanham).

*Number and sexes of types*: Holotype  $\delta$ , 9-VII-14; Allotype  $\text{♀}$ , 3-VII-12; 2  $\delta$  Paratypes, 13-VII-12, 23-VII-10; 8  $\text{♀}$  Paratypes, various July dates; 1  $\text{♀}$  Paratype, no date.

*Types in*: Barnes Collection; 1  $\text{♀}$  Paratype 15-VII-14, Canadian National Collection; 1  $\text{♀}$  Paratype 20-VII-10, E. H. Blackmore Collection.

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### Three Supposed New Species of *Ceraturgus* (Diptera, Asilidae) from North Carolina.

By C. S. BRIMLEY, Division of Entomology, N. C. Dept. of Agriculture, Raleigh, North Carolina.

In overhauling our species of this genus I find that we have three apparently new species in our collections; the descriptions follow.

#### *Ceraturgus elizabethae* n. sp.

Resembles *cruciatus* but is a little larger with the abdomen proportionately longer and more slender, and the antennae also longer. Differs from all our other species in having only one complete light pollinose cross-band on the abdomen.

$\delta$ . Black, face and cheeks golden yellow, pollinose, with a narrow black stripe down the center of the former, which is clothed with rather scant, long, black hairs, mystax black. Front and vertex black shining, the sides golden yellow, pollinose, as are also the posterior orbits. Antennae 6 mm. long, black, the fifth joint clothed with short dense black pile, the first joint longer than the second, the third more than twice as long as the first two together, the fourth very short, the fifth about as long as the third.

Thorax black with golden yellow, pollinose markings as follows: an elongate spot on the humeri, a similar spot extending from just in front of the transverse suture to some distance behind it, two dots on the suture near the middle, an elongate spot below the humeri, a dot above the base of each haltere, and

another above the hind coxae. Scutellum golden yellow, pollinose in the middle.

Wings smoky black, becoming hyaline towards the apex and on the posterior border.

Legs, the coxae mainly black with a pollinose spot on the hind pair, femora nearly black with a little yellow at the base of the middle and hind pairs and at the apex of the front and middle ones, tibiae and tarsi yellow, last joint of latter tinged more or less with dusky, front pulvilli black, the others yellow.

Abdomen with a narrow transverse band of golden yellow pollen on the apex of the first segment, and transversely elongate spots on the sides of the three following segments, these separated on the dorsum by more than their combined width, and decreasing in size posteriorly so that those on the sides of the fourth segment are barely perceptible: venter black.

Pile scantier everywhere than in *cruciatus*, that on the back of the head and at base of proboscis black, elsewhere varying shades of yellow. Length of body 17 mm.

♀. Similar to male, but pile of face and mystax scantier, and yellow in color instead of black. The elongate spot on the humeri unites with that at the suture and extends the whole length of the mesonotum. There is more yellow on the hind coxae and a yellow dot on the pleurae. All the femora yellow, the hind pairs darker, tibiae, tarsi and pulvilli all wholly yellow. Wings smoky all over, paler in the centers of the cells. Length 18 mm.

Two other females taken at Raleigh, June 21, 1922, by myself, and in late June, 1921, by T. B. Mitchell, are similar but have less yellow on the thorax and the yellow spots on the sides of the abdominal segments are lacking on the fourth in the first and on the third and fourth in the second specimen named.

*Type* male collected at Raleigh, North Carolina, June 16, 1922, by T. B. Mitchell. *Paratype* female taken *in coitu* with the type male.

Male type and female paratype will be deposited in the U. S. National Museum, female paratypes in our collection.

Named for my little friend, Elizabeth Dunn.

### ***Ceraturgus mitchelli* n. sp.**

Gray or whitish, pollinose, with almost the entire vestiture white; resembles most closely Bach's description of *dimidiatus*, but differs in having only the front tibiae yellow and in having hyaline wings.

Black, face and cheeks whitish, pollinose, with long white hair, mystax white. Front dull whitish, pollinose, but black at base of antennae above and on a narrow stripe above this: ocellar area and occiput black, narrowly whitish, pollinose, on the sides, posterior orbits narrowly white, pollinose. Proboscis black, reddish at tip. Antennae about 4 mm. long, first and second joints about equal, third about twice as long as the first two together, fourth short, fifth about half as long as third, fourth and fifth covered with very short, dense, black pile, first and second with some long, white hairs. All the hair on the head white.

Thorax black with yellowish white pollen, this forming a broad stripe along each side of the mesonotum above the wing bases which unites with its fellow before the scutellum: two, narrow, submedian bands on the dorsum, broader in front, and a narrow line on the suture, the black consisting of a broad median longitudinal stripe, (faintly divided by a median line of whitish hairs) and two large rounded spots on the sides. Scutellum margined with whitish behind. Metanotum whitish pollinose on the sides. Pleurae black, extensively white, pollinose, but with one obliquely elongate spot of golden yellow pollen.

Legs, all the coxae whitish pollinose, all the trochanters and femora black, the front femora yellow at extreme tip, front tibiae and tarsi yellow with short yellow pile, the long hairs and bristles white, middle tibiae black, yellowish at base, middle tarsi black, yellowish beneath, hind tibiae black, yellowish at the knees, hind tarsi black above, slightly yellowish beneath. Front pulvilli black, the others yellow (as is also the case with the males of *cruciatus* and *elizabethae*). Claws black. Hairs and spines of the legs white, except that there are some black hairs and spines near the base of the hind femora and beneath the hind tarsi.

Wings hyaline, tinged with yellow in the costal region, veins blackish, except in the costal region where they are yellow.

Abdomen shining black with complete, moderately broad, white, pollinose crossbands on the apices of the first five segments, these produced forwards on the sides nearly or quite to the anterior margins, sixth segment with a triangular white pollinose spot on each side, seventh segment unmarked, a tuft of yellow hairs on each side of the hypopygium. Length of body 18 mm.

*Type* and only specimen taken at Swannanoa, North Carolina, May 26, 1923, by T. B. Mitchell for whom the species is named. Type will be deposited in the National Museum.

*Ceraturgus mabelae* n. sp.

Differs from the other species of the genus in having no black at all on the abdomen.

Dark brown, face and cheeks golden yellow, pollinose, mystax and beard yellow, front and occiput black, shining, narrowly golden, pollinose next the eyes, posterior orbits grayish pollinose, hairs of front, occiput and back of head black. Antennae about 3 mm. long, black, first and second joints subequal, third about one and one-half times as long as the first two together, fourth short, about as broad as long, broader at apex, fifth flattened, rather broad, tapering to the apex, clothed with short dense black pile. Hairs on the basal antennal joints black.

Thorax golden yellow, pollinose, with the usual broad, median dark stripe, and two large rounded dark spots on each side, scutellum and posterior part of mesonotum yellowish brown, the former golden yellow, pollinose, on the margin, a rounded golden yellow, pollinose spot on each side of the metanotum. Short hairs of the thoracic dorsum black, the long ones mainly yellow. Pleurae almost wholly golden, pollinose, this divided into spots by the sutures. Wings wholly hyaline. Legs dark yellowish brown, somewhat lighter on the front tarsi, all the coxae golden yellow, pollinose, hairs and spines of legs yellow.

Abdomen wholly yellowish brown above, each segment with a broad posterior band of golden pollen, the last three or four segments being almost wholly pollinose. Venter wholly yellowish. Length of body 12 mm.

Described from a single female collected in late May, 1920, at Linville Falls, North Carolina, by Franklin Sherman, Chief in Entomology. The type will be placed in the U. S. National Museum.

Resembles *nigripes* in size and *cruciatus* in shape.

Named for my young friend, Mabel Payne.

The following key appears to separate the species of *Ceraturgus* of which we have specimens or descriptions.

1. Abdomen without any black ..... *mabelae*  
Abdomen with black ..... 2
2. Legs all black ..... *nigripes*  
Legs partly yellow or yellowish ..... 3
3. None of the hair on the head black ..... 4  
Some of the hair on the head black ..... 6
4. Legs all yellow, body almost wholly golden yellow, pollinose, size small (length 8-9 mm.) ..... *aurulentus*

- Legs largely black, size larger (length over 10 mm.) . . . 5
5. Front tibiae yellow others black, wings hyaline. . . *mittchelli*  
Front and middle tibiae yellow, wings not hyaline  
*dimidiatus*
6. Only one complete light pollinose crossband on the abdomen, namely that on the first segment. . . . *elizabethae*  
Several complete crossbands on abdomen . . . . . 7
7. Beard and mystax yellow, size smaller . . . . . *similis*  
Beard black, mystax often partly so . . . . . *cruciatus*

## New Species and Forms of Lepidoptera (Heterocera).

By WM. BARNES and F. H. BENJAMIN, Decatur, Illinois.

### *Automeris zephyria* form *zephyriata* nov.

Entirely similar to *zephyria* but with the fuscous tints of the primaries, secondaries, and thorax, largely replaced by deep rufous.

*A. zephyria* form *zephyriata* holds the same relative position to *zephyria* that *A. pamina* form *aurosca* holds to *pamina*. It apparently emerges as an uncommon form in bred lots. Intergrades occur.

*Type locality*: High Rolls, New Mexico, (Bonniwell).

*Number and sexes of types*: Holotype ♂, April; Allotype ♀, April; 4 ♂ Paratypes, March (1), April (2), July (1); 2 ♀ Paratypes, no date.

### *Epia jola* sp. nov.

1913, B. & McD., Contr. Nat. Hist. Lep. N. A., II, No. 1, 14, pl. VI, f. 11, as *cetrapela*, *Epia*.

Primaries: ground color whitish, heavily overlaid by fuscous shades; basal line black, double, included space white, waved from costa to below cell, thence obsolete; its point of obsolescence being marked by a broken, basal, black dash; t. a. line black, double, included space white, strongly and obliquely excurved to claviform, thence drawn to a mesal point on vein 1, thence distally produced to a point below vein 1; claviform large, outlined and more or less filled in by black; orbicular outlined by black, white filled with a central fuscous shade; an oblique white shade from orbicular to near inner margin; reniform outlined by black, white filled, with a darker central crescent which has a whitish center; a waved, fuscous, median shade, connecting the reniform with the distal end of the claviform, and the inner margin; t. p. line produced to points on the veins, black, double, included space white, strongly excurved from costa to about vein 4, incurved to inner margin; s. t. space with a black patch on costa, and sagittate black dashes between veins 2-3, 3-4, 4-5; s. t. line inwardly oblique from costa to about vein 7, broken, again starting on vein 7 almost parallel to outer margin, pro-

duced on veins 3 and 4 forming a small W-mark; terminal space not intersected by black dashes; a terminal line of black crescents between the veins; fringe whitish-gray, interlined by fuscous.

Secondaries: fuscous, somewhat paler basally, veins darker, with discal spot and median shade.

Beneath: whitish, powdered by black; both pairs of wings with discal spots and darker outer margins; secondaries showing obscure median and s. t. shade lines, and with the discal spot often connected to the base by a bar of black scales. *Expanse*: 28-33 mm.

Allied to *minorata*, but lacking the strong brown tinges, with the s. t. space much wider, dashes in the s. t. space not obsolescent (as in the type male of *minorata*, Havilah, Calif., Hy. Edw. Coll.), besides possessing less strongly laminated and ciliated antennae in the male.

Perhaps more closely allied to *cctrapela*, but much more brightly marked. Compared with the series in the Smith Collection it seems quite distinct from the female type from Agnes Lake, British Columbia, and nearer to specimens labeled *minorata*.

It is possible that further specimens may show intergrades with true *cctrapela*, but twenty-two specimens from Utah, seem to present an almost uniform appearance. Seven specimens from Wallace, Idaho, received through the kindness of Messrs. Doll and Marloff, seem to be the same species, altho slightly darker than the Utah specimens. Genitally there appears to be a slight difference between the Utah and Idaho specimens in the spinulation of the penis, but this is probably individual. In order to insure against a mixed series, the types are restricted to the following:

*Type locality*: Eureka, Utah (Tom Spalding).

*Number and sexes of types*: Holotype ♂, 1 July 1921; Allotype ♀, 1 July 1921; 8 ♂, 12 ♀, Paratypes, various dates from 21 June to 1 August.

*Types in*: Barnes Collection; Paratypes, Brooklyn Museum, Canadian National, Marloff and Spalding Collections.

***Hyssia marloffii* sp. nov.**

Primaries: ground color violaceous-gray, powdered with black; basal line black, double, outwardly oblique from costa to radius, thence almost erect to median vein where it becomes obsolescent; t. a. line black,

double, outwardly oblique from costa, interrupted by a slight tooth above cell, inwardly oblique from submedian fold, produced to a long point below vein 1; median shade black, outwardly oblique from costa to inner margin; t. p. line black, double, produced to small points on the veins, excurved from costa to about vein 5, thence inwardly oblique, with a slight curvature, to inner margin; s. t. line marked on the costa by a black patch, thence as a pale diffuse shade, marked by small black dots, to inner margin; terminal line of black dots; basal-t. a. area heavily powdered with black, disconcolorous with the basal half of the median area; orbicular present but obsolescent, faintly outlined by a few black scales; reniform large, more or less kidney-shaped, yellowish, with somewhat darker central crescent, obscured on median vein by fuscous; cell between median shade and reniform filled in with black; a black dash connecting the reniform with the t. p. line; another black dash, in submedian fold, connecting the basal line with the t. a. line, thence often faintly marked to the median shade; fringe basally checkered by a line of whitish blotches.

Secondaries fuscous, somewhat paler basally; fringe white, with a fuscous interline.

Beneath: primaries suffused with fuscous, with t. a. line marked on costa, a black discal spot, and t. p. line reproduced as a black shade, terminal line and fringes as on upper side. Secondaries: suffused with fuscous, paler basally, with black discal spot and median shade line, fringes as on upper side. Some of the maculation on the under side may be lost by suffusion. *Expanse*: 25-28 mm.

According to specimens compared with the type of *H. fasciata* Smith, the present species is closely allied, by the black dash connecting the reniform with the t. p. line, but presents a considerably different habitus due to the primaries being more heavily powdered with black, while the dash in the submedian fold, and the dark basal-t. a. area plus the dark area distad of the median shade causes the mesal half of the median area to present a strong contrast, appearing as a pale oblique band.

True *H. fasciata* is in the Barnes Collection only from "New Mexico (F. H. Snow)," and High Rolls, New Mexico, Bonniwell.

*Type localities and number and sexes of types*: Holotype ♂, Ft. Wingate, 8-15 July; Allotype ♀, id., 1-7 July; 2 ♂ Paratypes, id., 24-31 July, 1-7 Aug.; 2 ♂ Paratypes, Jemez Springs, 28 July 1921, (6400 ft.), 24-31 Aug.; 1 ♀ Paratype, id., 16-23 Aug.

*Types* in: Barnes Collection, except 1 ♂ Paratype, 28 July 1921, received from Mr. Fred Marloff for identification, and returned to him.

***Syneda athabasca* Neum.**

1883, Neum., Papilio, III, 143, *Syneda*.

Mr. Neumoegen states in the original description, "secondaries yellowish white." The types in the Neumoegen Collection appear to have yellowish-white secondaries. A series of specimens from Calgary and Nordegg, Alberta, in the Barnes Collection, vary greatly in the color of the secondaries, but always showing at least a considerable yellowish tinge. The authors are unable to state whether the pale condition of the secondaries of some specimens is the result of fading while the insect is still alive, or while in collections, or due to chemical action of ammonia in poor killing bottles; or if there actually are individual differences.

***Syneda athabasca* race *crokeri* nov.**

A series of eight specimens from Saskatchewan, and three specimens without locality, in the Barnes Collection, do not show the faintest trace of yellow on the secondaries. There are additional specimens in the Brooklyn Museum. It seems impossible that these specimens could have completely lost all trace of yellow, as such a condition is not present in hundreds of specimens of the various species of *Syneda* in the Barnes Collection.

The authors are inclined to consider the white hind-winged form a geographical race, although it appears to be more worthy of specific rank than many of the so-called "species" of *Syneda*. Most, and probably all, of the specimens were collected by A. J. Croker.

*Type localities and number and sexes of types*: Holotype ♂, Allotype ♀, 3 ♂, 1 ♀, Paratypes, "Sask. Canada, 27-6-07 A. J. Croker"; 1 ♀ Paratype, "Redvers, Sask. 27-6-07"; 1 ♀ Paratype, "Redvers, Sask. 4-6-06 A. J. C."; 1 ♀ Paratype "9-6-06"; and 2 ♀ Paratypes, no data, in Barnes Collection; also a series of specimens from A. J. Croker in the Brooklyn Museum Collection.

***Anticarsia schausi* sp. nov.**

Head, thorax, abdomen and wings concolorous, brownish-rufous, more or less tinged with violaceous.

Primaries: t. a. line waved from costa to inner margin; orbicular a small yellowish dot; median shade line more or less obsolescent in some specimens, in others clearly defined, outwardly oblique from costa to reniform, thence inwardly oblique to inner margin, produced to points on veins 2 and 1; reniform yellowish, erect, narrow, with a black central line; t. p. line erect between costa and radius, excurved to vein 3, thence incurved, produced to a point on vein 1, s. t. line composed of black dots between the veins; terminal series of black dots between the veins connected by a few fuscous scales and a bright rufous line; fringes bright rufous, interlined by violaceous.

Secondaries: with black discal mark and median shade line; a sub-terminal series of dots corresponding to the s. t. line of the primaries present or absent; terminal line and fringes as on primaries.

Beneath: bright brownish-rufous, maculation similar to the upper side except that the t. a. line is absent and that the other lines and spots are more contrastingly black, more or less outlined by luteous-white; the veins bright red. *Expanse*: 37-40 mm.

The authors are enabled to describe the present species thru the kindness of Mr. Schaus, who supplied a specimen of *A. mixtura* Wlk. = *leucoma* F. F. & R. for comparison. *A. schausi* appears genitally distinct, its closest ally being *feruginca* Sm., from which it may be easily recognized, by the reniform being yellowish and not strongly broken by intersecting veins, and by its more even and less patchy appearance.

*Type localities and number and sexes of types*: Holotype ♂, Palmerlee, Cochise County, Arizona; 3 ♂ Paratypes, id.; 2 ♂ Paratypes, Southern Arizona (Poling); 6 ♂ Paratypes, Huachuca Mts., Arizona, the only dated specimen being from the Huachuca Mts., 8-15 October.

***Hemeroplanis finitima* race *concoloralis* nov.**

Tibiae and underside of the primaries without secondary sexual characters. Head, collar, thorax, abdomen, and ground color of wings, concolorously dull brown.

Primaries: t. a. line blackish, punctiform, almost erect, only slightly incurved in submedian fold; orbicular not present; reniform poorly marked by a few blackish scales; t. p. line yellowish, almost erect from costa to vein 4, incurved in submedian fold, preceded by a punctiform black line; s. t. line punctiform, parallel to the outer margin, marked by black sagittate dashes and small violaceous spots between the veins; a terminal series of faint black dots between the veins; fringe concolorous with the primaries.

Secondaries: similar in color to the primaries, only very slightly paler basally, with an obsolescent discal spot and s. t. shade.

Beneath: primaries: dull brownish with a slight rufous cast; a faint blackish discal spot; median and s. t. shades blackish, parallel to the outer margin. Secondaries: pale, sprinkled with black atoms and strongly tinged with rufous; with blackish discal spot; blackish median and s. t. shades parallel to the outer margin. *Expanse*: 27 mm.

This form has been standing as possibly *H. reversalis* Sm., in the Barnes Collection. Examination of the type of *reversalis* in the Smith Collection proved that *reversalis* was more closely allied to *secundalis*.

*Concoloralis* is possibly a distinct species with a more northern habitat than *finitima*. The type is the only specimen the authors have seen from so far north in California, and it is not closely approached by over one hundred and thirty specimens representing *finitima* and its various forms. The t. p. line, especially on the underside where it shows as a "median shade," appears a little straighter than in typical *finitima*, and is not excurved below the costa.

As the name is based upon a single specimen, and mainly upon characters which are variable in the group, it appears best to describe it as a northern race of *finitima*. There are probably more names than species in the genus *Hemeroplanis* (= *Pleonectyptera*), but most of the names will eventually have at least "form" status.

*Type locality*: Shasta Retreat, Siskiyou County, California.

*Number and sexes of types*: Holotype ♂, 8-15 August, unique.

#### *Metalestra diabolica* sp. nov.

Ground color brownish rufous, but so covered with indistinct markings as to appear blackish.

Primaries: basal line rufous, obsolescent except on costa; t. a. line rufous, poorly defined, waved from costa to inner margin; orbicular a small round black dot, often obsolescent; median shade double, more or less diffused in a generally fuscous basal-median system of shades; the area between the median shades and the t. p. line rufous, more or less obscured by fuscous; reniform black, distinct; t. p. line black, produced to blunt points on the veins, rounded from costa, drawn in to a point opposite the cell, this point being marked by a black dot, again excurved to about vein 3, thence incurved to inner margin but interrupted by being produced to a point on vein 1; the t. p. line followed by a rufous shade line in contact with it for its entire length; s. t. line faint, yellowish-rufous, strongly bent inward below costa, opposite the cell, and in the submedian fold; terminal line composed of narrow, black

crescents, the hollows between the veins being filled by yellowish dots; fringe black, more or less checkered by yellowish.

Secondaries: basal area heavily obscured by black shades; discal spot large and black but often difficult to see because of being fused with, and obscured by, the black basal shadings; medial line narrow, black, more or less irregular, outwardly produced opposite the cell; followed by an obsolescent pale shade line; an s. t. intermediate pale shade line; terminal line, yellow dots, and fringes as on the primaries.

Beneath: ground color dirty-yellowish, heavily powdered with fuscous; terminal lines and fringes as on the upper side; primaries with a black discal dot and median shade line; secondaries with blackish discal dot bounded mesially and distally by blackish shade lines which make contact with it, ordinary median shade line black and distinct. *Expanse* 18-23 mm.

This is the *tantillus* of various authors. Specimens were sent to Sir George Hampson, who failed to match it in the British Museum, returning a specimen marked "not *tantillus*." A specimen of *monodia* agreed with the type of *tantillus*.

It is possible that Grote had a mixed type series as he records *tantillus* from Texas, but his description agrees identically with his type in the British Museum and not with *diabolica*, so the name is restricted to the British Museum type.

Both authors have personally compared specimens, of the two species involved, with the types of *monodia*, and the series of other *Metalestra* in the National Museum, where *diabolica* is placed as *tantillus*. Mr. Schaus kindly informed the junior author that no tropical species entered into the synonymy.

*M. diabolica* belongs to that group of *Metalestra* which lacks the yellowish dashes on the veins in the s. t. space at the ends of the points of the t. p. line. From *edilis* and *cincta* it may be told by its darker appearance and totally different habitus; from *miserulata* (= *ircentis*) by the possession of either a large black discal spot on the secondaries or heavy banding which obscures the spot; while from *tantillus*, its closest ally, by not possessing a nearly unicolorous black appearance only interrupted by narrow broken, but strongly contrasting, whitish-yellow lines.

*Type localities and number and sexes of types*: Holotype ♂, San Benito, 16-23 June; Allotype ♀, id., 8-15 July; 8 ♂ Paratypes, id., 16-23 June (1); id., Aug. (1); Kerrville, April (2); id., no date (1); Black Jack Springs (1); Brownsville (1); Harris County, 16-23 Sept. (1); 2 ♀ Paratypes, San Benito (1); Brownsville, "5-11," Geo. Dorner (1), all Texas.

Types of all the forms here described as new are in the Barnes collection, unless otherwise stated.

## Entomological Uses for Yucca Stems.

By JAMES G. NEEDHAM, Cornell University, Ithaca, New York.

During my year as exchange professor in Pomona College, I lived in the land of magnificent yuccas. They grew sparingly scattered about the mesa near at hand, and more abundantly about the foot of the mountain slopes farther away, rising starkly above the chaparral to a height of 20 or 25 feet, a unique and conspicuous feature of the landscape.

On my first trip out from Claremont to the Cañons in the adjacent San Gabriel mountains in September, I broke off a dead yucca stem and took it home and cut it up in part into sections to be used for pin cushions—a use well known to the general public in yucca-land. Having stock left over, stock that was clean, white, very light in weight, soft and easily worked, I began to find new uses for it. The stems may readily be cut crosswise with a coping saw, or punched lengthwise with any thin-walled tubular instrument, or sliced in any direction with a sharp knife. The stems are commonly 3 to 6 inches in diameter at the base, composed of a thin, tough, yellow rind inclosing a soft white pith, that is easily penetrated or split lengthwise but that holds pins rather well, if they are inserted crosswise. These qualities adapt dry yucca to the following uses:

1. *Pinning blocks*: Short sections of the stem set up on end; these are the entomologists' pin cushions, known and used by many, especially in the southwest. They serve well as depth gauges in setting insects to a proper height on pins, if one grasp the pin heads uniformly and push the pin down through the body of the fresh insect until his finger tip just touches the pith. Glued to a heavier base that will keep them from toppling over, they will receive and hold scalpel, forceps, scissors, needles, etc., as well as pins.

2. *Cyanide caps for the bottom of killing bottles*. For this use the stem is cut lengthwise in thin sheets, say an eighth of an inch in thickness. The sheets are cut into circular discs to fit the inside of the killing bottle *tightly*. Shears will cut them readily. With powdered cyanide of potassium and a little dry

oxalic acid placed in the bottom of the bottle one of these discs is pressed down to the bottom by something having a broad, flat surface (such as the bottom of another smaller bottle) and then a second disc is added with its grain crosswise to that of the first one. The discs undergo compression at the edges and need no glue to keep them in place. They are easiest fitted into large shell vials, but may be bent up at the sides and inserted into any wide-mouth bottle. If smoothly cut the feet of the insect will not catch in them. They are porous, clean and white and easily replaceable. If the top one becomes soiled, a third one may be quickly added, making the bottle as new. They do not add weight, like plaster of paris, and they hold much better than blotting paper discs.

3. *Micro-blocks for pin-point mounting.* Only the finer textured pith is suitable for this; the rapidly-grown, open-meshed basal portion will not hold securely on the pins. Blocks of uniform size are easily obtained by punching suitable pith with a small metal tube, withdrawing the cylinder of pith from the tube and cutting it into pieces of uniform length. Into one of these pieces the micro pin, and the holding pin are inserted in the same way as into cork or paper strips. For a punch I used a 5-inch piece of small, thin-walled brass curtain rod.

4. *Spreading blocks.* These are made by shaving off a tangential lengthwise strip from two opposite faces of a thick block of yucca with a sharp knife, and cutting suitable groove or grooves on each of the two faces. I make the groove by punching out the pith beneath the face (as under 3) and then, with a sharp knife, cutting a slit down into the punched hole of a width adopted to the size of the bodies of the insects whose wings are to be spread. If a downward slope to the sides of the groove is desired it is easily obtained by shaving off the surface with a sharp knife. I make my blocks with a single median groove for macros on one side, and a pair of smaller grooves for micros on the other. The smooth white pith makes a nice soft surface on which to spread the most delicate wings, and it takes pins more readily than soft wood. I have abandoned the use of cumbersome and expensive modern pinning boards altogether.

5. *Small containers for duplicate micros.* When hundreds of parasites and hyperparasites were emerging from some of my rearing cages, and it seemed desirable to save them all, and I was put to it to find time to preserve them all in the usual way, some pieces of yucca pith out of which I had punched micro-blocks (as under 3) lay before me, and I used these for containers. I plugged one end of the hole with a piece of the pith punched from it, put in the freshly killed insects, plugged the other hole with cotton, and wrote the necessary data on the smooth surface of the pith, which takes ink very well. Since then I have sent small specimens of many sorts to specialists in this sort of containers. They may be softened in a water bath and opened by splitting, being of so small value and so easily replaceable.

6. *Small shipping cases for single vials.* Punch a hole to fit the vial lengthwise of a piece of yucca stem, insert the vial with a piece of the pith from the punch replaced in the ends of the hole, wrap, and mail, and save postage.

7. *Tops for small breeding cages.* An inch-long section of a large yucca stem may have the top end of a tin can pressed into it, making a closed cage. If a removable shell vial be first fitted into the yucca cap, the cage will be of the best sort for rearing insects that are attracted to light. The vial may be fitted to the place by using it to punch its own hole, and then removing the plug from its mouth, and then withdrawing the vial till its mouth is on a level with the inner surface of the pith. With a tin can, a pith section and a shell vial at hand such a cage can be made in two minutes. Nothing better can be had for rearing gall-makers, leaf-miners, and other small insects when found in the pupal stage.

This last is the most important use I have found for yucca stems.

The stems should be cut in August, when fully mature and before the rains have come to darken their color, and, of course, stems that are free from the all too frequent holes of burrowing beetles should be selected for these uses.

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., JANUARY, 1924.

## Loan of Types.

Types appear to be the court of last resort in systematic entomology. In the narrow sense they are the property of institutions or individuals. Broadly speaking they are the property of the entomological world at large and the individuals and institutions are holding them in trust for the students of the present and also for those that come after.

If loaned they are subjected to many kinds of risk and not infrequently lost or destroyed.

The systematic worker is often grieved when he is refused the loan of types and seldom considers that future students would apply censure to the owners, if lost or destroyed when loaned out.

If types were loaned, especially by an institution having thousands of them, it would become very burdensome to be sending them whenever there was an application. One distinguished American entomologist said: "If persons are obliged to see my types to identify species, my descriptive work must be faulty and not worth while."

It is a question whether a donor's types should be loaned without his consent if he is living. Not infrequently types are presented with the understanding that they are not to be loaned.

There are some individuals that have no moral sense and who will acquire specimens in any way possible and institutions can't be too careful in such matters.

It is probably safest not to loan types, especially those held as holotypes.—HENRY SKINNER.

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## *Agraulis vanillae* Linn. on the Pacific Coast (Lepid.; Nymphalidae).

The late W. G. Wright was mistaken when he wrote in his *Butterflies of the West Coast* that this species was not a native of the West Coast, but was introduced into California following the opening of the Southern Pacific Railroad from New Orleans, about 1885. The butterfly is certainly indigenous to the Mohave and Colorado Desert regions, and as early as 1876

was reported to be very abundant about San Diego. *Vanillae* is very common in Southern California, especially in the hotter fall months, but I have records of it for every month of the year. Above Santa Barbara County it becomes rarer, and I know of only several captures in the San Francisco Bay region. Several years ago I received from Mr. W. J. Chamberlin a specimen of *vanillae* taken at Corvallis, Oregon, in June. Very possibly this example was imported in some early stage on its food-plant.

The species of *Passiflora*, upon which *vanillae* feeds as a larva, are with the exception of a few Malayan, Chinese and Australian species, natives of tropical America. In California the commonest species is *P. caerulea*, and this seems to be the only one that can be grown successfully as far north as San Francisco. Other species are *P. edulis* Sims.; *P. laurifolia* Juss., the Jamaica Honeysuckle or Water Lemon; *P. mollissima* Bailey and the Red Passion Vine, *P. mandicata* Pers. Strangely, still another species, *P. radiata*, perhaps better known as *P. princeps*, appears to be immune from the attacks of the larvae of *vanillae*. I have never been able to locate any larvae on it, and horticulturists tell me that they regard it as caterpillar-proof. I have not been able to locate the food-plant of *vanillae* on the desert regions, but possibly species of *Trifolium* supply food for the larvae, as on several occasions I have noted females hovering about this as though bent on ovipositing.—KARL R. COOLIDGE, Hollywood, 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.

Papers of systematic nature will be found in the paragraph at the end of their respective orders. Those containing descriptions of new genera and species occurring north of Mexico are preceded by an \*.

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. 9—The Entomologist, London. 10—Proceedings of the Entomological Society of Washington, D. C. 12—Journal of Economic Entomology, Concord, N. H. 13—Journal of Entomology and Zoology, Claremont, Cal. 14—Proceedings of the Zoological Society of London. 21—The Ento-

mologist's Record, London. 22—Bulletin of Entomological Research, London. 40—Genera Insectorum, Diriges par P. Wytsman. 44—Ectoparasites. Edited by Jordan & Rothschild, Tring, England. 48—Wiener Entomologische Zeitung. 49—Entomologische Mitteilungen, Berlin-Dahlem. 52—Zoologischer Anzeiger, Leipzig. 61—Proceedings of the California Academy of Sciences, San Francisco. 68—Science, Garrison on the Hudson, N. Y. 69—Comptes Rendus, des Seances de l'Academie des Sciences, Paris. 71—Novitates Zoologicae, Tring, England. 76—Nature, London. 82—The Ohio Journal of Science, Columbus, Ohio. 85—The Journal of Experimental Zoology, Philadelphia. 100—Biological Bulletin of the Marine Biological Laboratory, Woods Hole, Mass. 112—Entomologische Berichten, The Hague. 118—Die Naturwissenschaften, Berlin. 133—Zoologica. Scientific Contributions of the New York Zoological Society. 134—Annales de Biologie Lacustre, Brussels. 147—Archiv für Mikroskopische Anatomie und Entwicklungsmechanik, Berlin. 151—Occasional Papers of the Boston Society of Natural History. 152—United States Department of Agriculture.

**GENERAL.** Colledge, W. R.—An interesting insect larva. (Queensland Nat., 1923, 39-40.) Eggers, F.—Ergebnisse von untersuchungen am Johnstonschen organ der insekten und ihre bedeutung für die allgemeine beurteilung der stiftführenden sinnesorgane. 52, lvii, 224-40. Finkler, W.—Die ueberpflanzung von insektenkopfen. 48, xl, 77-80. Kopftransplantation an insekten. 147, xcix, 104-133. Graham, S. A.—Effect of physical factors in the ecology of certain insects in logs. (Rep. Sta. Ent. Minn., xix, 22-40.) Horn, W.—Et meminisce et vaticinari liceat. 14. Ueber "Typen." 49, xii, 210-13. Hoyt, W. D.—Some aspects of the relation of species to their environment. 68, lvii, 432-4. Karny, H. H.—Ueber die anwendung der nomenklaturregeln. 49, xii, 168-98. Knoll, F.—Insekten und blumen. Experimentelle arbeiten zur vertiefung unserer kenntnisse ueber die wechselbeziehungen zwischen pflanzen und tieren. (Abh. Z.-B. Ges. Wien, xii, H. 1-2.) Rothschild, N. C.—Obituary. 21, xxxv, 175-6. 76, cxii, 697. Sheppard, T.—Zoological bibliography. 76, cxii, 652. Summers, J. N.—A refrigerator for shipping live insects. 12, xvi, 539-43. Tiegs, O. W.—Researches on the insect metamorphosis. (Trans. R. Soc. So. Australia, xlvi, 319-527.) Walton, W. R.—Some phases of insect parasitism. (Can. Field-Nat., xxxvii, 128-32.) West & Hull—List of manuscript bibliographies in the biological sciences. (Rep. & Circ. Ser., Nat. Res. Council, No. 45.)

**ANATOMY, PHYSIOLOGY, MEDICAL, ETC.** Blunck, H.—Krankheiten, feinde und schmarotzer des gelbrands. 52, lvii, 296-328. Mann, M. C.—A demonstration of the stability of the genes of an inbred stock of *Drosophila melanogaster* under experimental condition. 85, xxxviii, 213-44. Mavor, J. W.—An effect of X-rays on the linkage of mendelian characters in the first chromosome of *Drosophila*. (Genetics, viii 355-66.) Redway, J. W.—Disease carriers: Biological and geographical. (Ecology, iv, 335-40.) Stieve, H.—Neuzeitliche ansichten ueber die bedeutung der chromosomen, unter besonderer beruecksichtigung der Drosophilaversuche. (Zeit. f. d. Ges. Anat., Berlin, Abt. 3, xxiv, 491-587.) Toedtmann, W.—Die spermatozoen von *Gryllotalpa vulgaris*. 52, lvii, 287-91.

**ARACHNIDA AND MYRIOPODA.** Kastener, A.—Beitrage zur kenntnis der locomotion der Arachniden. 52, lvii, 247-53.

Chamberlin, R. V.—On four termitophilous millipeds from British Guiana. 133, iii, 411-21. \*Emerton, J. H.—New spiders from Canada and the adjoining states. No. 3. 4, lv, 238-43. Oudemans, A. C.—Acarologische aantekeningen. 112, vi, 200-8. \*Moore, J. I.—A review of the present knowledge of fossil scorpions with the description of a new species from Pottsville formation of Clay County, Ind. (Proc. 38 An. Meet. Indiana Ac. Sci., 1922, 125-34.)

**THE SMALLER ORDERS OF INSECTA.** Brocher, F.—La corne prosternale des larves des Trichopteres. 134, xii, 83-91. Hegh, E.—Les termites, Partie generale. Description, Distribution géographique, Classification, Biologie, Vie sociale, Alimentation, Constructions, Rapports avec le monde extérieur. [Reviewed in Psyche, xxx, Nos. 3-4, p. 133.] Searle, J.—The sticktight flea, *Echidnophaga gallinacea*. (Victorian Nat., xl, 119.)

\*Chamberlin, J. C.—A revision of the genus *Anisembia*, with description of a n. sp. from the Gulf of California. 61, xii, 341-51. \*Claassen, P. W.—News sps. of N. American Plecoptera. 4, lv, 257-63. Folsom, J. W.—A new lepidopteran from Porto Rico. 10, xxv, 170. Termitophilous Apterygota from British Guiana. 133, iii, 385-402. Silvestri, F.—Descriptiones termitum in Anglorum Guiana repertorum. 133, iii, 307-21. Williamson, E. B.—Notes on American species of *Triacanthagyna* and *Gynacantha*. (Misc. Pub. Univ. Mich., Mus. Zool., No. 9.)

**ORTHOPTERA.** Bucknell, E. R.—*Cyphoderris monstrosa* in British Columbia. 4, lv, 225-30. Mercier et Poisson, Contribution a l'etude de l'atrophie des ailes et des muscles

du vol chez les Forficulidae. 69, 1923, 1142-45. **Seliskar, A.**—Die männlichen duftorgane der hohlenheuschrecke *Troglophilus*. 52, lvii, 245-68. **Weiss, H. B.**—The chinese mantis, a beneficial insect in New Jersey. (N. J. Dept. Agr., Bur. Stat. & Insp., Circ. 68.)

**Hebard, M.**—Studies in the Dermaptera and Orthoptera of Colombia. Third paper. Orthopterous family Acrididae. 2, xlix, 165-313.

**HEMIPTERA.** **Cragg, F. W.**—Observations on the bionomics of the bed-bug *Cimex lectularis*, with special reference to the relations of the sexes. (Ind. Jour. Med. Sci., xi, 449-73.) **Knight, H. H.**—Studies on the life history and biology of *Perillus bioculatus*, including observations on the nature of the color pattern. (Rep. Sta. Ent. Minn., xix, 50-96.) **Readio, P. A.**—The life history of *Jalysus spinosus* (Neididae). 4, lv, 230-36.

**Chamberlin, J. C.**—A systematic monograph of the Tachardiinae or lax insects. (Coccidae). 22, xiv, 147-212. **\*Ferris, G. F.**—Observations on the Chermidae. 4, lv, 250-56. **Green & Laing.**—Descriptions of some new sps. and some new records of Coccidae.—I. Diaspidinae. 22, xiv, 123-32. **McAtee, W. L.**—Tingitoidea of the vicinity of Washington, D. C. 10, xxv, 143-51. **Melichar, L.**—Homoptera. Fam. Acanalonidae, Flatidae et Ricaniidae. 40, Fasc. 182, 185 pp. **Morrison, H.**—On three apparently n. sps. of Termitaphis. 133, iii, 403-8. **\*Oestlund, O. W.**—A synoptical key to the Aphididae of Minnesota. (Rep. Sta. Ent. Minn., xix, 114-51.)

**\*Sanders & DeLong.**—Nine n. sps. of Cicadellidae from the U. S. and Canada. 10, xxv, 151-56. **\*Van Duzee, E. P.**—A new subsp. of *Euryophthalmus cinctus*. 4, lv, 270.

**LEPIDOPTERA.** **Bishopp, F. C.**—The puss caterpillar and the effects of its sting on man. 152, Dept. Circ. 288. **Butler, A. G.**—Reversion to ancestral colouration. 9, lvi, 263. **Crozier, W. J.**—On the locomotion of the larvae of the slug moths (Cochliidiidae). 85, xxxviii, 323-30. **Meadows, D. C.**—Notes on the lepidoptera of southern California. No. 1. 13, xv, 33-4.

**\*Barnes & Benjamin.**—Notes on the egans-group of *Oligia* (Phalaenidae). 4, lv, 264-5. **Gibson, A.**—The specific name of the green bud-moth. 4, lv, 243. **Prout, L. B.**—New Geometridae in the Tring museum. 71, xxx, 191-215. **Schaus, W.**—A new gen. and sp. of moth of economic interest in the U. S. Nat. Mus. 10, xxv, 164. **Schaus & Cockrell.**—Three new forms of *Rhopalocera* from Colombia and a new geometrid moth from Madeira. 10, xxv, 162-4.

**DIPTERA.** Hearle, E.—Notes on two mosquitoes from Br. Columbia. 4, lv, 265-6.

Aldrich, J. M.—The present status of Coquillett's *Hypochoaeta longicornis*. 10, xxv, 161-2. Austen, E. E.—A revision of the family Pantophthalmidae, with descriptions of n. sps. and a n. gen. 14, 1923, 551-598. \*Cole, F. R.—Diptera from the islands and adjacent shores of the Gulf of California. 61, xii, 457-481. \*Curran, C. H.—A new dolichopodid from Ontario. 4, lv, 236-7. The genera of the family Blepharoceridae. [Includes key to genera of the World.] A new syrphid from Ontario. 4, lv, 266-9; 269. \*Garrett, C. B. D.—Two new D. in the Canadian national collection, Ottawa. New North American D. 4, lv, 244; 245-6. \*Greene, C. T.—A new sp. of *Volucella*. 10, xxv, 165-8. \*Johnson, C. W.—New and interesting species of diptera. 151, v, 69-72. \*Jordan & Rothschild.—New American Siphonaptera. On the genera *Rhopalopsyllus* and *Parapsyllus*. 44, i, 309-19; 320-70. Schmitz, H.—Zwei neue Phoridae aus Australien und Brasilien. 112, vi, 188-92. \*Van Duzee, M. C.—Diptera of the family Dolichopodidae, collected on the Katmai expedition. 82, xxiii, 241-62.

**COLEOPTERA.** Dodds, C. T.—A list of coleoptera collected on the beach during the summer of 1921 at Laguna Beach, California. 13, xv, 35-6. Herrick, G. W.—Notes on the biology of *Desmocerus palliatus*. 12, xvi, 546-8. Janisch, E.—Ueber alterserscheinungen bei insekten und ihre bekämpfungsfysiologische bedeutung. 118, 1923, 929-31. McIndoo, N. E.—Glandular structure of the abdominal appendages of a termite guest (*Spirachtha*). 133, iii, 367-81.

Bernhauer, M.—Neue Staphyliniden aus Sudamerika (29. Stuck). 48, xl, 49-60. Hyslop, J. A.—The present status of the coleopterous family Plastoceridae. 10, xxv, 156-60. Mann, W. M.—New genera and species of termitophilous coleoptera from northern S. Am. 133, iii, 323-66.

**HYMENOPTERA.** Caillas, A.—Sur la composition de la propolis des abeilles 69, 1923, 1145-47. Howard, L. O.—A curious phase of parasitism among the parasitic H. 4, lv, 223-4. Garlick, W. G.—Notes on the feeding habits of an adult sawfly. 4, lv, 256-7. Logier, S.—An interesting ant from Muskoka. 4, lv, 247-9. Plath, O. E.—Breeding experiments with confined *Bremus* (*Bombus*) queens. 100, xlv, 325-41.

\*Mickel, C. E.—Preliminary notes on the Mutillidae of Minnesota. (Rep. Sta. Ent., Minn., xix, 97-113.) \*Rohwer, S. A.—A new *Macrocentrus* reared from the strawberry leaf roller (*Braconidae*). 10, xxv, 168.

## SPECIAL NOTICES.

**List of manuscript bibliographies** in the biological sciences. This is one of the Reprint and Circulars of the National Research Council, No. 45. There are quite a number of entries under Insects; Taxonomy. Also under Entomology: Economic.

**Genera Insectorum.** This great work published under the direction of P. Wytsman, Tervueren, Belgium, is appearing in about its pre-war frequency. Of course, it is hardly necessary to state that this work should be consulted by all systematists in entomology. The part treating of the homopterous families Acanaloniidae, Flatidae and Ricaniidae, by L. Melichar has just appeared.

**Our attention** has been called to an error on our part occurring in the November list. Under Arachnida, the following titles should be credited to J. C. Chamberlin: New and little known pseudoscorpions, principally from the islands and adjacent shores of the Gulf of California; and A revision of the genus *Anisembia*, with descriptions of a new species. The latter should be listed under The Smaller Orders. [If the order had been mentioned in the latter title, this error would probably not have occurred.]

FOSSIL INSECTS.<sup>1</sup>

In his day, our own S. H. Scudder was the leading exponent of the science of Palaeoentomology, but the modern representative of Scudder is Dr. A. Handlirsch of Vienna, whose monumental labors have greatly lightened the work of all others concerned with this subject. Not content with having produced that indispensable book, *Die Fossilen Insekten* (1430 pp.; 1906-1908), he has continued along the same lines, and in Schröder's *Handbuch* has given us a new summary, including a considerable amount of previously unpublished material. Even while this was being printed, he returned to his favorite study of the earlier forms, and has produced a *Revision der Paläozoischen Insekten*, published recently in Vienna. The topics dealt with by Handlirsch are so varied, including the whole problem of the descent and phylogenetic classification of the Insecta, that it is impossible to discuss them all in a review. Indeed, the subject re-

<sup>1</sup> *Handbuch der Entomologie.* By Dr. Chr. Schröder. Lief. 5-7. By A. Handlirsch. Consisting of Chapter 7, pp. 117-306, Palaeontologie, and Chapter 8, Phylogenie oder Stammesgeschichte, pp. 307-376. (Gustav Fischer, Jena: 1920, 1921.)

quires the coöperation of numerous entomologists, and far more analysis will be necessary before a really satisfactory synthesis can be made. It is already apparent that in certain quarters there is a tendency to accept the results of Handlirsch without question, out of regard for his great learning and enormous industry. It is too easily forgotten that such a comprehensive undertaking must necessarily be largely a matter of compilation from sources which are by no means always reliable, and that many judgments are tentative and subject to revision.

For the general entomologist as well as the student of fossils, the treatment in Schröder's *Handbuch* is full of instruction, if taken with sufficient caution. The broad results will stand; many of the details will have to be amended. Although the work is so recent, it was written too long ago to include Tillyard's Australian fossils, the new work on the Gurnet Bay (I. of Wight) fauna, the inclusions in Burmese amber, and various other remarkable discoveries. Among the recorded fossils, are many which on critical examination will need reinterpretation. Thus, Mr. F. W. Edwards, of the British Museum, has very recently reviewed the whole subject of fossil Culicidae or mosquitoes. Handlirsch, with due caution, catalogues the Culicidae from the Mesozoric with a query; and Edwards finds, on looking at the specimens, that it is quite impossible to definitely recognize any of them as belonging to that group. It has lately been reported (*Amer. Mus. Novitates*, No. 77, 1923) that butterflies and mosquitoes were found in the Ondai Sair formation of Mongolia, which is at least as old as the Cretaceous, and may even be Upper Jurassic. The material is now in my hands for description, and there are no butterflies, while the supposed mosquitoes are apparently Chironomidae.

The difficulty of correctly interpreting insect fossils has led many entomologists to turn away from the study in despair, and I have heard it said that too little reliance could be placed on the published records to render them of any value. This attitude is entirely wrong, overlooking the vast amount of indisputable and significant evidence which throws light on the whole subject of Entomology. Errors which have been made can often be corrected by renewed study, especially when we have more careful morphological treatments of the various parts of modern insects. There is hardly any part of an insect which does not show characteristic features, if we only know what these are, but they must be discovered by intensive comparative studies. Perhaps the most striking result of Paleontomology is the discovery of the immense antiquity of insect structures, even of existing families and genera. This is now much more impres-

sive since the investigations of the disintegration of radio-active minerals have caused us to greatly increase our estimates of geological time. Why should insect organization be so extremely stable? It is not on account of its simplicity, for an insect is a wonderful and very complex machine. Species of insects appear to be short-lived, as shown by the Pleistocene remains, but genera and families persist while vertebrates change, and mountain ranges are raised up or levelled down. Mr. F. W. Edwards, in a recent study of the Anisopodidae (Rhyphidae), has come to the conclusion that my *Estherera simplex* from the Colorado Eocene was placed in the wrong family on account of a misinterpretation of the structure of the antennae. I have no doubt that he is correct and that the species must stand as *Olbiogaster simplex*. This is not all; he finds that even the vastly more ancient (Jurassic) *Platyura fittoni* Brodie is to be called *Olbiogaster fittoni*. He did not notice that in the work now reviewed, Handlirsch figures a *Mesorhyphus nanus* from the Jurassic (Upper Lias) of Mecklenburg, and this, by the same tokens, is to be called *Olbiogaster nanus*. Now it is open to any one to say of these Jurassic flies, that probably if we had them alive the palpi, or legs, or thorax would show differential generic characters. This is a matter of speculation, but in any case we have positive evidence of the vast antiquity of the *Olbiogaster* venation. Such a fact is neither doubtful nor insignificant. Contrary to what we might expect, even the pattern of the wings (well shown in many fossils) is extremely stable as to its general character, sometimes more so than venation. It is amazing to find insects as old as the Upper Carboniferous (Pennsylvanian) showing the wing-markings. On p. 154 of the work reviewed, Handlirsch figures a remarkable example of this, *Narkema taeniatum* Handl. from the Pennsylvanian of Illinois. I have examined a second species of this genus, equally well marked, belonging to the Maryland Geological Survey.<sup>2</sup> I find very few misprints or clerical errors, but there is one which should be corrected. *Lithodryas* (p. 273) is a Nymphalid butterfly, not a Geometrid.—T. D. A. COCKERELL.

<sup>2</sup> *Narkema alternatum* n. sp. Resembling *N. taeniatum*, but media branching at a much greater distance from margin; black bands much wider, fully as wide as the intervals between them. Width of bands about 1.85 mm., of intervals about 1.40 mm. Benson's Clay Mine, Big Savage Mt., Mt. Savage fire clay horizon. Maryland.

[The genus *Narkema* is one of those of which Handlirsch is uncertain as to whether they should be referred to the order Protorthoptera or the order Protoblattoidea. See his *Revision der palaeozoischen Insekten*, 1919, pp. 551-552.—ED.]

## MACGILLIVRAY'S EXTERNAL INSECT ANATOMY.

For the better part of a century taxonomy has been losing caste. It is time we admit this and try to discover the why of the situation. The work is an absolute necessity to many of the other biologic sciences. Its field holds much that is attractive; its methods have great value as training for embryo scientists. If there are adequate reasons for the decadence of systematics, they must lie in the way in which we systematists have been doing things, and the sooner we learn to do them differently the sooner taxonomy will engage the interest and esteem of other biologists.

This is the justification of an adverse criticism of MacGillivray's new book on "External Insect-Anatomy" (1923, Scarab Co., Urbana, Illinois).

The title page states that it is an "introduction to systematic entomology," and the preface adds that "the author in the preparation of this book has had foremost in mind the needs of students," that "a thorough knowledge of the external anatomy of insects is fundamental to their taxonomy," and that the first drafts of the book were laboratory outlines loaned to students. There is no question that this is conceived to be the material which should be presented to a student in insect taxonomy.

In the face of this claim, the book gives no attention to the elucidation of the principles involved in making distinctions, but is concerned with the minute morphology of insects. The student is directed to examine insect after insect in close detail, and then,—to learn names for each minutest structure.

I have had some slight experience with insect morphology; I cannot escape the impression that words, big words, new words, strange and fearful words are the meat and dessert of this new course. Granting that my judgment may not be ripened in wisdom, I still wonder what impression would be made upon a beginner who, perchance, wanders into an entomology course because the University schedule happens to work that way, or because he has a vague but uninformed idea that the insect world might have enchantments worth investigating. He has been told that the out-of-doors is worth a real man's observations; he has heard that ants and wasps and some other small creatures have surprising and entrancing ways. Perhaps the stray student has even tasted the truth of this idea,—just enough to persuade him into a course in insect taxonomy. He understands that in science he will do things very exactly, and will pay attention to many details, but only because these are the stepping stones to knowledge and consequent enjoyment. Don't

doubt for a moment that the student thinks of the goal of it all! He probably knows better than the scientist, for he is not yet lost in minutiae, and he still sees their relation to the rest of life. All of us engaged in teaching ought to remember that the student's viewpoint is liable to be very normal. And so, a normal individual is ready to submit to rigid training. Is he to be satisfied or sufficiently rewarded? Let us begin by introducing him to the "tummy" of a ground beetle, as follows (page 190):

"*Mesosternum*.—The mesosternum is the mesal subtriangular area. The mesocoxacavae are subadjacent and formed by the infolding of the adjacent parts of the mesosternum and metasternum. The mesocoxacoriae are small and concealed in the cephalic part of the mesocoxacavae. The mesocoxae are said to be closed when, as in this insect, they are completely surrounded externally by the mesosternum and metasternum, so that the mesepimera do not reach the mesocoxacavae. The mesosternoideae are completely fused with the mesepisterna. The exposed part of the mesosternum belongs to the mesosternannum. The suture along each lateral margin is a mesotrocasuture. The cephalic\* mesosternannum\* hyposternum\* mesotrocasutures\* caudad\* mesocoxacava\* mesal\* mesosternannum\* mesocoxacavae\* metacoxal\* mesofurca\* mesopleuradema\* mesofurcella\* mesofurcinae\* mesosternellum\* mesotrochantin\* mesotrocoila\* mesocoxella \* \* \*" and so on to the end of the paragraph! And so on for pages! And so on for 380 pages!

The book might be designed as a study in morphologic homologies. That, it is not, for no adequate studies of embryology or paleontology have been made to warrant such extensive treatments, and the material is so arranged in a running text that it would be difficult to discover any co-ordination which may exist. As a dictionary of terms employed, it is useless. Dictionaries are not written in solid text. Many of the terms are not of accepted standing; they are either quite new, or unusual, or given new meanings. In regard to the latter, on page 254 appears the calm statement that by substituting the new term larvapod, the term proleg is thereby freed for use with an entirely new meaning! Worst of all, most of the technical terms are quite uncalled for. It is getting bad when we have to call a left leg of an insect a "sinistral leg." (At that point the word leg should have been displaced by a new derivative from the Greek, for an insect leg is really not homologous with the mammalian appendage which is properly called a leg!) It is getting worse when the left front leg has to be called the sinistral proleg, when

the middle leg becomes the mesoleg, the hind leg the metaleg, etc., etc. And were I, an humble student, asked to draw the cephalic aspect of the dextral metaleg, I might be tempted to wonder what scientists were anyway, or I might use profanity, —unless my sense of humor survived!

In a very few hours' time one can teach a beginning student enough about the external anatomy of a particular family of insects to have him interpret the taxonomic literature on that group; and that is about all the anatomy he needs in taxonomy until he is ready to make specialized studies in homologies between diverse groups. After the initial lesson, I would engage his time with such exercises as would illustrate and drill him in the principles employed in making keen distinctions. These principles are worth while things in our science, and the only worth-while things beyond the practical utility of the subject in other fields of biology. Teach the student to recognize scant differences, to utilize obscure and varied data, to coordinate conflicting evidence, to know the inadequacies of conclusions, the necessity for wary judgments. This training will do more to make him a good taxonomist than any number of pages of names of morphologic structures. This training will be of inestimable value to the student who enters other fields of research. More, it will be a training fit for the man who has no plans for further study of zoology or botany but who, in the every-day affairs of life, has need of knowing how to make judgments of just the sort which the taxonomist is continually making.—ALFRED C. KINSEY, Indiana University, Bloomington, Indiana.

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## Doings of Societies.

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

Meeting held November 16, 1922. Director Philip Laurent presided; nine persons present.

MYRIOPODS.—Dr. Skinner read a letter about an infestation by millipeds of a house at Haverford. Mr. Kisliuk reported an infestation of a field of introduced bleeding-hearts by this pest working in the roots, the entire planting being destroyed.

LEPIDOPTERA.—Mr. Williams made a brief communication on his researches in the lepidopterous family Hesperiidæ, showing some important genitalic characteristics.

DIPTERA.—Mr. Cresson spoke about some of the conspicuous

genitalic appendages of the dipterous family Micropezidae, showing a few of the more striking forms.

Mr. Laurent commented on the diversity of terms used for the same parts of the genitalic structure.

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Meeting of December 11, 1922. Director Philip Laurent in the chair with 10 persons present.

Mr. R. J. Titherington was nominated for membership.

Dr. Calvert read a paper on the distribution of insects and some theories on evolution which was freely discussed by those present.

The following Officers and Committee were elected to serve for the ensuing year: *Director*, Philip Laurent; *Vice-Director*, Roswell C. Williams; *Secretary*, James A. G. Rehn; *Recorder*, Ezra T. Cresson, Jr.; *Treasurer*, Ezra T. Cresson; *Conservator*, Henry Skinner; *Publication Committee*, E. T. Cresson, Philip P. Calvert, E. T. Cresson, Jr.—E. T. CRESSON, JR., *Recorder*.

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Meeting of Jan. 25, 1923. Vice Director R. C. Williams presided; five persons present.

The chairman read a translation of a notice of the death of Dr. Kalman Kertész, the distinguished Hungarian dipterist and Director of the National Hungarian Museum.

HYMENOPTERA.—A letter from Mr. T. H. Frison, relative to the great value of the collection of Bremidae (Bombidae) at the Academy, was read.

DIPTERA.—Mr. Hornig spoke regarding the presence and emergence of *Musca domestica* on the city dumps as early as the 19th of this month.

ORTHOPTERA.—The same speaker exhibited several slides of the egg-mass of *Tenodera sinensis*, sectioned, showing the method in which the eggs are placed within the mass. Mr. Rehn exhibited several boxes of specimens illustrating certain results of the field work being done in the Orthoptera by Mr. Hebard and himself.

Robert J. Titherington was elected a member.—J. A. G. REHN, *Acting Recorder*.

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Meeting of May 24, 1923. Vice-Director R. C. Williams, Jr., presided; eleven persons present.

Dr. Calvert made a brief communication on some early writers on American Entomology, particularly John Bartram and John Banister in and about the year 1700.

ORTHOPTERA.—Mr. Rehn made a few remarks on a recently completed paper on the West Indian Blattidae.

HYMENOPTERA.—Dr. Bradley gave a brief account of his work on a classification of the Hymenoptera, particularly mentioning the ready co-operation given him by several of the world's foremost students in the order. He stated that so far a tentative classification has been reached regarding most of the families. The chair congratulated Dr. Bradley on his success in securing such effective co-operation and on the extent of progress made.—E. T. CRESSON, JR., *Recorder*.

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## OBITUARY.

MR. PHILIP NELL, who died at his home, 3619 North Marshall Street, Philadelphia, was elected an Associate of The Entomological Section of The Academy of Natural Sciences of Philadelphia, in 1891, and was a subscriber to this journal since its first number.

From the time he was fifteen years of age he was passionately fond of natural history, particularly the study of entomology. After making a general collection for a number of years, he took a special interest in the microlepidoptera and made a large local collection. He was noted for unusual skill in mounting these small and delicate moths. He also made excellent mounting boards, being very handy with tools and made his own boxes for the collection. For a long time he printed pin labels for those interested.

Mr. Nell was a jeweler by trade, but later was connected with the White Dental Company of this city where he was employed twenty-seven years.

He was born in Philadelphia, June 17th, 1857 and died from nephritis, after a short illness, November 7th, 1923, and was buried in Northwood cemetery.—HENRY SKINNER.

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### EDGAR LEEK DICKERSON

It is with deep regret and a sense of personal loss that I record the death of my friend, Edgar Leek Dickerson, on October 30, 1923, in St. Mary's Hospital, Passaic, New Jersey, following an operation. Burial was made on November 2 in the family plot at Chester, New Jersey. He is survived by his wife, son, mother and two brothers.

Mr. Dickerson was born in Newark, New Jersey, on January 13, 1878, and graduated from the Newark High School in 1898 and from Rutgers College in 1902. According to the minutes of the executive committee of the New Jersey State Board of Agriculture for June 13, 1902, he was appointed as assistant for the summer months to Doctor John B. Smith, State Entomologist. This appointment was made permanent on May 7, 1903, according to the minutes of the committee for that date. From this time until 1911 he was closely associated with Doctor Smith and with the economic entomology of New Jersey. In the reports of the Entomological Department of the New Jersey Agricultural College Experiment Station from 1902 to 1911 frequent mention is made of Mr. Dickerson's entomological activities and duties. In 1911 he resigned and entered the biological department of the Barringer High School, Newark, New Jersey. From here he went in February, 1912, to the Central High School of Newark, where he taught until the time of his death, becoming head of the Department of Biological Sciences and Commercial Geography about 1918 or 1919.

Mr. Dickerson was an ardent collector whenever opportunity afforded and many of the Chester, New Jersey, and other records in *Insects of New Jersey* are due to Mr. Dickerson's activities. During the months of July and August from 1912 until 1915 he was employed by the New Jersey State Board of Agriculture and from 1916 to 1919 by the New Jersey State Department of Agriculture in nursery inspection work dealing both with insects and plant diseases and during this work it was my privilege to spend many pleasant days in Mr. Dickerson's company, collecting insects in various parts of New Jersey and making observations which were subsequently written up and published.

During recent years Mr. Dickerson's interest turned to the Cicadellidae and the distribution of this family in New Jersey, and most of his collecting was done in this group. It was his intention to revise the New Jersey list of these insects when enough material had accumulated and to treat them from a standpoint of geographical distribution.

During his connection with the State Board of Agriculture, he frequently spoke at Farmers' Institutes on economic insects and lectured on entomology in the Short Courses in Agriculture. In addition to his interest in entomology, Mr. Dickerson took considerable interest in civic affairs and was chairman of the Shade Tree Commission in Nutley, New Jersey, where he lived, a member of the consistory of the Franklin Reformed Church of Nutley and chairman of the building committee of the church Community House. He rarely missed a meeting of the New York Entomological Society and often presented papers and took part in the discussions. He was a member of this society for some eighteen years and secretary in 1911. At the time of his death he was a member of the Delta Upsilon Fraternity, the American Association for the Advancement of Science, American Association of Economic Entomologists, Entomological Society of America, New York Entomological Society, Brooklyn Entomological Society, New Jersey Microscopical Society, New Jersey Science Teachers' Association, and the Newark High School Teachers' Association. Mr. Dickerson was the author of some twenty-five papers on entomology which are listed below.

*Papers by Mr. E. L. Dickerson.*

1904. The Chinese mantis, *Tenodera sinensis* in New Jersey. Rept. Ent. Dept. N. J. Agric. Exp. Sta. pp. 585-587.
1907. The cabbage and onion maggots, with J. B. Smith. Bull. 200 N. J. Agric. Exp. Sta. pp. 1-48.
1910. Notes on *Rhynchites bicolor* Fabr. Jour. Econ. Ent. Vol. 3, pp. 316-317.
1912. The Work of Professor John B. Smith in Economic Entomology. Proc. Staten Is. Asso. Art. & Sci. Vol. IV, Parts I & II, Oct. 1911-May, 1912, pp. 17-24.
1916. Notes on *Leptoypha mutica* Say.\* Ent. News XXVII, 308-310.
1916. The Ash leaf bug, *Necoborus amoenus*.\* Jour. N. Y. Ent. Soc. XXIV, 302-306.
1917. *Psyllia buxi* Linn. in New Jersey.\* Ent. News XXVII, 40-41.
1917. The azalea lace-bug, *Stephanitis pyrioides* Scott.\* Ent. News XXVIII, 101-105.

1917. Notes on *Leptobyrsa rhododendri* Horv. Jour. N. Y. Ent. Soc. XXV, 105-112.
1917. *Plagioderia versicolora* Laich, an imported poplar and willow pest.\* Canad. Ent. March, 1917, 104-109.
1917. *Idiocerus scurra* Germar, a poplar leafhopper.\* Jour. N. Y. Ent. Soc. XXV, 218-224.
1918. The early stages of *Corythucha pergandci* Heid.\* Ent. News XXIX, 205-209.
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1918. The life history and early stages of *Corythucha parshleyi* Gibson.\* Canad. Ent. Dec., 1918, 401-406.
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1919. The life history and early stages of *Macropsis virescens* var. *graminea* Fabr., a poplar leaf hopper in New Jersey.\* Journ. Econ. Ent. XII, 437-440.
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1921. Notes on milkweed insects in New Jersey.\* Jour. N. Y. Ent. Soc. XXIX, 123-145.
1921. *Gargara genistae* Fabr., a European membracid in New Jersey.\* Ent. News XXXII, 108-112.

HARRY B. WEISS, New Brunswick, New Jersey.

\* With H. B. Weiss.

Number 10, Volume XXXIV, of Entomological News, for December, 1923, was mailed at the Philadelphia Post Office, December 15, 1923.

## 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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- 839.—Landis (E. M.).—A tabular account of the structural differences between the four larval instars of *Culex pipiens*. (Trans., 49, 25-42, 1923) ..... 35

## COLEOPTERA.

- 844.—Davidson (W. M.).—Biology of *Scymnus nubes* Casey. (Trans., 49, 155-163, ill., 1923) ..... 20

## LEPIDOPTERA.

- 842.—Braun (A. F.).—Microlepidoptera: notes and new species. (Trans., 49, 115-127, 1923) ..... 25
- 843.—Skinner & Williams.—On the male genitalia of the Hesperiiidae of North America. Paper III. (Trans., 49, 129-153, ill., 1923) ..... 30

## NEUROPTERA.

- 841.—Dodds (G. S.).—Mayflies from Colorado. Descriptions of certain species and notes on others. Trans., 49, 93-114, 2 pls., 1923) ..... 50

## ORTHOPTERA.

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# ENTOMOLOGICAL NEWS

Vol. XXXV

No. 2



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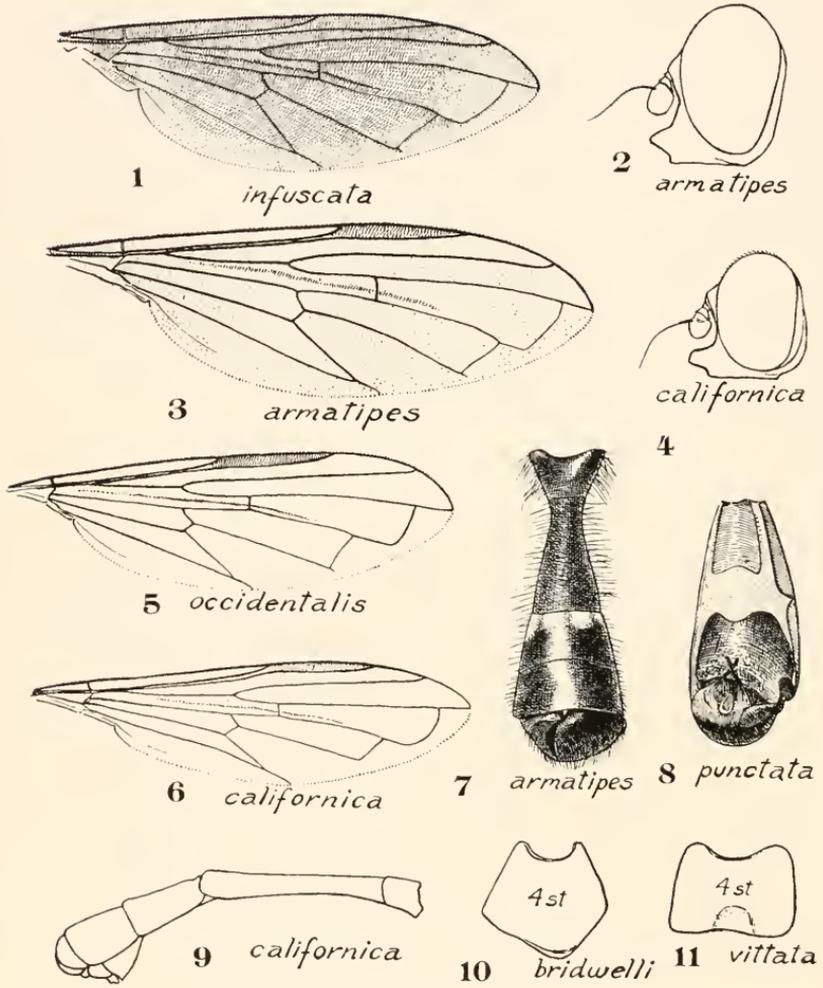
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Of the Entomological Section of The Academy of Natural Sciences of Philadelphia, and of The American Entomological Society will be held at 7.30 o'clock P. M. on the following dates during 1924: January 24, February 28, March 27, April 24, May 22, September 25, October 23, November 20, and Dec. 8.

Communications on observations made in the course of your studies are solicited; also exhibits of any specimens you consider of interest.

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SPECIES OF SPHEGINA.—COLE.

# ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXV

FEBRUARY, 1924

No. 2

## CONTENTS

Cole—Notes on Diptera of the Syrphid Genus <i>Sphegina</i> .....	39	Weiss and Lott—Notes on <i>Corythucha marmorata</i> Uhler in New Jersey (Hemip.: Tingitidae) .....	68
Ewing—Florida Proturans .....	44	Rudolfs—Note on the mating of <i>Anopheles maculipennis</i> (Dipt.: Culicidae) .....	69
Smith—An Annotated List of the Ants of Mississippi (Hym) .....	47	Malloch—A Gynandromorph of <i>Odynerus conformis</i> Sauss. (Hymenoptera, Aculeata) .....	70
Reinhard—A New Southern Tachinid Fly (Diptera) .....	54	Bell—An Hermaphrodite Hesperid (Lepid.; Rhop.) .....	70
Weiss and West—Notes on the False Indigo Lace Bug, <i>Gelchossa heidemanni</i> Osborn and Drake, in New Jersey (Hemip.: Tingitidae) .....	56	Entomological Literature .....	71
Alexander—Undescribed Crane-Flies from Argentina (Dipt.: Tipulidae), Part VIII. ....	61	Review of Ruggle's Nineteenth Report State Entomologist of Minnesota ..	75
Robertson—Color Preference of Bees (Hymen.) .....	65	Review of Reports on Certain Arthropods of the Barbadoes-Antigua Expedition .....	75
Editorial—Entomology at the Convocation Week Meetings, December 27, 1923, to January 2, 1924 .....	66	Obituary—Nathaniel Charles Rothchild .....	76

## Notes on Diptera of the Syrphid Genus *Sphegina*.

By F. R. COLE, Redlands, California.

(Plate 1)

The writer has been collecting material in this genus for some time and this short paper will supplement the recent work by J. R. Malloch on this group. Drawings of some of the species were made in 1918 and are published at this time as an aid to the determination of the species.

In his first paper (Proc. Biol. Soc. Wash., vol. 35, pp. 141-144, 1922) Malloch adds seven species to the seven previously known from North America, and in a later paper (Ent. News, vol. 33, pp. 266-270, 1922) describes one more species and gives a table for all the species.

Verrall says of the European species that only four or five are well defined, and he doubts if anybody has ever possessed a clearly and sharply defined series of more than one species. He goes so far as to say that the whole genus might resolve it-

self into one species—*clunipes*. The writer has a few European specimens loaned by Dr. Melander, presumably determined by Strobl. The fourth sternite, genitalia and hind tibiae differ quite distinctly in *latifrons* Egger and *clunipes* Fallen. The North American species are surely distinct and no doubt structural differences can be found in European species.

The shape of the hind tibiae, the shape and armature of the fourth and fifth abdominal sternites and the structure of the male genitalia are among the most important characters used in separating species. There is some variation in the shape of the third antennal joint in different species and the antennal arista is usually characteristic. The shape of the face and the comparative width of the frons offer additional characters. The wing venation is much the same for all forms, but cell R5 is often shaped differently, vein M1+2 curving into R4+5 at different angles. Color differences need not be relied upon for separating species but they are usually constant.

The flies of this genus are not uncommon throughout the Pacific Coast region. The writer collected five species in the Hood River Valley, only one of them known to science at the time. Some of the species are among the early spring forms found in western Oregon. The blossoms of the maple have a great attraction for them and the best collecting places are more or less shaded spots, preferably near a stream of water, where one can find maples.

#### ***Sphegina occidentalis* Malloch.**

This species is quite common in some regions along the Pacific Coast and has been confused with *rufiventris* Loew, a closely allied species that probably does not occur in the western United States. I have specimens from Hood River and Rock Creek (near Corvallis) in Oregon; from Vashon, Alмота, Tulalip, Quilcene, Adna and Ilwaco in Washington; also specimens from Huntington Lake, and from Mt. Home Canyon, San Bernardino County, in California. The wing is illustrated in figure 5.

#### ***Sphegina californica* Malloch.**

I have specimens from Walnut Creek, California, the type

locality, and from Hood River, Mary's Peak (near Corvallis), and Mt. Jefferson, Oregon. This is a very slender species and is illustrated by figures 4, 6, and 9.

***Sphegina armatipes* Malloch.**

I have a large series taken along a small stream west of Hood River, Oregon, May 20, 1917; also one specimen from Parkdale, in the upper Hood River Valley, and one from Contra Costa County, California. Figures 2, 3, and 7 illustrate the species.

***Sphegina armatipes* var *rufa* Malloch.**

Specimens from Moscow Mount, Idaho, seem to belong to this variety. Malloch recorded a male of typical *armatipes* from this same locality. Two females have the dorsum of the abdomen reddish brown. I have seen a female of this variety taken at Mary's Peak, Oregon, May (A. L. Lovett).

***Sphegina infuscata* Loew.**

This widespread species has a tendency to melanism in some localities. One male from Hood River has the legs and abdomen almost entirely black, and one male from Tillamook, Oregon, March 26, 1919 (A. C. Burrill) is melanic. Two specimens loaned by Dr. Melander are melanic, one a male taken at L. Waha, Idaho, June 9, the other a female from Tacoma, Washington, May 27, the latter entirely black. The melanic forms appear to have scutellum more strongly bristled. The wing is shown in figure 1.

***Sphegina nigrimana* new species.**

♂. Length 5.5 mm. Largely shining black. Third antennal joint brown, the arista yellow, short, gradually tapering and with short pubescence. Lower face and oral margin yellow, rest of head black, with some gray pollen.

Thorax, pleura and most of hind coxae shining black. Scutellum shining black, with two apical bristles not far apart. Mesonotum and upper pleura with scant gray pollen, the pile sparse and pale.

Three basal segments of abdomen (apparently two) slightly longer than the remaining segments combined. Base of fourth tergite and most of fourth sternite reddish, rest of abdomen and genitalia shining black. Posterior margin of fourth sternite straight, on the fifth broadly indented and with a half-circular membranous portion reaching back of this; no spinules on fourth and fifth sternites.

The front four legs pale yellow, pale brown near apex of front femora, the last two tarsal joints black; hind femora black except base, the tibiae transverse at apex and with two blackish rings; hind tarsi blackish, the first joint noticeably wider than the tibiae. Wings faintly infuscated, especially towards the apex; venation as in *occidentalis* Malloch (see fig. 5).

♀. Very nearly like the male. Frons broader, almost one-third the width of head. Abdomen almost entirely black, with a faint tinge of dark red on the second tergite and two faint spots on the third.

*Holotype*, male, and allotype, female, in the collection of the California Academy of Sciences, taken July 16 and 28, 1921, by E. P. Van Duzee.

*Type locality*, Huntington Lake, 7000 feet elevation, Fresno County, California.

The species is closely related to *keeniana*, but the hind tibiae in the male do not have a spur or scoop at the tip, and there are no spinules on the fifth sternite.

### **Sphegina bridwelli** new species.

♂. Length 6.5 mm. A species largely yellow in color. Frons and upper occiput black, the face, cheeks and lower occiput yellow. Antennae blackish brown, arista yellow and swollen at base, quite long and distinctly pubescent. Outline of face somewhat like that of *armatipes*.

Mesonotum shining black, somewhat yellow on sides. Median portion of pleura blackish brown, humeri, coxae and metanotum yellow. Scutellum yellowish brown, darker at base, rounded at apex and with apical bristles close together.

Abdomen largely yellow, some pale brown on second, third and fourth tergites. Hypopygium black above, reddish below. Third and fourth sternites without armature, the fourth very large and produced triangularly on posterior margin (see fig. 10). Right genital style much longer than the left.

Legs yellow, with faint brown marks on middle and hind femora; apex of hind tibiae darkened, and the posterior tarsi darker brown. Hind tibiae transverse at apex, without a terminal scoop, laterally compressed on the basal half and narrowly black along the line where the tibia fits against the femur. Wings hyaline, faintly smoky at apex, the venation much as in *infuscata* but the wing shaped more like that of *occidentalis*.

*Holotype*, male, in the collection of the California Academy of Sciences, taken August 2, 1907, by J. C. Bridwell.

*Type locality*, Pamela Lake, Mt. Jefferson, Oregon, about 3,000 feet altitude.

The species runs to *californica* in Malloch's synoptic table, but the genitalia and fourth sternite are different and the antennal arista pubescent.

***Sphegina melanderi* new species.**

♂. Length 3.8 mm. to 4.5 mm. Very nearly like *nigrimana*, but differs in having more yellow on base of hind femora, the fourth sternite smaller and only slightly excavated on the posterior margin. The third sternite is only slightly excavated on the posterior margin. The spots on third tergite are faint brownish yellow. Cell R5 is more rounded at the apex than in *nigrimana*.

♀. Very nearly like the male. Hind femora more slender than in male and all legs darker. Abdomen largely shining black; faint red spots on second tergite, larger and more distinct on the third and fourth, but without definite outline. Cell R5 more rounded at apex than in *nigrimana*.

*Holotype*, male, and allotype, female, in the collection of A. L. Melander, who took the specimens June 2, 1917 and August 16, 1910.

*Type locality*, Husum, Washington.

The allotype was taken at Quilcene, Washington, and some paratypes at Vashon and Viento in the same state. The female would run to *keeniana* in Malloch's table of species.

***Sphegina vittata* new species.**

♂. Length 7 mm. Closely related to *armatipes* var. *rufa*, but paler in coloration and with different markings. Antennae brown, the arista yellow on the basal portion and finely pubescent.

Thorax and scutellum not shining black as in *armatipes*, but brownish yellow, paler on the humeri. Mesonotum with a broad median blackish brown vitta, not reaching scutellum and divided by a faint, narrow reddish line; two elongate spots, one on either side of the median line, narrowing posteriorly.

First and second abdominal segments brown with a yellowish tinge. Genital segments and styles yellow. Third and fourth sternites without spinules, the fourth large and with a median posterior portion that is unchitinized (see fig. 11).

Front legs yellow, the last two tarsal joints darker; hind femora yellow, a little darker at the tip; hind tibiae yellow with two faint brown rings, the process at apex of tibia rounded; hind trochanters without black setulae; hind tarsi dark brown. Wings faintly infuscated at tips, stigma pale brown; venation as in *armatipes*.

*Holotype*, male, in collection of California Academy of Sciences, A. L. Melander collector, May 27, 1917.

*Type locality*, Tacoma, Washington.

There is one male paratype taken at the same time and place. A female specimen taken by Dr. Melander at Glacier Station, Mt. Rainier, Washington, August 15, 1917, probably belongs here, but the mesonotum is shining black and the abdomen almost entirely yellow.

---

### Florida Proturans.

By H. E. EWING, Bureau of Entomology, U. S. Department of Agriculture.

On several occasions while in the state of Florida during the months of May and June, 1922, I made a particular effort to collect specimens of the primitive order Protura. All efforts, however, except one, proved vain. But on that one occasion many specimens were obtained. While waiting for an auto to take me back to the town of Orlando, on May 26, I began to investigate an accumulation of dead leaves and other organic matter under a mammoth camphor hedge which marked the division between two citrus orchards. The leaves were rather loose and fully a foot deep on the ground. Those on or near the top were dry, but those nearest the ground were wet and considerably packed together. Among the latter, where swarmed hundreds of mites, springtails and other minute Arthropods, were found Proturans in some numbers.

The specimens then obtained have now been determined and are found to belong to three species, one of them being new. This new species, a member of the genus *Acerentomon*, is here described.

***Acerentomon floridanum*, new species.**

Head about one-and-two-thirds times as long as broad. Pro-

cess of labrum (or rostrum) vestigial or wanting. Pseudoculi conspicuous, circular, dorso-lateral and situated slightly behind the middle of the head. Setae on head of moderate length.

Thorax almost twice as long as head; prothorax with upper side about twice as broad as long; mesothorax much larger than prothorax but smaller than metathorax; metathorax considerably broader than long. First two thoracic segments without tergal apodemes, but the metathorax has a short, slightly bent, unbranched, tergal apodeme that falls far short of reaching the sides of the body. First legs fully twice as long as head and when extended forward reaching beyond the latter by the full length of the tarsi and about four-fifths the length of the tibiae. Second and third legs subequal, about three-fifths as long as the first legs. Tarsus I with a long claw, straight for the first half of its length, then only slightly curved beyond. Tarsi II and III each with a much smaller claw than I and curved throughout.

Abdomen of the usual shape. Typical tergal apodemes, as represented by those on segments V and VI as follows: Gently bowed at the middle; first branch arising not far from the median line and extending laterally, forward and downward, as a tapering chitinous rod to about one-half the distance to the pleura; second branch of apodeme given off posteriorly at a distance about equal to that from the origin of the first branch to the median line; it follows an irregular course laterally and backward and may itself be branched. Eighth abdominal segment as long as ninth, tenth and eleventh taken together, and with a simple tergal apodeme that is much thickened at the middle. Vestigial abdominal appendages of the usual type.

Length of female specimen when extended to maximum, 1.3 mm.; width 0.21 mm.

*Type locality*.—Orlando, Florida.

*Type slide*.—Cat. No. 23766, U. S. N. M.

Description based on holotype, a female, and fourteen other female specimens. No males or young taken. This species is most nearly related to *A. microrhinus* Berlese, but is smaller and lacks the process of labrum, or rostrum.

The fact that only female specimens were taken would indicate that the annual reproductive cycle for these hexapods starts much earlier in Florida than in Maryland or any of the other

more northerly situated states. In Maryland only adults are taken late in the fall or winter. The males die off rapidly during the spring, and in May young individuals usually predominate over adults.

The five known species of the genus *Accrentomon* may be separated as follows:

*Key to the Known Species of Accrentomon Silvestri (1907).*

- a<sup>1</sup>. Median process of labrum (rostrum) either vestigial or wanting ..... *A. floridanum*, new species.
- a<sup>2</sup>. Median process of labrum (rostrum) present and not vestigial .....
  - b<sup>1</sup>. Bifurcations, or branches, of tergal apodemes of abdomen indistinct and apparently lacking for most of the large abdominal segments *A. microrhinus* Berlese.
  - b<sup>2</sup>. Bifurcations, or branches, of tergal apodemes of abdomen broad and conspicuous for most of the large abdominal segments.
    - c<sup>1</sup>. Total length when segments are extended to maximum but little over one millimeter; rostrum short, not over half as long as the distance between the pseudoculi ..... *A. conurus* Ewing.
    - c<sup>2</sup>. Total length when segments are extended to maximum considerably over one-and-one-half millimeters; rostrum long and very sharp-pointed, about as long as the distance between the pseudoculi.
      - d<sup>1</sup>. Seventh tergal apodeme of abdomen either unbranched, or at most seen to be indistinctly branched when viewed laterally; head, exclusive of the rostrum, not over one-and-three-fourths times as long as broad  
*A. dodcroi* Silvestri.
      - d<sup>2</sup>. Seventh tergal apodeme of abdomen typical of those in front of it being broadly forked laterally and the posterior ramus thus formed being again forked; head, exclusive of the rostrum, twice as long as broad  
*A. americanum* Ewing.

The other two species taken in Florida are *Accrentuloides bicolor* Ewing and *Eoscentomon minimum* Ewing. Of the former species, two females were collected, of the latter, one female. Again the absence of males and nymphs is noted.

## **An Annotated List of the Ants of Mississippi (Hym.).**

By M. R. SMITH, A. and M. College, Mississippi.

The need for lists of insects common to certain localities is becoming more appreciated each day. Not only are accurate lists almost indispensable to the systematist but they are also the source of much help to the economic entomologist. This list, although not complete by any means, is being published with the idea that it will make known to some extent the characteristic ant fauna of the Gulf States; an area in which there has never been any consistent collecting for ants until recently. The ant fauna of the South Eastern and the South Western States is fairly well known, so this list will tend to bridge the intervening gap.

The genera best represented in Mississippi are *Pheidole*, *Crematogaster* and *Camponotus*, others such as *Myrmica*, *Pogonomyrmex*, *Tapinoma*, etc., have only one species.

Of the 76 species, subspecies and varieties recorded in this paper, 7 are imported species, namely: *Monomorium pharaonis*, *Tetramorium guineense*, *Prenolepis longicornis*, *Iridomyrmex kumilis*, *Solenopsis rufa*, *Pheidole floridana* and *Camponotus socius*. Two of the species mentioned, *Iridomyrmex humilis* and *Monomorium pharaonis* are of considerable economic importance as house ants.

This list also includes two new species of *Colobopsis* and one new variety of *Aphaenogaster* which have recently been found in Mississippi.

The writer could enlarge this list by adding species which will no doubt be taken in the state in later years, but since there are always chances for errors in doing this, he prefers to list only the species which are definitely known to occur in Mississippi.

The species here listed, include specimens collected by the writer, those given him by friends, and specimens in the collections of the Mississippi A. and M. College. The writer particularly wishes to acknowledge here the kind assistance of Mr. Andrew Fleming, who has furnished numerous specimens and notes.

Dr. W. M. Wheeler has very kindly aided the writer by determining a number of the more difficult species. Professor R. W. Harned has offered much encouragement and been very generous in the allotment of time for such work.

Family FORMICIDAE.

Subfamily PONERINAE.

1.—*Ponera trigona* Mayr. var. *opacior* Forel.

A. and M. College. This uniform, brownish colored species has been taken a number of times here at the college; no doubt it occurs throughout the state. *P. opacior* nests under logs in the woods where there is plenty of moisture available. The ants are very timid and not always easy to capture.

This ant may be distinguished from the other species of the genus by the worker having her eyes located near the anterior fourth of the head; joints 3-6 of the antennal funiculi are much broader than long.

2.—*P. coarctata* Latr. subsp. *pennsylvanica* Buckley.

This ant has been reported by Mayr to occur in Mississippi, but so far the writer has not been able to take it in the state, although he has collected in various localities.

*P. pennsylvanica* is somewhat larger than the species mentioned above and may be distinguished from it by the very distinct punctuation of the head and by the darker color of the body, usually black. It is a very common ant in the Northern and North-eastern States where it lives under stones, logs, or leaf mold in the woods in the presence of abundant moisture.

Subfamily MYRMICINAE

3.—*Pseudomyrma brunnea* F. Smith.

Gulfport; Sibley; Ocean Springs. This ant has been found nesting in the twigs of white ash, *Fraxinus americana*, and in the twigs of the so-called China berry tree, *Melia Azedarach*. Very little is known concerning its habits but it is believed to feed principally on honey dew. This and the other species of *Pseudomyrma* appear to occur only in the lower part of the state.

*P. brunnea*, as its name indicates, is a brownish colored species which may be easily distinguished by its distinct coloration.

4.—*P. pallida* F. Smith.

Pascagoula; Union City; Sibley. This ant has been found to nest in the twigs of China berry trees also. It most probably nests in the stems of other trees and plants.

The writer has for some time believed that this and the following species are the same, *flavidula* being nothing more than a nest variety. Specimens from numerous nests show considerable variation in color, ranging from the pale yellow of *pallida*, without spots at the base of the abdomen, to the distinct yellow of *flavidula* which has a definite black spot on each side of the base of the abdomen. If these two species should prove to be the same, *flavidula* would become a synonym of *pallida* since the latter species was described at an earlier date.

5.—*P. flavidula* F. Smith.

Bay St. Louis; Gulfport; Sibley. Nests of this ant have been found in the twigs of China berry, pecan, swamp dogwood, white ash, etc. The habits of this species are like those of the two *Pseudomyrmæ* mentioned above.

6.—*Leptothorax curvispinosus* Mayr.

A. and M. College; Fulton; Tupelo. This species usually nests in galls or twigs but has been reported to nest in decaying wood. Workers are very often seen licking up honey dew on the leaves of trees and plants. It is one of the most common species of *Leptothorax* in Mississippi.

*L. curvispinosus* is a small, yellowish ant with characteristic, long, curving, thoracic spines from which the ant gets its name. A dark spot is present near the base on each side of the first gastric segment.

7.—*L. fortinodis* Mayr.

A. and M. College; Okolona; Rara-Avis; Tupelo; Sibley. Without doubt this is the most common species of *Leptothorax* in Mississippi. The ants nest in oaks and other trees and can be found crawling up and down the trunks or entering small holes in the bark.

This species can be distinguished from the other species of *Leptothorax* here mentioned by its dark or blackish color, absence of the meso-epinotal constriction, the presence of short,

dentiform, thoracic spines and the rather prominently enlarged petiole.

8.—*L. schauimi* Roger.

A. and M. College. This pretty, yellowish red species has been taken on numerous occasions here at the College. The ants have been collected from oak logs and oak trees. Evidently this species has the same nesting habits as *L. fortinodis*. A nest found in a niche of a dead cottonwood tree contained 31 workers, 2 queens, and a number of larvae.

*L. schauimi* is closely related to *fortinodis* in general appearance and habits. It may be separated from the latter by its yellowish red color, and its much smaller petiole. *Schauimi* like *fortinodis* has no distinct meso-epinotal constriction.

9.—*L. (Dichothorax) pergandei* Emery.

A. and M. College. This is distinctly a ground-nesting species, the workers of which may be easily confused with the workers of *Pheidole* upon superficial examination. Because the workers forage singly their nest is hard to locate.

*L. pergandei* can be distinguished from the other ants of this genus by its 12-jointed antennae, pronounced meso-epinotal constriction, and by the abundance of long white hairs covering the body.

10.—*Aphaenogaster treatae* Forel.

A. and M. College; Rara-Avis. Nests of this ant are constructed in the ground in shady places. The workers forage singly, feeding on smaller insects, etc. Because of their slender build they can run very rapidly and for that reason are exceedingly hard to capture.

The worker is easily recognized by the prominent lobe at the base of the antennal scape.

11.—*A. treatae* subsp. *harnedi* Whlr.

Caesar. This subspecies, which was named for Professor R. W. Harned, is distinguished from *treatae* by its much shorter and narrower antennal lobes and by the more opaque coloration of the thorax, petiole, post-petiole and basal half of the first gastric segment.

12.—**A. fulva** Roger.

Meehan Junction; Rara-Avis. Nests of this species are built in rotten logs in dense forests. This species does not seem to be as common in Mississippi as *treatae*.

*A. fulva* is a slender, reddish brown ant with epinotal spines which are about one half the length of the base of the epinotum.

13.—**A. mariae** Forel.

Rara-Avis. Only one specimen of this rare species has been taken in the state. *A. mariae* is thought to be parasitic on *A. fulva* and its varieties.

This species can be distinguished from any of the other *Aphaenogasters* by the base of the first gastric segment being longitudinally striated.

14.—**A. lamellidens** Mayr. var. **nigripes** Smith.

A. and M. College; Columbus. This variety has nesting habits similar to those of *A. lamellidens*.

This is a variety of the species which may be easily recognized by its distinctly dark colored legs.

15.—**Monomcrium minimum** Buckley.

A. and M. College; Greenville; Yazoo City; Sibley. This little, shining black species is very widely distributed throughout the state. It may be found nesting in the soil, trees, rotten logs, and houses. The workers feed on honey dew and on smaller insects. "The tiny black ant," as it is called, is one of the most common house-infesting species that we have in Mississippi. According to housekeepers, the ants show a preference for greasy foods, such as meat, lard, butter, etc.

16.—**M. pharaonis** Linn.

Columbus; A. and M. College. This imported species is well distributed throughout the state. Unlike *minimum*, it lives only in greenhouses, dwellings, stores, etc., and is never found nesting in the open, so far as the writer knows. It is a very common house-infesting ant.

*M. pharaonis* can be easily separated from *minimum* by its distinct, pale yellowish color. It is commonly called "the tiny red ant," or "Pharaoh's ant." There is an infuscated spot on

each side of the base of the first abdominal segment. This species bears a superficial resemblance to *Solenopsis molesta* but may be distinguished from that species by its larger size and by the fact that it possesses a three-jointed antennal club instead of a two-jointed club like *molesta*.

17.—*Trachymyrmex septentrionalis* subsp. *obscurior* var. *seminole* Whlr.

Columbus; A. and M. College. This is the only fungus-growing ant known in the state and is easily recognized by the numerous tubercles and spines on the body of the workers. Nests are constructed in sandy soils in shady locations. The nests, which are most common in the early spring months, can be identified by the crescentic shaped mass of excavated earth which is placed from a foot to a foot and a half from the entrance to the nest. Oak catkins, caterpillar excrement, etc., is used by the workers on which to cultivate the fungus and, so far as is known, the ants depend entirely on this as a source of food. Later in the year the extreme hot weather causes the ants to plug the gallery to their nests in order to prevent evaporation of the moisture, since the ants and the fungus are entirely dependent on excessive moisture for their growth and development.

18.—*Myrmica scabrinodis* subsp. *schencki*, var. *emeryana* Forel.

Rara-Avis. This is the only species of *Myrmica* known to occur in Mississippi. A number of workers were collected in a low, damp spot in the hilly northeastern section of the state.

This species can be easily recognized by its very distinct rugose head and thorax and by the exceedingly large lobes at the base of the antennal scapes.

19.—*Pogonomyrmex badius* Latr.

Lucedale; Gulfport; Laurel; Star; Clara; Ocean Springs. This ant is commonly known as "The Florida Harvester" because of the fact that the workers feed principally on seeds. It is the only species of *Pogonomyrmex* known to occur in Mississippi. The nests are fairly large mounds usually constructed

in sandy areas. The workers can sting severely and this species is without doubt our worst stinging ant. This ant seems to be confined altogether to the central and southern part of the state.

"The Florida Harvester" is a large reddish ant with heavily striated head and thorax. The epinotum is bare of spines.

20.—*Pheidole pilifera* Roger.

A. and M. College. This is not a very common ant in this locality being more strictly a northern form. Nests are built in pastures or grassy spots in fields. The workers are known to store seed in the nest for food.

Soldiers of this species have exceedingly large heads, so large that their heads are out of proportion to their bodies; this will serve to distinguish them from any of the other *Pheidoles* which occur in Mississippi. They bear a closer resemblance to *P. sitarches rufescens* than to any other species of the genus in Mississippi.

21.—*P. sitarches* subsp. *rufescens* Whlr.

A. and M. College. This is a much more common species than the one just mentioned above. *Sitarches*, although resembling *pilifera* somewhat in color and structure, lacks the exceedingly large head which is common to *pilifera*. This is also a soil nesting species, with habits similar to those of *pilifera*.

*Sitarches* is a reddish, opaque colored species with head, thorax, petiole and post petiole bearing abundant, closely set punctures.

22.—*P. morrisoni* var. *vanceae* Forel.

Starkville; Sturgis. Nests of this species are always built at the base of clumps of grass, usually of the genus *Andropogon*. When the nest is disturbed, numerous workers and soldiers rush forth angrily. Occasionally they get on the collector's hands and when they nip the flesh in a tender place the bite is rather noticeable. It is by far the most courageous species of *Pheidole* in Mississippi.

The soldiers of this species can be easily recognized by the vestigial spines on the epinotum and by the presence of long, abundant hairs over all portions of the body.

23.—*P. crassicornis* Emery.

McHenry. This does not seem to be a common species in Mississippi, at least not in the eastern part of the state, where the writer has done most of the collecting. It probably nests under stones and logs and feeds on insects.

*P. crassicornis*, as its name indicates, may be distinguished from the other species of *Phcidole* in this state by the distinctly flattened antennal scapes and by the deep reddish color of the head and thorax of the soldier.

24.—*P. vinelandica* Forel.

A. and M. College; Tunica; Decatur. This is one of the smallest members of the genus in Mississippi, and one of our most common ants. Nests are constructed in the soil and the earth thrown out to form a small crater, which is about an inch in diameter. The workers feed on insects and small seeds.

Because of her small size there is no danger of confusing the soldier of *vinelandica* with the soldier of any other *Phcidole* except *floridana*. The latter species has a deeply punctate thorax which *vinelandica* does not have. *Vinelandica* has a much larger and broader head in proportion to the body and also has very prominent thoracic angles.

(To be continued)

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## A New Southern Tachinid Fly (Diptera.)

By H. J. REINHARD, Texas Experiment Station,  
College Station, Texas.

### *Cuphocera aurifrons* n. sp.

♂. Black, grayish, pollinose, thorax and abdomen sub-shining, length 9 to 12 mm. Eyes bare. Head slightly wider than thorax, diameter at vibrissae much shorter than at base of antennae. Sides of front opaque, yellowish, pollinose, clothed with long fine erect hairs. Vitta rather obscure, yellow, narrow at vertex, widening at base of antennae. Front at narrowest point about one and one-fourth times as wide as either eye. Basal joints of antennae yellow, third brown or blackish, except on base and inner side. The latter joint broad and decidedly rounded on the front edge, at most but slightly longer than second. Arista black, rather short, thickened almost to tip, second joint elongated. All macrochaetae of head strong. Orbital bristles absent. Ocellars usually absent, but occasionally

represented by weak proclinate bristles. Inner and outer verticals equal, the inner pair strongly cruciate. Frontals in two rows on each side, diverging below and descending almost level with apex of second antennal joint. Median depression, genae, and sides of face silvery white. The latter at the lower corner of the eye bearing two macrochaetae more or less surrounded by short black hairs which extend upward to lowest frontals in an irregular row along margin of the eye. Vibrissae strong, cruciate, situated slightly above the prominent front border of oral margin. Facial ridges practically bare. Cheeks nearly four-fifths the eye height, sparsely covered with black bristles and bearing a row of macrochaetae along the oral margin. Beard dense, short and whitish in color. Proboscis moderately long, once geniculate, distal segment ridged, brownish-black, shining. Labella small, brown or yellowish. Palpi absent.

Thorax grayish, pollinose, with four distinct vittae, the inner pair narrow and becoming obsolete near middle of dorsum, the outer pair more conspicuous, broadly interrupted at the suture. Postsutural dorsocentral bristles three, sternopleurals three. Pleurae cinereous, pollinose. Scutellum gray, pollinose, yellow apically, with three pairs of long, marginal macrochaetae and a shorter, cruciate, apical pair.

Abdomen ovate, white pollinose, dorsum with reflecting spots. First three segments black, sides of second and third occasionally tinged with yellow, last segment rufous. All macrochaetae marginal, except on last segment, which bears a discal and sub-discal row.

Legs dark, thinly pollinose, coxae, knees and tibiae yellowish, bristles on the outer side of middle tibiae, unusually long. Hind tibiae not ciliate. Pulvilli tawny, front pair nearly as long as last tarsal joint, claws elongate.

Wings grayish, hyaline, costal spine obsolete. First posterior cell narrowly open, terminating far before wing tip. Veins yellow. Third vein bristly almost or quite to small crossvein, all others bare. Hind cross vein oblique, posterior end at less than one-third the distance from bend to small crossvein. Bend of fourth vein angular, with a very short stump or distinct fold. Calypteres whitish, tinged with faint yellow along the border.

♀. Similar to male differing as follows: Front distinctly wider, orbital bristles present, and the outer row of frontal bristles reduced to one or two posteriorly directed macrochaetae situated between the inner row and the orbitals. Pulvilli short.

Described from many specimens of both sexes, collected at College Station, May-November, 1917-23 (H. J. Reinhard). *Type*: Male, deposited in the U. S. National Museum.

This species probably has been confused with *fucata* v. d. W. described from Mexico. Coquillett, in his *Revision*, p. 140, referred several northern specimens here, but unfortunately none of these are available for comparison. Subsequent to the publication of his paper he added the following note, "sides of front opaque." In *Biol. Cent. Amer.*, Vol. II, p. 476, van der Wulp described *fucata* as having front laterally shining bluish-black and third antennal joint twice as long as the second. These characters do not agree with any specimens of the series from which this species has been described.

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**Notes on the False Indigo Lace Bug, *Gelchossa heidemanni* Osborn and Drake, in New Jersey (Hemip.: Tingitidae).**

By HARRY B. WEISS and ERDMAN WEST, New Brunswick, New Jersey.

Smith (*Insects of New Jersey*, p. 149) records this species under the name *Leptostyla oblonga* from several localities in New Jersey and these together with the localities listed by Barber (*Circ. 54*, N. J. Dept. Agric. 1922) indicate rather a wide distribution in the state. As a matter of fact the species is distributed over a large part of the United States, occurring on the false indigo *Baptisia tinctoria* L. Osborn and Drake (*Ting.* of Ohio. *Ohio Biol. Survey Bull.* 8, Vol. II, No. 4, p. 238, 1916) cite localities in Arkansas, Washington, District of Columbia, and Massachusetts. McAtee (*Bull. Brook. Ent. Soc.* Vol. XII, No. 3, pp. 63-64, 1917) states that it is common about Washington, D. C., and mentions also the states of Massachusetts, New Jersey and Louisiana. In the *Hemiptera of Connecticut* (p. 705) it is listed as occurring at several places. Parshley records it from several localities in Massachusetts in his *Fauna of New England, Hemiptera-Heteroptera*, (Occas. Papers Bost. Soc. Nat. His. VII). Van Duzee (*Cat. Hem.*

Amer. No. Mex. p. 218, 1917) gives its distribution as Massachusetts, Pennsylvania, District of Columbia, Maryland and Arkansas.

Nothing appears to have been recorded concerning its life history and the following notes relating to observations made mainly at Monmouth Junction but also at South Amboy, Hornerstown, Prospertown, Lahaway and High Bridge, New Jersey, supply some of this information. In the central portion of New Jersey overwintering adults appear about the last week of May and persist in more or less plentiful numbers until about the middle of June. As a rule the adults inhabit the lower surfaces of the leaves and do noticeable feeding, causing white areas to appear on the upper surfaces. Eggs are deposited during the last of May and first part of June and the young nymphs become plentiful about the middle of June. By the last of June and first week of July many last stage nymphs are in evidence and adults issue shortly afterwards, becoming numerous from the beginning of the second week of July until the end of the month. There is apparently only one brood and the adults gradually disappear during August.

The eggs are deposited singly, or in irregular groups of two or three, in the lower tissue of the leaf either near or away from the midrib. Each egg is embedded well in the tissue with the long axis of the ~~leaf~~ parallel with the leaf surface and with only the truncated, oval end of the neck of the egg visible as it projects slightly beyond or remains flush with the leaf surface. These oval ends resemble *stomatata* somewhat and are similar in color to the leaf. After hatching the young nymphs appear to feed close to the midrib, assuming a position as a rule, parallel to this part of the leaf. As they become older they feed in colonies of 10 or 12 on the lower surface, although many leaves may contain more and some only 1 or 2 nymphs. Usually both adult and nymphal feeding is well scattered over the plant. In severe infestations, which often occur, every leaf is white and hundreds of whitish nymphs and adults inhabit each plant. Such a condition existed at Prospertown, N. J., on July 18, when hundreds of adults and a very few last stage nymphs were

observed on the whitened plants. Five nymphal stages were observed and the following descriptions indicate the changes which take place in the development of the insect from egg to adult.

*Egg.* Length 0.39 mm. Width 0.1 mm. Smooth, yellowish-white, translucent, somewhat cylindrical, flask-shaped with the broad neck-like portion bent to one side. Truncate end of neck-like part suboval, opposite end broadly rounded with diameter slightly less than that of middle portion of egg.

*First Stage Nymph.* Width of head including eyes 0.1 mm. Length about 0.45 mm. White or white slightly tinged with yellow. Subrectangular, pointed at anterior and posterior ends. Antennae slender, 4-jointed, as long or almost as long as body. Eyes lateral, red, consisting of 5 distinct ommatidia. Head, thorax and abdomen subequal in width. Prothorax twice as long as mesothorax; remainder of thoracic and abdominal segments subequal in length. Legs long, whitish. Sheath of rostrum reaching to between the third pair of legs. Armature similar to that of the third stage. Triangular group of three spines on the head, the two spines on the posterior margin of the head and the single median, dorsal, abdominal spines quite pronounced; remainder minute.

*Second Stage Nymph.* Width of head including eyes 0.15 mm. Length about 0.72 mm. Shape suboval or elliptical. Whitish except for large spines which are brownish. Antennae, eyes, legs, etc., similar to those of preceding stage. Tip of rostrum reaching to between the third pair of legs. Spines minute, similar in position to those of the third stage; the pair on the posterior margin of the head and the single, median, dorsal spines on abdominal segments 2, 5, 6 and 8 being comparatively long and prominent.

*Third Stage Nymph.* Width of head including eyes 0.2 mm. Length about 0.95 mm. Shape elongate-oval or elliptical, sides subparallel, converging acutely anteriorly and posteriorly. Whitish except for portions of legs, pair of spines on head and long, median dorsal spines on abdomen which are brownish. Antennae slender, 4-jointed, almost as long as body, third joint longer than other three combined. Eyes lateral, prominent, red, consisting of several ommatidia. Head sub-globular. Prothorax wider than head, subrectangular in shape and about as long as mesothorax. Mesothorax subrectangular, slightly wider than prothorax. Metathorax about one-half as long as mesothorax. Head bearing three rather prominent, median spines, arranged triangularly, also a median pair of long spines on the posterior

edge. Prothorax with two pairs of small, median, dorsal spines, one pair posterior to the other and a single spine on each lateral edge. Mesothorax with pair of median, dorsal spines and a single spine on each lateral edge. Metathorax with a minute pair of median, dorsal spines. First abdominal segment with a minute pair of median, dorsal spines. Second abdominal segment with a single, prominent, median, dorsal spine. Abdominal segments 5, 6 and 8 each with a rather prominent single, median, dorsal spine. Single lateral spines on abdominal segments 1 to 9, those on segments 1 to 3 being minute and the remainder quite pronounced. Each spine arising from a tuberculate base and bearing a minute hair at or near tip. Tip of rostrum reaching to between the third pair of legs. Legs comparatively long.

*Fourth Stage Nymph.* Width of head including eyes 0.25 mm. Length about 1.4 mm. Similar in shape and color to preceding stage. Spines more pronounced. Armature similar to that of preceding stage except that lateral spines are absent from the first abdominal segment. Wing pads of mesothorax sub-oval, extending laterally slightly beyond edges of mesothorax and posteriorly to or slightly beyond the first abdominal segment. Tip of rostrum extending to between second pair of legs.

*Fifth Stage Nymph.* Width of head including eyes 0.3 mm. Length about 1.8 mm. Color white except as noted. Shape elongate-oval or subelliptical. Antennae almost as long as body, light brown, sparsely hairy, hairs minute; 4-jointed, third joint longer than the other three combined. Eyes prominent, lateral, red, consisting of numerous ommatidia. Head subglobular, bearing a minute tubercle between the base of each antenna and eye, also three rather prominent, median spines arranged triangularly and a pair of prominent spines on median portion of posterior margin.

Prothorax somewhat shield-shaped, anterior margin transverse, sides projecting outward slightly, posterior margin ending in an obtusely angled point; anterior margin bearing a pair of small median spines which are white; prothorax bearing a pair of dorsal, median spines and one spine at each posterior, lateral angle. Lateral edges of prothorax bearing minute hairs or spine-like hairs. Mesothorax partly covered by posterior projection of prothorax and bearing a pair of prominent, median, dorsal spines on posterior edge. Wing pads of mesothorax elongate, narrow, projecting back to fifth abdominal segment. Wing pads of metathorax slightly longer. Mesothoracic wing pad bears a prominent spine on lateral edge about beginning of posterior third; anterior to this spine along the lateral edge are

several spine-like hairs. Metathorax with a dorsal, median pair of greatly reduced white spines or tubercles.

Lateral edges of abdomen slightly margined, anal segment tubular. First abdominal segment bears a pair of median, dorsal, greatly reduced spines or tubercles. Prominent median, dorsal spines on abdominal segments 2, 5, 6, 7 and 8, the one on the seventh segment sometimes being absent. Single spines on posterior lateral edges of abdominal segments 4, 5, 6, 7, 8 and 9. All spines on body dark or dark-tipped except the two, median, dorsal, prothoracic pairs, and the lateral, abdominal spines on segments 4 to 8, which are white. Sometimes the median, dorsal spine on the fifth abdominal segment is white. All spines except lateral, abdominal ones are directed vertically or nearly so. Legs long whitish or slightly browned, bearing a few minute hairs. Tip of rostrum reaching almost to between the second and third pair of legs. Minute spines present on lateral edges of abdominal segments 2 and 3 which were present in stage four are missing in stage 5.

*Adult.* This was described by Osborn and Drake in 1916 (Ohio Biol. Survey Bull. 8, Vol. II, No. 4, p. 238) and need not be repeated here. Van Duzee in his *Catalogue of the Hemiptera of America North of Mexico* places *heidemanni* O. & D., as a synonym of *Leptostyla clitoriae* Heid., but both are distinct species. Moreover the eggs of *clitoriae* as described by Heidemann (Proc. Ent. Soc. Wash. XIII, p. 137) are ovate, black and deposited upright on the under leaf surface of *Clitoria mariana*, whereas the eggs of *heidemanni* are of a different shape and embedded in the leaf tissue of *Baptisia tinctoria*. Parshley in the *Hemiptera of Connecticut* (P. 705) and McAtee (Bull. Brook. Ent. Soc. Vol. XII, No. 3, pp. 63-64, 1917) state that Mr. Heidemann's cabinet name for the species was *L. affinis* and Parshley further states that the species has usually been referred to as *oblonga* Say. Drake (Mem. Carn. Mus. Vol. IX, No. 2, p. 372, 1922) writes that the genus *Leptostyla* was first established in 1864 by Paolo Lioy for a genus of *Muscidae* (*Diptera*) and has priority over *Leptostyla* Stål, 1873 (*Hemiptera*). This was recognized by Kirkaldy in 1904 (Entom. XXXVII, p. 280) who proposed the name *Gelchossa*.

## Undescribed Crane-Flies from Argentina (Dipt. : Tipulidae). Part VIII.

By CHARLES P. ALEXANDER, Amherst, Massachusetts.

The four new species of *Dicranomyia* described at this time were collected in the Province of Córdoba by Dr. Bruch, and in the Province of Jujuy by Engineer Weiser, to both of whom I am greatly indebted for numerous specimens of Argentinian Tipulidae. The types are preserved in the writer's collection through the kindness of the collectors.

### *Dicranomyia flavofascialis* sp. n.

Antennae with the scalpal segments obscure brownish yellow, the flagellum dark brown; head with a grayish yellow bloom; mesonotum dark reddish brown, the praescutum with three, brownish black stripes; scutal lobes brownish black; pleura largely dark brown; femora with the tips broadly yellow and with a more or less distinct subapical brown ring; wings yellowish subhyaline; stigma and indistinct seams along the cord and outer end of cell *1stM*<sub>2</sub> darker; vein *Sc* short; abdomen dark brown, the segments ringed caudally with yellowish.

♂. Length 8.2-8.5 mm.; wing 9.4-10 mm. ♀. Length 8.5-10.5 mm.; wing 8.5-11.5 mm.

Rostrum and palpi dark brown. Antennae with the scapal segments obscure brownish yellow; flagellar segments oval, dark brown. Head dark with a greyish yellow bloom; vertex between eyes narrow.

Mesonotal praescutum dark reddish brown with three, brownish black stripes, the median stripe broad, becoming indistinct before the suture; scutum pale medially, the lobes brownish black; scutellum yellowish medially, the lateral margins brownish black; postnotum dark brown, the lateral margins narrowly obscure yellow. Pleura dark brown, the dorsal margin of the sternopleurite more yellowish; remainder of sternopleurite dark brown. Halteres pale brown, the knobs and distal half of the stem brown.

Legs with the coxae obscure yellow, the outer faces more or less darkened; trochanters dull yellow; femora pale brown with the tips broadly and conspicuously light yellow, preceded by a dark brown ring; tibiae and tarsi brown.

Wings yellowish subhyaline; stigma suboval, brown; narrow and very indistinct seams along the cord and outer end of cell *1st M*<sub>2</sub>; veins dark brown. Venation: *Sc* short, ending opposite or slightly before the origin of *Rs*, *Sc*<sub>2</sub> a short distance

from the tip, *Sc1* alone being about equal to the outer deflection of *M3*; *Rs* about one-half longer than the deflection of *R4+5*; cell *1st M2* closed; basal deflection of *Cu1* at the fork of *M* or nearly so.

Abdominal tergites dark brown, the posterior margins of the segments conspicuously and broadly ringed with dull yellow; sternites obscure yellowish brown, similarly ringed with yellow.

*Holotype*: ♂, La Granja, Alta Gracia, Córdoba, April 1-8, 1920, (C. Bruch). *Allotopotype*: ♀. *Paratopotypes*: 30 ♂ ♀.

*Dicranomyia flavofascialis* is closely related to *D. andicola* (Alexander) but is readily told by the darker coloration of the thorax and abdomen, the less distinct brown pattern on the wings, and the subterminal brown ring on the femora.

*Dicranomyia patruelis* sp. n.

Antennae dark brown, the first scapal segment obscure brownish yellow; flagellar segments oval; head light brown; mesonotum obscure yellow, the praescutum with three, broad, dark brown stripes; scutellum dark brown with a pale median line; halteres long and slender; legs uniformly brown; wings yellowish subhyaline, the stigma pale brownish yellow; *Sc* short, cell *1st M2* closed; abdominal tergites uniformly dark brown.

♂. Length 8 mm.; wing 9 mm. ♀. Length 9 mm.; wing 10 mm.

Rostrum and palpi dark brown, the former elongate. Antennae with the basal segment obscure brownish yellow, the remainder of the organ dark brown, the flagellar segments oval. Head light brown, somewhat narrowed behind.

Pronotum long and narrow, dark brown above, paler laterally. Mesonotal praescutum shiny obscure yellow with a broad, dark brown, median stripe that becomes bifid and obliterated shortly before the suture; lateral stripes not well indicated; scutum whitish, each lobe dark brown; scutellum dark brown, with a capillary pale median vitta; postnotum dark brown, paler laterally. Halteres long and slender, dark brown, the base of the stem paler.

Legs with the coxae obscure yellow, the fore coxae darker; trochanters obscure yellow; femora light brown; remainder of the legs darker brown.

Wings yellowish subhyaline, the stigma very pale brownish yellow; veins brown. Venation: *Sc1* ending just before the origin of *Rs*, *Sc2* some distance before this tip, *Sc1* alone being a little longer than the basal deflection of *M1+2*; *Rs* about one-

third longer than the deflection of  $R4+5$ ; tip of  $R1$  beyond  $r$  indistinct; cell  $1st\ M2$  closed, subrectangular; basal deflection of  $Cu1$  much shorter than  $Cu2$ , placed just beyond the fork of  $M$ .

Abdominal tergites uniformly dark brown; sternites uniformly obscure brownish yellow, the terminal segments a little darker.

*Holotype*: ♂, La Granja, Alta Gracia, Córdoba, April 1-8, 1920, (C. Bruch). *Allotopotype*: ♀.

*Dicranomyia patruelis* is closely allied to *D. flavofascialis* but is readily told by the uniform femora and abdomen, the subhyaline wings with the stigma pale, and the different coloration of the body.

### *Dicranomyia globulicornis* sp. n.

Antennae uniformly dark brown, the basal flagellar segments subglobular; head grayish brown, the orbits clearer gray; mesonotum yellowish buff, the praescutum with four, narrow, brownish gray stripes, the scutellum and postnotum whitish, pruinose; legs brown; wings hyaline, highly iridescent; stigma pale brown;  $Sc$  short,  $Sc2$  far before the tip of  $Sc1$ ; cell  $1st\ M2$  closed; abdominal segments uniformly brown.

♂. Length about 5.8 mm.; wing 6.5-6.8 mm.

Rostrum and palpi dark brown; rostrum slightly produced. Antennae dark brown throughout, the basal five or six segments of the flagellum nearly globular, the succeeding segments passing into oval, the terminal segments elongate. Head grayish brown, the orbits broadly paler gray; head strongly narrowed behind; vertex between eyes wide.

Pronotum large, dark brown medially, paler laterally. Mesonotal praescutum yellowish buff with four, narrow, brownish gray stripes, the intermediate pair narrowly separated and not attaining the suture; scutum pale grayish white medially, the centers of the lobes dark brownish gray; scutellum and postnotum pale, covered with a sparse white bloom. Pleura pale reddish yellow, covered with a sparse white bloom. Halteres short, pale, the knobs indistinctly darker.

Legs with the coxae shiny reddish brown; trochanters obscure yellow; femora pale brownish yellow; remainder of the legs brown.

Wings hyaline, highly iridescent; stigma pale brown; veins brown. Venation:  $Sc$  short,  $Sc1$  ending before the origin of  $Rs$ , the distance about equal to  $m$ ;  $Sc2$  far from the tip of  $Sc1$ , the latter vein alone thus being very long, only a little shorter than  $Rs$  and a little longer than the deflection of  $R4+5$ ; cell  $1st\ M2$

closed; *m* about two-thirds the outer deflection of *M*<sub>3</sub>; basal deflection of *Cu*<sub>1</sub> longer than *Cu*<sub>2</sub>, placed at or before the fork of *M*.

Abdomen uniformly brown, the tergites a little darker colored.

*Holotype*: ♂, Tilcara, Province of Jujuy, March 20, 1920, (V. Weiser). *Paratopotype*: ♂.

*Dicranomyia jujuyensis* sp. n.

Mesonotal praescutum with an obscure yellow median stripe, the posterior half of the sclerite with four, narrow, dark brown stripes; scutal lobes with a dark brown ring; halteres yellow, the knobs dark brown; wings subhyaline, with a heavy reticulate pattern; *Sc* long, cell *1st M*<sub>2</sub> closed; abdomen uniformly reddish brown.

♂. Length 4.8 mm.; wing 5.8 mm.

The unique type is not fully matured. Rostrum relatively long and slender, brown, sparsely pollinose; palpi dark brown. Antennae with the first segment brown, the second segment and basal segments of the flagellum paler, distal flagellar segments brown. Head with a sparse, grayish yellow pollen, the center of the vertex with a brown mark.

Pronotum pale, sparsely pollinose. Mesonotal praescutum with a broad, median, obscure yellow stripe, the posterior half broadly margined with dark brown, the mesal margin of the usual lateral stripes similarly dark brown, the interspaces silvery white, pruinose; lateral margins of the sclerites obscure yellow; scutum silvery-white, each lobe obscure yellow, encircled by a broad, dark brown marking; scutellum silvery; postnotum obscure yellow, sparsely pollinose. Pleura brownish yellow. Halteres yellow, the knobs dark brown.

Legs long and slender, the coxae and trochanters yellow; remainder of the legs not fully colored, apparently to become dark brown with the femoral tips paler.

Wings subhyaline with a conspicuous reticulate brown pattern, the heavier areas being at the origin of *Rs*, before midlength of cells *Sc* and *R*; near midlength of *M*; a conspicuous stigmal area that extends onto the deflection of *R*<sub>4+5</sub>; a large, conspicuous area occupying the outer end of cell *2nd R*<sub>1</sub>, the centers of cells *R*<sub>3</sub> and *R*<sub>5</sub>; all the other cells of the wing with conspicuous spots, clouds and transverse bars; costa yellow with about 22 subequal dark brown marks alternating with yellow areas that are usually much wider; remaining veins pale brown. Venation: *Sc* long, *Sc*<sub>1</sub> ending beyond midlength of the long *Rs*, *Sc*<sub>2</sub> at the tip of *Sc*<sub>1</sub>; *r* at the tip of *R*<sub>1</sub>; *Rs* long, square and spurred at origin; cell *1st M*<sub>2</sub> closed; outer deflec-

tion of  $M_3$  about twice the length of  $m$ ; basal deflection of  $Cu_1$  before the fork of  $M$ , the distance being about equal to  $r-m$ .

Abdomen reddish brown, possibly darker when fully colored.

*Holotype*: ♂, Tilcara, Province of Jujuy, March 20, 1920, (V. Weiser).

In its reticulate wing-pattern, *D. jujuyensis* bears a certain resemblance to *D. reticulata* (Alexander) of Cuba and Southern Florida, but is readily told by the long subcosta and the details of coloration.

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### Color Preference of Bees (Hymen.).

Lately there has come a statement that bees are largely given to visiting blue, purple or violet flowers, although not totally ignoring yellow or red ones. Bees are heterotropic. They have become diversified along with the entomophilous flora. Of 437 local flowers whose visitors were observed, 96.2 per cent are visited by bees. There are only three on which I am sure bees never occur. The colors of the local flora are red (all dark colors) 29.4 per cent, yellow 30.7, white 39.8. Of the flowers observed 30.2 per cent are red, 30.6 yellow, 39.1 white, showing a little discrimination in favor of red flowers. The flowers visited by bees show red 28.7 per cent, yellow 31.1, white 40.0. Of 6063 bee visits 23.1 per cent are to red, 33.5 to yellow, 43.2 to white. The flowers visited and visits made are about what might be expected without regard to color. The determining condition is the situation of the nectar, which is most accessible in white flowers and the least in red ones. Of local bees only 70 (23.6 per cent) are largely given to visiting red flowers. Of their visits, 45.9 per cent are to red, of the visits of 96 other species, 52.9 per cent are to yellow, while of the visits of the remaining 130 species, 55.9 per cent are to white.

When a statement about bee visits is made, one would like to know the percentages of red in the flora referred to, in the flowers observed and in the visits recorded. In the Alps 57.1 per cent of the bee visits were to red flowers, but these were about 48 per cent of the flowers observed, and the visits of insects of all classes showed 41.6 per cent under that color. In the Berlin Garden 55.4 per cent of bee visits were to red, but such flowers were 48.2 per cent of the flowers observed, indicating that they had been selected.

The general statement criticized here would be more correct if applied to hawk-moths or to butterflies.—CHARLES ROBERTSON, Carlinville, Illinois.

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., FEBRUARY, 1924.

## Entomology at the Convocation Week Meetings, December 27, 1923 to January 2, 1924.

The meetings of the American Association for the Advancement of Science and of Associated Scientific Societies were held at Cincinnati, Ohio, on the dates mentioned above. The occasion was the Seventy-fifth Anniversary of the A. A. S., the third of its meetings in the "Queen City of the West."

Papers relating, in whole or in part, to the tracheate Arthropods were listed on the programs of the following seven organizations, a smaller number of societies than were represented on the list for last year (see the NEWS for February, 1923, page 55).

American Society of Zoologists (alone) .....	9
The same with the Ecological Society of America .....	3
The same with the Botanical Society of America (joint Genetics Section) .....	6
Entomological Society of America .....	70
American Association of Economic Entomologists (including its sections on Apiculture and Horticultural Inspection) .....	89
American Phytopathological Society .....	1
Ecological Society of America (alone) .....	1
A. A. S. Section N, Medical Sciences .....	1

Total .....180

The 180 papers were concerned with the following subjects:

Cytology .....	1	Insecticides and Fumigants	24
Anatomy .....	7	Apiculture .....	14
Histology .....	1	Araneina .....	2
Physiology .....	11	Acarina .....	4
Ontogeny .....	4	Orthoptera .....	6
Genetics .....	6	Ephemera .....	1
Geographical Distribution .....	4	Odonata .....	1
Taxonomy .....	2	Mallophaga .....	1
Ecology .....	48	Anoplura .....	2
Parasites of Insects .....	7	Neuroptera .....	1
Relations to Man .....	2	Homoptera .....	17
General Economic Entomology .....	26	Heteroptera .....	12
Insects Injurious to Plants	20	Thysanoptera .....	2
		Coleoptera .....	16

Hymenoptera (excluding <i>Apis</i> ) .....	11	Diptera (excluding <i>Droso-</i> <i>phila</i> ) .....	9
<i>Apis</i> .....	6	<i>Drosophila</i> .....	6
Trichoptera .....	1	Siphonaptera .....	1
Lepidoptera .....	14		

Many of these figures are duplicated; thus the papers on *Drosophila* appear also under Genetics.

The large number of papers credited to Ecology is due to the extensive symposium of the Entomological Society of America on "Methods of Protection and Defense Among Insects," divided into five parts: *a* Protective Structures; *b* Protective Constructions; *c* Protective Size, Form and Color; *d* Protective Positions, and *e* Protective Behavior or Reactions, and listing 41 separate papers and authors. To it also is partly due the highest total (180 papers) yet presented at a Convocation Week.

The American Association of Economic Entomologists had two symposia: one on "Methods of Estimating Insect Abundance and Damage" (8 speakers listed); the other on the "European Corn Borer" (9 speakers listed).

The Ecological Society of America had a symposium on "Ohio Ecology," including one paper on Insects (Odonata, Prof. C. H. Kennedy).

The annual address before the Entomological Society was by Prof. James G. Needham, of Cornell University on "The Rôle of Insects in Food Production." The Presidential address to Economic Entomologists was by Mr. A. G. Ruggles, State Entomologist of Minnesota, on "Pioneering in Economic Entomology."

It is a matter of regret that none of the Editors of the NEWS were able to be present at Cincinnati, but, thanks to the kindness of Dr. Annette F. Braun, we are able to add a statement of the numbers participating in the sessions. Dr. Braun writes:

The following figures will give an idea of the attendance at the Entomological meetings in Cincinnati.

Entomological Society of America. Thursday afternoon session, December 27, 92; Friday morning, December 28, 125\*; Friday afternoon, December 28, 178\*: Saturday morning, De-

ember 29, 95; Saturday afternoon, 50-75; Saturday evening, 125.

The figures marked \* approximate the number of different persons present at some time during the session; not all were present at one time. In the Friday afternoon session, there were about 150 in the room at the same time throughout the session.

The Economic Entomologists had an average attendance of about 175. About 200 were present at one time or another.

The total registration at Cincinnati nearly equalled that of the 1920 meeting in Chicago.

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#### Notes on *Corythucha marmorata* Uhler in New Jersey (Hemip.: Tingitidae).

Since Dr. Felt's account of this species, in the *19th Report of the State Entomologist of New York* (N. Y. St. Mus. Bul. 76, P. 125, 1903), practically nothing has appeared concerning its life history and the following notes are intended as supplemental. At Mendham, New Jersey, on July 24, the species was noted as being very abundant and injurious to wild asters. Eggs, all nymphal stages and adults were present and the leaves of the plants were so injured that they were almost white, many of them being withered from the attacks of the nymphs. Eggs were observed in the tissue of the undersides of the leaves close to the mid and side ribs and sometimes in the tissue of the ribs. They were laid in irregular, elongate masses parallel to the ribs, some of the masses being made up of from 4 to 75 eggs placed with little or no regularity. Some leaves contained as many as 150 eggs. As a rule only the cap of the egg projected above the leaf tissue, but in a few cases the eggs appeared to have been carelessly laid and fully one half was exposed. The location of the eggs could be detected readily by reason of the brown, varnish-like excrement which was placed over them, the streaks of this material being quite pronounced along the mid-ribs. Eggs were noted in leaves badly injured by nymphal feeding as well as in uninjured leaves. The nymphs feed in colonies on the lower leaf surfaces, the newly hatched ones always being found close to the eggs from which they hatched. Colonies numbering from 6 to 100 individuals were noted and in quite a few instances, an adult female was near each colony of nymphs. The eggs and early stages were described by Dr. Felt and since his paper, the species has been mentioned often in systematic literature and faunal lists.—HARRY B. WEISS & RALPH B. LOTT, New Brunswick, N. J.

**Note on the mating of *Anopheles maculipennis*  
(Dipt.; Culicidae).**

While on a visit in Holland the mating of *A. maculipennis* was observed during several evenings. The observations were made in Gelderland, not far from the Rhine, in the middle of June and on the days of July 3 to 8 inclusive.

After a period of cold, with rainy days, the weather improved and the temperature increased. On June 16 at 8.45 P. M. a small swarm of *A. maculipennis* males were seen hovering at the windward side of some lilac bushes. Three pairs of copulating anopheles\* were kept under observation for 20 to 35 seconds until they separated.

On July 3, at 8.30 P. M. a number of small swarms of males of *A. maculipennis* were noticed on the windward side of some small pear trees. The swarms were composed of from 50 to 100 individuals. The movements of the insects were free and varied, circling upward and downward, back and forth, with their heads against a gentle breeze. The movements were often very irregular, individuals leaving the swarms and returning after a few seconds. Suddenly a female was seen entering the swarm causing a decided disturbance. The males were excited and made an extreme high singing sound.

In the course of 6 successive evenings swarm formation was observed. The formation of columns started about 7.30 P. M. and ended about 9.15-9.30 P. M. (Sun set 8.30-8.45). A few males would gather and as time went on others joined and took part in the dancing. It was repeatedly seen that a female entered the swarm, caught a male and flew away copulating end to end. In every case the female led off and dragged the male behind, flew for a short time and separated. The time of union lasted from 30 to 55 seconds. The temperature on these evenings ranged from 64 to 67° F. One copulating pair was seen to fly to a resting place at the edge of the thatched roof of the farm house about 5 feet above the ground. The united pair rested quietly for about 30 seconds, when the male flew away and the female shortly afterwards.

It was interesting to notice that swarms started to form first and hovered on the windward side of English walnut trees, then on the windward side of pear and apple trees, while only once a small swarm was observed at the end of a branch of linden trees. On the edges of the large walnut trees from 20 to 30 small swarms were counted. It is the common belief that English walnut trees are a protection against mosquitoes.

\* One pair caught while copulating was determined by Dr. L. O. Howard a few days later as *A. maculipennis*, while others were determined later.

Swarming was much more pronounced near the dwelling than near the chicken pen or empty stable. The nearest pigsty was about 300 yards away. In the proximity of these pigsties swarming and mating took place during the same evenings, although in apparent smaller numbers.—WILLEM RUDOLFS, Biochemist in Entomology, New Jersey Agricultural Experiment Stations, New Brunswick, N. J.

**A Gynandromorph of *Odynerus conformis* Sauss.  
(Hymenoptera, Aculeata).**

On August 21st, 1923, while collecting at Glen Echo, Md., I captured a gynandromorph of *Odynerus* (*Stenodynerus*) *conformis* Sauss. The right antenna is male, and the left female, but the clypeus is colored as in the females on the right side, being yellow only on the upper third and the apical tooth is longer than on the left side which is entirely yellow as in typical males of this species. The yellow spot between the bases of the antennae reaches only midway to base of antenna on the right side while it extends to the base on left side, another reversal of color similar to that on clypeus. On the right side the mid and hind coxae are pale yellow in front, while on the left side they are entirely black; the pale spots are characteristic of the male. The mid femur is yellow on anterior side from base to apex on right side (male), and yellow only on apical third on left side (female). The left fore tarsus is noticeably broader than the right one and the left fore wing is 1 mm. longer than the right one (7.8 mm.), the right side evincing male characters. The genital organs are those of a typical female. The specimen was specifically identified by Mr. S. A. Rohwer.—J. R. MALLOCH, Washington, D. C.

**An Hermaphrodite Hesperid (Lepid.: Rhop.).**

Among some Hesperidae collected by the author at Oakdale, Long Island, New York, on July 1, 1923, was a somewhat worn specimen of *Polites manataaqua* Scudder combining the characters of both sexes of this species. The specimen is of the size of the normal female and of the general brownish color of that sex; on the right primary is a distinct stigma corresponding to that found in the male, of the same shape and length but slightly narrower and is followed on its outer border by the usual dark patch of scales; the two spots found below the end of the cell are present in both primaries but in the right primary the lower and normally larger, subquadrate spot of the female is greatly reduced, being about half as wide as that of the left primary and corresponding to the form of this spot in the male; the upper subtriangular spot is of the same size in

both primaries and about normal; the left primary is rounded on its outer margin as in the normal female, but the right primary has the outer margin straighter and at a point opposite the upper end of the stigma is curved slightly inward and then straight up to the apex, which is nearly as pointed as in the male.

There is a narrow ray of tawny scales in the cell of both primaries, extending from the base of the cell for about two-thirds the length; the ray in the cell of the right primary is slightly wider for its entire length than that of the left primary; this ray is not present in any of the normal female specimens in my collection, though occasionally a female is found with a small tawny spot in the cell near the end, and seems to indicate in this specimen the tawny area usually found in the normal male.

The general appearance of the under surface of both wings is about as in the normal female except that there is a complete absence of the band of spots usually found on the secondaries.—E. L. BELL, Flushing, New York.

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## 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.

Papers of systematic nature will be found in the paragraph at the end of their respective orders. Those containing descriptions of new genera and species occurring north of Mexico are preceded by an \*.

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. 13—Journal of Entomology and Zoology, Claremont, Cal. 15—Insecutor Inscitiae Menstruus, Washington, D. C. 16—The Lepidopterist, Salem, Mass. 19—Bulletin of the Brooklyn Entomological Society. 30—Tijdschrift voor Entomologie, The Hague, Holland. 39—The Florida Entomologist, Gainesville, Florida. 54—Proceedings of the Biological Society of Washington, D. C. 68—Science, Garrison on the Hudson, N. Y. 69—Comptes Rendus, des Seances de l'Academie des Sciences, Paris. 82—The Ohio Journal of Science, Columbus, Ohio. 85—The Journal of Experimental Zoology, Philadelphia. 119—Proceedings of the National Academy of Sciences of the U. S.

A., Washington, D. C. 132—Revista do Museu Paulista, Sao Paulo, Brazil. 147—Archiv fur Mikroskopische Anatomie und Entwicklungsmechanik, Berlin. 153—Zeitschrift fur angewandte entomologie. Herausg. von K. Escherich, Berlin.

**GENERAL.** Baker, A. W.—Diamond jubilee meeting of the entomological society of Ontario, 1923. 4, lv, 293-4. Buxton, P. A.—Two further cases of co-ordinated rhythm in insects. 9, 1923, 271-3. Janische, E.—Ueber alterserscheinungen bei insekten und ihre bekampfungsphysiologische bedeutung. 118, 1923, 929-31. Rothschild, N. C.—Obituary. 8, 1923, 279-80. 9, 1923, 284-6. Searle, J.—Medium for mounting small insects. (Vict. Nat., xl, 140.) Stoner, D.—On the abundance of tropical terrestrial arthropods. 19, xviii, 162-3. de la Torre-Bueno, J. R.—The crumbs of Dives (editorial). 19, xviii, 170-1.

**ANATOMY, PHYSIOLOGY, MEDICAL, ETC.** Ferry, Lancefield, & Metz.—Additional mutant characters in *Drosophila willistoni*. (Jour. Heredity, xiv, 373-84.)

**ARACHNIDA AND MYRIOPODA.** Levy, R.—Sur le mecanisme de l'hemolyse par le venin de scolopendre. 69, clxxvii, 1326-8. Stekhoven, J. H. S.—Zur biologie der kratzmilben. (Verh. Kon. Akad. V. Weenns. te. Amsterdam., xxi, No. 2.)

Bryant, E. B.—Report on the spiders collected by the Barbados-Antigua expedition. . . (Univ. Iowa Stud., x, No. 3, 10-18.) Chamberlin, R. V.—A new cryptodesmoid milliped from Santo Domingo. 54, xxvi, 189-90. Ewing, H. E.—The generic and specific name of the orange rust mite. 39, vii, 21-2. Leitac, M.—Theraphosoideas do Brasil. Arachnideos da ilha dos Alcatrazes. 132, xiii, 5-438; 515-25. Oudemans, A. C.—Studie over de sedert 1877 ontworpen systemen der Acari; nieuwe classificate; phylogenetische beschouwingen. 30, lxvi, 49-85.

**THE SMALLER ORDERS OF INSECTA.** Cleveland, L. R.—Symbiosis between termites and their intestinal protozoa. 119, ix, 424-8. van Heurn, W. C.—Over een waarschijnlijke parasiet (*Thripoctenus brui*) en een vermoedelijke hyperparasiet van *Thrips tabaci*. 30, lxvi, 119-28.

Navas, P. L.—Algunos insectos del Brasil. 132, xiii, 767-74. Priesner, H.—Ein beitrag zur kenntnis der Thysanopteren Surinams. 30, lxvi, 88-111.

**HEMIPTERA.** Dingler, M.—Beitrage zur kenntnis von *Lecanium hesperidum*, besonders seiner biologie. 153, ix, 191-246. Funkhouser, W. D.—New host for Membracidae. 19, xviii, 156. Marcovitch, S.—Plant lice and light exposure. 68, lviii, 537-8. Olsen, C. E.—Distributional notes on Hemiptera. 19, xviii, 163-4.

Barber, H. G.—Report on certain families of Hemiptera-heteroptera collected by the Barbados-Antigua expedition. . . (Univ. Iowa Stud., x, No. 3, 17-29.) \*Dodds, C. T.—A new salt marsh mealy bug. 13, xv, 57-60. Hempel, A.—Hemipteros novos ou pouco conhecidos da familia Aleyrodidae. 132, xiii, 1119-91. Porter, C. E.—Insecto nuevo de la fam. Berytidae. (Rev. Chile. Hist. Nat., xxvii, 20-1.) de la Torre-Bueno, J. R.—Report on the Aquatic Hemiptera collected by the Barbados Antigua expedition. . . (Univ. Iowa Stud., x, No. 3, 30-8.) \*de la Torre-Bueno, J. R.—A saldid genus new to the U. S. and new sps., with notes on other water bugs from the Adirondacks. 19, xviii, 149-54.

**LEPIDOPTERA.** Bell, E. L.—Notes on *Calpodes ethlius*. (Rhopalocera.) *Polygonia* progne on Long Island. 19, xviii, 154; 164-5. Chittenden, F. H.—Note on *Ogdoconta cinereola*. 19, xviii, 155-6. Hutchings, C. B.—A note on the monarch or milkweed butterfly with special reference to its migratory habits (Can. Field-Nat., xxxvii, 150). Jurriaanse, J. H.—Some remarks about the supposed scent-organs of the genus *Opsiphanes*. 30, lxvi, 147-51.

\*Barnes & Benjamin.—The change of a preoccupied name. Notes on the types of two recently described aberrations of *Basilarchia archippus*. 16, iv, 17; 29-30. \*Cassino & Swett.—New geometrids. Some new *Eupithecias*. 16, iv, 18-24; 25-9. Coolidge, K. R.—California butterfly notes. 19, xviii, 159-61. Kaye, W. J.—A striking new lycaenid from St. Vincent, B. W. I. 9, 1923, 277. Schaus, W.—New sps. of American Geometridae in the U. S. N. M. 15, xi, 149-67.

**DIPTERA.** Brelje, R.—Ein fall von zwitterbildung bei *Aedes meigenanus*. 147, c, 315-343. Freeborn, S. B.—The range overlapping of *Anopheles maculipennis* and *A. quadrimaculatus*. 19, xviii, 157-8. Glaser, R. W.—The effect of food on longevity and reproduction in flies. 85, xxxviii, 383-412. Jacobson, E.—Micro-dipteren als ectoparasiten enderer insekten. 30, lxvi, 135-6.

**Bonne, C.**—The male hypopygium of *Chagasia farjardi* and the systematic position of this sp. The male hypopygium of *Anopheles mediopunctatus*. The eggs of *A. mediopunctatus*. 30, lxxvii, 112-14; 115-17; 118. **Borgmeier, T.**—Una nova especie termitophila de *Dohrniphora*. . . . 132, xiii, 1213-24. **\*Curran, C. H.**—New cyclorrhaphous diptera from Canada. 4, lv, 271-9. **Dyar, H. G.**—The mosquitoes of Panama. A new *Culex* from Mexico. On some of the American subgenera of *Culex*. 15, xi, 167-86; 186-7; 187-90. **\*Hull, F. M.**—Notes on the family Syrphidae with the description of a n. sp. 82, xxiii, 295-8.

**COLEOPTERA.** **Bernet Kempers, K. J. W.**—Iets naar aanleiding van d'Orchymonts "Apercu de la nervation alaire des coleopteres." 30, lxxvi, 129-34. **Campbell, R. E.**—Notes on the life-history of *Dinapate wrightii*. 13, xv, 61-5.

**Barber, H. S.**—A remarkable wingless glow-worm from Ecuador. 15, xi, 191-4. **Bondar, G.**—Notas biologicas sobre alguns buprestideos brasileiros do genro *Colobogaster*. 132, xiii, 1265-76. **\*Frost, C. A.**—New sps. of Buprestidae from the U. S. 4, lv, 279-81. **Melzer, J.**—Longicorneos novos, ou pouco conhecidos, do Brasil. 132, xiii, 529-33. **Obenberger, J.**—Eine serie neuer Buprestidenarten. 30, lxxvi, 1-32.

**HYMENOPTERA.** **Bequaert, J.**—Ants accidently introduced into New York and New Jersey; and a correction. Neopasites and *Polyergus* at White Plains, New York. 19, xviii, 165; 171. **Savin, W. M.**—A wasp that hunts cicadas. (Nat. Hist., xxii, 569-75.)

**Fattig, P. W.**—The bumble-bees of Florida. 39, vii, 25. **Santschi, F.**—Description de quelques nouvelles fourmis du Brasil. 132, xiii, 1253-64. **Wheeler, W. M.**—Report on the ants collected by the Barbados-Antigua expedition. (Univ. Iowa Stud., x, No. 3, 3-9.)

#### SPECIAL NOTICES.

**Lepidoptera: Some new *Coenocharis*.** This is the title of a paper in *The Lepidopterist* of which the author is not given. Two new species from the western states are described.

**The Mystery of the Hive**, by E. Evrard, translated from the French by B. Miall. New York, Dodd Meade & Co., 1923, 369 pp. This book will be found of interest to

the general reader who cares for nature and her children; wherein he will find out all about the home life of the honey-bee. The concords and discords of the bee family are told here in a very readable and understandable manner. Price, \$2.50.

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NINETEENTH REPORT, STATE ENTOMOLOGIST OF MINNESOTA to the Governor. By A. G. RUGGLES, St. Paul, Minn. Published Nov. 1, 1923. 151 pp., 3 pls. This latest addition to a well and favorably known series covers the two years ending December 1, 1922. Mr. Ruggles discusses the principal insect problems of the biennium, naming 13 insects, or groups of insects, which attracted special attention for their economic importance (pp. 3-9) and, in conjunction with J. R. Eyer, gives Preliminary Notes on the Life History and Control of the Potato Leaf Hopper, *Empoasca mali* Le B. (pp. 10-14). S. A. Graham gives the results of investigations on the Red Turpentine Beetle (*Dendroctonus valens* Le C.) in Itasca Park, Minn. (pp. 15-21) and an interesting summary of his studies on the Effect of Physical Factors in the Ecology of certain Insects in Logs (pp. 22-40). His experiments "have shown conclusively that the activities of wood-boring insects are controlled very decidedly by the action of external factors and that the zone of their optimum development is often very narrow. [Thus] on the upper side of logs [in the open] are found only insects which are most resistant to heat, such as *Chrysobothris*. . . . Under three-quarters shade. . . . no *Chrysobothris* was present." The economic value of such researches is evident. Paul M. Gilmer contributes an informing paper on Derris as an insecticide (pp. 41-49). H. H. Knight has some valuable Studies on the Life History and Biology of *Perillus bioculatus* including observations on the nature of the color pattern (pp. 50-96, 3 pls.) C. E. Mickel furnishes Preliminary Notes on the Mutilidae of Minnesota with descriptions of three new species (pp. 97-113) and O. W. Oestlund A Synoptical Key to the Aphididae of Minnesota (pp. 114-151), a revision of his Synopsis of 1887, accompanied by a phylogenetic tree of the tribes.—P. P. CALVERT.

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REPORTS ON CERTAIN ARTHROPODS . . . OF THE BARBADOES-ANTIGUA EXPEDITION of 1918. University of Iowa Studies in Natural History, X, No. 3. Iowa City, Aug. 1, 1923.—These reports are on the Ants by Prof. W. M. Wheeler, the Spiders by Elizabeth B. Bryant, Certain Families of Hemiptera-Heter-

optera (Coreidae, Pyrrhocoridae, Lygaeidae, Reduviidae Tingidae) by H. G. Barber, and on the Aquatic Hemiptera (6 families) by J. R. de la Torre-Bueno. The last three reports are, so far as these two islands are concerned, based entirely on the material collected by the University of Iowa Expedition. Prof. Wheeler has included Barbados and Antigua records derived from other sources in a list of 26 forms, including one new variety. Twenty-nine species of spiders (six new), 24 species of terrestrial Heteroptera (1 Reduviid new) and 10 species of aquatic Heteroptera (1 Corixid, 1 Belostomid new) are listed from these two islands. No generalizations on geographical distribution are contained in any of these four reports, but Mr. de la Torre-Bueno exposes the unsatisfactory condition of the taxonomy of the aquatic Hemiptera.—P. P. CALVERT.

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## OBITUARY.

The Hon. NATHANIEL CHARLES ROTHSCHILD, who died October 12, 1923, was a wealthy banker, who from boyhood had a keen love for all nature. He elected to make a special study of a somewhat neglected field in Entomology which has become of the greatest importance to humanity, in relation to the transmission of epidemic and endemic, high mortality diseases. He took up the study of the Ectoparasites, particularly Siphonaptera. He did splendid work on these interesting insects and in conjunction with Dr. Karl Jordan, published more than 138 articles. There are now known nearly 700 species of fleas and in 1880 only about 33 were recorded. Mr. Rothschild always took a great interest in the Lepidoptera, and had a collection. He paid particular attention to the biological aspect of these insects. His splendid collection of Siphonaptera, with ten thousand pounds, he willed to The British Museum. He took a great interest in places of historic value or natural beauty and was an advocate and patron in this line of endeavor. Full articles on the life work of Mr. Rothschild will be found in the British entomological journals. The writer wishes to pay tribute to the memory of the gentleman, who was a handsome man, modest, able, kindly and generous, and the news of his death was learned with sincere sorrow and keen regret.—HENRY SKINNER.

## 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.

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*, *biimpresa*, *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. Hesperiiidae (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 isoratra* ♂, *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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- 839.—Landis (E. M.).—A tabular account of the structural differences between the four larval instars of *Culex pipiens*. (Trans., 49, 25-42, 1923) ..... .35

## COLEOPTERA.

- 844.—Davidson (W. M.).—Biology of *Scymnus nubes* Casey. (Trans., 49, 155-163, ill., 1923) ..... .20

## LEPIDOPTERA.

- 842.—Braun (A. F.).—Microlepidoptera: notes and new species. (Trans., 49, 115-127, 1923) ..... .25
- 843.—Skinner & Williams.—On the male genitalia of the Hesperidae of North America. Paper III. (Trans., 49, 129-153, ill., 1923) ..... .30

## NEUROPTERA.

- 841.—Dodds (G. S.).—Mayflies from Colorado. Descriptions of certain species and notes on others. Trans., 49, 93-114, 2 pls., 1923) ..... .50

## ORTHOPTERA.

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1840-1897



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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.

## STATED MEETINGS

Of the Entomological Section of The Academy of Natural Sciences of Philadelphia, and of The American Entomological Society will be held at 7.30 o'clock P. M. on the following dates during 1924: January 24, February 28, March 27, April 24, May 22, September 25, October 23, November 20, and Dec. 8.

Communications on observations made in the course of your studies are solicited; also exhibits of any specimens you consider of interest.

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.

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AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXV

MARCH, 1924

No. 3

## CONTENTS

Smith—An Annotated List of the Ants of Mississippi (Hym).....	77	Barnes and Benjamin—On the retention of ii or i in Specific Patronymic Names.....	103
Blatchley—Some Apparently New Heteroptera from Florida.....	85	Crosby and Bishop—The Genus <i>Cyrtobunus</i> Banks (Phalangida).....	104
Wright—Lepidoptera Geometridae: Notes and Descriptions.....	91	Shannon— <i>Muscina pascuorum</i> Meigen in Maryland (Dipt.: Muscidae)....	104
Malloch—The American Species of the Drosophilid genus <i>Stegana</i> (Dipt)	96	Entomological Literature.....	105
Editorial—Flying Men and Insects....	101	Special Notices.....	110
Barnes and Benjamin—On the Synonymy of <i>Prodenia eridania</i> Cram. (Lep., Phalaenidae=Noctuidae)...	102	Review of MacGillivray's External Insect—Anatomy.....	111
		Obituary—Edwin A. Bischoff.....	114

### An Annotated List of the Ants of Mississippi (Hym.).

By M. R. SMITH, A. and M. College, Mississippi.

(Continued from page 54.)

#### 25.—*P. dentata* Mayr.

Tupelo; Aberdeen; A. and M. College; Sturgis. Next to *vinelandica* this is one of the most common species of *Pheidole* in Mississippi. Unlike the former species, *dentata* seems to prefer building its nests under stones, logs, planks, etc. The soldiers and workers probably feed almost entirely on insects.

*P. dentata* is considerably larger than *vinelandica* and possesses more rounded thoracic angles. The specimens examined by the writer have two spines on their gular borders, while those of *vinelandica* are bare of spines. The presence, or absence of spines should not be relied upon entirely, however, in the determination of the species of *Pheidole*.

#### 26.—*P. dentata* var. *commutata* Mayr.

Sibley. The writer has not taken this variety in the state but on different occasions has received specimens from Mr.

Andrew Fleming of Sibley. Mr. Fleming found this variety nesting in a post resting on the gallery floor of his house. The workers were noticed carrying a small beetle and a leaf hopper into the nest; they would also carry flies and sugar into the nest when these were placed near the nest's entrance. Mr. Fleming thinks that the ants do most of their foraging at night, for very few ants were seen during the day and these appeared quite timid, almost frantic, if disturbed.

This variety is a much more smooth and shining ant than *dentata*. The posterior portion of the head, the prothorax, gaster and legs are very noticeably shining. The specimens sent to the writer are very dark brown, almost black. Dr. Wheeler states that there is considerable variation in the color of *commutata*.

27.—*P. tysoni* Forel.

Sibley. This is also a soil-nesting species which does not seem to be common in the state.

The soldiers of this species can be distinguished by their distinctly elongated heads, the sides of which are sub-parallel. The gular border contains two prominent spines which can be easily seen in profile.

28.—*P. flavens* Roger subsp. *floridana* Emery.

Ocean Springs. This is a tropical species which has become established in the state.

29.—*P. metallescens* var. *splendidula* Whlr.

Gulfport. This is another soil-nesting species of *Phcidole*. According to Dr. Wheeler nests are built in the sand in more or less grassy places.

The beautiful violaceous, or metallic colored workers of this species at once distinguish it from the other *Phcidole* that occur in Mississippi.

30.—*Solenopsis geminata* Fabr.

"The fire ant" as it is commonly called, because of its fire-like sting, is one of the most common ants in the state. It is often complained of as a house pest, the workers showing a decided fondness for greasy foods. Nests are built in the soil in open, sunny places and the particles of earth thrown out in a more or less loose mass which is characteristic of this species.

When the nest is disturbed the workers rush forth in a very vicious manner and will sting the intruder who dares put his hand or feet near them. The fire ant is a very important predator of the boll weevil because of its habit of entering the squares and feeding on the immature young of the weevil. In literature it is reported as eating into ripening strawberries and other small fruits of this type.

This ant is rather variable in color, the smaller workers being much darker than the larger workers. The head of the larger workers is reddish while the thorax, petiole, abdomen and appendages are darker.

31.—**S. geminata** var. **xyloni** McCook.

This is a color variety of *geminata*. The workers are much darker than those of the species. *Xyloni* has habits similar to *geminata*.

32.—**S. geminata** subsp. **rufa** Jerdon.

Tupelo. This is an imported ant which has been found in only one locality in the state. Nests were found under concrete sidewalks. The workers were noticed crawling here and there on the sidewalk in search of food.

This subspecies may be distinguished from *geminata* by the presence of a tooth on each side of the thorax between the prosternum and the mesosternum, the tooth extending backward and downward.

33.—**S. molesta** Say.

This tiny yellow species is well known in the literature of economic entomology. It is very often a troublesome house pest. It has been reported to attack the germinating seed of small cereals in Kansas. *Molesta* seems to have a very varied food habit, feeding on insects, seeds, human eatables, etc. It occasionally lives in the nest of other ants, stealing the larvae and pupae for food. This is the smallest ant mentioned in this paper.

34.—**Cremastogaster ashmeadi** Mayr.

A. and M. College; West Point. This little species nests in the twigs of trees or in galls. It feeds on the honey dew excreted by plant lice.

*A. ashmeadi* may be distinguished from the other *Cremastogaster* occurring in this state by its unusually small size and by the short, blunt, incurved spines on the epinotum of the worker.

35.—*C. lineolata* Say.

This common North American ant undoubtedly occurs throughout the state. It nests in the ground under stones, in rotten logs, etc. It is also very fond of honey dew. The workers when disturbed turn up their abdomens in such a manner as to earn for themselves the title of acrobatic ants. *Lincolata* is more closely related to *atkinsoni* than to any of the other ants mentioned here.

36.—*C. laeviuscula* Mayr.

This species is very commonly found crawling up and down the trunks of trees or over logs on the ground. The workers are exceedingly fond of honey dew but no doubt feed on insects, etc. Wheeler states that he has found *laeviuscula* nesting in the galls of the Cynipid, *Holcaspis cinerosus*, on oak in Texas.

*Laeviuscula* may be recognized by the uniform smoothness of the body; the head, thorax and pedicel are shining and very finely punctate above. The epinotal spines are rather long, acute and diverging.

37.—*C. laeviuscula* var. *clara* Mayr.

The variety *clara* is a larger ant than *laeviuscula*. It has similar food and nesting habits.

It may be distinguished from the other species of the genus by the bright yellowish red color of the head, thorax, pedicel, and appendages of the worker. The abdomen is black, usually with a slight tinge of red at the base. The spines on the epinotum are longer, more curved and acute than those of *laeviuscula*.

38.—*C. atkinsoni* Wheeler.

A. and M. College. This species builds large paper-like nests which resemble very much those of the white-faced hornet, *Vespa maculata*. For a long time this species was confused with *C. lincolata*; recently Wheeler has published an article pointing out the differences between the two species. It is a smaller and more slender ant than the typical *lincolata* and has a smoother, and more shining thorax. The epinotal spines are also straighter and more acute than in the former.

39.—*C. victima* subsp. *missouriensis* Pergande.

A. and M. College; Sibley. Nests are built in the soil, usually in a clay or a clay loam. Small particles of earth are thrown out of the nest's entrance to form a small crater. The ants when unearthed are slow of movement and appear blinded by the light. Nothing is known concerning their food habits.

This species can be recognized by its pale, yellowish color; the gaster is slightly infuscated at the tip. It is the smallest of the species of *Cremastogaster* found in this state.

40.—*Tetramorium guineense* Fabr.

Gulfport; Biloxi; Pascagoula. This is the only species of *Tetramorium* known to be present in the state, although the writer has been expecting to find *caespitum* also. This imported ant is very common in the localities mentioned above, where it may be found crawling up and down trees in search of honey dew. Like *caespitum*, it is a house-infesting ant.

This is a reddish yellow ant with dark colored gaster. It can be easily distinguished from *caespitum* by the distinct rugosity of the head and thorax, the former species having this portion of the body striated.

41.—*Dolichoderus (Hypoclinea) mariae* Forel.

A. and M. College; Columbus. This beautiful red and black species constructs its nest in the soil at the base of broom straw grass, *Andropogon* sp., or more occasionally about the roots of small bushes. The colonies are very large, consisting of thousands of individuals. Not only are the ants fond of honey dew but they also like insect food. The workers have a habit of crawling up and down tree trunks in files.

The workers are easily distinguished from the other species of *Dolichoderus* by their color, size, and smooth, shining surface of the body.

42.—*D. (Hypoclinea) taschenbergi* Mayr.

Rara-Avis; A. and M. College. The shining, black workers of this species are easily recognized. Nests are built in situations similar to those of *mariae*, the habits of the two species being about the same. A large nest found at A. and M. College on

May 5, 1922, contained thousands of workers, and numerous males and immature forms.

This species is about the same size as *mariae* but is easily distinguished from that species by its black color. It is also smooth and shining.

43.—**D. (Hypoclinea) plagiatus** subsp. **pustulatus** Mayr.

Okolona. This species has habits similar to those mentioned above, the colonies, however, are not so large, consisting only of a few hundred individuals.

The workers are smaller than those of *mariae* or *taschenbergi*. The head is almost black, the thorax reddish brown and the base of the gaster is spotted with yellow.

44.—**Dorymyrmex pyramicus** Roger.

Macon, Columbus, Aberdeen, Laurel, Sibley. The "lion ant," as it is commonly called, builds its crater-shaped nests in sunny spots. The workers are very fond of honey dew, but also feed on small insects. Sexed forms have been found in the nests as early as April and the writer is led to conclude from this that the queens take their nuptial flights early in the spring. The workers when crushed have the peculiar rotten cocoanut-like odor, which is so common to many of the species of Dolichoderinid ants. This species and its varieties are often found nesting together.

This ant can be distinguished by its slender form, its dark color, and by the conical shaped epinotum of the worker.

45.—**D. pyramicus** var. **niger** Pergande.

Macon; Sibley; McHenry. This is a very dark form of *pyramicus* with similar nesting, and other habits. It seems to be more common to the lower part of the state.

46.—**D. pyramicus** var. **flavus** Pergande.

Tupelo; Gulfport; A. and M. College; Newton. This is a distinct yellow variety of the species, which also has similar nesting habits. *Flavus* is a more common variety than *niger* in this state.

47.—**Tapinoma sessile** Say.

Artesia; Clarksdale. This species nests in logs, also in the

soil under planks, stones, etc. The workers when crushed have the peculiar odor so characteristic of this, and related species. *T. sessile* does not seem to be a common ant in Mississippi, at least the writer has not found it so. The workers bear some resemblance to the Argentine ant and might be taken for that species by the ordinary layman, but the presence of the distinct odor in *sessile* is evidence enough to distinguish the two.

This ant varies considerably in size and color but is usually a very dark brown with a pruinose tinge. The petiole is vestigial, another characteristic which readily separates it from the Argentine ant.

48.—*Iridomyrmex pruinosus* Roger.

Pascagoula. Several workers of this species were taken at the above named locality.

49.—*I. pruinosus* var.  *analis* Andre.

This is probably the most common ant found in the state. Nests are constructed in the soil and the earth very often piled up at the entrance to form a small crater. The workers are exceedingly fond of sweets and, not only attend plant lice, scale insects, etc., but often wander into houses in search of food. This is the nearest relative of the Argentine ant and is often confused with it. The presence of a distinct odor readily separates it from the Argentine ant. It may be told also from this species by the pale, yellowish white color of the abdomen, that of the Argentine ant being a uniform dark brown.

50.—*I. pruinosus* var.  *humilis* Mayr.

This imported species, commonly known as the Argentine ant, is by far the worst house-infesting ant that we have in the state. At present, about seventy towns in Mississippi are known to be infested with it and there are, no doubt, many others of which we have no record. The workers have a habit of getting into every conceivable place, especially where food is stored. They have been known to crawl over a chunk of ice in a refrigerator in order to reach meat. They also drive setting hens from the nest, thus making chicken raising in some towns practically impossible. The greatest damage from the Argentine ant is

caused, no doubt, through its pernicious habit of spreading scale insects, plant lice, mealy bugs, etc. Last year the state spent about \$25,000 in fighting this pest. Campaigns of control were conducted in seventeen of the infested towns. Once these ants become established in a town they drive, or kill out all of the native ants, with the exception of a few small species with which they live amicably. The spread of this species is, for the greater part, accomplished by man through the channels of commerce. The Plant Board has, on numerous occasions, intercepted these ants in nursery shipments from infested to non-infested places.

This ant can be distinguished from its nearest relatives by the absence of an odor, by the rather slender appearance, the uniform brownish color, and by the absence of a sting.

51.—*Eciton (Acmatius) schmitti* Emery.

A. and M. College; Natchez; Starkville, Toomsuba. This is perhaps the commonest *Eciton* in the state. The workers have vestigial eyes and are more or less blind, probably depending on their sense of smell for guidance. The ants are seldom seen on the surface of the ground. They are fond of fleshy foods and, as far as the writer is aware, are never seen in attendance on any honey dew-excreting forms of insects. A female of this species was plowed up by a correspondent at Toomsuba.

*E. schmitti* can be distinguished from its nearest relatives by the opaque, reddish brown head, thorax, petiole and postpetiole, which are also punctate and foveolate.

52.—*E. (Acmatius) opacithorax* Emery.

Sibley. This species has been taken but once in the state, altho it will probably be found later to occur throughout the state. The ants seem to show a fondness for nesting in wood, the writer having taken them from beneath the bark of a pine log in North Carolina. Mr. Fleming has also found them nesting in the base of a stump at Sibley. The food habits of *schmitti* and *opacithorax* are the same.

*Opacithorax*, as its name indicates, can easily be distinguished from the other *Ecitons* by its opaque thorax. The head, abdomen and appendages are smooth and shining. This is a light, yellowish red species.

53.—E. (*Acmatius*) *pilosus* F. Smith.

Sibley; Hazlehurst. This does not seem to be a very common species in Mississippi. Mr. Fleming, who took specimens at Sibley, wrote the writer as follows concerning them: "I saw several colonies moving the same day. The colonies are evidently very large, one moving along a path leading to my yard formed a solid column,  $\frac{3}{8}$  to  $\frac{1}{2}$  inch broad and about 150 feet long: it then separated into two lines going a little to the right and left of the original column. I could see the two branches for about 25 feet. I do not know how long they were in going, but in places they left a distinct trail where they had passed along. I did not see where they came from or where they went." Mr. Fleming also sent the writer a species of ant, which some of the workers of *pilosus* were carrying in their mouths; the ant, on determination, proved to be *Cremastogaster ashmeadi*. Wheeler mentions that the *Ecitons* are fond of the larvae and pupae of other ants and will forage their nests. This may explain what was taking place when Mr. Fleming observed them. In January, 1915, a correspondent at Hazlehurst sent in a number of specimens of *pilosus* which he claimed were getting into his well and decomposing, thus causing the water to have a foul odor.

(To be continued.)

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**Some Apparently New Heteroptera from Florida.**

By W. S. BLATCHLEY, Indianapolis, Indiana.

During the past two years the writer has had in preparation a work on the Heteroptera of the Eastern United States. While thus engaged a number of apparently undescribed forms have been found among the Florida material in his private collection. As it will be two years or more before the main work is ready for the press, it is thought best to publish the descriptions of five of these at the present time. The types of all are in the private collection of the writer.

***Geotomus cavicollis* sp. nov.**

Broadly oval, subdepressed. Head, pronotum, scutellum and under surface black, shining; hind margin of pronotum and corium piceous; membrane dull whitish- to fuscous-hyaline;

antennae, beak, tibiae and tarsi reddish-brown; femora piceous.

Head slightly wider across the eyes than long, its front margin broadly rounded, thickened and reflexed, but without bristles or teeth within the margin; cheeks vaguely, transversely rugose, sparsely, irregularly, rather finely punctate. Antennae with joints 2 and 3 subequal in length, the former more slender and almost nude, 5 slightly longer than 4, 3—5 thickly pilose with stiff suberect hairs. Beak reaching middle coxae.

Pronotum wider than long, its front margin broadly concave, bordered within by a regular row of rather coarse punctures; side margins feebly sinuate; disk with a large, broad, rather deep, impunctate concavity on middle of apical half, on each side of this sparsely and coarsely punctate, the punctures extending along the sides behind the concavity to basal third. Submargins of head and pronotum with a few scattered erect bristly hairs. Scutellum with a submarginal row of fine punctures and a few coarser scattered ones on apical half. Corium with four irregular rows of punctures, the inner row nearly entire, the others abbreviated; clavus with a single row of punctures.

Genital plate of male deeply concave above, its apex broadly rounded. Length 5-6 mm.

Arch Creek and Dunedin, Florida, March 1-21. Taken by sifting dead leaves and beneath cover along the margins of wet hammocks. Not being able to determine from literature the first examples taken, they were submitted to both E. P. Van Duzee and H. G. Barber. The former called it *Pangaeus* sp. ?, the latter at first thought it was *Aethus indentatus* Uhler with the submarginal bristles of front of head abraded. However, the finding of additional specimens without bristles on head proved that it is not an *Aethus*. Mr. Barber later compared it with all specimens in the Uhler and National Museum Collections, finding it very distinct from *A. indentatus* Uhl. He found no named specimens like it; but among the unidentified material there was a single specimen from Paradise Key, Fla., and another from Alabama, and he has one in his own collection from North Carolina. This species forms a sort of connecting link between the genera *Pangaeus* and *Geotomus*. In size and general facies it more closely resembles the former but the preapical impressed line of pronotum, which is the primary

distinguishing character of *Pangaeus*, is represented only by a row of coarse punctures. It is much larger than our other known species of *Geotomus* and the sculpture of the upper surface is very different from them, but in all generic keys of literature it runs to *Geotomus*, and is therefore described as a member of that genus. *Type* a male taken at Dunedin, Florida, March 4, 1921.

**Podops peninsularis** sp. nov.

Oblong-oval, small for the genus. Above dull grayish-brown, tinged with fuscous; head and front portion of pronotum thinly clothed with prostrate yellow pubescence; punctures of pronotum and scutellum each enclosing a minute yellow scale; first four joints of antennae reddish-brown tinged with fuscous, last joint piceous, pubescent; under surface uniform piceous, the punctures each with a yellow prostrate scale-like hair; legs fuscous or piceous, annulate with dull yellow.

Head as in *dubius*, the cheeks just equalling or scarcely exceeding the tylus, the convex portion of latter shorter. Joints 2-4 of antennae subequal, fifth fusiform, longer and stouter. Beak as described in *bb* of accompanying key, scarcely reaching middle coxae.

Pronotum with median transverse groove less distinct than in *dubius*, the disk behind it strongly convex, rather coarsely and thickly punctate, the tooth or projection of front angles much smaller than in *dubius*, not exceeding the eye, subtriangular, its tip subacute; sinus in front of humeral projection less deep. Scutellum much as in *dubius*, the posterior impression scarcely evident.

Abdomen much more thickly and finely punctate. Male genital segment semicircular, with a deep curved median impression, the basal portion thickly coarsely punctate, the apical one broadly and deeply concave with slightly projecting apical angles. For other characters see the key. Length 5-5.5 mm.; width, 3.2-3.5 mm.

Described from two males and four females taken at Dunedin, Florida, December 24—March 4, from beneath boards and among grass roots on the margins of ponds. Our smallest species, resembling a miniature *dubius* but very distinct by the characters given in the key and description. *Type* a male taken at Dunedin, Fla., February 21, 1921.

Four species of *Podops* are now known from the Eastern

United States. These may be readily separated by the following

*Key to Species of Podops.*

- a. Tooth or projection near humeral angle of pronotum very prominent subcylindrical, surpassing the humerus by a distance equal to length of eye, its apex and front edge curved; margin of pronotum in front of humeral tooth deeply sinuate or concave.
- b. Lobe or tooth at front angle of pronotum very large, surpassing the eye by one-third or more of its length, its apex obtuse; beak reaching or slightly surpassing the hind coxae, its second and third joints subequal, each one-half longer than fourth; femora wholly piceous-black; length 7-9 mm. *dubius* (P. B.)
- bb. Tooth at front angle of pronotum much smaller, not surpassing eye, its apex subacute; beak scarcely reaching middle coxae, its second joint nearly as long as third and fourth united; femora annulated with paler; much smaller, not over 5.5 mm. *peninsularis* sp. nov.
- aa. Tooth near humeral angle of pronotum much less prominent, but slightly surpassing the humerus, subtriangular, its apex obtuse or subacute; margin of pronotum in front of tooth feebly sinuate or straight.
- c. Larger, 6-6.5 mm.; middle of abdomen sparsely, irregularly punctate; margin of pronotum between apical and humeral projections, distinctly not deeply sinuate; outer apical angles of male genital plate produced and visible from above beyond the apex of scutellum. *cinctipes* (Say.)
- cc. Smaller, not over 5.5 mm.; abdomen deeply and uniformly punctate throughout; margin of pronotum between the projections straight; outer apical angles of male genital plate short, obtuse, not visible from above. *parvulus* Van D.

**Mezira novella** sp. nov.

Elongate-oblong. Dark reddish-brown, under surface and dorsum of connexivum paler; membrane fuscous with a vague pale spot at base.

Head as long as wide across the eyes; tylus almost reaching apex of first antennal; antenniferous spines small, triangular, acute; vertex coarsely unevenly granulated, the impressions very small; postocular tubercles distinct, obtuse; antennae stout, distinctly shorter than head and pronotum united, joints 2 and 4 subequal in length, 3 two-thirds longer than either.

Pronotum subtrapezoidal, sides distinctly not deeply sinuate near middle, margins finely reflexed, median transverse impression evident, ill-defined, disk with front portion bearing four oval or lozenge-shaped low but distinct tubercles, hind portion finely and densely granulated. Scutellum triangular, much narrower than in *granulata*, the apex more acute; disk with a transverse smooth elevation at base, this divided at middle by a distinct longitudinal median ridge which extends to apex.

Abdomen narrow, the sides parallel. Ventral segments with the usual ridge lying just within the spiracles very faint. Genital segment of male subtriangular, obtuse behind, carinate and subimpressed each side above, lobes narrow, very small. Length 4.5-4.8 mm.

Cape Sable, Florida, February 25-28; a dozen or more specimens beneath bark of decaying limbs in dense hammocks. Smaller and paler than *granulata*, with sculpture of scutellum very different. Pronotum with side margins narrower, much less deeply sinuate, their apical lobe less pronounced; front portion of disk with tubercles more distinct, hind portion much more finely and densely granulated. *Type*, a male from Cape Sable, Florida, February 25, 1919.

### **Ptochiomera (Carpilis) barberi** sp. nov.

Oblong-oval. Head, pronotum, base of scutellum and under surface dark reddish-brown; elytra, nodulose hind angles of pronotum and apical half of scutellum in part, pale brownish-yellow, their punctures but slightly darker; antennae reddish-brown, the base of second joint paler; legs and beak pale yellow.

Antennae relatively stout, as long as head and pronotum united; first joint stout, subcylindrical, exceeding tip of tylus by half its length; second subclavate, twice the length of fourth three times that of third; the third joint and apical half of second as stout as fourth.

Brachypterous form with pronotum subcylindrical, front lobe scarcely wider and three times as long as hind one, minutely punctate, its sides straight, very feebly converging from base to apex; hind lobe with hind angles strongly nodulose, rather

coarsely rugosely punctate. Scutellum sparsely punctate, the preapical median carina very fine. Elytra obovate, the corium and clavus scarcely differentiated; membrane absent; corium reaching fifth dorsal, its hind margin obliquely truncate.

Front femora strongly swollen, armed beneath with two rows of fine subequal teeth; front tibiae of males strongly curved, armed beneath at apical fifth with an acute tooth. Length 2.8-3 mm.

Dunedin and Cape Sable, Florida, January 26-February 23. Described from two brachypterous males taken from beneath boards on the bay beaches. *Type*, a male from Dunedin, Florida, January 26, 1921. Named in honor of H. G. Barber, of Roselle, New Jersey, our leading American authority on the Lygaeidae. The cotype is in his collection. The form of pronotum and antennal segments and the dark hue of hind lobe of pronotum easily distinguish this from *ferruginea* Stål. These two species represent in the United States the genus *Carpilis* of Stål, erected in 1874, with *ferruginea* as the type. They differ from our other *Ptochiomera* in having the antennae shorter with the last three joints furnished with stiff erect hairs, in the toothed front tibiae of males and in the front lobe of pronotum being more than twice the length of hind one. These characters are, in my opinion, of sufficient value to retain *Carpilis*, at least as a subgenus, instead of making it an absolute synonym of *Ptochiomera*, as has been done by Barber.

**Cnemodus hirtipes** sp. nov.

Smaller and more slender than typical *mavortius*. Color the same, except that the femora are tinged with fuscous. Hind lobe of pronotum with the sides more thickened and the disk more finely and sparsely punctate. Femora and tibiae furnished with numerous long, erect yellowish hairs. Length, 7-8 mm.

Ormond, Moore Haven, Sarasota and Dunedin, Florida, December 6-April 6. Scarce about Dunedin beneath pine needles and other cover. The macropterous form at porch light. In *mavortius* the tibiae are glabrous and the femora have only a very few widely scattered erect hairs. *Type*, a male from Moore Haven, Florida, March 20, 1922.

**Lepidoptera Geometridae: Notes and Descriptions.**

By W. S. WRIGHT, San Diego, California.

**Stannodes coenonymphata** Hulst.

Of all the species of *Stannodes* known to me, *coenonymphata* Hulst is perhaps the most puzzling. A small series identified by the late John A. Grossbeck has stood under this name in my collection for a number of years. Three of the series are from the San Francisco Bay region, the rest from San Diego. Before me at the time of this writing is a small series of San Diego specimens from the collection of my friend, George H. Field. The examples in this series were identified by Mr. Louis Swett and the late Mr. Grossbeck. Specimens in the Pearsall and Grossbeck collections now deposited with the American Museum, New York City, were mostly from Mr. Field's and my collections. Practically all these specimens are more or less worn and might easily agree with Hulst's diagnosis, since it lacks certain details which, in the light of recent collections made in San Diego, seem to be necessary to exactly describe the species. Unfortunately I do not have before me either the type or specimens from the type locality. A single specimen from Los Angeles falls into my Group D.

During the winter and spring of 1921-22 I collected about 150 specimens at San Diego. None but perfect specimens were taken. These, together with the small series before referred to, comprise a series of 170 examples. Viewed from above the entire group seems to be quite typical of *coenonymphata* as identified by Swett and by Grossbeck. The three San Francisco specimens differ quite markedly in the form of the wings, the costal edge being much less curved and the apex more produced than in the case with San Diego examples. This small group may require another name. The San Diego specimens easily fall into four groups with variants in each group. While the lines defining the several groups are quite distinct they do not, to my mind, provide sufficient evidence for the erection of new species, but they do, in the light of present day practices among students, justify form or race names.

**Stamnodes coenonymphata coenonymphata** (Hulst).

Group A. This group containing 61 specimens agrees most nearly with Hulst's description of *coenonymphata*. There are, however, some differences. Beyond the third costal spot and near the apex a faint line appears crossing the "dark apex, in triangular shape" parallel with outer margin. This line is a reflection of a sharp division of the apical area beneath, the outer portion being of the same general color as the inner portion but less intense, the difference being due to the presence of some scattered white scales and small masses of red scales in the marginal space. The so-called "broad light colored cross lines, nearly white" on the secondaries fail to appear as described. In the typical specimens of this group the line is narrow, often reduced to a mere hair line. The basal area is nearly black. The narrow white line starts from just beyond the small white discal dot, rounds the cell and reaches the middle of the inner margin perpendicularly. Beyond the white line is a broad blackish band with a few scattered white scales and small masses of red scales. In the marginal space the black of the mesial band gives way to red, while the costal edge from base to mesial dark band is often broadly red with small scattered masses of black scales and, in some specimens, a diffuse mass of white near the outer end of the cell.

This group, although apparently differing rather widely from the description, seems to me to be nearest the type and for it I propose the name *coenonymphata coenonymphata* (Hulst).

**Stamnodes coenonymphata prunata** forma nova.

Group B. has a much different appearance both above and below. Above, the costal spots are larger and more contrasting, the subterminal faint line mentioned in Group A is more conspicuous and the veins in the terminal space are more or less distinctly outlined in yellow. In nearly every specimen of this group the central portion of the "subquadrate darker space" of the primaries is yellowish, especially on the costa where the yellow often occupies fully one-third of the costal space between the second and third costal spots.

Beneath, the maculation is quite remarkable. The costa of primaries is marked by four yellow spots. From the fourth spot a broad line crosses the wing as in typical *coenonymphata*, the apex is of a brilliant white faintly tinged with blue. The basal third of the secondaries is white, with a thick scattering of fuscous-black strigae. Just before the characteristic broad white line at the middle is a clear fuscous-black patch irregular in outline and approximating the inner margin. In the space

beyond the white line is a broad fuscous-black band occupying about half the space between white line and termen and crossing the wing completely from costal to inner edge, while the broad marginal band is a clear brilliant white with a few scattered dark strigae; fringe concolorous.

For this Group, containing 55 specimens, I propose the name *coenonymphata prunata* forma nova.

**Stamnodes coenonymphata pallidata** forma nova.

Group C. contains 46 examples and is more nearly typical above, according to the description, than are the members of either Group A or B; however, beneath it is much lighter in color, with a tendency for the first and second costal marks to become obsolete. The bluish white apical patch of primaries is less brilliant, tending to become more or less obsolete, while the bands of the secondaries tend to become diffuse, losing the fuscous and black scales and tending to numerous strigae and masses of bright red scales.

On account of its much lighter appearance I propose for this group the name *coenonymphata pallidata* forma nova.

**Stamnodes coenonymphata brunneata** forma nova.

The fourth group, Group D, is composed of twelve specimens, much smaller than those of the other three groups, 22 to 25 mm. This group resembles the members of Group C on the upper surface. Beneath, however, there is a wide difference. Only the third costal mark is apparent in most of the specimens, the first and second are either absent or reduced to mere specks. The costal edge and apex are bright red, the rest of the wing is smoky fuscous. The secondaries are a clear red with black strigae in the basal area, while in the area beyond the cell only scattered black atoms appear in the red field. In a few specimens the outer edge of the basal area is marked by a thickening of the black strigae sufficiently to form a definite line across the wing.

For this group I propose the name *coenonymphata brunneata* forma nova.

**Stamnodes coenonymphata eldridgensis** (Swett).

Another small group of six specimens appears to answer to the description of *eldridgensis* Swett.

Some time ago I sent a specimen of what I now propose to call form *prunata* to Mr. Swett, with an MS. giving it specific

standing, for his criticism. He then pointed out to me that it was in all probability his *eldridgensis*, but recently described from a single male taken at Eldridge, California. A careful comparison of Swett's diagnosis with that of Hulst fails to show differences of sufficient clearness to warrant the retention of Swett's species and, in the face of his admissions (in lit.), I feel sure that *eldridgensis* must either fall to *coenonymphata* or become one of its forms, in which case it would be known as *coenonymphata eldridgensis* (Swett).

The recorded captures in all these groups are from the latter part of November to early in March except in Group C which, with but four exceptions was taken in January, two were captured in the last of December and two during the first week of February. All specimens were taken at light, only perfect specimens being taken.

The types and paratypes here listed are all in the author's collection.

***Cosymbia piazzaria* n. sp.**

Alar expanse 22-25 mm. Palpi pale, tinged outwardly at tip and on second member with fulvous. Front fulvous, a little lighter just above the clypeus. Antennal pectinations fulvous on the upper side. Thorax and abdomen concolorous with the upper surface of the wings.

*Primaries*:—The ground color above is ochreous with bright fulvous strigations rather evenly distributed over the entire surface of the wings. About one-fourth out from the base is a black line curving outwardly across the wing in a series of dots on the veins. At one-fourth in from the apex a similar line crosses the wing parallel with the outer margin. In the cell a white dot, broadly linear, surrounded by a wide ring of black. Just beyond the discal dot is a broad, smoky, sinuate line or band crossing the wing from costa to inner margin. A terminal line of black dots, while in the base of the fringe and alternate with the black dots is a series of fuscous dots. Fringe short, concolorous and lustrous.

Beneath; the same color as above but with fewer fulvous strigations. Discal dot visible, outer and terminal lines repeated but rather fulvous than black.

*Secondaries* concolorous; lines and bands of the primaries continued across the wings. Beneath; as in the primaries.

The female is colored and marked as in the male with the

exception that the black median band is likely to be more or less fulvous on the disk.

*Holotype*, male, San Diego, California, Aug. 21, 1919. *Allotype*, female, Echo Mt., Calif., July 24, 1921. *Paratypes*; (a) male, San Diego, Calif., Febr. 15, 1916. (b) male, Echo Mt., Calif., July 23, 1921; (c) female, Echo Mt., Calif., July 24, 1921. (d) female, Yavapai County, Arizona, Sept. 13.

I have before me 9 specimens of this very interesting species. Three are so badly damaged as to make it unwise to make them paratypes. One of the three, taken at Prescott, Arizona, is much lighter in color and marked much as in *myrtaria*, the others present all the essential characters of *piazzaia* but are otherwise torn and broken. Paratype (a) is quite remarkable in that the colors are much stronger and more contrasting than in the holotype. The species has much the same general appearance as to color as *myrtaria* while the maculation resembles that of *lumenaria*; I should say that its taxonomic position is between the two.

I dedicate the species to my friend Mr. E. Piazza, of San Diego, through whose kindness I obtained all but one of the specimens.

#### **Venusia foxi** n. sp.

Expanse 28 mm. Palpi rough scaled, brown. End joint minute and lighter colored. Antennae of the female filiform, scaled above, annulate, ciliate beneath. Front brown and white scales mixed, rounded but not bulging. Vertex and collar concolorous with the front.

Thorax brown; patagiae white with a slight mixture of brown.

Abdomen cinereous with brown and white cross lines at the joints.

Legs brown cinereous; tarsi annulate with white.

*Primaries* with brownish white ground color, darkest along outer margin. A basal half-line, faint on costa but well marked on median vein where it stops. About 2 mm. out is a broad black line accented on the veins, widest on costa and narrowing gradually to inner margin where it terminates about 1.5 mm. out. Between this line and the middle of the wing are three rather indistinct or diffuse black lines accented on the veins, especially on sub-median and on 1a. At the middle, or a little less than half-way out, is a broad black line, appearing as a

black spot from costa to subcosta, a short < mark at beginning of vein 2 and a black streak on 1a. A small black discal dot followed by a sinuate hair line traceable clear across the wing. An extra discal line commences in a squarish spot on costa and parallels the preceding hair line in a series of black dots on the veins. Three more black lines cross the wing in the submarginal space. A submarginal, scalloped, white line crosses the wing from a point about 1 mm. in from apex to anal angle. The nervures through the marginal space are streaked with dark brown or blackish. At the ends of the nervures is a series of twinned black spots. Fringe sordid, checkered with brownish.

*Secondaries* concolorous, darker at margins. Discal dot black. Veins beyond the cell accented with brown. Marginal line as in primaries.

Beneath cinereous; smoky along costa and outward; discal dots apparent; extra-discal line on primaries traceable beyond the cell in both wings. Nervures accented with brown.

*Holotype* female; Mendocino County, California, Aug. 23, 1915 (Fox).

The type agrees best with *Epperrata dilutata* Hübner as described in Packard's Monograph; it is, however, much smaller and quite distinct. I am pleased to dedicate the species to Mr. C. L. Fox, of San Francisco, through whose kindness the specimen came to me.

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### The American Species of the Drosophilid genus *Stegana* (Diptera).

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

In this paper are presented in synoptic form brief descriptions of the species of the genus *Stegana* Meigen which are known to occur in the New World with the exception of one described by Williston from St. Vincent.

The material was, with the exception of one specimen, collected by Pablo Schild in San Mateo, Costa Rica; the single exception being a paratype of *uniformis* taken in the Canal Zone, Panama, by R. C. Shannon. The types are all in the United States National Museum collection.

Fuller descriptions will appear later in the Proceedings of the National Museum.

*Key to Species.*

1. Thorax and abdomen brownish black, only the humeri and apex of scutellum yellowish; all femora and mid and hind tibiae except their apices pitchy black; palpi, frons and knobs of halteres brownish black; apical scutellar bristles about three-fourths as long as basal pair; pleura not conspicuously vittate with black  
*nigrita* sp. n.
- Thorax more largely yellowish, at least the lower half of pleura pale, usually with a well differentiated black vitta on upper half .....2
2. Fore tarsi compressed, three or four segments deep black, fifth or basal and fifth pale yellow.....3
- Fore tarsi not or very slightly compressed, with at most the basal two segments dark.....4
3. Palpi partly black; basal segment of fore tarsi pale yellow; pleura with a deep black vitta on upper part  
*tarsalis* Williston
- Palpi yellow; basal segment of fore tarsi black, only the fifth pale yellow; pleura with two blackish vittae; eye fully as high as long; scutellum with the apical pair of bristles not half as long as basal pair; third antennal segment mostly black, pale only at extreme base  
*atrimana* sp. n.
4. Palpi largely or entirely black.....5
- Palpi entirely yellow.....8
5. Height of cheek posteriorly at least as great as width of third antennal segment; antennae hardly extending to mouth margin, generally entirely pale yellow; thorax normally with three narrow complete black vittae, two incomplete paler vittae laterad of these, and the lateral margins blackish; pleural vittae entire; all tibiae yellow; face usually yellow, with an elongate mark in each antennal fovea; eyes much higher than long; scutellum with the apical pair of bristles about two-thirds as long as the basal pair; labrum yellow. . . . *curvipennis* Fallén
- Cheek linear, at no point half as high as width of third antennal segment; antennae extending to or below mouth margin .....6
6. The black vitta on upper part of pleura not entire, not extending to anterior margin of propleura; thoracic dorsum yellow, with two broad entire submedian fuscous vittae, and the lateral margins fuscous from slightly in front of bases of wings to hind margin, the mesonotum thus having a broad yellow mark from propleura run-

ning obliquely over humeral angle to near middle of disc; frons with a very large black mark on ocellar region and another on anterior margin connected by a black median line; femora except apices, and tibiae in middle black; face not carinate above; vibrissal angle and sides of labrum conspicuously blackened; a vitta over upper part of sternopleura; fore tarsi yellow

*interrupta* sp. n.

- The black vitta on upper part of pleura complete, extending broadly over propleura; mesonotum not vittate as above, no oblique pale humeral stripe. . . . . 7
- 7. Fore tarsi entirely yellow; mesonotum with two rather distinct narrow dark vittae along each lateral margin; fore femur with a brown band at base and a brown spot at apex on anterior side; face with a rounded convex elevation in center above middle, and two black transverse bands, one close to lower margin and the other over the convexity; frons marked as in *interrupta*  
*tempifera* sp. n.
- Basal segment of fore tarsi largely or entirely fuscous; mesonotum not noticeably vittate; fore femur with a blackish mark at apex on anterior side; face concave, entirely yellowish; frons yellow, ocellar region blackish  
*flavifrons* sp. n.
- 8. Eye longer than high; cheek as high as width of third antennal segment . . . . . 9
- Eye at least as high as long, generally higher; cheek linear, or almost so, not over half as high as width of third antennal segment . . . . . 14
- 9. Wing unevenly infuscated, the costal margin broadly brown, two spots in first posterior cell, one in middle of discal cell, the veins and apical margin suffused with brown, the latter irregularly so; dorsum of thorax with six, pleura with two black vittae; large species, 6 mm. in length . . . . . *magnifica* Hendel
- Wing almost uniformly infuscated, generally slightly paler along hind margin, never spotted; each humeral angle with two bristles except in *coleoprata*. . . . . 10
- 10. Face not noticeably carinate in center below bases of antennae; thoracic dorsum and scutellum brownish black, the latter with a conspicuous white central vitta which is not sharply margined; mid and hind femora each with a fuscous stripe which runs obliquely downward from near middle to near apex on anterior side; frons glossy black,

- yellowish on each side in front of proclinate bristle, and at each anterior lateral angle. . . . . *planifacies* sp. n.
- Face with a conspicuous sharp ridge or carina on upper half in center; scutellum without a conspicuous white central vitta; femora not marked as above. . . . . 11
11. Frons entirely glossy black; mesonotum and abdomen brownish black, the former paler on sides, but not distinctly vittate; inner cross-vein of wing at middle of discal cell; femora of mid and hind legs broadly fuscous at apices, tibiae of same legs fuscous at bases  
*atrifrons* sp. n.
- Frons largely yellow. . . . . 12
12. Anterior third of frons glossy black, remainder dusky yellow, the ocellar region brownish or fuscous; inner cross-vein close to middle of discal cell; mid femora dark brown on apical half or more, most conspicuously so on anterior side, hind femora less distinctly marked, the brown color extending along almost the entire anterodorsal surface. . . . . *schildi* sp. n.
- Anterior third of frons not darker than ocellar region; inner cross-vein very distinctly proximad of middle of discal cell . . . . . 13
13. Anterior third of frons and a large mark covering ocellar region and extending from vertex to middle, but not covering lateral margins, black; mesonotum with the brown vittae in part fused, giving it the appearance of having a broad central vitta, which is widened posteriorly, and one on each side, which is more or less subdivided by yellow lines; scutellum uniformly fuscous brown; each humeral angle with two bristles. . . . . *uniformis* sp. n.
- Frons inconspicuously marked with pale brown, ocellar region fuscous; mesonotum with six brown vittae, the median pair sometimes fused; scutellum usually with a pale median line; each humeral angle with one bristle  
*coleoprata* Scopoli
14. Pleura without an opaque black vitta above; inner cross-vein at one-third from base of discal cell; wing brown, hyaline from base to inner cross-vein, and with a large hyaline spot beyond outer cross-vein; interfrontalia rather densely covered with microscopic erect hairs; apical scutellar bristles not much shorter than basal pair; subcostal cell pointed at apex; fifth vein continued in a straight line beyond outer cross-vein, its apex slightly curved upward; fourth vein curved forward on apical

- third of its last section, not gradually approaching third on its entire length. . . . *Orthostegana acutangula* Hendel
- Pleura with a very conspicuous opaque black vitta on upper portion; inner cross-vein at or very close to middle of discal cell; wing more uniformly brown, posterior margin generally paler, but there are never sharply defined hyaline areas; inter-frontalia bare; fifth vein usually rather abruptly deflected at or very little beyond outer cross-vein. . . . . 15
15. Face entirely yellow; frons yellow, ocellar region darker; antennae yellow, apex of third segment black; mid femur with a brown spot beyond middle; knobs of halteres yellow . . . . . *brunnea* sp. n.
- Face not entirely yellow. . . . . 16
16. Face and frons yellow, the former with a narrow black cross-band above mouth and sometimes a darkened area below bases of antennae; frons yellow, ocellar region fuscous; antennae yellow, third segment partly or entirely black. . . . . 17
- Face and frons brownish fuscous; antennae but little paler than face except basally. . . . . 18
17. Third antennal segment almost entirely deep black; cheek over half as high as width of third antennal segment; fore tibia dark brown beyond middle; eye about as long as high. . . . . *affinis* sp. n.
- Third antennal segment blackened at apex; cheek linear, much less than half as high as width of third antennal segment; fore tibia dark brown at base; eye distinctly longer than high. . . . . *conformis* sp. n.
18. Fore tarsi and tibiae yellow; cheeks linear. *flavimana* sp. n.
- Bases of fore tibiae and basal two segments of fore tarsi dark brown; cheek about half as high as width of third antennal segment. . . . . *fuscibasis* sp. n.

From the description I judge that *horae* Williston will run to *tempifera* in this key but there are color differences which cause me to consider that it is probably not that species. An examination of the type will be necessary to determine its identity.

All the species in the key average from 2 to 3.5 mm. in length with the exception of *interrupta* and *acutangula* unless where mention is made of the size, and all conform in the generic characters distinguishing the genus from *Phortica* Schiner.

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., MARCH, 1924.

## Flying Men and Insects.

A recent interesting bulletin (No. 1204, January, 1924) of the United States Department of Agriculture, entitled "Dusting Cotton from Airplanes," by B. R. Coad, E. Johnson and G. L. McNeil, describes a phase of Tennyson's well-known prediction—

Heard the heavens fill with shouting and there rain'd a  
ghastly dew.

From the nations' airy navies grappling in the central  
blue,

of which the poet probably never dreamed. By coöperation of the Federal Bureau of Entomology and the Air Service of the United States Army, experiments were made at Tallulah, Louisiana, in August, 1922, to determine the possibility of checking the cotton leaf worm (*Alabama argillacea* Hüln.) by dusting the threatened plants with insecticides from airplanes.

Many technical difficulties had to be overcome, as set forth at length in the bulletin. Flights were made at varying elevations from 5 to 50 feet above the cotton plants "and it was almost always possible to distribute the poison from 25 feet or lower regardless of air conditions," as for example, "with an 8-mile breeze blowing, which would render absolutely impossible any effort to dust cotton with ordinary ground dusting machines." In some of the tests the airplane operated "at an average rate of ground speed of 88 miles an hour and the 120 pounds [of calcium arsenate] contained in the hopper lasted over a strip 17,424 feet long." The flights were directed from the ground by a system of wig-wag signals with white flags.

Among the advantages claimed for the use of airplanes for this purpose are their independence of ground conditions, such as rain-soaked fields which would prevent the employment of any ground machines, or the presence of stumps and similar obstacles, and an actual economy of cost at least where large areas are concerned.

Many illustrations, some very striking, accompany the bulletin.

The airplane has frequently been suggested for the exploration of relatively inaccessible countries. We look forward to its use by some enterprising entomologist to obtain the gorgeous butterflies which frequent the flowers at the summits of mighty trees in the tropical forests, or rare and swift flying cicadas and dragonflies. The hitherto inviolate habitats of restricted mountain insects will be invaded by the knight of the net and the bottle and the supremacy of the Age of Insects will be threatened by the Flying Man.

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## Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE

### On the Synonymy of *Prodenia eridania* Cram. (Lep., Phalaenidae=Noctuidae.

#### *Prodenia eridania* Cram. (partim.)

1782, Cram., Pap. Exot., IV, 133, pl. CCCLVIII, f. F, (nec E), *Noctua*.

1825, Hbn., Verz., p. 244, *Calliergis*.

1852, Gn., Sp. Gén., V, Noct., I, 148, *Xylomyges*.

1856, Wlk., Cat. Lep. Het. B. M., IX, 182, ?*Xylomyges*.

1893, Sm., Bull. U. S. N. M., XLIV, 169, *Prodenia*.

1909, Hamp., Cat. Lep. Phal. B. M., VIII, 271, as *eridania* ab. I = *externa*, *Xylomyges*.

1917, B. & McD., Check List, p. 67, No. 2573, *Prodenia*.

#### *externa* Wlk.

1856, Wlk., Cat. Lep. Het. B. M., IX, 114, *Leucania*.

1909, Hamp., Cat. Lep. Phal. B. M., VIII, 272, *eridania* ab. I, *Xylomyges*.

#### *nigrofascia* Hlst.

1881, Hlst., Bull. B'klyn Ent. Soc., III, 77, *Leucania*.

1881, Tepper & Smith, Bull. B'klyn Ent. Soc., IV, 7, pl. I, f. 9, *nigrofascia* (in err.), *Leucania*.

#### form norm. *linea* Fabr.

1794, Fabr., Ent. Syst., III, No. 2. 106, *Noctua*.

1909, Hamp., Cat. Lep. Phal. B. M., VIII, 271, text fig. 73, as *eridania*, *Xylomyges*.

#### *eridania* Cram. (partim.)

1782, Cram., Pap. Exot., IV, 133, pl. CCCLVIII, f. E, (nec F), *Noctua*.

#### *phytolaccæ* A. & S.

1797, A. & S., Lep. Ins. Ga., II, 193, pl. XCVII, biol., *Phalaena*.

1852, Gn., Sp. Gén., V, Noct., I, 148, = *eridania* Cram. 358E, *eridania* var., *Xylomyges*.

1856, Wlk., Cat. Lep. Het. B. M., IX, 183, *eridania* var. *B.*, ?*Xylomyges*.

*derupta* Morr.

1875, Morr., Proc. Ac. Nat. Sci. Phila., p. 62, *Actinotia*.

The correct nomenclature of this economic species appears confused.

Cramer figured both the normal form and the form with the black fascia from reniform to termen.

Guenée (1852) restricted the name *eridania* to figure F of plate CCCLVIII of Cramer, placing the normal form as *phytolacca* A. & S. In this, he is followed by Walker (1856).

Hampson (1909) seems to have overlooked these prior fixations, designating the form with the black fascia as *eridania* ab. 1 = *externa* Wlk.

The normal form of the species will apparently have to be called *Prodenia eridania* form *linea* Fabr., while the aberrant form with the black fascia, not restricted to females, must take the specific name, *Prodenia eridania* Cram.

Only that part of the bibliography which may prove of interest is listed. Other synonyms, based on exotic specimens, are not listed herein; (see Smith 1893 and Hampson 1909).—WM. BARNES and F. H. BENJAMIN, Decatur, Illinois.

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### On the Retention of *ii* or *i* in Specific Patronymic Names.

In general the rules formulated by the Ninth International Zoological Congress, and the opinions rendered by the International Commission on Zoological Nomenclature, regarding the retention of *ii* or *i* in specific patronymic names seem to have escaped the attention of Lepidopterists.

The Barnes and McDunnough *Check List*, and most workers, have followed Article 14 of the International Rules, which states; "If the name is a modern patronymic, the genitive is always formed by adding, to the exact and complete name, an *i* if the person is a man, or an *ae* if the person is a woman, even if the name has a Latin form; it is placed in the plural if the dedication involves several persons of the same name."

The result has been that many names originally published with *ii* termination have been changed to *i* termination.

However, Article 19 states; "The original orthography of a name is to be preserved unless an error of transcription, a *lapsus calami*, or a typographical error is evident".

The question of the *ii* versus *i* in specific patronymic names, is exhaustively dealt with in Opinion 8 of the International Commission, (see Pub. 1938, Smithsonian Institution, pp. 11-12, 1910).

As this opinion may be unavailable to many readers, its conclusion is quoted.

"The conclusion must therefore be drawn that under the present Code the original form of the name should be retained, regardless of the question whether it ends in *i* or *ii*, although authors are advised to be very careful about this point in forming new names, and to adopt the *ii* only when the person's name used as a basis for the specific name ends in *i*".—WM. BARNES and F. H. BENJAMIN, Decatur, Illinois.

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### The Genus *Cyptobunus* Banks (Phalangida).

In 1905 Banks described (Ent. News, 16:252) a small Phalangid from a cave near Limespur, Montana, which he named *Cyptobunus cavicolus*. Banks based his genus *Cyptobunus* primarily on the absence of lateral teeth on the claws of the tarsi of the third and fourth legs. In 1914 Roewer (Arch. f. Naturg. v. 80, Abt. A. Heft. 12, p. 167) stated that he believed that the type was an immature specimen and that the real position of the genus must await the examination of mature specimens.

Some years ago the Cornell University collection received from Prof. R. A. Cooley two specimens of the species from the same cave, collected in 1910. They are apparently mature and about 2 mm. in length. The claw of the tarsi of the third and fourth legs bear on each side a small but distinct tooth. Since in other respects this species agrees generically with *Sclerobunus robustus* Packard, the type of the genus, it must be placed there. *Cyptobunus* therefore becomes a synonym of *Sclerobunus*.—C. R. CROSBY and S. C. BISHOP, Cornell University, Ithaca, New York.

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### *Muscina pascuorum* Meigen in Maryland (Dipt.: Muscidae).

This common European fly, first captured in America in 1922 in Massachusetts, Connecticut, New York and New Jersey (C. W. Johnson, Psyche, XXX, 1, 1923) is taken this, the following year at Plummers Island, Maryland; one female, in house, November 11, 1923. R. C. SHANNON, U. S. National Museum, 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.

Papers of systematic nature will be found in the paragraph at the end of their respective orders. Those containing descriptions of new genera and species occurring north of Mexico are preceded by an \*.

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.

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. 15—Insecutor Inscitiae Menstruus, Washington, D. C. 20—Bulletin de la Societe Entomologique de France, Paris. 21—The Entomologist's Record, London. 42—Entomologiske Meddelelser udgivne af Entomologisk Forening, Kjobenhavn. 49—Entomologische Mitteilungen Berlin-Dahlem. 50—Proceedings of the United States National Museum. 57—Biologisches Zentralblatt, Leipzig. 59—Journal of Agricultural Research, Washington, D. C. 64—Parasitology, London. 68—Science, Garrison on the Hudson, N. Y. 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. 79—Bulletin of the Museum of Comparative Zoology at Harvard College, Cambridge, Mass. 85—The Journal of Experimental Zoology, Philadelphia. 87—Arkiv for Zoologi, K. Svenska Vetenskapsakademien, Stockholm. 90—The American Naturalist, Lancaster, Pa. 99—Bulletin du Museum National d'Histoire Naturelle, Paris. 100—Biological Bulletin of the Marine Biological Laboratory, Woods Hole, Mass. 101—Journal of The Linnean Society of London. 116—Entomologische Zeitschrift, Frankfurt, a. M. 119—Proceedings of the National Academy of Sciences of the U. S. A., Washington, D. C. 133—Zoologica. Scientific Contributions of the New York Zoological Society. 141—Internationale Entomologische Zeitschrift, Guben, Germany. 154—Annales de la Societe Linneenne de Lyon.

**GENERAL.** Baker, C. F.—Comparison of neotropical and palaeotropical insect faunae (Phil. Jour. Sci., xxiii, 531-2.) Clements and Long—Experimental pollination. An outline of the ecology of flowers and insects. (Carnegie Inst. Wash., Pub., No. 336.) Fabre, J. H.—Biographical note. (La Nature, 1923, 353-4.) Horn, W.—Et meminisce et vaticinari liceat. 15. Ueber Kropotkin und Darwin. 49, xii, 215-6. Howard, L. O.—Retarded establishment of introduced parasites of injurious insects. 119, x, 16-18. Hungerford, H. B.—Historical account of department of entomology [Kansas Unive.]. (Kans. Univ. Sc. Bul., xiv, 7-15.) Lawson, P. B.—Report upon the celebration of May 16, 1921, in honor of the twenty-fifth anniversary of S. J. Hunter's connection with the department. (Kans. Univ. Sc. Bul., xiv, 21-3.) Moore & Hungerford.—Water insects from a portion of the southern Utah desert. (Kans. Univ. Sc. Bul., xiv, 409-21.) Pavlovsky, E. N.—Description of a box for collecting and transporting living insects, etc. 64, xiv, 47-50. Pratt, J. G.—Preparing insects for the camera. (Nature Mag., 1924, 95-98.) Swinehoe, C.—Obituary. 9, lvii, 23-4. Wulker, G.—Parasitische wurmer bei insekten. 141, xvii, 138-43 (cont.)

**ANATOMY, PHYSIOLOGY, MEDICAL, ETC.** Brambell, F. W. R.—Sex-reversal and intersexuality. (Jour. R. Microsc. Soc., 1923, 395-408.) Burrows, M. T.—A study of the relation between function and growth in body cells (Kans. Univ. Sc. Bul., xiv, 475-504.) Clausen, R. E.—The inheritance of cinnabar eye color in *Drosophila melanogaster*, including data on the locus of jaunty. 85, xxxviii, 423-36. Crampton, G. C.—A comparison of the labium in certain holometabolous insects from the standpoint of phylogeny. 10, xxv, 171-80. Glenn, P. A.—A problem in the relation of temperature to rate of insect development. (Kans. Univ. Sc. Bul., xiv, 317-23.) Hering, M.—Das histologische bild der von insektenlarven erzeugten blattminen. (Mikrokosmos, xvii, 49-53.) Kopec, S.—Studies on the influence of inanition on the development and the duration of life in insects. On the heterogeneous influence of starvation of male and of female insects on their offspring. 100, xlvi, 1-21; 22-34. McFarland, J.—Fighting foes too small to see. (Philadelphia, F. A. Davis Co., 1924, 309 pp.) Turner, C. H.—A new field method of investigating the hydrotropisms of fresh-water invertebrates. 100, xlvi, 35-54.

**ARACHNIDA AND MYRIOPODA.** Chamberlin, R. V.—The northern range of the scorpion. 68, lix, 64. Han-

**strom, B.**—Ueber die histologie und vergleichende anatomie der sehganglien und globuli der araneen. (Kongl. Svenska Vet.-Akad. Handl., lxi, No. 12.) **Mallock, A.**—The eyes of spiders. 76, cxiii, 45-8. **Sokolska, J.**—L'appareil de Golgi dans les cellules somatiques et sexuelles (spermatogenese et ovogenese) de l'araignee domestique (*Tegenaria domestica*). 77, lxxxix, 1395-6. **Archev, G.**—A new genus of Chilopoda from Br. Guiana, and a n. sp. of Wailamyetes from Auckland Island. (Rec. Canterb. Mus., ii, 113-16.) \***Ewing, H. E.**—Holosiro acaroides, new genus and species, the only New World representative of the mite-like phalangids of the suborder Cyphophthalmi. 7, xvi, 387-90.

**THE SMALLER ORDERS OF INSECTA.** **John, O.**—Fakultative viviparitat bei Thysanopteren. 49, xii, 227-32. **Meissner, O.**—Wespen und libellen, 116, xxxvii, 35-6.

\***Banks, N.**—Descriptions of new neuropteroid insects. 79, lxxv, 421-55. **Ferris, G. F.**—The mallophagan family Trimenoponidae. 64, xiv, 75-86. \***Ferris, G. F.**—Contributions towards a monograph of the sucking lice. (Stanford Univ. Pub., Biol. Sci., ii, No. 4). **Lacroix, J. L.**—Etudes sur les Chrysopides. II. Memoire. 154, 1922, 119-44. **Snyder, T. E.**—A new Prothinosoma from Panama. (Jour. Wash. Ac. Sci., xiv, 43-5.)

**HEMIPTERA.** **Buchner, P.**—Ueber ein neues, symbiontisches organ der bettwanze. 57, xli, 570-4. **DeLong, D. M.**—The distribution of the leafhoppers of Presque Isle, Pa., and their relation to plant formations. 7, xvi, 363-73. **Doering, K.**—Biology and morphology of *Lepyronia quadrangularis*. (Cercopidae). (Kans. Univ. Sc. Bul., xiv, 515-87.) **Hackman, L. M.**—Studies on *Cicadella hieroglyphica*. (Kans. Univ. Sc. Bul., xiv, 189-209.) **Hungerford, H. B.**—The life history of the toad bug. (Kans. Univ. Sc. Bul., xiv, 145-71.) **Leonard & Barber.**—The immature stages of the catnip leafhopper (*Eupteryx melissae*). 6, xxxi, 181-4. **Radio, P. A.**—The ovipositors of the Cicadellidae. (Kans. Univ. Sc. Bul., xiv, 217-98.) **Wadley, F. M.**—Factors affecting the proportion of alate and apterous forms of aphids. 7, xvi, 279-303. **Wiley, G. O.**—Life history notes on two species of Saldidae found in Kansas. Some notes on the biology of *Curicta* from Texas. (Kans. Univ. Sc. Bul., xiv, 301-11; 507-11.)

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**LEPIDOPTERA.** **Baylis, H. A.**—Colour production in *L.* 9, lvii, 2-6. **Coolidge, K. R.**—The life history of *Thanaos funeralis*. (Hesperiidae). 6, xxxi, 175-81. **Robertson-Miller, E.**—Observations on the bellura. (*Bellura gortynoides*). 7, xvi, 374-86. **Turner, H. J.**—*Lycaenid* larvae and aants. "Hermaphroditism" in the Hesperiidae. 21, xxxvi, 8-9. **Vansell, G. H.**—The urinary system of *Phlegethontius sexta*. (Kans. Univ. Sc. Bul., xiv, 365-9.)

**Beebe, W.**—Notes on Galapagos *L.* 133, v, 50-9. **Bouvier, E. L.**—Observations sur quelques Saturniens recueillis au Venezuela. Quelques Saturniens nouveaux de l'Amérique tropicale. 99, 1923, 5 353-9; 422-7. **Dyar, H. G.**—New *L.* from Mexico and one from Argentina. 15, xii, 15-21. \***Dyar, H. G.**—A new noctuid from Louisiana. 15, xii, 21-2. **Le Cerf, F.**—Descriptions de formes nouvelles de lepidopteres rhopaloceres. 99, 1923, 360-7, 428-9. **Niepelt, W.**—Neue formen palaearktischer und exotischer lepidopteren. 141, xvii, 134. **Niepelt, W.**—Neue u. wenig bekannte exotische Rhopaloceren. 141, xvii, 138. **Schaus, W.**—Galapagos heterocera with descriptions of new sps. 133, v, 23-48.

**DIPTERA.**—**Bezzi, M.**—On the dipterous genera *Passeromyia* and *Ornithomusca*, with notes and bibliography on the non-pupiparous *Myiodaria* parasitic on birds. 64, xiv, 29-46. **Freeborn, S. B.**—The "proepimera" of the Culicidae. 15, xii, 37-8. **Frew, J. G. H.**—On the larval and pupal stages of *Forcipomyia piceus*. 72, x, 409-41. **Frew, J. G. H.**—On the morphology of the head capsule and mouth parts of *Chlorops taeniopus*. 101, xxxv, 399-410. **Genna, M.**—Ricerche sulla nutrizione dell'*Anopheles claviger*. (Arch. Zool. Ital., x, 15-33.) **Morris, H. M.**—On the larva and pupa of a parasitic phorid fly, *Hypocera incrassata*. 64, xiv, 70-4. **Seguy, E.**—Note sur les larves des *Muscina stabulans* et assimilés. 99, 1923, 443-5. **Shannon, R. C.**—Some special features of

the wings of *D.* 15, xii, 34-6. **Turner, C. L.**—The Psychodidae (moth-like flies) as subjects for studies in breeding and heredity. 90, lvii, 545-58.

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**Barber, H. S.**—Two new *Conotrachelus* from tropical fruits. (Curculionidae). 10, xxv, 182-5. **Benderitter, E.**—Quelques Rutilides nouveaux. 20, 1923, 216-9. **Dawson, R. W.**—A synopsis of the Scarabaeidae of Nebraska. (Univ. Neb. Stud., xxii, 163-244.) **Desbordes, H.**—Description de reninus nouveaux de la Republique Argentine et tableaux de determination des especes de ce genre. 99, 1923, 368-71. **Fisher, W. S.**—A change of name in Buprestidae. 10, xxv, 190. **Horn, W.**—Einiges ueber neue und alte Cicindeliden. 42, xiv, 211-16. \***Leng, C. W.**—New species and synopsis of *Statira*. 6, xxxi, 184-8. **Portevin, G.**—Description d'une

nouvelle espece de Silphide des collections du museum. 99, 1923, 380-1.

**HYMENOPTERA.** Isely, D.—Notes on nesting of *Polistes*. (Kans. Univ. Sc. Bul., xiv, 341-3.) Meissner, O.—Wespen und libellen. 116, xxxvii, 35-6. Nielsen, E.—Contributions to the life history of the pimpline spider parasites (*Polysphincta*, *Zaglyptus*, *Tromatobia*). 42, xiv, 137-205. Olsen, C. E.—Backyard collecting in Ramsey, N. J. 6, xxxi, 171-5. Picard, F.—Recherches biologiques et anatomiques sur *Melittobia agasta*. 78, lvii, 469-508. Roth, P.—A propos de instinct de *Bembex rostrata*. 154, 1922, 47-52. Sandhouse, G. A.—A gyandromorphic bee of the genus *Osmia*. 90, lvii, 569-70. Stumper, R.—L'illusion des amputes chez les fourmis. (La Nature, Paris 1923, 335-6. Viereck, H. L.—The flower relations of wild bees. (Can. Field-Nat., xxxvii, 164-5.)

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### SPECIAL NOTICES

**Hemiptera:** Science bulletin of the University of Kansas, Vol. XIV, has just come to hand. It contains 587 pages, including many plates, all with the exception of a small paper on Crustacea, treating of subjects of entomological interest. The largest papers are reviews or monographs of several families and genera of the Hemiptera, while others are of more biological and anatomical nature, mainly of several species of Hemiptera. This volume is dedicated to Samuel John Hunter, Head of Department of Entomology. **Macrolepidoptera of the World.**—Parts 306-308. Fauna americana parts 128-130 have been issued in the English edition. These continue the *Hesperiidæ* by Dr. M. Draudt.

The **Catalogue of Indian Insects**, Part 1 of which on the *Acrydidae* (*Tettigidae*) was reviewed in the NEWS for March,

1922, page 95, has been advanced by the publication of Part 2. Culicidae and Part 3. Bombyliidae, both by Ronald Senior-White (Calcutta, Sup't Govt. Printing, India, 1923). The Indian Culicid fauna "is now represented by 28 genera containing a total of 160 valid species and varieties," the Bombyliid by 17 genera and 103 species. In both parts the localities, both within and outside of India, cited in each reference are given as marginal notes.

The progress of Indian Entomology is recorded in a **List of Publications on Indian Entomology, 1920-21**, compiled by the Imperial Entomologist (Bull. 139, Agri. Research Inst., Pusa; Calcutta, Supt. Govt. Printing, India, 1922; 67 pp.) The publications are listed under their authors' names, the names arranged alphabetically. The title and place of publication of each article are followed by a list of the Indian and near-Indian species concerned. No means of finding the papers on any given group of insects is furnished, however.

The recent death of the Hon. N. C. Rothschild (see the NEWS for February, page 76) lends a melancholy interest to Part 5 of Volume I of **Ectoparasites**, published Nov. 10, 1923, which he edited in conjunction with Dr. K. Jordan. It comprises pages 287-370, text figures 281-383 and contains five articles by the two editors on Swiss, Algerian, Eastern Hemisphere and American (North and South) Siphonaptera and a revision of the fleas of the chiefly neotropical genera *Rhopalopsyllus* and *Parapsyllus*, with keys to the American species of both.

Under the title **Some Remarks about the supposed scent-organs of the Genus *Opsiphanes***, Heer J. H. Juriaanse describes and figures (Tijdschr. v. Ent. LXVI, pp. 147-151, pl. 2, 1923) structures which he sums up as follows:

"The sexual attraction mechanism of this male [Brassolid] butterfly consists of three leading functions, viz. 1. The secretion of scent by a gland at each side of the abdomen. 2. The ejection of same over a special contact-organ consisting of bud-shaped projections implanted in those glands. 3. The distribution of the scent in the air derived from those projections by the contact of a hair pencil on the wing."

EXTERNAL INSECT-ANATOMY by ALEXANDER D. MACGILLIVRAY, Urbana, Illinois. The Scarab Co., 1923.\*

In *External Insect-Anatomy* the author has departed from the usual method of writers on entomology by an attempt to bring

\*The review of this work published in the NEWS for January suggested submitting the volume for comment to Mr. Turner, a senior in

the material of the text-book into closer relation with the work in the laboratory. Such an innovation is particularly desirable in connection with a subject such as comparative morphology in which there is such a close inter-relationship between the laboratory work and the background usually afforded by the text-book, so that the author would be justified in asserting that the method in which his material is presented as well as the material itself supplies a real need.

The bulk of *External Insect-Anatomy* consists of outlines for the study of a wide variety of insects representing the fruits of a tremendous amount of work on the part of the author and those who have collaborated with him. These laboratory outlines are grouped in appropriate sub-topics under the general headings of Fixed Parts of the Head, Movable Parts of the Head, Thorax, Abdomen, Legs and Wings. No attempt has been made, as is sometimes the case, to make structures which are really very complicated appear simple by disregarding the minor points of anatomy; the student who has mastered well-chosen portions of *External Insect-Anatomy* will have an unusually firm basis on which to proceed with further studies in systematic entomology and taxonomy.

What may be termed the text-book portion of *External Insect-Anatomy* consists of generalized discussions in considerable detail introducing each topic and sub-topic. These are intended primarily for use in connection with the laboratory outlines which follow, and for this reason the illustrations are few in number and, with several exceptions, all of a hypothetical character. As a consequence the beginner in entomology would find the book of little profit to him except when used in conjunction with laboratory work; when so used, however, it would be entirely suitable for the beginner, as no previous knowledge of insects is assumed.

In the matter of illustrations the chapter on wings presents a contrast to the remainder of the volume; here the author has found it advisable to accompany the reference to each species with a drawing of a wing. The excellent discussion at the beginning of this chapter on the origin and development of wings is also well illustrated.

The student who is already familiar in a general way with the anatomy of one insect, say the grasshopper or cricket, will re-

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the College Department of the University of Pennsylvania. Mr. Turner began his first course in Entomology in October, 1923, having previously completed courses in general zoology and in invertebrate zoology (exclusive of insects). He tells me that he had not read any notices of Dr. MacGillivray's book up to the time that his manuscript was placed in my hands. I have carefully avoided trying to influence Mr. Turner's opinions on the book.—EDITOR.]

gard the absence of illustrations as a real advantage, since it has permitted of a degree of completeness not usually found in a book of such handy size. The unusual care taken in the matter of arrangement and the inclusion of extra material which helps in the full understanding of the subject-matter proper makes the acquisition of this abundance of information a much easier matter for the student than it might otherwise be.

The comprehensive introduction contains all the preliminary material that is needed by the beginner, including a discussion of technical nomenclature, a subject with which familiarity is too often assumed. As occasion requires series of clear definitions are given of the terms about to be employed. Other commendable features are the pronouncing index and the list at the end of the volume giving the systematic position of the species described as well as the English equivalents of their names. Such a list in several of the entomology text-books of a general character would be still more useful than in a book on comparative morphology. The student who knows how difficult it is to secure satisfactory information on laboratory methods will appreciate the comprehensive instructions in technique which are given as the need arises.

But more important than these incidental features in establishing the worthwhileness of *External Insect-Anatomy* as a text-book are the very obvious pains which the author has taken to make plain at every step the significance of the comparative study of insects, particularly in its relation to the matter of evolution. The inclusion of material drawn from embryology has been an effective part of this policy. As a consequence *External Insect-Anatomy* might be used with profit even in a course where the stress is laid more upon the characteristics of the several orders and less upon the comparative structure of the parts of insects, as it would shed light upon the laboratory work from a slightly different angle. During the term reference might be made to sections in different chapters dealing with the order being studied in the laboratory, and towards the end of the term a reading of the general treatments at the beginning of each chapter would make clearer the relations to one another of the orders studied and broaden the student's knowledge of insects in general.

A feature of *External Insect-Anatomy* which in no way affects the value or usefulness of its contents but which is still of considerable importance is the freedom the author has allowed himself in the formation of new compounds. Many who are mindful of the responsibility of biologists in contributing new words to the language will look askance at hybrids such as

"mesowings" and "metalegs," and object strenuously to the disregard of roots shown in the numerous compounds introduced of the type of "quaspiracles" and "quispiracles," where *qua-* and *qui-* stand for *quattuor* and *quinque*. Others who hold language in less esteem will probably argue along with the author that accuracy and conciseness are the prime essentials in a book like *External Insect-Anatomy*, and that all means to secure them are legitimate.—PAUL A. TURNER.

## OBITUARY.

EDWIN A. BISCHOFF.

Edwin A. Bischoff, a coleopterist of repute, died on December 23rd last, at the hospital in Newark, New Jersey, following an operation. Mr. Bischoff was born January 23, 1866 and became known beyond his own locality as an energetic collector of Coleoptera with the publication in 1890 of Smith's first list of the Insects of New Jersey. His records in the third list, published in 1909, covered a large part of the coleopterous fauna of New Jersey and he was thereafter recognized as the possessor of one of the largest collections in the state and of a fund of information acquired by his constant field work. Many specialists obtained part of their data from him and as one result *Thysanocnemis bischoffi* was named for him by Blatchley.

His own writings are not numerous but include "Neoclytus jouteli in Virginia" (Journ. N. Y. Ent. Soc. XXVII, 1918, p. 231).

Mr. Bischoff was a member of the Newark Entomological Society, and of the New York Entomological Society, also of several fraternal associations. His home was at 151 Maple Avenue, Irvington, where many entomologists have visited and seen his collections, remarkable for their neat arrangement as well as for the great series of specimens included. His collecting trips were made chiefly in the Newark district and the Orange Mts., but Eagle Rock, Berkeley Heights, and Lakehurst were also among his favorite haunts. His companion on many of these trips was Mr. Edgar L. Dickerson, whose death was recorded in the January number of the NEWS.

CHARLES W. LENG.

## 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.

**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.

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**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.

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**Wanted** in exchange or cash 1000 *Precis orithya* ♂, *Precis isorattia* ♂, *Precis mevaria* ♂. A. F. Porter, 104 W. Broadway, Decorah, Iowa.

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- 844.—Davidson (W. M.).—Biology of *Scymnus nubes* Casey. (Trans., 49, 155-163, ill., 1923) ..... 20

## LEPIDOPTERA.

- 842.—Braun (A. F.).—Microlepidoptera: notes and new species. (Trans., 49, 115-127, 1923) ..... 25
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# ENTOMOLOGICAL NEWS

Vol. XXXV

No. 4



GEORGE HENRY HORN  
1840-1897

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## STATED MEETINGS

Of the Entomological Section of The Academy of Natural Sciences of Philadelphia, and of The American Entomological Society will be held at 7.30 o'clock P. M. on the following dates during 1924: January 24, February 28, March 27, April 24, May 22, September 25, October 23, November 20, and Dec. 8.

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# ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXV

APRIL, 1924

No. 4

## CONTENTS

Coolidge—The Life-History of <i>Brephidium exilis</i> Bdv. (Lepid.: Lycaenidae).....	115	Garrison—Rearing Records of <i>Pollenia rudis</i> Fab. (Dipt.: Muscidae).....	135
Smith—An Annotated List of the Ants of Mississippi (Hym.).....	121	Hayes and McColloch—A New Species of <i>Anomala</i> (Coleop. Scarabaeidae).....	138
Reinhard—Notes on Texas Sarcophagidae (Diptera).....	127	Fox—A New Lycaenid (Lep.) from the Pacific Coast.....	140
Weiss and West—Notes on the Judas Tree Leafhopper, <i>Erythroneura aelys</i> McAtee in New Jersey (Homop.).....	129	Editorial—Professor Jacques Loeb.....	142
Frost—Two Little Known Leaf-miners of Apple (Lepid.: Tineidae; Col.: Curculionidae).....	132	An Entomologist at Law.....	143
		The Monument to J. Henri Fabre.....	144
		Cockerell and Harris—A New Form of Rhynchites (Col.: Curculionidae).....	144
		Cleanup Week in Pennsylvania.....	144
		Entomological Literature.....	145
		Obituary—Colonel Charles Swinhoe.....	152
		“ Rev. Canon Theodore Wood.....	152

## The Life-History of *Brephidium exilis* Bdv. (Lepid.: Lycaenidae).

By KARL R. COOLIDGE, Hollywood, California.

*Brephidium exilis* Bdv., well named “The Pygmy Blue,” since it is one of the smallest species of butterflies in the world, is the most abundant form of Rhopalocera in Southern California. Along the coastal region it flies in countless millions, is well distributed throughout the Mohave and Colorado Deserts, but does not invade the higher mountains to any great extent. Some idea of its abundance can be gleaned by the fact that from one patch of Australian saltbush, hardly several acres in extent, half a million perfect specimens were taken in a few weeks’ time—and yet this considerable number did not diminish the status of the colony to any noticeable degree.

Wright (Butt. West Coast) was in error in stating that *exilis* in California does not occur north of Santa Barbara, since it is very common in the San Joaquin Valley as far north as Sacramento, and simply swarms in the salt marshes about San Francisco Bay.

About Los Angeles I have seen it on the wing every month of the year, but as a rule it does not appear in numbers until early July, reaching the apex of the season's flight in the hot days of September, and from the middle of November, or earlier according to the coolness of the season, rapidly diminishing.

It is severely parasitized by a Tachinid fly, specifically unidentified as yet, and the amazing thing about *civilis* here is its continued abundance in view of the vast numbers of larvae that fall victims to the parasite. As an example, on one occasion twenty-eight larvae were collected. Of these eleven were found to already contain the parasitic grub internally, its black head readily being seen laterally on thoracic segment three, or abdominal one, generally on the left side, only rarely on the right. Four others bore parasitic eggs, making a total of fifteen out of twenty-eight. In another instance fourteen larvae out of eighteen were found to be parasitized.

The parasitic egg is usually placed on one of the anterior segments, more frequently on the first or second thoracic than elsewhere. It may be briefly described as: Egg shaped, pale yellowish white, with a very delicate scarcely raised tracery of round cells, .01 mm. in diameter. Length .34 mm.; .14 mm. in diameter at the smaller end; .32 mm. at the larger end.

I once witnessed an encounter between the parasitic fly and a larva in the fourth instar. The larva was being attended by several ants when the fly alighted on the same leaf. The ants immediately became greatly excited, and as the fly endeavored to get into a position to place an egg, the ants scurried back and forth over the larva at a frenzied rate of speed. It did not appear that the ants were deliberately seeking to attack the fly, but by the hurried scamperings over the larva they soon discouraged the parasite, which after three or four fruitless attempts to oviposit flew away. The impression I received was that the ants were assuredly aware of the danger to their larva, and were certainly responsible for its being saved.

The eggs are placed everywhere on the food-plants, but more frequently on the upper surfaces of the leaves than elsewhere. Of forty-six eggs, thirty-four were on the upper sides

of the leaves, eight on the under surfaces, two on the stems, and two on the seed pods.

I have discovered eggs or larvae on the following food-plants:

*Chenopodiaceae.*

*Atriplex semibaccata* R. Br. Australian saltbush, introduced in California about thirty years ago as a forage plant, and which has now completely established itself. This is the favorite food-plant.

*Atriplex coulteri* Dietr. At Santa Catalina Island.

*Atriplex serena* Nelson. (*bracteosa* Wats.) Lamb's Tongue, a common weed in saline places.

*Atriplex canescens* (Pursh.) James. Shad-bush. On the Mohave and Colorado Deserts.

*Atriplex leucophylla* Sietr. Along the seashore.

*Atriplex breweri* Wats. A popular low hedge in Southern California.

*Atriplex patula* L. With *A. hastata* L., the food-plants in the San Francisco Bay region.

*Chenopodium leptophyllum* Nutt. A common weed in waste places. Also *C. album* L., Lamb's Quarters, a native of the Old World, but now a familiar weed in the settled parts of California.

*Solanaceae.*

*Petunia parviflora* (Lehm.) Juss. Petunia, a plant growing on margins of ponds and along streams, especially in subsaline places. I found *exilis* swarming about this at Buena Vista Lake, in Kern County.

The young larva eats its way out of the egg through a jagged hole, usually in the side, and only devours sufficient of the shell to make its exit. In the earlier stages the larvae prefer the young buds, but also eat out irregular roundish holes in the leaves. Later, they attack mainly the seed-pods, boring into them and eating out the inner contents. Pupation takes place in debris or under stones, and hibernation occurs in the pupal state.

Eggs laid July 11th.

Passed third moult July 26th.

Hatched July 14th.

Passed fourth moult August 1st.

Passed first moult July 18th.

Pupated August 6th.

Passed second moult July 22nd. Imagoes emerged August 10th.

*The Egg*.—Turban-shaped, more than half as high as broad, the upper portion almost perfectly flat, sloping evenly to the central depression, the micropyle; the sides strongly convex to

the flattened base. The micropyle in a deep even round pit, .02 mm. in diameter, of a deeper green than rest of egg.

Ground color a very delicate bluish green, with the usual raised net-work white; as the embryo develops the greenish coloration becomes lost, the egg becoming a solid chalky white. The raised network on the sides divides itself into irregular sub-triangular and subquadrate cells, measuring .02 mm. in their longest axes, with the cell walls .005 mm. in thickness; the usual protuberances at the angles .01 mm. in height and .015 mm. in thickness, broadly rounded. About the micropyle the net-work becomes confused, more irregular and the cells are much smaller. Base sharply flattened, of a deeper tint of green, marked by a delicate tracery of quite regular pentagonal cells. Diameter .44 mm. Height .20 mm.

*First Instar.*—Head dark chestnut brown, shining, .14 mm. in diameter. First thoracic segment pallid, with a bluish tinting.

Body finely granulated. The usual Lycaenid triangular chitinous dorsal plates with a white sheen. Series of rather high conical papillae, projecting hairs, in the following arrangement:

A suprastigmatal series, placed anteriorly on the segments, one to a segment on either side, projecting minute, crooked, clavate, densely spiculiferous hairs, .015 mm. in length. A second similar set of suprastigmatal hairs above these, one on each side, and centrally located.

Two substigmatal papillae, an anterior with the projected hair .02 mm. in length, clubbed, crooked, densely spiculiferous; and a much larger one placed considerably below and centrally on the segment, with the hair .08 mm. in length, straight, sharp, and colorless.

A subdorsal row, one to a segment, placed centrally; the hairs from these colorless, clubbed, spiculiferous, .08 mm. in length, .009 mm. in width at the base and .01 mm. in width at the tip; these hairs closely appressed and directed caudad and slightly laterad, except on the first thoracic where they project over the head. The papillae emitting these hairs .01 mm. in height and diameter, and those of the first thoracic are dark brown.

Color of body pale lemon yellow, but as the larva feeds the original yellow coloration fades more and more, with a greenish tinge taking its place, until at the end of the instar the larva is a solid pale delicate green. Ventral surface and prolegs bright lemon yellow, at beginning of stage. Spiracles pallid, round, with a very fine brown ring, .01 mm. in diameter. A latero-dorsal row of naked fuscous lenticles, two to a segment on either side, close together, the outer the smaller. Anal segment

with a fringe of minute fuscous papillae that project fine, sharp, colorless spiculiferous hairs posteriorly, these being .11 mm. in length.

Length, at birth, .66 mm. Width at first thoracic segment, .20 mm. Width at anal segment .16 mm.

*Second Instar.*—Head dark chestnut brown, shining, .26 mm. in diameter. As before, first thoracic pallid, with a bluish tinting.

Body densely studded with dark brown tubercles projecting heavy, short, curved, densely spiculiferous hairs, clavate; these tubercles .007 mm. in height and diameter, with the arising hairs .02 mm. in height and width at the tip, but the hairs vary slightly, some being as long as .04 mm. Long, sharp, colorless hairs bordering anal segment posteriorly now .16 mm. in length on the average. On first thoracic some similar anteriorly projecting hairs, some .16 mm. in length, others but half that size. Some fine, sharp, straight hairs, colorless, .06 mm. in length, on ventral surface along base of prolegs.

Color of body pale green, excessively finely granulated with brownish atoms. Ventral surface and prolegs pale yellow green. Legs pale yellow brown, opaque. Spiracles pallid, round, .02 mm. in diameter, with a fine brown ring.

Length, 1.40 mm. Width at first thoracic .40 mm. Width at anal segment .34 mm.

*Third Instar.*—Head dark chestnut brown, shining, .34 mm. in diameter. As before, first thoracic pallid, with a bluish tinge.

Body densely studded with tubercles as before; these are mostly concolorous with the body, but some, irregularly scattered, are conspicuously dark brown. The arising hairs colorless and clavate, averaging .04 mm. in height and .02 mm. in diameter at their tips. First thoracic with a fringe of sharp, colorless hairs projecting over the head and a similar but posteriorly projecting fringe to the anal segment; these hairs are as long as .16 mm., with some shorter ones down to .08 mm.

Color of body green to gray green, with the surface finely granulated with brownish atoms. Ventral surface and prolegs pale yellowish green. Legs pale yellow brown, opaque. Spiracles round, with a fine brown ring, .025 mm. in diameter.

Length, 2.30 mm. Width at first thoracic .70 mm. Width at anal segment .54 mm.

*Fourth Instar.*—Head .44 mm. in diameter, dark chestnut brown, shining. Neck bluish green.

Body densely studded with tubercles as before; these are now dark brown, short and stout, .02 mm. in height, and .025 mm. in diameter at base. The arising hairs colorless and clavate, densely spiculiferous, varying slightly in length, but

.03 mm. in length on the average. Anteriorly projecting, colorless spiculiferous hairs of first thoracic now from .06 to .20 mm. in length. Anal segment spatulate, moderately depressed, with a fringe of colorless, spiculiferous hairs averaging .20 mm. in length.

Color of body light green, but for the various phases that may exist see under mature larva. The flattened, dorsal, triangular processes pale yellowish brown, mottled with rosaceous, and in the center of each, so as to form a broken yet conspicuous dorsal line, a heavy blotching of rosaceous. Or, these subtriangular processes may be quite pallid, with the dorsal, rosaceous line only faintly present. Anal segment usually with a rather heavy blotching of rosaceous dorsally and substigmatally. Ventral surface and prolegs bright blue green. Legs pale yellow brown. Spiracles round, pallid, with a fine brown ring, .03 mm. in diameter. Tubes and sac conspicuous, the tube cases pallid, .1 mm. in diameter, prominent, elevated to a height of .12 mm.

Length 3.9 mm. Width at first thoracic 1.04 mm. Width at anal segment .90 mm.

*Fifth Instar.*—Head .60 mm. in diameter, now a rather dull brown.

As before, body densely studded with dark brown tubercles, .025 mm. in height, giving rise to white, densely spiculiferous, crooked processes, for most part bent anteriorly. These average .04 mm. in length. Some of the basic tubercles, especially in the dorsal region, are pure white. First thoracic with a heavy fringe of colorless, spiculiferous hairs, averaging .22 mm. in length, mounted on dark brown papillae .03 mm. in height and diameter. A similar fringe of hairs, of the same length, to the anal segment. Segmental incisures deep. Surface of body finely punctate. Spiracles round, pallid, .05 mm. in diameter, surrounded by a narrow brown ring.

Color yellowish green. A bright yellow, substigmatal band, only weakly indicated, sometimes obsolete. A yellowish white, dorsal line, with a more or less pinkish tinge, not prominent, extending from the second thoracic and fading out on the anal segment. The above is the commonest coloration phase, with others as follows:

A greenish phase, with weak roseate dorsal line and no substigmatal rosaceous or yellowish line.

A greenish phase with roseate dorsal and roseate substigmatal bands well developed.

A greenish phase with dorsal line dark green and bordered by a yellowish tinge. No rosaceous either dorsally or substigmatally.

A greenish phase with roseate dorsal line well developed, but roseate substigmatal line only faintly indicated.

A dark green phase, devoid of either yellowish or rosaceous anywhere.

Prolegs and ventral surface green. Legs pale yellow brown.

Length, at maturity, 7 mm. Width at first thoracic 2 mm. Width at anal segment 1.8 mm.

*The Pupa*.—Viewed dorsally, the sides quite straight to the middle of the abdomen, swelling out only very slightly, so that the greatest breadth is at the point where a rather sudden slope begins to the well rounded, posterior abdominal segment. Viewed laterally, the thorax is highest in the middle of posterior half of mesothorax. Abdomen highest at third segment, slightly higher than the highest point of thorax.

Color light brownish yellow, of varying depths; rarely, the pupa may be a solid pale grass green. A fuscous dorsal line of varying depths and intensity, sometimes quite strong and conspicuous, again weak and broken; this, on the abdominal segments, is often pale red brown. Wing cases pale yellowish green, infuscated with some brownish dots. An abdominal, subdorsal row of rather prominent dark brown dots, quadrate or round, sometimes very heavy. On the thorax these are replaced by two concolorous streaks, projecting outward, and joined together at their furthest points.

Surface of body almost smooth, only exceedingly finely broken by a whitish tracery of scarcely raised lines. A few, minute, fuscous papillae giving rise to colorless hairs which enlarge as they proceed apically and at the extreme summit are expanded into bulbous heads. These hairs most numerous on the abdominal segments, .005 mm. in width at their bases, and though they vary slightly in height the average is .025 mm. Spiracles white, .06 mm. in length.

Length 5.5 mm. to 6 mm. Greatest breadth of abdomen 2 mm.

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## An Annotated List of the Ants of Mississippi (Hym).

By M. R. SMITH, A. and M. College, Mississippi.

(Continued from page 85)

Subfamily CAMPONOTINAE.

### 54.—*Prenolepis imparis* Say.

Holly Springs; A. and M. College; Yazoo City. This species builds its nests in clay-like soils where there is an abundance of moisture. Very characteristic earthen pellets are distributed around the nest's entrance. The workers are very fond of honey dew and are often found in attendance on insects which

excrete this substance. The writer has often seen workers whose gasters were so distended from feeding on honey dew that they were almost unable to walk. Some of the workers act as storehouses for their sisters, during periods when food is scarce, and are known as repletes. This species often enters houses in its search for food.

*P. imparis* may be distinguished from the other species of *Prenolepis* here mentioned by its larger size and by its pronounced more or less cylindrical mesonotum.

55.—*P. (Nylanderia) bruesi* Whlr.

A. and M. College. This is a much smaller species than *imparis*. Nests are built under the bark of logs or stumps, or under stones. The workers are also fond of honey dew.

56.—*P. (Nylanderia) vividula* Nyl.

A. and M. College. This ant is very closely related to *bruesi* and it is almost impossible to distinguish the two unless male forms are present. The genital appendages of the males of the two species are quite distinct showing that these cannot be the same species.

57.—*P. longicornis* Latr.

Gulfport; Biloxi. The workers of this imported species can be recognized by their slender forms and by their exceedingly long legs and antennae. These ants infest houses, stores, cafeterias, etc., but are far from being as troublesome as the Argentine ant, which is the house pest pre-eminent in Mississippi. The workers run very swiftly, darting here and there, as if devoid of any sense of general direction; this term has earned for them the name of "crazy ant."

58.—*Lasius niger* var. *americanus* Emery.

A. and M. College; Lula; Trimcane. The corn, or cotton field ant, as it is generally known, does not seem to be common in Mississippi, although collecting for it has been done in numerous localities in the state. Nests are constructed in the soil or under stones in the open. The workers are given to attending plant lice and their relation to one species, *Aphis-maidi-radici* has attracted much attention. Because of this peculiar relation the ant is considered of economic importance.

This ant can be separated from the species given below by its much darker color and by the presence of three-jointed maxillary palpi. Workers when crushed have a very strong formic acid odor.

59.—**L. (Acanthomyops) interjectus** Mayr.

A. and M. College. This is the largest ant of the subgenus *Acanthomyops*. Nests are built in the soil under stones or logs. The workers are also fond of attending subterranean plant lice, mealy bugs, etc. The ants seem to shun light and are never seen on the surface unless unearthed or exposed.

*L. interjectus* can be distinguished from *americanus* by its six-jointed maxillary palpi, its yellow color, its shining appearance and the presence of a peculiar lemon verbena-like odor.

60.—**Formica pallide-fulva** Latr.

Tupelo; A. and M. College. This ant nests in the soil under stones or in the open in fields and pastures, seeming to prefer a clay, or a clay loam soil. The workers are very timid and cowardly and are made slaves of by other species of *Formica*. They feed largely on insects but are also fond of honey dew.

This pale yellow species can be easily separated from the other two forms mentioned under this genus. It differs from the subspecies *schaufussi* in being more slender and less robust and in lacking the hairs on the gular and petiolar borders. *F. subsericeae* is a black species which is densely covered with a silk-like pubescence.

61.—**F. pallide-fulva** subsp. *schaufussi* Mayr.

A. and M. College. The workers of this form have the same habits as those of the species. It is also made slaves of by other species of *Formica*.

62.—**F. fusca subsericeae** Say.

Caesar. This species does not seem to be common in Mississippi, in fact it is much less common than the two preceding species. It has habits similar to those species and is made a slave of by other species of the genus.

63.—**Camponotus castaneus** Latr.

Mt. Olive; Ocean Springs. This large, yellowish, or castaneous colored species lives in the soil under stones in open wood-

lands. The workers are rather timid and probably nocturnal. This species is fond of honey dew but no doubt feeds on insects also.

*C. castaneus* is easily distinguished from other ants by its large size and by the more or less uniform yellowish or castaneous color of all the various phases.

64.—***C. castaneus* subsp. *americanus*** Mayr.

Oakland; Neshoba. This subspecies has the same habits as *castaneus*. The workers can be distinguished from those of the species by the dark colored head, the remainder of the body being a uniform yellowish or castaneous color.

65.—***C. herculeanus* subsp. *pennsylvanicus*** DeGeer.

"The carpenter ant" is widely distributed throughout the state and is one of the most common ants in Mississippi. Nests are built in more or less faulty or decayed trees, the ants sometimes simply honey-combing the wood with their galleries and chambers. McCook states that a queen is able to establish a nest and raise her first brood unaided. Workers are very fond of honey dew and are often found in attendance on plant lice, tree hoppers, etc.

The workers of this ant can be recognized by their large form, their black color and by the golden hairs and pubescence on their bodies.

66.—***C. herculeanus* subsp. *pennsylvanicus* var. *ferrugineus***  
Fabr.

Oakland; Neshoba; A. and M. College. This is a beautiful color variety of *pennsylvanicus* which has similar habits but not quite so wide a distribution. In this variety the workers have the thorax, petiole, coxae, femora, and base of first gastric segment yellowish ferruginous; sometimes the pronotum and the mesonotum are black. The other portions of the body are black, with the exception of the funiculi, mandibles, anterior border of head, tibiae and tarsi which are deep red.

67.—***C. socius*** Roger.

Waynesboro; Benoit. This imported South American species has been found at the above named localities in Mississippi. The

writer has seen specimens of this ant in Dr. Wheeler's collections from Florida, Georgia, North Carolina and Alabama. Evidently it is spreading throughout the Southern States, for when Dr. Wheeler published his paper on the ants of the genus *Camponotus* in 1910, this species was then only known from Florida. Nothing is known concerning the nesting and other habits of *socius*.

The major worker has a ferruginous red head, the mandibles and scapes are darker, with the anterior border of clypeus and cheek black. The gaster is black with golden yellow posterior borders to each segment and a broad transverse golden band on the first and another at the base of the second segment. Because of its very distinct coloration one has no difficulty in separating this from any of the other species of *Camponotus* here mentioned.

68.—*C. caryae* Fitch.

This species is widely distributed throughout the state. Nests are constructed under the bark of trees, in twigs, or occasionally, in galls. The nests are rather small and contain very few individuals as compared with nests of other species of *Camponotus*. The workers are very fond of honey dew and may be found crawling over the trees in search of this substance. They are rather timid and hard to capture. *C. caryae* and its various subspecies and varieties are all similar in that the workers have the clypeus cut out, or emarginate in the middle.

The workers are usually shining black, but occasionally some specimens show considerable red on the appendages, the articulation of the joints, etc.

69.—*C. caryae* var. *minutus* Emery.

This is a smaller and paler form of the species. The coloration is highly variable. The habits of the two are the same.

The worker major differs from that of *caryae* in that it is smaller and that it possesses a reddish, or yellowish, thorax and petiole. The legs and antennae are paler and the mandibles, sides and lower surfaces of the head red or brown.

70.—*C. caryae* var. *decipiens* Emery.

Louisville; Starkville; A. and M. College. These ants have

been found nesting in the twigs of fig and white ash, also in galls on oak trees. The workers have reddish yellow heads and thoraces and black abdomens. *Decipiens* bears a close resemblance to *rasisis* in color, but is smaller than this subspecies and has much darker appendages. The gaster is black with pale yellow margins to the segments.

71.—*C. caryae* subsp. *rasisis* Whlr.

Starkville. As stated above, this subspecies bears a close resemblance to the variety *decipiens*, but is larger and of a lighter yellowish red color, without the noticeable infuscation on the legs, antennae and head of the worker. Nests are made in galls or in twigs of trees. Occasionally, the workers invade houses, showing a decided fondness for sweets such as syrup, jams, sugar, etc.

72.—*C. caryae* subsp. *rasisis* var. *pavidus* Whlr.

Starkville; Sibley. Nests of this variety have been found under the bark of a dead oak twig and in the stem of elder. The workers of this variety are similar to those of *rasisis* in the color of the head, thorax, petiole and appendages, but the gaster is yellow at the base. The yellow of the gaster may cover all of two segments or only the base of the first segment.

73.—*C. caryae* var. *pardus* Whlr.

The workers of this variety are small, averaging about 5.5 mm. In color they are very variable, even specimens from the same colony showing a wide variation in this respect. Typical specimens have dark brown, or black heads, with ivory yellow thoraces which are spotted with brown, and the base of the gasters often banded with yellow.

74.—*C. (Colobopsis) impressus* Roger.

A. and M. College. A nest of this species was found in a pecan twig. The ant probably nests in the twigs of other plants also. This and all other forms of the subgenus *Colobopsis* can be distinguished by the truncate head of the soldier form.

*C. impressus* can be distinguished from the other two species mentioned here by the shape of the soldier's head, the sides of which are distinctly parallel.

75.—**C. (Colobopsis) mississippiensis** Smith.

Tupelo; Starkville; A. and M. College; Sibley. This species has been found nesting in the twigs of white ash and in galls on red oak. It is the most common species of *Colobopsis* in this section of Mississippi. The workers have been observed to feed on honey dew.

*C. mississippiensis* can be distinguished from *impressus* by the shape of the head of the soldier, the sides being divergent anteriorly; and from *fraxinicola* by the anterior portion of the head being deeply concave and sharply margined, while that of *fraxinicola* is blunt with the clypeus projecting above the general truncated surface.

76.—**C. pylartes** subsp. **fraxinicola** Smith.

A. and M. College; Starkville. This species also nests in the twigs of white ash. It is not as common a species of *Colobopsis* in this locality as *mississippiensis* but is more common than *impressus*.

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**Notes on Texas Sarcophagidae (Diptera).**

By H. J. REINHARD, Texas Experiment Station,  
College Station, Texas.

This paper includes a list of Sarcophagidae collected at College Station and a number of other points in the southern and western sections of the State. More extended collections will undoubtedly bring to light many additional species not listed here. Authentic records on the distribution of the Sarcophagidae within this State are extremely meagre, and the following list is published as a preliminary contribution to the present knowledge of this important family of muscoid flies. Grateful acknowledgment is made to Dr. J. M. Aldrich for making determinations of several species, and to all others who have assisted in collecting material.

CAMPTOPS UNICOLOR Ald. College Station, common, April-October.

CAMPTOPYGA ARISTATA Ald. Houston, abundant, May, 1921.

HYPOPELTA SCROFA Ald. College Station, 4 specimens, March-November, 1921.

- STHENOPYGA GLOBOSA* Ald. College Station, abundant, April-October.
- SARCOPHAGA* n. sp. Sonora, 2 specimens, February, 1922 (Dr. D. H. Bennett), Aldrich determination.
- S. ACULEATA* Ald. College Station, abundant, June-October; Balmorhea, October, 1921, (C. S. Rude).
- S. ALCEDO* Ald. College Station, 3 specimens, October, 1920, May-July, 1923.
- S. AMPULLA* Ald. Dallas, April, 1914, (Aldrich) Sarc. and Allies, p. 153.
- S. ANGUSTIFRONS* Ald. College Station, 2 specimens, October, 1916.
- S. ASSIDUA* Walk. College Station, very common, March-November.
- S. AUSTRALIS* Ald. El Paso, 2 specimens, August, 1923, (C. S. Rude); Sonora, February, 1922, (Dr. D. H. Bennett).
- S. BISHOPPI* Ald. Crystal City, July, 1914, (Aldrich) Sarc. and Allies, p. 260.
- S. BULLATA* Park. College Station, abundant, April-November.
- S. CIMBICIS* Tns. College Station, 3 specimens, May, 1919, October, 1921.
- S. CISTUDINIS* Ald. College Station, 1 specimen, April, 1921.
- S. COMMUNIS* var. *ochracea* Ald. College Station, common, April-September.
- S. DAVIDSONI* Coq. Midland, November, 1914, (Aldrich) Sarc. and Allies, p. 100.
- S. FALCULATA* Pand. Dallas, (Aldrich) Sarc. and Allies, p. 207.
- S. FLAVIPES* Ald. College Station, 4 specimens, October, 1920-1.
- S. GALEATA* Ald. College Station, 1 specimen, October, 1921.
- S. HAEMORRHOIDALIS* Fall. College Station, common, April-November.
- S. HELICIS* Tns. College Station, very common, March-November; Balmorhea, October, 1921, (C. S. Rude).
- S. HUNTERI* Hough. College Station, fairly abundant, May-October; Balmorhea, October, 1921, (C. S. Rude).
- S. IMPAR* Ald. College Station, common, March-July; Houston, May, 1921.
- S. JOHNSONI* Ald. Galveston, (Aldrich) Sarc. and Allies, p. 165.
- S. KELLYI* Ald. College Station, abundant, May-June; Sonora, February, 1922, (Dr. D. H. Bennett).
- S. LATISETOSA* Park. College Station, 1 specimen, October, 1921; Laredo, Duval County, Marathon, February-May, 1922, (C. S. Rude).
- S. MARGINATA* Ald. College Station, 2 specimens, May-July, 1923.

- S. MELAMPYGA Ald. College Station, abundant, April-June.  
S. OPIFERA Coq. College Station, 3 specimens, May-July, 1917, November, 1919.  
S. PACHYPROCTA Park. Laredo, 1 specimen, May, 1922, (C. S. Rude).  
S. PECTINATA Ald. College Station, fairly abundant, April-November.  
S. PELTATA Ald. College Station, 1 female, June, 1919, referred here doubtfully by Dr. R. R. Parker.  
S. QUADRISETOSA Coq. College Station, common, April-November; Houston, May, 1921; Kirbyville, July, 1922, (C. S. Rude).  
S. ROBUSTA Ald. College Station, abundant, April-November; Sonora, August-October, (Dr. D. H. Bennett).  
S. RUDIS Ald. College Station, 1 specimen, May, 1922.  
S. RUFIVENTRIS Wied. College Station, abundant, June-November.  
S. SALVA Ald. College Station, common, May-November.  
S. TUBEROSA var. SARRACENIOIDES Ald. College Station, very common, April-September.  
S. SINGULARIS Ald. College Station, 2 specimens, October, 1920, April, 1922.  
S. SULCULATA Ald. Balmorhea, 1 specimen, October, 1921, (C. S. Rude); Sonora, October, 1920, (Dr. D. H. Bennett).  
S. TEXANA Ald. Dilley, 1 specimen, May, 1920.  
S. UTILIS Ald. College Station, abundant, April-October.  
S. XANTHOPYGA v. d. W. College Station, common, July-October. Assigned here doubtfully since this determination by Coquillett has not been verified by comparison with the type.
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### Notes on the Judas Tree Leafhopper, *Erythroneura aclys* McAtee in New Jersey (Homop.).

By HARRY B. WEISS and ERDMAN WEST,  
New Brunswick, New Jersey.

This species\* was noted at Kingston, New Jersey, on August 10, at which time thousands of adults, many first, second and third stage nymphs and a few fourth and fifth stages were infesting a specimen of Judas tree or red-bud (*Cercis canadensis* L.) growing on the front lawn of a householder. Nearly

\*Identified by Mr. C. E. Olsen.

every leaf on the tree was white from the combined attacks of the nymphs and adults and an adjacent specimen of the mist tree also showed some injury presumably from adults which were present. At this date a brood of adults was well under way and many eggs were found. The eggs were placed anywhere just under the tissue of the lower leaf surface, but usually close to a mid or side vein. There appeared to be no regularity in their deposition and many were found between the veins, near the leaf base, edges, etc. Each egg showed as a little oblong, slightly curved, greenish swelling or blister on the lower surface. After hatching the blisters collapse and the tissue turns brown at the spot occupied by the egg.

The nymphs inhabit the lower leaf surfaces, feeding singly or in loose colonies of many individuals. On August 23, the infested tree was visited again and many adults were found but comparatively few nymphs. On September 19, the number of adults had decreased and only a few last stage nymphs remained. At this date many adults were found resting on the trunk of the tree and several were found under loose bark. It is supposed, therefore, that the species hibernates as an adult. On October 10, fewer adults were found on the leaves, no nymphs remained and several adults were noted again under loose bark. The following descriptions indicate the development which takes place from egg to adult.

*Egg.* Length 0.52 mm. Width 0.15 mm. Whitish, translucent, subcylindrical, broadly rounded at both ends, egg slightly curved when viewed laterally.

*First Nymphal Stage.* Width of head including eyes 0.18 mm. Length about 0.8 mm. Whitish, form narrow, elongate. Head triangular, broadly rounded, almost truncate anteriorly. Anterior truncated portion bearing several fine hairs. Eyes prominent, lateral, red, consisting of numerous, distinct ommatidia. Antennae whitish, about three-fourths as long as body: first segment short, subcylindrical, second segment subcylindrical, slightly longer than first, third segment very long, whip-like, swollen at base and tapering to a fine point. Thorax as broad as head excluding eyes, sides subparallel. Prothorax and mesothorax subequal in length. Metathorax slightly less in length. Slight constriction between thorax and abdomen. Second abdominal segment widest, remainder gradually taper-

ing to anal segment which is acutely pointed or tube-like. Legs whitish, comparatively long. Rostrum reaching almost to third pair of legs.

*Second Nymphal Stage.* Width of head including eyes 0.26 mm. Length about 1.1 mm. Whitish with lemon-yellow tinge; form narrow, elongate. Head triangular, broadly rounded or truncate anteriorly, anterior edge bearing two fine setae. Eyes prominent, lateral. Prothorax as broad or slightly broader than head excluding eyes and slightly longer than mesothorax. Mesothorax and metathorax similar in shape and slightly wider than prothorax; anterior and posterior edges broadly curved. Mesothorax and metathorax each subcrescent-shaped with rounded points of crescents extending posteriorly. Constriction between thorax and abdomen more pronounced. Abdomen broadest at second or third segment, gradually tapering to an acute point at ultimate segment. Abdominal segments for the most part subequal in length. Legs long, narrow. Antennae about two-thirds as long as body. Rostrum reaching to between the second and third pair of legs.

*Third Nymphal Stage.* Width of head including eyes 0.31 mm. Length about 1.5 mm. Similar in shape and color to preceding stage. Constriction between thorax and abdomen very pronounced. Antennae about one-half as long as the body. Posterior extensions of mesothorax and metathorax quite pronounced, those of mesothorax subparallel or slightly diverging and those of metathorax widely diverging, the ends extending slightly beyond the extensions of the mesothorax.

*Fourth Nymphal Stage.* Width of head including eyes 0.41 mm. Length about 1.8 mm. Similar in shape and color to preceding stage except that extensions of mesothorax and metathorax have developed into pronounced wing pads; those of mesothorax slightly subparallel or slightly divergent and those of metathorax widely divergent or extending considerably beyond the body line. Antennae less than one-half as long as body. Rostrum extending to between the second pair of legs.

*Fifth Nymphal Stage.* Width of head including eyes 0.51 mm. Length about 2.4 mm. Whitish with lemon-yellow tinge; form narrow, elongate gradually tapering posteriorly. Antennae white, about one-third as long as body, three-segmented, first segment short, cylindrical, second segment slightly longer than first, third segment whip-like, very long, swollen at base and tapering to a fine point. Head triangular, broadly rounded anteriorly and bearing two setae on anterior margin and several smaller setae between the marginal setae and the antennae. Eyes prominent, lateral. Prothorax slightly narrower than the

width of head including eyes, sides parallel, length slightly less than one-half width. Mesothorax slightly longer than prothorax, wing pads long and narrow extending beyond body line laterally and posteriorly to slightly beyond the middle of the third abdominal segment. Metathorax slightly less than one-half as long as mesothorax, with narrow wing pads extending laterally beyond the body line and posteriorly to the beginning of the fourth abdominal segment. Abdomen widest at about the third segment and gradually tapering to posterior end. Segments subequal in length except the first, which is shorter, and the last one, which is longer. Last segment bearing several hairs which are short. Legs long, narrow, tibiae bearing minute, short spines which are most pronounced on the third pair of legs. Tip of rostrum extending to the second pair of legs.

*Adult.* This was described by McAtee from specimens collected at Plummer's Island, Maryland, December 21, 1913 (Trans. Amer. Ent. Soc. xlvii, p. 290, 1920). In past years Mr. E. L. Dickerson has collected this species on Judas trees in several nurseries in the north-eastern part of New Jersey.

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## Two Little Known Leaf-miners of Apple (Lepid.: Tineidae; Col.: Curculionidae).

S. W. FROST, State College, Pennsylvania.

There are two species of leaf-miners on apple which have received little attention in literature. One of these belongs to the order Lepidoptera, the other to the Coleoptera. The habits of these have been referred to only briefly. Both are pests on apple, working chiefly on the water sprouts and more succulent growth.

### *Lyonetia speculella* Clem.

*Lyonetia speculella* Clem.<sup>1</sup> is the more interesting of the two, differing considerably in habits from the numerous other leaf-miners which are more common on apple. The only record of food plants is that of Busck (1904)<sup>2</sup> where he states that a series of specimens was bred by Dr. Dyar at Kaslo, British Columbia from *Ceanothus*, *Prunus* and *Betula*. Engel (1908)<sup>3</sup>

<sup>1</sup> Syn. *L. nidifincansella* Pack., *gracilella* Cham., *apicistrigella* Cham. The determination of the species was kindly made by Miss Annette Braun.

records the species as rare in the woods in the vicinity of Pittsburgh, Pa. The writer has found the small miner abundant in Eastern Pennsylvania during recent years.

The larvae confine themselves to the leaves where they mine during their entire larval stage. They make small irregular blotch mines on the upper surface of the leaf which are slightly visible from the lower surface. Five or six of these mines may be found on the same leaf. The mature dried mines distort the leaf considerably.

The larvae are cream in color, distinctly constricted between the segments. The head is slightly depressed with the front triangle not extending to the vertical triangle. The thoracic legs are present, the pro-legs are rudimentary and represented on the third, fourth, fifth and sixth abdominal segments by a uniserial circle of crochets.

The full-grown larva abandons the mine and pupates in a delicate white silken cocoon fastened by means of a few silken threads to the under side of the leaf. The pupa is light brown in color and superficially resembles the pupa of *Ornix geminata* Pack., which also mines the leaves of apple. The antennae project considerably beyond the tip of the abdomen. The anterior end of the pupa is prolonged into two sharp horns.

Several adults were reared. These issued from August 18th to August 25th. The moths are beautiful silvery white in color with a dark spot at the tip of each fore-wing. Miss Braun states that the writer's specimens are unusually light in color and that they are usually well suffused with fuscous.

*Lyonetia* is apparently a leaf-mining genus. The habits of the known species bear this out. Meyrick (1895)<sup>4</sup> speaking of the genus says "larva mining in leaves of trees and shrubs. Pupa in an elongate white cocoon suspended by threads from its ends." Packard (1874)<sup>5</sup> described *Lyonetia saccatella*, feeding from a case rather than mining the leaves. This species, however, was subsequently transferred to the genus *Coptodisca* and made a synonym of *splendoriferella* Clem. The habits of four other species of *Lyonetia* are well known. Two of these occur in Europe; *L. clerkella* L., mining *Betula alba*, *Prunus cerasus*, *Pyrus*, *Crataegus* and *Sorbus*, and *L. prunifoliella*

Walsh., mining *Betula* and *Crataegus*, while two occur in America; *L. latestrigella* Walsh. and *L. candida* Braun. which have been bred as miners on the leaves of *Rhododendron*.

The Apple Flea-weevil, *Orchestes pallicornis* Say.

This small Curculionid has been found at times as abundant as the foregoing species. It was first recorded by Forbes (1911)<sup>6</sup> from Illinois as a pest on apple, cherry and other plants. Blatchley and Leng (1916)<sup>7</sup> give the distribution as ranging from Nova Scotia and Quebec through New England to Oregon and South to Texas. In the state collection at Harrisburg, Pennsylvania, there is a long series of specimens from Pine Grove and Hummelstown, Pa., (Knull), Lakehurst and New Brunswick, New Jersey, (Knull), Laurel Springs, N. J., (Daecke), Delaware, Ohio, (Houser) and Chillicothe, Ohio, (Guyton).

The larvae mine the leaves of apple, cherry, elm and alder. Each larva makes a separate mine which is at first linear but later takes the form of an irregular blotch. The full-grown larva transforms in a gall-like pocket within the leaf. The adults feed on the foliage eating out small holes. They resemble flea-beetles more than Curculionids because their hind legs are enlarged and they are powerful jumpers. Records have been made of the adults feeding on the flowers of *Amelanchier* and the leaves of willow.

According to Blatchley and Leng (1916),<sup>7</sup> most of the species of the genus *Orchestes* are miners in the leaves of willow. The habits of another species *Orchestes rufipes* Lec., are well-known, the larvae mining the leaves of *Salix lucida* and *Salix pentandra*. There are two species in Sweden *O. populi* L. and *O. fagi* L., both miners on poplar. It is very probable that all the species of this genus are leaf-miners.

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<sup>4</sup> Meyrick, E. Handbook of British Lepidoptera, 1895.  
<sup>5</sup> Packard, A. S. Guide to the Study of Insects, 1874.  
<sup>6</sup> Forbes, S. A. Twenty-sixth Rep. Nox. Ins. Ill. :83, 1911.  
<sup>7</sup> Blatchley, W. S. & Leng, C. W. Rhynchophora of N. E. America: 281, 1916.

## Rearing Records of *Pollenia rudis* Fab. (Dipt., : Muscidae).<sup>1</sup>

By G. L. GARRISON, Bureau of Entomology, Washington, D. C.

The larva of *Pollenia rudis*, Fab., was discovered by Keilin<sup>2</sup> in 1908 and found parasitic on the earthworms, *Allolobophora chlorotica* and *A. rosca*. In Paris he found that eggs were deposited during August or early September on the soil. They hatched after five to seven days and the larva, when it found an earthworm, gained entrance to the body through the male genital opening located on the ventral side of the 15th segment. From September or October to the following May or June the *Pollenia* larvæ were found in a dormant state in the body cavity of the genital segments, i.e. from the 9th to the 12th or even as far back as the 16th. In May or June the larva became active, worked its way toward the anterior end of the worm, where it pierced with its posterior end the prostomium of the worm and thus exposed its stigmata. It continued to feed and gradually destroyed the worm, working backward as fast as the segments were destroyed. Pupation occurred usually from the 5th to the 25th of June, and the pupal stage had a duration of from 32 to 45 days, emergence occurring from the middle of July to the first part of August.

He found only one generation per annum, but admits the possibility of the existence of a summer generation.

The larva of *Pollenia rudis* was found in this country by Webb in June, 1916. Webb and Hutchison determined that the life history of this fly in Washington is quite different from that found by Keilin in Paris<sup>3</sup>. They found no indications of a dormant period during which the larvæ remain practically motionless in the body cavity of the worm.

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<sup>1</sup>This work was conducted under the supervision of Mr. J. L. Webb.

<sup>2</sup>Keilin, D. "Recherches sur les larves de Dipteres Cyclorhaphes," Bul. Sci. de la France et de la Belgique, T. XLIX, 7e Serie, 30th. Dec., 1915.

<sup>3</sup>A Preliminary Note on the Bionomics of *Pollenia Rudis*, Fabr., in America. Proc. Ent. Soc. of Washington, Vol. XVIII, No. 3, pp. 197-199, 1916.

Their record of summer generations indicate the following developmental periods.

Egg stage .....	3 days
Larval stages .....	13-22 "
Pupal stages .....	11-14 "

Total developmental period 27-39 days and the tentative conclusion was reached that there are four broods or generations in the latitude of Washington, D. C.

Further work was started at Drummond, Maryland, during the Spring of 1922 by the writer to obtain additional information along these lines but flies were not caught in sufficient numbers to work with until late in the season.

The cages used were 16 inches high by 12 inches square. The top, door and three sides were covered with fine mesh screen wire while the framework was of zinc. They were kept on the shelves of a screened insectary and were protected from the direct rays of the sun, while being under conditions as near those of outdoors as possible.

*Pollenia* caught in traps baited with banana were released in cages with a cigar box containing a small amount of soil, which was kept slightly moistened throughout the time of observation, and a piece of banana for food. As soon as eggs were found all flies were removed and a known number of earthworms, *Helodrilus (Allolobophora) chloroticus*, free from parasitism, were placed on the soil and daily watch kept for emergence. The following tables give the result of these experiments:

#### EMERGENCE FROM CAGE 1, LOT 2

Date Eggs found	No. worms		Date emerged	♂	♀	Total	No. days egg to adult emerg.
	eggs	introd'c'd					
Aug. 30-31	30	30	Oct. 3	1	0	1	34
Aug. 30-31	30	30	Oct. 4	1	0	1	35
Aug. 30-31	30	30	Oct. 7	1	0	1	38

#### EMERGENCE FROM CAGE 2, LOT 2

Date Eggs found	No. worms		Date emerged	♂	♀	Total	No. days egg to adult emerg.
	eggs	introd'c'd					
Sept. 1-2	15	15	Oct. 7	1	0	1	36
Sept. 1-2	15	15	Oct. 9	2	2	4	38

## EMERGENCE FROM CAGE 3, LOT 1

Date Eggs found	No. worms eggs introd'c'd	No. worms introd'c'd	Date emerged	♂	♀	Total	No. days egg to adult emerg.
July 13	20	20	Aug. 10	0	1	1	28

*Experiment 1.*

On August 18, A.M., a petri dish containing a small amount of moist soil was placed in a cage with 5 ♂ and 5 ♀ *Pollenia*. As soon as eggs were found worms were placed with them. The following table gives the result of this experiment:

Date Eggs found	No. worms eggs introd'c'd	No. worms introd'c'd	Parasitic worm found	Date	Larva had entered soil	Remarks
Aug. 21	25	10	Aug. 29	Sept. 9	—	Did not emerge
			Aug. 30	—	—	Worm soon died
			Aug. 30	—	—	Worm soon died
			Aug. 31	—	—	Worm soon died

*Experiment 2.*

From September 2 to September 5, 9 male and 29 female *Pollenia* were released in this cage with a small box of moist soil and banana for food. On September 6 there were 2 males and 9 females alive in cage when 30 eggs were found and 15 worms placed with them. Seven days later at the first examination of worms, one was found parasitised but 3 days later it had dried up and larva was not seen again.

*Experiment 4.*

Date Eggs found	No. worms eggs introd'c'd	No. worms introd'c'd	Parasitic worm found	Date	Larva had entered soil	♂ <i>Pollenia</i> had emerged
Sept. 8	27	10	Sept. 14	Sept. 25	Oct. 21	

Twenty-seven eggs were found in this experiment one day after 3 male and 20 female *Pollenia* were released in cage. Six days later, at the first examination, one parasitised worm was found. Eleven days from this time larva had entered soil, and 26 days from the time it had entered soil 1 male *Pollenia* had emerged.

*Experiment 6.*

On September 12, 4 male and 18 female *Pollenia* were released in a cage with a tin salve box of moist soil, and banana for food. One day later 40 eggs were found and 15 earthworms placed with them. Seven days from the time eggs were found, at the first examination, 3 parasitised worms were found. Thirteen days from the time eggs were found the fourth parasitised worm was found. No emergence from this lot.

In all cases the eggs were laid singly and partly hidden in the soil.

The larvæ were found in different parts of the body of the worm and do not appear to be confined to any particular point.

*Trapping Pollenia rudis.*

On June 6, a fly trap baited with bananas was placed in the open field and on June 27 a second trap was put in operation. Beginning June 26 collections were made early each morning, when the flies were stupefied with chloroform and removed from the traps. It was found that more flies were caught when the trap was raised about 8 inches from the ground.

The first *Pollenia* were removed from the trap on June 10 at the second collection.

In July 277 *Pollenia* were caught in both traps or 117 ♂ and 160 ♀. The highest catch, 39, was on July 5th.

In August 314 *Pollenia* were caught; 190 ♂ and 124 ♀. Largest catch 137, August 26-27, Saturday and Sunday collection.

In September 368 *Pollenia* were caught; 151 ♂ and 217 ♀. Largest catch, 77, September 9-10, Saturday and Sunday collection.

In October 938 *Pollenia* were caught; 473 ♂ and 465 ♀. Largest catch, 120, September 10.

In November 1026 *Pollenia* were caught; 494 ♂ and 532 ♀. Largest catch, 280, November 11-12, Saturday and Sunday collection.

TOTALS OF *POLLENIA* CAUGHT BY MONTHS

Month	♂	♀	♂ and ♀
July .....	117	160	277
August .....	190	124	314
September .....	151	217	368
October .....	473	465	938
November .....	494	532	1026
Season .....	1425	1498	2923

**A New Species of *Anomala* (Coleop. Scarabaeidae.)\***

By WM. P. HAYES, and J. W. MCCOLLOCH, Kansas Agricultural Experiment Station.

During the course of the studies of white grubs in Kansas by the writers, an apparently new species of *Anomala* has been found which is of considerable economic importance. A

\*Contribution No. 320 from the Entomological Laboratory, Kansas State Agricultural College. This paper embodies some of the results of Project 100 of the Kansas Agricultural Experiment Station.

description is presented at this time in order that reference can be made to the species in a forthcoming publication on its life history.

**Anomala kansana** new species.

♂. Color dorsally dark brown to piceous with lateral margins of elytra flavo-testaceous; ventrally fusco-testaceous to rufo-testaceous with faint, greenish metallic lustre; legs rufo-testaceous proximally, piceous distally; antennæ fusco-testaceous. *Size* 11-12.5 mm. long, 5-6.75 mm. wide.

*Head* piceous with faint purple to æneous iridescence. Labrum concealed dorsally by clypeus. Clypeus strongly reflexed apically, angles broadly rounded, about twice as wide as long, closely and confluent punctured, producing a dense rugosity on disk, less coarsely punctured on caudal margin. Clypeo-frontal suture slightly curved, with tentorial depressions laterally. Front slightly flattened, coarsely and confluent punctured, vertex more sparsely punctured, punctures not confluent, front and vertex with purple to æneous iridescence.

*Prothorax* unicolorous, piceous to rufo-piceous. *Size* 5.75 mm. wide, 3.25 mm. long. Surface evenly punctured on disk, punctures larger than those of vertex but sparser, becoming more confluent laterally. Faint median, depressed line anteriorly, in some specimens extending caudad at least half the length of prothorax, in others almost obliterated; near each lateral margin a rather strongly depressed, rounded area; sides evenly and strongly arcuate, converging in apical half of margin; angles rather strongly rounded, posterior pair more rounded than anterior angles. Basal bead entire.

*Scutellum* semicircular, punctures irregular, about equal in size to those of prothoracic disk, posterior margin impunctate, forming a smooth margin. *Elytra*, in type, piceous with posterior two-thirds to three-fourths of lateral and caudal margins flavo-testaceous, extending slightly anteriorly on suture, varying as noted below, lateral margins subparallel, becoming more rounded apically, punctures on disk strongly rugose. Striæ moderately coarse, deeply impressed and almost confluent punctured, first interval finely and sparsely punctate; second interval wide and confusedly, rugosely punctate, narrowing toward the apex; in some specimens the punctures form a median sulcus apically; third interval narrow and faintly punctate; fourth interval almost as wide as second and confusedly punctate.

*Pygidium*, shining, rufo-testaceous, finely and densely punctate, punctures shallow and somewhat arcuate.

Tarsi of posterior legs longer than tibia by length of tarsal claws, femur and tibia about equal. Upper claw of first and second pair cleft, rami equal in length with one ramus slightly stouter in male. In female one ramus slightly shorter and stouter than other ramus.

♀. Differs from male in having the club of antenna shorter than the stem, in the male longer than the stem. The eyes of the female are less prominent and separated by about twice their width, while in the male, eyes are convex and separated by less than twice their width.

*Variations.* The normal piceous color of the elytra is replaced by spots, splashes or streaks of testaceous coloring.

*Systematic position.* This species belongs in the *flavipennis* section as defined by Casey (1914)<sup>1</sup> and is closely related to *flavipennis* Burm., but is readily distinguished by its larger size, its darker thoracic coloration and the characteristic markings of the elytra.

*Material.* Described from 125 specimens. *Type* in the collection of the Kansas State Agricultural College. Paratypes will be deposited in United States National Museum. Described from specimens collected and reared during June and July. Locality, Riley and Clay Counties, Kansas.

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### A New Lycaenid (Lep.) from the Pacific Coast.

By CHAS. L. FOX, San Francisco, California.

*Plebeius shasta comstocki* new variety.

Separable from *shasta* and *minnehaha* by the much broader border on the outer margin of the upper side of the primaries in the male, brighter shade of color of the upper side of the female, different ground color and absence of white markings on the under side of both male and female.

♂.—Expanse 23 mm. *Upper side.* Primaries: color purplish blue; broad fuscous border on outer margin with slight ferruginous tinge twice as broad as in *shasta* averaging 2.5 mm. in width; fringes white, inside a narrow black line; black, reniform, discal spot. Secondaries: same color as primaries; fuscous border on outer margin half the width of that on primaries.

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<sup>1</sup>Casey, T. L. A Revision of the American species of Rutelinae, Dynastinae and Cetoniinae. Mem. Coleop. VI. 1915. pp. 1-394.

surmounted by row of dull orange lunules, the second from the angle larger and more conspicuous, partially enclosing black spots, followed on outer margin of each by a trace of white scales; fringes white; black discal spot smaller than on the primaries.

*Under side.* Primaries: color brownish gray (grayish white in *shasta*), bluish tinge at base; black spot near base; small inconspicuous spot above and below discal spot close to costal margin; transverse sinuous row of black spots midway between discal spot and outer margin bending most strongly towards the costal margin; beyond this a less conspicuous row of submarginal spots, followed by a row of still fainter spots becoming obsolete towards the tip; a distinct fine black line at base of fringes; fringes light brown becoming paler outwardly. Spots not distinctly edged with white as in *shasta* and *minnehaha*. Secondaries: same color as primaries; three spots more or less conspicuous near base; discal spot and transverse sinuous row of spots scarcely darker than the ground except large black spot close to costal margin; other margin with a series of round black spots bordered with pale metallic scales, each spot surmounted by a yellow lunule which is again surmounted by a small dark lunule; lacking accompanying row of white triangular spots found in *shasta* and *minnehaha*; fringes and marginal line as in primaries.

♀.—Expanse 23-25 mm. *Upper side.* Primaries: color a brighter reddish brown than in *shasta*, slightly tinged with blue at base; a narrow dark border on outer margin; black discal spot at apex of cell; fringes whitish brown. Secondaries: somewhat darker in color; discal spot inconspicuous; submarginal row of yellow lunules surmounting black spots brighter and more conspicuous than in *shasta*.

*Under side.* Primaries and secondaries similar to the male except that markings are more conspicuous and ground color brighter, having a slightly yellow hue. The white markings of *shasta* and *minnehaha* wanting.

Described from 26 males and 9 females taken at Glacier Point, Yosemite National Park, California, July 11, 1923, by Mr. J. D. Gunder.

Named for Dr. John A. Comstock, Director of the Southwest Museum, Los Angeles, California.

*Type:* Male, and *allotype*, female, in the collection of Mr. J. D. Gunder, Pasadena, California. *Paratypes* in the collections of the California Academy of Sciences, San Francisco, the Southwest Museum, Los Angeles, and Mr. J. D. Gunder.

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., APRIL, 1924.

## PROFESSOR JACQUES LOEB.

Professor Jacques Loeb, physiologist and general biologist, who died at Bermuda, February 12, 1924, was widely known as an exponent of mechanistic theories of life. Some of his earliest papers—*Die Orientirung der Tiere gegen die Schwerkraft der Erde (tierischer Geotropismus)*, 1888; *Der Heliotropismus der Tiere und seine Uebereinstimmung mit dem Heliotropismus der Pflanzen*, 1889; *Weitere Untersuchungen über den Heliotropismus der Tiere u. s. w.*, 1890—were in part based on results obtained from the caterpillars of *Porthesia chrysorrhæa*, the winged plant lice of *Cineraria*, flies and maggots, establishing in his opinion, his theory of tropisms, recently restated in his book *Forced Movements, Tropisms, and Animal Conduct* (Volume One of the Monographs on Experimental Biology, Philadelphia and London, J. B. Lippincott Co.), 1918. He laid especial emphasis on quantitative experiments in biology and held that these methods lead to the theories which he advocated and oppose those of "trial and error" or of "physiological states." He sought also to extend the tropistic explanation to the instincts of insects, including the complicated actions of an *Amphiphila* in provisioning her nest. In the Introduction to the last quoted volume, he wrote:

Motions caused by light or other agencies appear to the layman as expressions of will and purpose on the part of the animal, whereas in reality the animal is forced to go where carried by its legs. For the conduct of animals consists of forced movements. . . . .

The idea that morphological and physiological symmetry conditions in an animal are the key to the understanding of animal conduct demanded that the same principle should explain the conduct of plants, since plants also possess a symmetrical structure. The writer was able to show that sessile animals behave toward light exactly as do sessile plants; and motile animals like motile plants. The forced orientations of plants

by outside sources of energy had been called tropisms; and the theory of animal conduct based on the symmetrical structure of their body was, therefore, designated as the *tropism theory of animal conduct*.

Prof. Loeb was born in Germany, April 7, 1859, received the M.D. at Strassburg in 1884 and, after assisting in Physiology at the Universities of Würzburg and Strassburg and the Biological Station at Naples, came to Bryn Mawr College as Associate in Biology in 1891. He was successively Assistant Professor, Associate Professor and Professor of Physiology and Experimental Biology at the University of Chicago, 1892-1902; Professor of Physiology at the University of California, 1902-10, and Head of the Department of Experimental Biology, Rockefeller Institute for Medical Research, New York, from 1910 to his death. Titles of many of his publications are included in the list of Literature appended to his volume on Forced Movements.

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## Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE

### An Entomologist at Law.

An unusual case of particular interest to the grain trade was decided in the United States District Court at Baltimore recently. In August, 1922, Raymond Carr consigned from the Eastern Shore of Maryland a cargo of wheat to Baltimore grain commission merchants on board the schooner Helen. When the wheat arrived at the Western Maryland Railroad elevator it was found to be heavily infested with weevil and the elevator company refused to allow it to be unloaded into its house until it had been treated for the eradication of the insects.

Dr. John G. Beck, specialist in treating grain infested with bugs, treated the wheat with carbon bisulphide. An explosion followed the use of the chemical, causing the seams of the vessel to expand, after which it sank, resulting in the loss of both boat and cargo.

The shipper entered suit against the commission merchants and Dr. Beck. Judge Soper ruled that Dr. Beck was negligent and that he was liable to the plaintiff for the loss of the vessel.—*Public Ledger*, Philadelphia, January 31, 1924.

### The Monument to J. Henri Fabre.

A committee has been formed to continue the subscription opened in 1914 (see the NEWS for July of that year, page 321) to celebrate the centenary of the great *savant* and to erect a monument to him at Sérignan. The public subscription is under the patronage of President Millerand; Premier Poincaré and M. Leon Bérard, Minister of Public Instruction and Fine Arts, are among the honorary presidents, while the honorary committee includes M. L. Mangin, director of the National Museum of Natural History, Dr. G. V. Legros, biographer of Fabre, Prof. Bouvier and others. Subscriptions should be sent by check or postal order to M. Henry de la Paillonne, Maire de Sérignan, Vaucluse, France.

### A New Form of Rhynchites (Coleop.: Curculionidae).

The red rose weevils, which have been known as *Rhynchites bicolor* Fab., were shown some years ago to present several distinct races. Pierce (1913) recognised *bicolor* Fab., *cockerelli* Pierce, *ventralis* Pierce, *wickhami* Ckll., *piccus* Pierce and *virid-illustrans* Pierce. Green (1920) showed that *wickhami* had additional characters to those previously recorded, and there seemed to be reason for considering it a distinct species, peculiar to the western part of the country. We now have an additional form, taken at Boulder, Colorado, on roses, which differs from all the others in being entirely red except the beak (which has the base red, or may be practically all black), the knees, and the ends of the tibiae and of the tarsal joints; or the sides of mesothorax and base of abdomen may be blackened. The sculpture of the elytra is practically as in *wickhami*, but the thorax resembles that of *bicolor* in form, instead of being strongly convex at the sides as in *wickhami*. In *wickhami* the front is nearly bare of pubescence, in *bicolor* and the new form the front is conspicuously pubescent. Two specimens of the new form were taken, one several years ago (Cockerell), the other July 8, 1923 (Harris.) The new form may be designated *Rhynchites bicolor erythrosoma*. — T. D. A. COCKERELL and R. C. HARRIS, Boulder, Colorado. — Type USNM no. 27825 — recd. Nov 29, 27 thru SAR.

### Cleanup Week in Pennsylvania.

Cleanup Week will be observed throughout the state during the week beginning April 14, 1924. Appeals are being sent to the officials of every city, borough, community and hamlet in the state by the officials of the state departments of health, forest and waters and state police to prepare for the most intensive cleanup period that Pennsylvania has ever witnessed.

The cleanup efforts this year will not be confined to the settled portions of the state. In the more remote vicinities, forest wardens, state police and health officers will direct the crusade to eliminate dirt, fire hazards and conditions that menace the public health. Especial attention will be devoted to breeding spots for flies. The avowed aims of the state wide drive are announced as health protection, fire protection and forest protection. A later date is not advisable, it is explained, because the intent of the drive is to eliminate the fly breeding spots before the first spring flies deposit their eggs.

A program providing for a certain type of cleanup work on each day of the week has been formulated by the state officials in charge of the drive. Wednesday is fly and mosquito day. Cesspools, stables, pig pens, chicken coops, stagnant pools and garbage cans are to receive the attention of the citizen cleanup army on that day.

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## 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.

Papers of systematic nature will be found in the paragraph at the end of their respective orders. Those containing descriptions of new genera and species occurring north of Mexico are preceded by an \*.

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.

1—Proceedings of the Academy of Natural Sciences of Philadelphia. 4—Canadian Entomologist, Guelph, Canada. 5—Psyche, Cambridge, Mass. 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. 19—Bulletin of the Brooklyn Entomological Society. 28—Entomologisk Tidskrift, Uppsala. 50—Proceedings of the United States National Museum. 52—Zoologischer Anzeiger, Leipzig. 54—Proceedings of the Biological Society of Washington, D. C. 57—Biologisches

Zentralblatt, Leipzig. 59—Journal of Agricultural Research, Washington, D. C. 68—Science, Garrison on the Hudson, N. Y. 69—Comptes Rendus, des Seances de l'Academie des Sciences, Paris. 76—Nature, London. 77—Comptes Rendus des Seances de la Societe de Biologie, Paris. 94—The American Journal of Science, New Haven, Conn. 96—Physis. Revista de la Sociedad Argentina de Ciencias Naturales, Buenos Aires. 104—Zeitschrift fur Wissenschaftliche Zoologie, Leipzig. 108—Journal of Genetics, Cambridge, England. 114—Entomologische Rundschau, Stuttgart. 115—Societas Entomologica, Stuttgart. 118—Die Naturwissenschaften, Berlin. 141—Internationale Entomologische Zeitschrift, Guben, Germany. 144—Proceedings of the Pacific Coast Entomological Society, San Francisco. 155—Stanford University Publications. Biological Sciences.

**GENERAL.** Blaisdell, F. E.—[as secretary editing the minutes of the meetings: many notes on insects of the Pacific States]. 144, ii, 15-32. Bryk, F.—Bibliographia Chr. Aurivilliana 28, 44, 3-56 [1871-1922, 216 titles]. Cook, W. C.—The distribution of the pale western cutworm: a study in physical ecology, (Ecology, Brooklyn, New York, v, 60-69). Dunbar, C. O.—Kansas permian insects. Pt. 1. The geologic occurrence and the environment of the insects. 94, vii, 171-209. Durck, H.—Sammel und Tötungezylinder aus Celluloid. 114, xli, Nr. 1, 3-4. Franck, G.—Obituary note. 19, xix, 1-3. Graham, S. A.—Forest entomological problems in the Lake States, (Journal of Forestry, Washington, xxii, 24-28.) Haldane, J. B. S.—A mathematical theory of natural and artificial selection. (Trans. Cambr. Phil. Soc., xxiii, 19-41.) Howard, L. O.—Address of the retiring president. On entomological societies. Insect parasites of insects. 10, xxvi, 25-46. Howes, P. G.—Fungus diseases that destroy insects. (Nature Magazine, Washington, iii, 151-2, 158.) International Commission on Zoological Nomenclature Opinions rendered 78-81 (Smithsonian Miscellaneous Collections, Washington, D. C., lxxii, No. 2.) Johannsen, O. A.—External insect anatomy. By A. D. MacGillivray. 68, lix, 214-5. Porter, C. E.—Brevé reseña acerca de la contribucion de los zoologos italianos al conocimiento de la fauna de Chile (Actas, Societe Scientifique du Chili, xxxi, 136-143.) Schroder, C.—Handbuch der entomologie. Lief. 11-12 (Bd. iii, p. 657-848). Seitz, A.—Verkehr und entomologie. 114, xli, 5-6 (Cont.) Strand, E.—Bitte um einsendung von auto-

biographien. 52, lviii, 56-7. **Swinhoe, C.**—Obituary. 8, 1924, 19-20. **Townsend, C. H. T.**—An analysis of insect environment and responses. (Ecology, Brooklyn, New York, v, 14-25.) **Tragardh, I.**—Mal och medel inom skogsentomologien, Ziele und Wege in der Forstentomologie [Résumé in German]. (Meddelanden från Statens Skogsforskningsanstalt, Stockholm, xx, 209-240, 1923.)

#### ANATOMY, PHYSIOLOGY, MEDICAL, ETC.

**Blunck & Speyer.**—Kopftransplantation bei Insekten I. Beilage zum Jahresbericht für 1924 des Naturwissenschaftl. Vereins in Naumburg a. S., 4 pp. **Eidmann, H.**—Das sogenannte "Praemaxillare" der Insekten. 52, lviii, 43-52. **Gauthier, H.**—Sur la présence d'Ochtebius (Hydrophilidae) dans les salines du Chott el Djerid, en Tunisie. Bulletin, Société d'Histoire Naturelle de l'Afrique du Nord, Algiers, xiv, 346-7. **Glaser, R. W.**—The relation of microorganisms to the development and longevity of flies. (Amer. Journ. Trop. Med. IV, 85-107.) **Legendre, J.**—Des variations dans le tropisme des Culicides. 69, T. 128, 423-425. **de Luna.**—Sur la participation d'une peroxydase à l'apparition du pigment chez la Drosophila melanogaster Loew, 69, T. 178, 525-527. **Muttkowski, R. A.**—Studies on the blood of insects. The structural elements of the blood. 19, xix, 4-19.

**ARACHNIDA AND MYRIOPODA.** **Hanstrom, B.**—Ueber die histologie und vergleichende anatomie der sehganglien und globuli der araneen. (Kunigl. Svenska Vet.-Akad. Handl., lxi, N. 12, 39 pp.) **Kastner, A.**—Die vergleichend anatomische bedeutung der interpulmonarfalte der araneen. 52, lviii, 97-102.

**Carbonell, J. J.**—Algunos Datos sobre las arañas del genero Latrodectus. Una nueva especie de scorpion. 96, vi, 350-353; 358. \***Chamberlin, R. V.**—Descriptions of new American and Chinese spiders, with notes on other Chinese species. 50, lxiii, art. 13.

**THE SMALLER ORDERS OF INSECTA.** **Alverdes, F.**—Beobachtungen an Ephemeriden- und Libellenlarven. 57, xliii, 577-605. **Baldus, K.**—Untersuchungen über Bau und Funktion des Gehirnes der Larve und Imago von Libellen. 104, cxxi, 557-620. **Dietz & Snyder, T. E.**—Biological notes on the termites of the Canal Zone and adjoining parts of the Republic of Panama. 59, xxvi, 279-302. **Howe, R. H., Jr.**—Williamsonia lintneri (Hagen), its history and distribution.

5, xxx, 222-225. \***McDunnough, J.**—New Ephemeridae from Illinois. 4, lvi, 7-9. **Shafer, G. D.**—The growth of dragon-fly nymphs at the moult and between moults. 155, iii, 307-37. **Snyder, T. E.**—Note on mating flight of *Hexagenia bilineata* (Plecoptera) 10, xxvi, 24.

\***Clemens, W. A., & Leonard, A. K.**—On two species of mayflies of the genus *Heptagenia*. 4, lvi, 17-18. **Snyder, T. E.**—A new subg. of *Nasutitermes* (Isoptera). 10, xxvi, 20-4. An extraordinary new *Rhinotermes* from Panama. 54, xxxvii, 83-6. **Tillyard, R. J.**—Kansas permian insects. Description of a new Paleodictyopterid. 94, vii, 203-8.

**ORTHOPTERA.** **Heikertinger, F.**—Was leistet das kontinuieratsprinzip in der nomenklatur. Der fall *Locusta-Phasgonura-Tettigonia* als nomenklatorisches schulbeispiel. 52, lvi, 115-34.

**MacCurdy, H. M.**—Orthoptera from Gratiot County, Michigan. (Papers of the Michigan Academy of Science, Arts and Letters, ii, 215-220.) **Uvarov, B. P.**—Revised lists of species of the genera *Arcyptera*, *Mecostethus* and *Ramburiella* (Acrididae). 11, (9) xiii, 242-248.

**HEMIPTERA.**—**Anon.**—[Review of] A Biology of the British Hemiptera Heteroptera by E. A. Butler, London, H. F., & G. Witherby, 1923, 63 shillings. 76, cxiii, 156. **Dunn, L. H.**—Life history of the tropical bedbug, *Cimex rotundatus*, in Panama. (Amer. Journ. Trop. Med. iv, 77-83.) **Lacroix, D. S.**—Notes on the Cape Cod brood of periodical cicada during 1923. 5, xxx, 203-206. **Parshley, H. M.**—A controversial note on some species of *Lygaeus* (Lygaeidae). 4, lvi, 18-19. **Radio, P. A.**—Notes on the life history of a beneficial reduviid, *Sinea diadema*. 12, xvii, 80-6. **Runner & Bliss.**—The three-banded grape leafhopper and other leafhoppers injuring grapes. 59, xxvi, 419-24. **Takahashi, R.**—On the nymphs of the Aphidinae. 10, xxvi, 1-11. **Van Duzee, E. P.**—A new *Ceratocombid* from Mexico. 144, ii, 33-34. **Van Duzee & Burke.**—Trackykele. 144, ii, 21-24.

\***Annand, P. N.**—A new *Chermes* from pine (Aphidae). 4, lvi, 5-6. **Blanchard, E. E.**—Aphid notes pt. III. Argentine species of the subtribes *Pentalonina* and *Aphidina*. 96, vi, 43-58. **Chamberlin, J. C.**—Classification and geographical distribution of the *Tachardiinae* of the *Coccidae*. 144, ii, 27-28. **Ewing, H. E.**—Our only common North American chigger, its distribution and nomenclature. 59, xxvi,

401-3. **Lizer, C.**—Tres coccidos nuevos para la fauna argentina. 96, vi, 99-100. **Lizer, C.**—Notas sobre tres especies del genero *Dactylopius* (Coccidae) halladas en el pais. 96, vi, 106-111. **Muir, F.**—Notes on some genera of Derbidae. 10, xxvi, 15-9. **Pennington, M. S.**—Hemipteros nuevos para la republica Argentina. 96, vi, 315-319.

**LEPIDOPTERA.** **Baylis, H. A.**—Colour-production in Lepidoptera, (cont.). 9, lvii, 29-34. **Blanchard, E. E.**—Apuntes sobre *Zophodia analamprella* Dyar y otros Lepidopteros que viven sobre Cactaceas en la Argentina. 96, vi, 119-123. **Corti, A.**—Studien über die Gattung *Agrotis* O. I. Ueber Kataplexie bei *Agrotis*arten. 115, xxxix, Nr. 2, 1-2. **Cottle, J. E.**—[Catocala at Anderson's Springs, Lake County, Calif.]. 144, ii, 16. **Flessa, L.**—Ist die Einbürgerung von *Philosamia cynthia* in Deutschland möglich? 141, xvii, 147. **Gibson, A.**—The occurrence of the tortricid, *Cacoecia rosana* in Canada. 12, xvii, 51-4. **Gillott, A. G. M.**—Peregrinatory flights of Lepi. in Costa Rica. 9, lvii, 45-6. **Glick, P. A.**—The cottonwood leaf miner (*Proleucoptera albella* Cham.) The survey of *Myelois venipars* Dyar in Arizona. (14th Ann. Rept. Arizona Comm. Agric. & Hortic., Phoenix, Ariz., 1923, 68-73, 78-97.) **Harrison, J. W. H.**—The inheritance of wing color and pattern in the Lepidopterous genus *Tephrosia* (*Ectropis*) with an account of the origin of a new allelomorph. 108, 13, 333-352. **Hering, M.**—Anatomischer befund eines witters von *Argynnis paphia*. 52, lviii, 74-81. **Kieper, A.**—Interessantes von *Pyrameis cardui* L. 141, xvii, 145-6. **Musgrave, A.**—Some caterpillars injurious to man. (Australian Mus. Mag., ii, 34-6.)

**Barnes & Benjamin.**—On the synonymy of the monarch butterfly (*Danaidae*). 4, lvi, 16. \***Barnes & Benjamin.**—A new *Oiketiscus* from Texas. (*Psychidae*). 19, xix, 24-5. **v. Dalla Torre, K. W.**—Lepidopterorum catalogus. Pars. 29. *Cossidae*. **Kruger, E.**—Beiträge zur kenntnis der columbischen *Satyriden*. 114, xli, 7. (Cont.)

**DIPTERA.** **Bruch, C.**—Observaciones biologicas acerca de *Salpingogaster nigriventris* Bigot (sirfido). 96, vii, 1-6. **Bodenheimer, F.**—Beiträge zur Kenntniss der Kohlschnake (*Tipula oleracea* L.) Zur Anatomie und Oekologie der Imago. 104, cxxi, 393-441. **Cockerell, T. D. A.**—Earthworms and the cluster fly. 76, cxiii: 193-4. **Cole, F. R.**—[Diptera at Sunol, on San Antonio Creek, Calif.]. 144, ii, 29-30.

**Copello, A.**—Biologia de Mallophora ruficauda (Wied.) 96, vi, 30-42. **Grassi, B.**—Razze biologiche differenti di Culex pipiens. (Rendiconti, Reale Accademia Nazionale dei Lincei, Rome, Classe di Scienze fis., mat. e nat., xxxii, 457-464.) **Jones & Bradley.**—Further observations on Tabanidae in Louisiana. 12, xvii, 45-50. **Keilin, D.**—On the nephrocytes in the larvae and pupae of Lonchaea chorea F. (Acalyp-terae). 11 (9) xiii, 219-223. **Leiby & Hill.**—The twinning and monembryonic development of Platygaster hiemalis, a parasite of the Hessian fly. 59, xxv, 337-349. **Mercier, L.**—L'atrophie des muscles du vol après la chute des ailes chez Lipoptena cervi L. (Dip. pupipare). 69, clxxviii, 591-4. **Nitzulescu, V.**—Sur l'ingestion du bleu de methylene par Stomoxys calcitrans. 77, xc, 155-6. **Tragardh, I.**—Skogsentomologiska Bidrag II [Chilosia] [Summary in English]. (Meddelanden från Statens Skogsförsöksanstalt, Stockholm, xx, 401-424, 1923.

**Blanchard, E. E.**—Apuntes sobre dos dipteros argentinos. 96, vi, 319-323. \***Cresson, E. T. Jr.**—Records of some western Diptera, with descriptions of two new species of the family Bombyliidae. 1, lxxv, 365-367. \***Curran, C. H.**—The generic position of Beris viridis Say (Stratiomyidae). 4, lvi, 24. \***Hine, J. S.**—The North American sp. of the gen. Mero-macrus, with one new sp. (Syrphidae). 19, xix, 20-3. \***Malloch & McAtee.**—Flies of the family Drosophilidae of the District of Columbia region. . . 54, xxxvii, 25-42. \***Melander, A. L.**—Studies in Asilidae. 5, xxx, 207-219. \***Spuler, A.**—North American genera and subgenera of Dipterous family Borboridae. 1, lxxxv, 369-378.

**COLEOPTERA.** **Brooks, F. E.**—Oak sapling borer, Goes tessellatus Haldeman. 59, xxvi, 313-317. **Bruch, C.**—Coleopteros fertilizadores de Prosopanche burmeisteri De Bary. La forma femenina de Castanochilus bruchianus Ohs. 96, vii, 82-88; 115-119. **Chittenden, F. H.**—Distribution of Epilachna corrupta. 19, xix, 3. **Dallas, E. D.**—Sobre dos anomalias en coleopteros remitidos por el señor Tremo-teras, de Montevideo. 96, vi, 356-357. **Frers, A. G.**—Metamorfosis, biologia y variaciones de una especie de Crisome-lido, Lema dorsalis (Oliv.) 96, vi, 1-21. **Frers, A. G.**—Metamorfosis de coleopteros argentinos. Algunas monstrosidades en coleopteros. 96, vi, 254-262; 347. **Frost, C. A.**—Agrilus viridis in Massachusetts. 19, xix, 27. **De Garnett.**—[Coleoptera on San Antonio Creek near Sunol, Calif.]. 144, ii, 19. **Lizer, C.**—Dos palabras acerca de una variedad

del Coccidophilus citricola Bthes. 96, vii, 54-55. **Snyder, A. F.**—Importance of the White Pine Weevil. (Forest Leaves, Philadelphia, Pa., xix, 109-110.) **Spessivtseff, P.**—Bidrag till kannedomen om bruna oronvivelus (*Otiorrhynchus ovatus* L.) morfologi och biologi. [Resumée in German.] Meddelanden fran Statens Skogsforsoksanstalt, Stockholm, xx, 241-260. 1923). **Tragardh, I.**—[Pissodes, Orchestes. (see Diptera)]. **Van Dyke, E. C.**—[Coleoptera of Oregon and California]. 144, ii, 16-19. **Wallace, G.**—[Coleoptera in the vicinity of Lake Tahoe, California]. 144, ii, 15-16, 19.

**Bernhauer, M.**—Coleopterologische Beiträge. [Nn. spp. Oligota from the Antilles.] 28, 44, 141-6. **\*Blaisdell, F. E.**—Two new species of Melyridae from California and one from British Columbia, including two new genera. 4, lvi, 1-5. **\*Dawson, R. W., & McColloch, J. W.**—New species of *Bolbocerosoma* (Scarabaeidae). 4, lvi, 9-15. **Dury, C.**—Note on Anamorphus. 19, xix, 25. **\*Fisher, W. S.**—A new sp. of *Brachys* from Arizona. (Buprestidae). 10 xxvi, 12-3. **Pic, M.**—Melanges exotico-entomologiques. Fasc. 39-40.

**HYMENOPTERA.** **Baumann, C.**—Ueber den bau des abdomens und die funktion des lege-apparates von *Thalessa leucographa*. 52, lviii, 149-62. **Bruch, C.**—La reina de una hormiga legionaria *Eciton dulcius* For. var. *jujuyensis* Forel; costumbres de las obreras y mirmecofilos de las mismas hormigas. Costumbres y nidos de hormigas. 96, vi, 105; 118. **Frühauf, E.**—Legeapparat und Eiablage bei Gallwespen (Cynipiden). 104, cxxi, 656-723. **Kuhn, A.**—Zum nachweis des farbenunterscheidungsvermögens der bienen. 118, vi, 116-8. **Johnson, C. W.**—Notes on the nests of *Odynerus* (*Ancistrocerus*) *birenimaculatus* Saussure. 5, xxx, 226-7. **Plath, O. E.**—Notes on the egg-eating habit of bumble bees. 5, xxx, 193-202. **Rau, P.**—A note on the nesting habits of *Tachytes distinctus* Sm. 5, xxx, 220. **Toedt-**  
**mann, W.**—Die spermatozoen von *Formica rufa*. 52, lviii, 52-5. **Tragardh, I.**—[*Lyda*, *Trichogramma* (see Diptera)].

**\*Malloch, J. R.**—A new sp. of the gen. *Brachycistus* (Aculeata). 19, xix, 23. **Schmiedeknecht, O.**—Opuscula ichneumonologica. Fasc. 38. (p. 2963-3042). **\*Viereck, H. L.**—Descriptions of two Canadian bees of the genus *Mellecta*; **\*Prodromus** of *Andrena*, a genus of bees. 4, lvi, 15; 19-24. **\*Viereck, H. L.**—The identity of *Conohaltictoides novaeangliae*. 10, xxvi, 14-5. **Wheeler, W. M.**—Ants of the genera *Myopias* and *Acanthoponera*. 5, xxx, 175-192.

### SPECIAL NOTICES

**Bibliographia Zoologica.**—Vol. 33 of this work has just been received. Pages 393-473 include the Insecta. For the most part the references are for the years 1917 to 1921, but several titles appearing before and after these dates are cited.

**Macrolepidoptera of the World.**—Parts 314-317 have just appeared (English edition). Part 314 contains Fauna americana Pt. 132, Genera Pseudalpia to Psychomorpha. By M. Draupt. The other parts contain Fauna indoaustralia.

**Opuscula Ichneumonologica.**—Herausg. von O. Schmiedeknecht. Fascicle 38 of this long interrupted work. The last previous part was issued in 1914. This part includes pages 2963 to 3042.

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### OBITUARY.

The death of Colonel CHARLES SWINHOE on December 2, 1923, at Avonmore, West Kensington, London, is announced in the English journals. He was born August 29, 1836, and served in the Indian Army for more than thirty years, accompanying Lord Roberts on the march to Kandahar. Becoming interested in the birds and Lepidoptera of India, he published a number of volumes on the latter, among them *Catalogue of the Moths of India* (in collaboration with E. C. Cotes, Calcutta, 1887-9), the completion of *Lepidoptera Indica* (after the death of Dr. Frederic Moore), *Catalogue of Eastern and Australian Lepidoptera-Heterocera of the Oxford University Museum* (2 vols., 1892, 1900) and *A Revision of the Genera of the Family Liparidae* (Ann. & Mag. Nat. Hist., 1923 and earlier years). For more than the last thirty years he lived in Oxford and in London. Ent. Mo. Mag., Jan., 1924; Nature, Jan. 5, 1924).

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The Rev. Canon THEODORE WOOD died at Wondsworth Common, England, December 13, 1923. He was the son of the Rev. J. G. Wood, author of numerous, well known, popular books on natural history, was born August 6, 1862, and himself the writer of *Our Insect Allies*, *Our Insect Enemies* and of notes on British Coleoptera. (Ent. Mo. Mag., Jan., 1924; Nature, Jan. 5, 1924).

## 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.

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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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**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.

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## COLEOPTERA.

- 844.—Davidson (W. M.).—Biology of *Scymnus nubes* Casey. (Trans., 49, 155-163, ill., 1923) ..... .20

## LEPIDOPTERA.

- 842.—Braun (A. F.).—Microlepidoptera: notes and new species. (Trans., 49, 115-127, 1923) ..... .25
- 843.—Skinner & Williams.—On the male genitalia of the Hesperiiidae of North America. Paper III. (Trans., 49, 129-153, ill., 1923) ..... .30

## NEUROPTERA.

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## STATED MEETINGS

Of the Entomological Section of The Academy of Natural Sciences of Philadelphia, and of The American Entomological Society will be held at 7.30 o'clock P. M. on the following dates during 1924: January 24, February 28, March 27, April 24, May 22, September 25, October 23, November 20, and Dec. 8.

Communications on observations made in the course of your studies are solicited; also exhibits of any specimens you consider of interest.

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NEW CALIFORNIA ABERRANT RHOPALOCERA.—GUNDER.

# ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION  
THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

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## CONTENTS

Gunder—Several New Aberrant Lepidoptera (Rhopalocera) from California.....	153	Genus <i>Orthomorpha</i> , Immigrant from the Philippines Islands.....	173
Cresson—Descriptions of New Genera and Species of the Dipterous Family Ephydriidae, Paper VI.....	159	Chamberlin—A New Leptodesmoid Milliped from Nicaragua.....	174
Gentner—Notes on North American Halticinae with Descriptions of Two New Species and a New Variety (Coleoptera).....	164	Picard and Howard—The Bad Collector (as Editorial).....	175
Cockerell—A New Genus of Bees from California (Hymen.).....	169	Napier— <i>Colias eurytheme</i> —First recorded in Philadelphia, Pa.....	176
Malloch—The North American Species of the Genus <i>Hoplogaster</i> (Diptera: Anthomyiidae).....	171	Strand—Autobiographies of Entomologists and Arachnologists Wanted!	178
Professor C. Sajo, of Hungary.....	172	A Philatelist.....	178
Chamberlin—A New Milliped of the		Entomological Literature.....	179
		A Reply to Dr. Kinsey.....	186
		Doings of Societies—Ent. Sec., Acad. Nat. Sci. Phila. (Lep., Odonata, Col., Orth., Lepid., Dip.).....	188
		Obituary.....	190

## Several New Aberrant Lepidoptera (Rhopalocera) from California.

By J. D. GUNDER, Pasadena, California.

(Plate II)

European students are more than ever dividing up and separating all groups of Lepidoptera. In America, some authorities say, we are just beginning to do so. As yet, we do not go in for general specialized breeding with the idea of producing variations just to name them. There is plenty of virgin territory left without that. California alone has thousands of square miles never trodden over by an entomologist.

In Southern California aberrant forms are plentiful. Every collection contains a number. On every collecting trip, one or more of the commoner things are apt to be taken. There are perhaps three or four good local reasons. Probably the foremost is our variation of climate, some seasons being cold, some hot, some dry, some wet, with sea breezes and desert winds all in the same locality. Besides the distances are short between sea level and the different higher altitudes. All of these are disturbing and discouraging elements to insect development and undoubt-

edly work for change. Eventually, though not perhaps in our day, there will be several aberrant forms alone noted for every butterfly in the State.

The specimens shown on the plate are natural size and are fairly colored. The half-figures are typical and normal specimens placed there for quick comparison, in conjunction with the following descriptive text.

**Callipsyche behrii** Edw. (half-fig. aa), ab. ♂ **nigroinita** nov. aberr. (fig. A).

Testaceous disks on upper sides of both primaries and secondaries centered and condensed in a small oval area nearer the inner margins. The fuscous from the borders extending inward even from along the inner margins of both wings, especially on the primaries, which is unusual. The under sides are normal. Expanse: 26 mm.

*Data: Holotype* ♂ (Author's Coll.) Mammoth Camp, Mono County, California; August 5, 1921.

**Melitaea chara** Edw. (half-fig. bb), ab. ♂ **jacintoi** nov. aberr. (fig. B).

*Primaries.* Upper side: fuliginous marginal border broader, tapering off at inner angle, curved in and much wider at apex; followed by a row of seven cylindrical clay-brown spots, bending in at apex, top one near costal being small and round; upper discal area paralleling lower radial, solid fuliginous, with irregular spots toward inner side, lower discal area with a prolongation of spotting from the outer series following interspaces; transverse semi-lunate bar on base line between the costal and inner margin; basal angle flashed with same color.

Under side: clay color predominant; pattern as on upper side; fuliginous only in outline; outer edges of cylindrical spots tinged with white.

*Secondaries.* Upper side: outer border as in primaries; row of spots less elongated and not reaching costal; single, conspicuous, dark, round spot in center of cell; semblance of three spots close to basal angle.

Under side: strongly similar to normal, except in basal area where the single spot is again conspicuous. Expanse: 24 mm.

*Data: Holotype* ♂, (Author's Coll.) Palm Springs, Riverside County, California; May 28, 1922. Named after Mt. San Jacinto on whose desert slope it was taken, flying with typical specimens.

**Euphdryas gabpii** Behr. (half-fig. cc), ab. ♂ **pasadenae** nov. aberr. (fig. C).

The brownish shades of both upper and under sides entirely replaced by luteo-testaceous, which also grades in shading in a corresponding way as in the typical. Design of marking unchanged. Condition and peculiarity of changed color very similar to ab. *foxi* of *Euphdryas rubicunda*. Expanse: 34 mm.

*Data: Holotype* ♂. (Author's Coll.) Pasadena, Los Angeles County, California; May 20, 1921.

**Euphdryas rubicunda** Hy. Edw. (half-fig. dd), ab. ♂ **foxi** nov. aberr. (fig. D).

The brick-red of both upper and under sides entirely replaced by luteo-testaceous; the original luteous remaining as in normal specimens, and only slightly contrasting. Design of marking unchanged. Peculiarity of changed color somewhat similar to that of ab. ♂ *pasadenae* of *Euphdryas gabpii*. Expanse: 39 mm.

*Data: Holotype* ♂. (Author's Coll.) Gold Lake, Sierra County, California; July 17, 1921.

*Paratype* ♂. (Deposited in Coll. of Southwest Museum, Los Angeles, California.) July 13, 1921; Gold Lake, Sierra County, California. Named for Mr. Chas. L. Fox, San Francisco, Calif.

*Note:* Normal typical specimens from this region have the outer half of the secondaries solid bright red, which is only cut by the black of the nervules. They are quite different from the *nubigena* group and the uncertain *quino* separation.

**Euphdryas editha** Bdv. (half-fig. ee), ab ♂ **fieldi** nov. aberr. (fig. E).

*Primaries.* Upper side: row of red spots on outer margin normal; followed by two broad bands of elongated, semi-sinuuous, pale ochraceous spots, confluent at 3rd. median nervule and contoured in at apex and occasionally having red tinge; beyond, black, through remaining half of discal and basal areas, with two small reniform red spots following and at right angles to median vein.

Under side: red predominant; red spots at outer margin become solid band; elongated pale ochraceous spots become small and partly crescentic in shape; black area of base mottled with red, fusing with the two reniform spots.

*Secondaries.* Upper side, right wing: outer half nearly normal; black outlines heavier; basal area solid black.

Under side, right wing: same condition, except redder.

Upper side, left wing: more aberrant, being only in black and red, having outer row of compressed red spots, followed at some distance by a parallel series slightly larger; a third row of three odd-sized and -shaped spots start just anterior to the basal area at the costa, but extend only half across the wing.

Under side, left wing: design similar; traces of white on outer edge of second row of red spots; partial row of diffused white spots between 2nd and 3rd rows; black and red conglomerate at base. Expanse: 38 mm.

*Data: Holotype* ♂, (Author's Coll.) San Diego, San Diego County, California; April 26, 1920. Named for Mr. Geo. Field, San Diego, Calif.

*Note:* Normal typical specimens, with which this aberration was found, are identical with Boisduval's illustration, though perhaps his appears clearer cut. It is remembered that *quino* (termed from this general territory) should be nearer the *chalcedona* group, especially in shape. Questioned.

**Brenthis epithore** Bdv. (half-fig. ff), ab. ♂ **wawonae** nov. aberr. (fig. F).

Markings of basal area of both wings up to mesial line more confluent and confused, with that of secondaries practically black immaculate. Row of round spots on primaries obsolete and lacking on secondaries, except for mere dots nearer inner angle. Lines and lunules of hind margin thicker and confused into a border banding. The under sides show the same consistent change in characteristics. Expanse: 38 mm.

*Data: Holotype* ♂ (Author's Coll.), Wawona, Mariposa County, California; July 6, 1922.

**Eurymus hartfordii** Hy. Edw. (half-fig. gg), ab. ♀ **weaverae** nov. aberr. (fig. G).

*Primaries:* Upper side: brighter yellow; normal, except for a powdered, salmon-rose patch or flush in the discal and sub-basal areas between the spot and inner margin, being more dense along the nervules and submedian vein and slightly shading out at inter-space openings.

Under side: this salmon-rose color has seemingly percolated through over the same described area.

*Secondaries.* Upper side: the whole wing seems dusted over with this color, the shade being more tense on the inner half; discal spot one-third larger and very bright in color.

Under side: normal, with no trace of the added color. Expanse: 44 mm.

*Data: Allotype* ♀, (Author's Coll.) Warner Springs, San Diego County, California, July 3, 1919.

Taken in company with other *E. hartfordii*. As some specimens lack color, so this one, through some freak of Nature, has an over-abundance of it. Because sometimes our West Coast *E. hartfordii* have a red or orange tinge on or near the discal spot, I do not quite consider this specimen a hybrid, though it is possible. Named in memory of Nettie E. Weaver, of Fairmount, Illinois.

**Argynnis montivaga** Behr. (half-fig. hh), ab. ♂ **mammothi** nov. aberr. (fig. H).

*Upper side:* the two parallel lines at outer margin fused together making a nearly solid black border edging, which is cut by nervules only on the primaries; crescents are flattened and smaller, especially on the secondaries; sub-marginal row of round black spots nearly obsolete on primaries, being mere dots, except in the interspace openings of the median nervules, where they are no larger than the smallest on typical specimens; they are entirely absent on the secondaries; irregular markings of basal half of both wings heavier and conglomerate.

*Under side:* corresponding change of characteristics. Expanse: 44 mm.

*Data: Holotype* ♂, (Coll. of J. Riddell, F.E.S., Hollywood, Calif.) Mammoth Camp, Mono County, California; July 31, 1921.

*Paratype* ♂, (Author's Coll.) Mammoth Camp, Mono County, California; July 28, 1921.

**Chlosyne californica** Wright (half-fig. ii), ab. ♀ **chinoi** nov. aberr. (fig. I).

*Primaries:* Upper side: ochraceous predominant from outer margin to sub-marginal black band which is obsolete and wholly so at median nervules; black of basal half, partly erased in appearance, especially in discal space; veining less marked.

*Secondaries:* Upper side: black sub-marginal band practically erased, and wholly so from costal margin to lower radial; basal area as in primaries with outer edge suffused and blending; veining much less marked also.

*Under sides:* less black marking with same changed condition. Expanse: 41 mm.

*Data: Allotype* ♀, (Author's Coll.) Palm Springs (Chino Canyon), Riverside County, California; October 18, 1921.

W. G. Wright in his original description says, "This new species is very different from any known *Synchlœ*, and is a departure from the Arizona tangle of the species of the intergrading, *Crocæ* type, for it is quite true and constant, not differing essentially at any point; these examples here figured are the extreme forms illustrated to show outside variations." Therefore, the author considers this an unusual specimen, being one of hundreds taken up Chino Canyon in the fall brood of 1921, a rainy season, and the only one with aberrant tendency.

**Eurymus eurytheme** Bdv., form **amphidusa** Bdv. (half-fig. jj), ab. ♂ **unicitrina** nov. aberr. (fig. J).

Entirely lacking the orange color and rose tinting of fringes, antennae and body parts which is replaced by that lemon-yellow found near the costal veins of normal specimens. There is no trace of contrasting color in or near the discal spot of the secondaries, which makes this specimen quite unique. The replacement by lemon-yellow is complete. Expanse: 41 mm.

*Data: Holotype* ♂, (Author's Coll.) Upland, Los Angeles County, California; August 2, 1921.

This specimen was taken in company with numerous examples of the typical form *amphidusa*.

*Note:* Form *eriphyle* occurs only in the extreme northeastern sections of California. These specimens show a distinct color at the discal spot and have slightly rose-tinted fringes.

**Zerene eurydice** Bdv. (half-fig. kk), ab. ♂ **fanniae** nov. aberr. (fig. K).

Different from the typical form only on the upper side of the primaries. Here the anthracinus of the limbal area in front of the "dog's head" extends up around through the discal and basal areas between the median vein and costal margin, translucently covering the "forehead and eye" with that dark blue opaline reflection peculiar to this species. The outline of the "nose and throat" is somewhat suffused. Expanse: 58 mm.

*Data: Holotype* ♂, (Author's Coll.) San Bernardino Mts., San Bernardino County, California; July 6, 1922.

Aberrations are quite rare, though hundreds of these butterflies are used for commercial purposes. Named for Mrs. J. D. (Fannie) Gunder.

## Descriptions of New Genera and Species of the Dipterous Family Ephydriidae. Paper VI.\*

By E. T. CRESSON, JR.

*Rhysophora robusta*, new genus, new species.

Large robust, black species with white halteres; wings immaculate, brownish tinged, with black veins. Subopaque species with brown dusting. Frons except the large ocellar triangle and narrow orbits, opaque; the reclinate frontal bristles far in advance of the ocellars. Face with well developed foveae; four or more bristles each side; lower part wrinkled; epistoma retreating. Supra-alar bristle very strong, much longer than the notopleurals. Length: 4.5 mm.

*Type*: ♂; Dyke, Virginia, July 16, 1915 (W. L. McAtee; on flowers of *Pontederia cordata*), [U. S. National Museum Collection]. *Paratypes*—2 ♀, topotypical.

I have seen other specimens from Massachusetts and New York. The wrinkled, retreating face, as well as the large size, will distinguish this species from those of *Discocerina*.

### *Ditrichophora*, new genus.

This genus is proposed for those *Discocerine* species having only two facial bristles in the primary series. The lower portion of the face is shorter than in typical *Discocerina*. The parafacialia are generally narrow, very slightly dilated below; eyes bare; no supra-alar bristle. Most species are shining and in many respects resemble those of the *Psilopini*.

*Genotype*.—*Ditrichophora exigua* n. sp.

The following known species also belong here: *Discocerina ranthocera*, Lw., *Discocerina nana*, Will., and *Discocerina aliena*, Cress.

### *Ditrichophora exigua*, new species.

Black; third antennal segment below, proboscis, fore coxae, bases and apices of tibiae, and tarsi except apices, pale yellowish. Halteres white. Wings hyaline with pale veins. Opaque to subopaque species. Frons opaque black, with large ocellar triangle and narrow orbits more grayish; face black, obscure shining in places; cheeks more grayish. Mesonotum and scutellum brownish to grayish at margins; pleura and metanotum

\* For Paper V, see Ent. News, xxxiii, 135-137, 1922.

grayish and more shining. Abdomen subopaque, black with brownish tinge.

Frons as long as or longer than broad; lower part of face prominent at upper bristle, then strongly receding to epistoma; no secondary series of bristles. Length: 1.5 mm.

*Type*: ♂; Swarthmore, Pennsylvania, July, 1908 (Cresson), [Acad. Nat. Sci. Phila. Collection, No. 6292]. *Paratypes*—7 ♂, 3 ♀; topotypical.

This species is apparently common in the Eastern United States.

#### *Ditrichophora tacoma*, new species.

A shining, sparingly brown to yellowish pruinose species, with antennae yellow in the male, less so in the female. Halteres white. Face densely golden yellow in the male, more whitish in the female; cheeks gray. Wings hyaline, with dark veins. Face scarcely longer than broad; foveae not very marked.

*Type*: ♂; Tacoma, Washington, August 27, 1911 (A. L. Melander) [University of Washington Collection]. *Paratypes*—2 ♀; topotypical.

A female from Fort Kent, Maine, August (C. W. Johnson) [Boston Soc. Nat. Hist.], appears to be conspecific.

#### *Ditrichophora parilis*, new species.

Very similar to the western *aliena*, but less polished, with the thorax overcast with gray. Head as broad as high; fronto-facial profile convex, not flattened and vertical as in *aliena*; face scarcely longer than broad.

*Type*: ♂; Bar Harbor, Maine, August 18 (C. W. Johnson) [Boston Society of Natural History Collection].

A female from Mt. Ascutney, Vermont, July 11 (Johnson; 3,000 feet altitude) [Boston], may or may not belong here, but it does not represent any other described species.

#### *Ditrichophora xanthocera* (Loew).

1869. *Hecamede xanthocera* Loew, Ber. Naturh. Ver. Augsburg, xx, 58.

1862. *Discocerina lacteipennis* Loew, Mon. Dipt. N. Am., i, 145.

The examination of Loew's types of *lacteipennis* reveals this synonymy. The species is very easily distinguished by the

general whitish appearance of the body and wings. The yellow antennae and the conspicuous, upcurved, lower facial bristle of the secondary series, are among the salient characters. The species is widely distributed in the United States.

### **Polytrichophora**, new genus.

This genus is erected for the reception of those species of *Discocerina*, *sens. lat.*, having a secondary series of facial bristles laterad of, directed outwardly in opposition to, and somewhat alternating with, those of the primary series. The eyes in all known species are distinctly pubescent.

*Genotype*—*Polytrichophora agens* n. sp.

*Discocerina orbitalis* Lw., 1861, also belongs here.

### **Polytrichophora agens**, new species.

Black; frons anteriorly, antennae entirely, palpi, knees, apices of tibiae and all tarsi, yellow. Halteres also yellow. Wings whitish with yellow veins, costa black. Opaque, light gray; frons slightly yellowish pruinose, except orbits and ocellar triangle. Abdomen slightly shining distally; femora dusted; tibiae silvery outwardly. Large robust species. Face and cheeks very broad with all bristles and setulae well developed, especially those on the parafacialia. The series examined seem to be composed of all females. I do not know the male. *Length*: 3 mm.

*Type*: ♀? Galveston, Texas, June, 1900 (W. M. Wheeler) [American Museum of Natural History Collection]. *Paratypes*—5 ♀? topotypical.

### **Polytrichophora conciliata**, new species.

Very similar to the Neotropical species *Discocerina setulosa* Cress., which also belongs in this genus. The oral cavity, on account of the broad, shallow, reflexed, epistomal emargination, attains the line of the middle primary facial bristles; setulae of the parafacialia are somewhat stronger than in *setulosa*. The posterior median mesonotal series of setulae contains two to three pairs which are bristle-like, nearly as strong as the praescutellars. Fore femora stout, with an anterior flexor series or comb of closely set, fine bristles or spines; the posterior flexor series of long bristles, but no comb.

*Type*: ♂; Wildwood, New Jersey, July 18, 1908 (Cresson) [A. N. S. P. No. 6293].

I also have examined specimens from Maine and New York.

**Hydrellia morrisoni**, new species.

Black; tarsi brownish-yellow. Halteres pale yellow. Wings hyaline, veins pale. Opaque; abdomen rather shining; frons and mesonotum dark gray; frontalia not conspicuous; lunule gray; face white, becoming gray along orbits; occiput, plenrae and venter gray. Reclinate frontals present; anterior dorso-centrals weak if discernible.

*Type*: ♂; White Mountains, New Hampshire (Morrison) [U. S. National Museum Collection]. *Paratype*: 1 ♂; topotypical.

**Hydrellia notiphiloides**, new species.

Black; palpi and halteres yellow. Opaque; frons, except frontalia, and mesonotum subopaque. Frontalia and anterior frontal margin black; lunule and face white, the latter somewhat yellowish. Occiput, humeri, pleura, abdomen laterally, venter and femora greenish-cinereous. Mesonotum olivaceous; abdomen more whitish. Wings hyaline, veins pale. Cheeks broader than third antennal segment; face with very strong bristles; arista with six hairs. Anterior dorso-centrals well separated. Ocellar bristles nearly as strong as post-ocellars. *Length*: 2 to 2.5 mm.

*Type*: ♂; Cedar Point, Sandusky, Ohio, August 5, 1902 [Ohio State University Collection]. *Paratypes*: 1 ♂, 5 ♀; topotypical.

This species also occurs in Massachusetts.

**Philygria picta** (Fallen).

1813. *Notiphila picta* Fallen, Handl. K. Svensk. Vet. Akad., xxxiv, 254.

1844. *Philygria picta* Stenhammar, Handl. K. Svensk. Vet. Akad., 1844, 243.

I can report this species from New Jersey and Maryland. It is probable that Coquillett's determination in Mrs. Slosson's list is correct.

**Lytogaster extera**, new species.

Black and shining; base of tarsi rather brownish. Face with highly polished median tubercle; the polished area extending dorsally in form of a stripe, being in contrast with the white pruinose remainder of the face. Cheeks and occiput white pruinose. Mesonotum smooth and shining, as are also the lateral areas of abdominal dorsum; the depressed area on

dorsum of second and third segments is not as distinct as in other species of the genus. *Length*: 2 mm.

*Type*: ♂; Trenton, New Jersey, August 21, 1910 (H. S. Harbeck) [A. N. S. P. No. 6294].

I have also seen this species from Massachusetts and Illinois.

### ***Napaea alpina*, new species.**

Black: base of tarsi tawny. Frons shining, bluish; vittae black and subopaque. Face white pruinose, becoming much denser at oral margin; clypeus concolorous. Mesonotum shining, sparingly brown pruinose, grayish towards pectus. Scutellum subspherically convex, broader than long, without tubercles; apical bristles separated by about one-third to one-half their length. Halteres whitish. Abdomen shining, scarcely metallic tinged, thinly white pruinose. Wings distinctly brownish towards costa and apex, with costal cell clear; cross-veins distinctly clouded in contrast with the whitish areas each side; second vein not appendiculated. *Length*: 3.5 to 4 mm.

*Type*: ♂; Longmire's Springs, Mount Rainier, Washington, August 2, 1905 (J. M. Aldrich) [A. N. S. P. No. 6295]. *Paratypes*: 2 ♀; topotypical.

A specimen from Fort Kent, Maine, August (C. W. Johnson) [Boston], shows no differences from the typical series except in its smaller size.

### ***Clanoneurum cimiciformis* (Haliday).**

1855. *Disomyza cimiciformis* Haliday, Nat. Hist. Rev., ii, 124.

1903. *Clanoneurum cimiciformis* Becker, Mitt. Zool. Mus. Berlin, ii, 165.

Specimens of this species are before me from Maine, New York, Arizona, Utah and California. Comparison with specimens of *cimiciformis* from Europe fail to reveal any differences of specific importance.

### ***Trimerina madizans* (Fallen).**

1813. *Notiphila madizans* Fallen, Handl. K. Svensk. Vet. Akad., xxxiv, 252.

1835. *Trimerina madizans* Macquart, Hist. Nat. Ins. Dipt., ii, 539.

On comparing specimens from Massachusetts, New Hampshire and New York before me with those from Europe, they fail to reveal any differences of specific importance.

**Canacea macateei**, Malloch.

1924. *Canacea macateei* Malloch, Proc. Ent. Soc. Wash., xxvi, 52.

This species was described from a series of both sexes from Jekyl Island, Georgia. I have specimens from several eastern states as well as one from California. It is the genotype of Malloch's? genus *Canacea*, which is not congeneric with *Canace*, but which may prove to be synonymous with *Chaetocanace* of Hendel, 1914, erected for an East Indian species.

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**Notes on North American Halticinae with  
Descriptions of Two New Species and  
a New Variety (Coleoptera).**

By L. G. GENTNER, East Lansing, Michigan.

The following paper is published with a view to giving additional distributional records and descriptions of new species. I am indebted to Prof. H. C. Fall for verification of identifications and to Dr. Henry Skinner, Mr. E. T. Cresson, Jr., and Mr. Nathan Banks, for comparison of specimens with types.

*HALTICA POLITA* Olivier.—Two males and one female of this species are in my possession from Wellfleet, Mass., Aug. 21, 1921. These specimens seem to be typical of that species except that they are somewhat smaller than the ones I have from Georgia. The species has heretofore been reported only from South Carolina and Georgia.

*EPITRIX BREVIS* Schwarz.—One specimen was taken by me at East Lansing, Mich., July 26, 1922, while sweeping *Solanum*. This species has not been reported north of Indiana.

*EPITRIX FASCIATA* Blatchley.—Three specimens were collected at Smith Point, Texas, September 1, 1922, on *Datura tatula* by L. J. Bottimer. Mr. Bottimer has also sent me 27 specimens collected in Jan., 1923, at Brownsville, Kingsville and San Benito, Texas. Heretofore this species has been reported only from Florida.

*EPITRIX PARVULA* Fabricius.—One female was taken by me at East Lansing, Mich., July 25, 1922, on *Solanum*, making a new record for the state.

**Chaetocnema (protensa) splendida** new variety.

Very elongate oval, more than twice as long as wide, surface distinctly bronzed or brassy except elytra which are deep blue, moderately shining.

Antennæ more or less rufotestaceous at base, the outer six joints piceous. Head more or less alutaceous, moderately punctured, front and genæ densely punctured and densely covered with whitish hairs.

Thorax one-third wider at base than long, sides regularly arcuate, narrowing slightly to apex, basal marginal line distinct at the sides, surface more or less alutaceous, the punctures moderate in size, separated at least by their own diameters. Elytra slightly wider at base than thorax, humeri rounded, umbones not prominent, disc convex, the striæ regular, not impressed, composed of rather coarse and moderately closely placed punctures, the intervals flat, wider than the striæ, surface faintly alutaceous. Body beneath piceous, brassy bronze.

Prosternum closely punctate.

Abdomen moderately coarsely, but not closely punctate, variable, shining, very faintly alutaceous. Femora piceous, bronzed. Tibiæ and tarsi rufotestaceous. Length 2.5—2.9 mm.

♂.—Last ventral segment of abdomen deeply sinuate each side of middle, median lobe prominent. First joint of anterior tarsi somewhat dilated.

*Type*: male: East Lansing, Mich., in collection of Entomology Dept., Mich. Agr. Coll. Paratypes in collections of U. S. National Museum, Canadian National Museum and Entomology Dept., Univ. of Wis.

Described from a series of twenty specimens. This is the prettiest of all of the North American species of *Chaetocnema*. It differs from the true *protensa* only in the deep blue color of the elytra. The tendency toward the blue coloration in the true *protensa* is seen in the bluish cast of the scutellum, of the region of the head between the base of the antenna and the eye, on the front, and sometimes on the anterior and middle femora. In the variety the scutellum is bronzed. I have one specimen in which the punctures of the scutellar striæ are somewhat confused. The punctuation of the head, thorax and abdomen is variable in density and some individuals are much more alutaceous than others. I have examined hundreds of individuals of the typical *protensa* and all are more or less distinctly alu-

taceous, which fact was not mentioned by Horn. Horn states that a specimen from Garland, Colorado, has the thorax distinctly cupreous and the elytra greenish bronze. I have taken two such specimens in Michigan, but they are quite distinct in coloration from the blue variety.

Occurs along with *protensa* on common marsh grass at the rate of about one to twenty-five at East Lansing, Mich., during the earlier part of May. One specimen was taken in September, 1923. I have seen one female from Edmonton, Alberta, Canada, collected by F. S. Carr and three males from Aweme, Manitoba, collected by N. Criddle, one of which was more of a violet blue.

*CHAETOCNEMA OPULENTA* Horn.—On May 21, 1920, I took one female and on May 25, one male and two females of this species at Madison, Wis., while sweeping the grass at the edge of a marshy place on the shore of Lake Mendota. This species has previously been reported from S. Calif., N. Mex. and Ind.

*CHAETOCNEMA PULICARIA* Melsheimer.—Oct. 16, 1922, I took one male at East Lansing, Mich., and on Sept. 17, 1923, one female by sweeping. This species has not previously been reported from this state.

### *Glyptina abbreviata* new species.

Oval, moderately elongate, convex. Wings rudimentary, normally reaching half-way to apex of elytra. Body above rufotestaceous, shining, below piceous to almost black except prothorax which is the same as above.

Antennæ and legs rufotestaceous. Last segment of antennæ and hind femora sometimes slightly darker. Head shining, impunctate, with the exception of a few coarse punctures near each eye. Thorax one-half wider than long, but little narrower in front than at base, anterior angles with an oblique truncation behind which there is a distinct angulation, sides moderately arcuate, disc convex, finely and sparsely punctate, punctation variable. Elytra more or less translucent, wider at base than thorax, regularly arcuate from base to apex, humeri indistinct, umbones very faint, disc very feebly striate, punctures coarse, well separated in rows.

Abdomen shining, distinctly punctate. Length 1.5—1.9 mm.

♂.—With the last ventral segment usually of paler color, sinuate each side, with a median lobe and a darker impressed

median line extending the entire length of the segment. First segment of anterior tarsi dilated. In the darker forms the last segment is scarcely paler and the median line is hard to distinguish.

*Type*: male; Madison, Wisconsin, in collection of Entomology Dept., Mich. Agr. Coll. Paratypes in collections of United States National Museum, Canadian National Museum and Entomology Dept., Univ. of Wis.

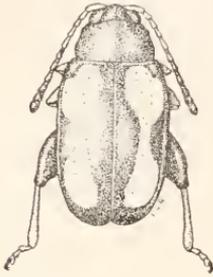
Described from a large series of specimens collected at Madison, Wisconsin, and East Lansing, Michigan. The elongate oval form, indistinct humeri, rudimentary wings and much darker under side distinguish this species from *spuria* to which it is most closely related. In Horn's key it should come first among those with yellowish or rufotestaceous elytra. The punctuation of the prothorax is quite variable ranging from fine and sparse to rather coarse and dense. The color above also varies from rufotestaceous to dark piceous. The elytra are more or less translucent permitting the rudimentary wings to show through as lighter blotches, while the dorsal abdominal segments show piceous or blackish. Possibly this species stands wrongly named as *brunnea* in some collections as I have received it under that name.

I have taken this insect in large numbers during May, feeding and mating on wild geranium, both in Wisconsin and Michigan. One specimen was sent me from Oradell, New Jersey.

GLYPTINA BRUNNEA Horn.—There seems to be a question as to what really is the true *brunnea*. Certain correspondence and the examination of specimens have led me to believe that for some reason the species which I am herein describing as *abbreviata* has been wrongly placed under the name of *brunnea* in some collections. I have examined a series of specimens from Georgia which I believed to be the true *brunnea* and comparison of examples with Horn's type proved them to be such. They agree very well with his description in that they are larger and more robust than either *abbreviata* or *spuria*, have the thorax wider in proportion and have the same color below as above. The reddish-brown color mentioned by Horn is peculiar to them.

***Phyllotreta conjuncta* new species.** Text figure.

Oblong oval, moderately robust, piceous, shining, each elytron with a broad brownish-yellow vitta, very much narrowed in the middle.



*Phyllotreta conjuncta* n. sp.,  
male type.

Antennæ about half as long as body, distinctly thicker externally, piceous, the basal five joints more or less rufotestaceous. Head sparsely, finely punctate, faintly alutaceous.

Thorax at base one-half wider than long, narrowed in front, front angles obliquely truncate, sides arcuate, disc convex, punctures moderate, not closely placed, surface faintly alutaceous. Elytra distinctly wider at base than thorax, humeri obtusely rounded, the punctures coarser than those of thorax, with a slight tendency toward strial arrangement on

basal half, vitta broad, covering about three-fourths the width of elytron, anteriorly nearly reaching base and margin, but not covering umbone, at middle with a deep and sudden excavation on outer side and a long shallower one on inner side, posteriorly not reaching margin or apex.

Body beneath piceous, abdomen sparsely punctate. Legs rufotestaceous, femora darker. Length 2.0 mm.

♂.—Last ventral distinctly sinuate each side, middle lobe moderately prominent with a rather deep, triangularly oval concavity and a median impressed line extending the length of the segment. Antennæ with the fifth joint not longer or larger than the sixth.

*Type*: male; East Lansing, Michigan, in collection of Entomology Dept., Michigan Agricultural College.

Described from a single specimen taken July 12, 1921, while sweeping. This species closely resembles *bipustulata* in form and sculpture and may at some time be shown to bear closer than specific relation to it. A careful examination gives one the impression that it might possibly be an individual of that species with the two spots connected by a vitta about one-eighth of a millimeter in width. It belongs to the series in which the antennæ are not different in the sexes.

I have taken one male *bipustulata* at Waupaca, Wisconsin, in which the spots are connected by a very faint narrow line on the left elytron and by an interrupted line on the right one. I have also taken a male and a female at Madison, Wisconsin, which show traces of a connecting line.

## A New Genus of Bees from California (Hymen.).

By T. D. A. COCKERELL, University of Colorado,  
Boulder, Colorado.

On April 18, 1923, Mr. E. Bethel was examining some flowers of *Calochartus maroccanus* Leicht on Montgomery Creek, California, and noticed upon them a curious black bee. Although he had no apparatus for collecting insects, he managed to preserve the bee, which reached me rather squashed and broken; but still available for study. Mr. Bethel remarked: "This bee persisted in staying on the Mariposa lily as if he wished to be recorded," and so sent it on. It is presumably an oligotropic visitor of *Calochartus*, and an examination of the mouth-parts indicates that it eats the pollen.

Much to my surprise, this persistent bee turns out to represent a distinct new genus of the subfamily Dufoureae (Dufoureae of Robertson). The following diagnosis, while incomplete for the reasons mentioned, will make recognition easy. I am glad to name the genus after Mr. Bethel, whose contributions to our knowledge of western botany and zoology have been numerous and varied.

### *Betheliella* new genus.

Male, Robust, intense black, with short broad abdomen, the general aspect suggesting *Macropis*.

Head very broad, eyes strongly diverging below; face without light markings; ocelli rather large, in a curved line; scape ordinary; clypeus transverse, very short, like a transverse band; labrum transverse, somewhat longer than clypeus, broadly rounded, not transversely striate, and without basal process, its apex with long hairs; mandibles long and strongly curved, with a well-formed inner tooth near apex; no distinct malar space; cheeks somewhat flattened behind eyes; maxillary palpi long, six-jointed, last joint extending beyond blade, joints measuring in microns (1.) 192, (2.) 176, (3.) 112, (4.) 96, (5.) 80, (6.) 112; broad hyaline intervals between the main (dark brown) portions; basal joint much thicker than second, and having a number of outstanding stiff bristles; last joint slender, with some small bristles at end; maxillary blade broad, the outer (convex) part very thin and pale, the inner (brown) part with a row of hyaline dots; four stiff bristles at apex; tongue only about 880  $\mu$ . long, elongate dagger-shaped; paraglossae reaching a little beyond middle of tongue, strap-shaped, with broad-

ened truncate hairy apex; labial palpi 656 mu. long, the joints measuring, (1.) 271, (2.) 192, (3.) 80, (4.) 112.

Mesothorax and scutellum finely punctured, the scutellum with a very shallow median furrow; metathorax distinctly truncate in middle, the area minutely rugulose, microscopically longitudinally striate basally; tegulae ordinary; anterior wings with well developed lanceolate stigma; marginal cell elongate-lanceolate, ending in a point on costa; basal nervure little bent, its lower end a little apicad of the oblique nervulus; two elongate cubital cells, about equally long, lower side of first with a conspicuous double curve; first recurrent nervure curved, meeting transverse cubital; second cubital cell narrowed more than half above, the second recurrent joining it at a right angle, a little before the beginning of its last third; legs robust, with very stout femora; hind tibiae broadened apically, on the inner side apically with a large flattened lamina, bearing the simple spurs below, and having a large tuft of black hair; hind femora with no tooth beneath; hind basitarsi long, not especially thickened or remarkable; hind claws bidentate at end.

Abdomen broad, the segments swollen at sides before the apical depression; fourth segment beneath with a pair of large shining bosses.

#### **Betheliella calocharti** new species.

♂.—Length about 8 mm., anterior wing 7; intense black throughout; pubescence black, long and stiff on face, long and erect on vertex, long on anterior part of mesothorax, on pleura and metathorax and sides of apical part of abdomen; front and clypeus dull; metathorax and scutellum shining, very finely punctured; tegulae black; wings dilute fuliginous, nervures and stigma piceous.

The nearest relative of this genus is perhaps Viereck's *Cryptohalictoides* from Nevada, but although the latter resembles *Betheliella* in the position of the first recurrent nervure, the second recurrent and other features are quite different, according to the published figures. The head and legs are also quite different.

In spite of the superficial resemblance, there is no real affinity with *Macropis*. In *Macropis ciliata* the maxillary blade has long hairs (up to 176 mu.) on apical part, while *Betheliella* has only very short ones, and these not dense. In *M. ciliata* the labial palpi are very stout, the joints measuring about (1.) 176, (2.) 112, (3.) 88, (4.) 112 mu long; the maxillary palpi

with short and very stout first joint; and these palpi do not have the long hyaline intervals between the dark joints. In *Betheliella* the bases of the joints are not abruptly narrower than the apices of the ones before, as is the case in *M. ciliata*. *Panurgus calcaratus* and *P. banksianus* differ by the long tapering maxillary blade, and many other characters. *Rhopitoides canus* is more similar in the mouth parts, but has maxillary palpi extending far beyond the blade, as is also true of *Halictoides campanula*, *H. dentiventris* and *Dufourca vulgaris*. *Hesperapis rhodocrata* has the maxillary blade all dark brown, and maxillary palpi not reaching its end; the first joint of maxillary palpi is short and stout. *Callandrena pectidis* has the stout joints of maxillary palpi broadened at end (except of course the last), and the first joint of labial palpi is longer than the next two united. Various other comparisons gave similarly discordant results, leaving *Betheliella* as a rather isolated type, presumably confined to the Californian region.

The type is in my collection, and will eventually go to U. S. National Museum.

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### The North American Species of the Genus *Hoplogaster* (Diptera : Anthomyiidae).

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

The genus *Hoplogaster* Rondani is doubtfully distinct from *Coenosia* Meigen, being separable only by the smaller lower calyptra, which does not protrude much beyond the upper one in the males and is much more slender and shorter in the females than in those of *Coenosia*. There is usually also an additional bristle, or weak setula, on the hind tibia at or beyond middle on its posterodorsal surface, which is absent in most species of *Coenosia*.

I present a key for the identification of the North American species known to me but base it on males alone, as that sex only is represented in some of the species I have.

#### *Key to Species (Males).*

1. Legs black, bases of tibiae narrowly reddish,  
*californiensis* Malloch—Legs yellow, tarsi and rarely the femora partly darkened. . . 2

2. Antennae and palpi black; femora partly brownish, the mid and hind pairs at apices; abdomen black, densely bluish gray pruinulent, with four pairs of large subtriangular dark brown spots on dorsum, which form two continuous vittae, the disc brownish gray between the spots,  
*morrisoni* sp. n.  
 —At least the third antennal segment and the femora entirely yellow . . . . . 3
3. Processes of fifth abdominal sternite measured along their inner margin not half as long as basal segment of hind tarsus; humeral angles and at least the propleura yellowish . . . . . *nigritarsis* Stein  
 —Processes of fifth abdominal sternite measured along the inner margin as long as basal segment of hind tarsus; pleura gray . . . . . *mollicula* Fallen

**Hoplogaster morrisoni, sp. n.**

♂.—Head, thorax and abdomen black, densely bluish gray pruinulent; antennae and palpi black. Thorax with two suffused brownish dorsal vittae. Abdomen with four pairs of subtriangular dark brown spots on dorsum, one on each of the visible tergites from first to fourth, and forming two broad vittae; fifth sternite and hypopygium black, gray pruinulent. Legs pale yellow, fore femora above and mid and hind pairs at apices browned; tarsi brownish. Wings hyaline, veins yellow. Calypterae white. Halteres yellow.

Arista pubescent. Abdomen depressed at base; processes of fifth sternite short and broad, the length along inner margin almost as great as that of basal segment of hind tarsus, the latter shorter than usual. Hind tibia with a fine median posterodorsal bristle. Lower calyptera a little protruded. *Length*: 4 mm.

*Type*: White Mountains, New Hampshire (Morrison).  
 U. S. National Museum. Named in honor of the collector.

**Professor C. Sajo, of Hungary.**

Professor Charles Sajo, a well-known Hungarian Entomologist, is over seventy years old, and the economic distress under which his country is now laboring is forcing him to dispose of part of his collections. The case is a particularly pathetic one, and I hope that you will feel that you can insert the [enclosed] notice without violating the rules of the Exchange Column.—

K. F. CHAMBERLAIN, Cornwall Bridge, Connecticut.

[The notice in question will be found on our Exchange page.  
 —EDITOR.]

## A New Milliped of the Genus *Orthomorpha*, Immigrant from the Philippine Islands.

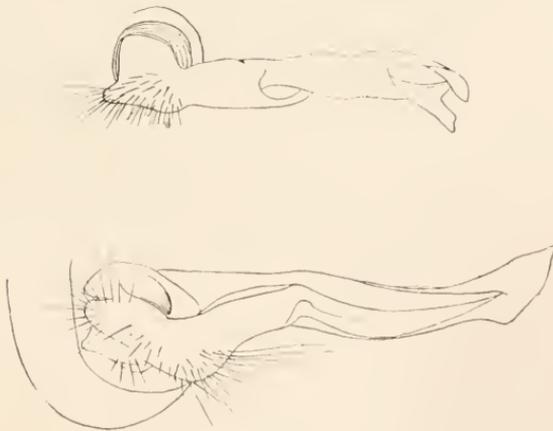
By RALPH V. CHAMBERLIN, Museum of Comparative Zoology, Cambridge, Massachusetts.

The new milliped which is here described is represented by a male and a female which were intercepted by H. Y. Gouldman at Washington, D. C. These were found in a box with a shipment of orchid plants from Manila, Philippine Islands. They were sent for identification by W. B. Wood, inspector for the Federal Horticultural Board in the District of Columbia.

### *Orthomorpha viatoria* sp. nov.

♂. Dorsum black or deep chocolate colored, with a series of reddish dots along the middorsal line, one of these dots covering cauda; lateral borders of keels yellow. Sides of body just below keels also blackish, the middle lateral region reddish yellow and the lower part of sides and the venter yellow. Antennae blackish like the dorsum. Legs yellow excepting distally where they are brownish.

Sulcus across vertex of head sharply impressed. Antennae of moderate length, slender.



Above, *Orthomorpha viatoria* sp. nov. Gonopod of male, ventral view.

Below, *Chondodesmus ucaraguae* sp. nov. Left phallopod, ventral view.

Anterior margin of collum evenly convex, the ends of the posterior margin curving forward. The lateral ends or keels of collum rounded.

Dorsum strongly convex, smooth and shining. Furrow between metazonite and prozonite strongly beaded. The keels are very narrow, with anterior corners rounded. Pleural keels occurring on anterior segments in the usual ridge-like form.

Cauda distally truncate. Anal scale broadly subtriangular, the setigerous tubercles small.

Forms of the gonopods as shown in figure accompanying.

Length, about 19 mm.

*Holotype*.—M. C. Z. No. 5217 (♂). *Allotype*.—M. C. Z. No. 5218 (♀).

### A New Leptodesmoid Milliped from Nicaragua.

By RALPH V. CHAMBERLIN, Museum of Comparative Zoology, Cambridge, Massachusetts.

The new milliped herewith described was taken at New York City, Aug. 8, 1923, on bananas forming part of the cargo of the vessel *Sagua* from Nicaragua. It was taken by Ivan Shiller and was transmitted to me for identification by Mr. E. R. Sasser of the Federal Horticultural Board. The genus *Chondrodesmus*, to which the new form belongs, is characteristic of Central and northern South America.

#### *Chondrodesmus nicaraguae* sp. nov.

♂.—The dorsum chocolate brown, with the outer portion of keels and the cauda lemon yellow. Legs and antennae very pale, scarcely pigmented.

Anterior margin of collum widely and evenly convex, the posterior margin somewhat arcuate.

Second, third and fourth keels as wide as the fifth, their caudolateral angles rectangular or nearly so and the anterolateral angle rounded and bearing laterally a small tooth.

Porigerous swelling elongate. Posterior angles of keels not produced excepting on sixteenth to nineteenth segments. On the ninth to the thirteenth keels the posterior margin with a broad but low angle or tooth. Posterior margin of eighth keels smooth, not angled or toothed.

Dorsal surface of metazonites roughened; with three rows of small, widely separated tubercles, two of these rows being behind the middle.

Anal scale broad, produced prominently between the setigerous tubercles much as in *C. alidens* Chamberlin.

Accessory blade of phallopods expanded at apex, a crest passing upon the enlarged apical portion from the inner margin as in *spatulatus*, etc. Seminal style distally slender. (See accompanying figure.)

Length, about 34 mm.; width, 6 mm.

*Type* in the Museum of Comparative Zoology, Cambridge, Mass.

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., MAY, 1924.

## The Bad Collector.

[Dr. L. O. Howard sends us the following for the NEWS.]

That excellent entomologist, Prof. F. Picard, on taking the presidential chair at the meeting of the Entomological Society of France on January 9th, paid his respects to the bad collector of insects in the following, freely translated, words:

"But alas, I find myself badly qualified to occupy this position when I think of the great number of good entomologists of which our Society is composed. My unworthiness appeals to me strongly on looking at the excellent collectors who surround me. To bring together a good collection is not easy, and demands an ensemble of qualities of which I find myself lacking. It is necessary to be orderly, tenacious and patient. It is necessary to spare neither time nor money, to fear neither journeys nor fatigue, to make numerous arrangements for exchanges, to fight ceaselessly moisture, Anthrenus and verdigris, in order that after years of work one may with pride show competent people the rarest species represented by specimens of an irreproachable freshness and grouped in a perfect order.

"Unfortunately, it is to the group of bad collectors that I confess, to my shame, I belong. The bad collector is endowed with an intermittent zeal. At times he fills, and then he empties his boxes, and he discovers many years later, if indeed Anthrenus has consented to it, that they are neither arranged nor even identified. His boxes are receptacles where he only (at least he so pretends) can find things. His pins are of all different lengths; his labels are of all shapes and colors; his specimens are placed in a secret order which very distantly corresponds to the systematic laws. The bad collector is a sentimentalist. He does not throw away defective specimens: faded butterflies, Coleoptera with three legs, abound in his boxes. Horror! this Longicorn has only one antenna! and as to this Carabid, do not touch it; it will fall to pieces.

"Do not allow yourselves, my dear colleagues, to say *avaunt* to this bad collector. Surely his collection, like hell, is paved with good intentions; and if the labels were all uniform in shape and correctly written it is hardly probable that the specimens would ornament a museum; but the disorder which they present, if it is not artistic in effect, is often the result of assiduous study.

"These unfortunate objects are often the fruit and the testimony of fertile biological research; these mutilated insects from which he cannot separate himself are souvenirs of youth and are bound in his memory to all sorts of charming incidents. As defective as it is, this collection has helped him to pass many happy hours, and it consoles him with the reflection that his life has not been empty."

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## Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE

### *Colias eurytheme*—First recorded in Philadelphia, Pennsylvania.

The first record for capturing *Colias eurytheme* Bdv. in southeastern Pennsylvania was made on September 2, 1923, on the meadows outside the Philadelphia Navy Yard.

Mr. Philip Laurent and I had been looking for *Chrysophanus thoe*. After an unsuccessful search of more than an hour, we had put our nets away and were walking back towards the trolley line, when suddenly a deep orange-colored butterfly flew across the road. We both thought it a dark form of *Catopsilia eubule*. There was apparently very little chance of capturing it, for it was flying very fast and with no apparent intention of alighting. It suddenly doubled in its flight, returning within a few feet of where I was. A lucky swoop of my net caught it. It turned out to be a fine fresh male specimen of *Colias eurytheme*. A few minutes later a second *eurytheme* appeared as suddenly as the first and seemed to be in just as much of a hurry to get where the first one had been going.

That second specimen was the hardest butterfly that has ever fallen to our lot to catch. It flew up and down the quarter mile of railroad tracks, back and forth, zigzagging across the stony and marshy meadows and several times up the steep bank

beyond the railroads. But never once in the ten minutes that we both followed it did it ever alight or even attempt to alight. Another lucky swoop caught what proved to be a second male *curythene* and slightly torn.

The following morning, Labor Day, we again visited the meadows, hoping to find more; in the hour and half we spent there that day we only saw two more males. We were unable to catch either, for, like the others, they never seemed to alight or even pause in their wild flight.

On September 9th, we again went collecting and Mr. Laurent had the good fortune to capture one of the three males we saw.

On the twenty-second and twenty-third we captured six males and two albino form females, and saw more than ten other males, which we could not get. The most noticeable characteristic of *curythene* seems its ability to make lengthy non-stop flights. Of all those we observed only two males were seen at rest.

This seems to be characteristic of the species as Scudder quotes Geddes, as follows: "*Eurythene* is the most agile and swiftest flying of all the *Eurymi*."

The females, however, were diametrically opposite in their habits. They seemed to be at rest all of the time at the base of plants ovipositing, or on the ground. They apparently only flew up when disturbed by our tramping through the tall herbage. We captured only one typical orange female; all the others were the light colored albino form. It was very difficult to distinguish the females of the *C. curythene* from those of our common *C. philodice*. It was only by capturing everything in sight and weeding out and liberating *philodice* that we were able to get the females of *curythene*.

W. G. Wright in his monograph on the *Butterflies of the West Coast*, calls attention to the increasing prevalence of the dimorphic female and states that if the present rate of increase goes on the normal orange colored female will become extinct.

On September 23rd we captured two fine specimens of *C. curythene* variety *keewaydin*, and this was the only day on which we captured this handsome variation of *curythene*.

It seems a curious fact that so many specimens should be seen in such a short time, yet never before recorded in this locality.

The only authentic record for the capture of this species near Philadelphia is by Mr. Caviney in Camden in the year 1890. Other records for this region are: One on Staten Island, New York, by Professor John B. Smith, and a pair from Astoria, Long Island, by Mr. William Beutenmüller.

Dr. Scudder in his great work on the *Butterflies of the Eastern United States and Canada* gives several instances of single "stray" captures from Maine, New Hampshire and Vermont.

As *C. carythene* is seasonally polymorphic it will be interesting to note whether any of the other forms will be taken in Philadelphia during the coming summer.—ARTHUR H. NAPIER, 503 E. Willow Grove Ave., Chestnut Hill, Philadelphia, Pa.

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### Autobiographies of Entomologists and Arachnologists Wanted!

For years I have been collecting materials for a *Biographic Entomological Dictionary*, to contain biographies of entomologists and arachnologists of all times and of all countries. Biographies of deceased entomologists and arachnologists I have already obtained from the literature almost completely, but to get biographies of living colleagues is much more difficult. Accordingly, autobiographies are wanted, and I hereby beg for such to be sent to me. All entomologists and arachnologists who have done scientific work as authors or as collectors are to be dealt with in this work. The autobiographies will, as far as possible, be printed in the form and the language as sent to me. Those who do not send their autobiographies ought not to expect that their biographies shall be contained in the book. Should anybody be willing to collect contributions for the work, I would beg him to be so kind as to communicate with me. The printing of the work is not in question.—EMBRIC STRAND, Professor of Zoology and Director of the Systematic Zoological Institute of the University of Riga (Latvia), Kronvalda bŭlvars 9. (Entomologist, London, March, p. 68).

[In connection with the above note, reprinted from "our esteemed contemporary," we call attention to the editorial, "The Desirability of a Bibliographical Dictionary of Entomologists" in the NEWS for May, 1914, Vol. XXV, pp. 227-229. EDITOR.]

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### A Philatelist.

In *Nature Magazine* for April, 1924, page 208, Mr. H. A. Allard gives an account of insects' sense of taste in which the white portions of a postage stamp has been deleted. "Since only the stamp itself was attacked, while the paper of the envelope upon which it was stuck was not eaten, it would appear that some substance in the adhesive used upon the stamps was attractive to the insects doing the work. In truth a child

could hardly have scraped away with greater precision these areas which the insect, doubtless an ant, has removed by depending, in all probability, upon some highly developed sense of taste or tactual sense." [More likely a Silverfish (*Lepisma*) or a Psocid. EDITORS.]

## 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.

Papers of systematic nature will be found in the paragraph at the end of their respective orders. Those containing descriptions of new genera and species occurring north of Mexico are preceded by an \*.

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. 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. 15—Insecutor Irsctiæ Menstruus, Washington, D. C. 19—Bulletin of the Brooklyn Entomological Society. 27—Revue Mensuelle de la Société Entomologique Namuroise, Namur, Belgium. 33—Annales de la Société Entomologique de Belgique, Brussels. 34—Bulletin de la Société Entomologique de Belgique, Brussels. 39—The Florida Entomologist, Gainesville, Florida. 50—Proceedings of the United States National Museum. 51—Deutsche entomologische Zeitschrift, Berlin. 52—Zoologischer Anzeiger, Leipzig. 53—Bulletin de la Section entomologique du Musée National de Prague. 59—Journal of Agricultural Research, Washington, D. C. 61—Proceedings of the California Academy of Sciences, San Francisco. 64—Parasitology, London. 68—Science, Garrison on the Hudson, N. Y. 69—Comptes Rendus des séances de l'Académie des Sciences, Paris. 70—Journal of Mor-

phology, Philadelphia. 71—Novitates Zoologicae, Tring, England. 74—Proceedings of the Staten Island Institute of Arts and Sciences, New York. 77—Comptes Rendus des seances de la Societe de Biologie, Paris. 82—The Ohio Journal of Science, Columbus, Ohio. 85—The Journal of Experimental Zoology, Philadelphia. 87—Arkiv for Zoologi, K. Svenska Vetenskapsakademien, Stockholm. 90—The American Naturalist, Lancaster, Pa. 93—Bulletin, Division of the Natural History Survey, Urbana, Illinois. 96—Physis, Revista de la Sociedad Argentina de Ciencias Naturales, Buenos Aires. 100—Biological Bulletin of the Marine Biological Laboratory, Woods Hole, Mass. 104—Zeitschrift fur Wissenschaftliche Zoologie, Leipzig. 105—Proceedings of the Iowa Academy of Sciences, Des Moines. 114—Entomologische Rundschau, Stuttgart. 116—Entomologische Zeitschrift, Frankfurt a. M. 124—Bulletin de la Societe entomologique d’Egypte, Cairo. 128—Zeitschrift fur Induktive Abstammungs und Vererbungslehre, Leipzig. 139—Bulletin of the Southern California Academy of Sciences, Los Angeles. 141—Internationale Entomologische Zeitschrift, Guben. 146—“Konowia,” Wien. 151—Occasional Papers of the Boston Society of Natural History. 156—Genetics, New York.

**GENERAL.** **Bouvier, E. L.**—La memoire chez les insectes. (“Scientia,” Bolognia, xviii, 103-16). **Brues, C. T.**—The specificity of food plants in the evolution of phytophagous insects. 90, lvii, 127-44. **Campion, Herbert**—Obituary notice. 9, 1924, 72. **Cockerell, T. D. A.**—Fossil Insects in the U. S. National Museum. 50, lxiv, art. 13. **Emerton, J. H.**—Early history of the Cambridge entomological club. 5, xxxi, 1-6. **Erhard, H.**—Eine fernrohrlupe fur insektenforschern. 116, xxxvii, 56. **Ferris, G. F.**—The study of minute insects. 4, lvi, 25-8. **Horsfall, J. L.**—The effects of feeding punctures of aphids on certain plant tissues. (Penna. Sta. Col. Agr. Exp. Sta. Bul. 182.) **Longin Navas, R. P.**—Preservation des insectes dans les collections. 27, 1924, 9-10. **Needham, J. G.**—Observations of the life of the ponds at head of Laguna Canyon. 13, xvi, 1-12. **Reuss, T.**—Nochmals “blaulingsraupen und ameisen” ein beitrag ueber die “Grenzen des ertraglicher.” 141, xvii, 177-9. **Strand, E.**—Autobiographies of entomologists and arachnologists wanted. 9, 1924, 68. **de la Torre Bueno, J. R.**—Entomology in non-entomological publications. 19, xix, 54-5. **Valentine, A.**—Breeding for varieties. 9, lvii, 91.

**ANATOMY, PHYSIOLOGY, MEDICAL, ETC.** Cleveland, L. R.—The physiological and symbiotic relationship between the intestinal protozoa of termites and their host, with special reference to *Reticulitermes flavipes*. 100, xlv, 178-201 (Cont.). Finkler, W.—Die ueberpflanzung von kopfen. (Kosmos, 1924, 16-18.) Gabritschevsky, E.—Farbenpolymorphismus und vererbung mimetischer varietaten der fliege *Volucella bombylans* und anderer "hummelahnlicher" zweiflugler. 128, xxxii, 321-53. Hersh, R. K.—The effect of temperature upon the full-eyed race of *Drosophila*. The effect of temperature upon the heterozygotes in the bar series of *Drosophila*. 85, xxxix, 43-45; 55-71. de Luna—A propos de notre note: Sur la participation d'une peroxydase a l'apparition du pigment chez la *Drosophila melanogaster*. 69, 1924, 878-81. Metz & Nonidez—The behavior of the nucleus and chromosomes during spermatogenesis in the robber fly, *Lasiopogon bivittatus*. 100, xlv, 153-64. Mavor & Svenson—An effect of X-rays on the linkage of mendelian characters in the second chromosome of *Drosophila melanogaster*. 156, ix, 70-87. Mazza, S.—Sur l'action des venins de vipere et de cobra sur les chenilles de *Galleria mellonella*. 77, xc, 669-71. Plath, O. E.—Do anesthetized bees lose their memory? 90, lvii, 162-6. Voinov et Voinov—Les cellules pigmentaires dans les larves de *Simulium*. 77, xc, 722-24. Warren, D. C.—Inheritance of egg size in *Drosophila melanogaster*. 156, ix, 41-69.

**ARACHNIDA AND MYRIOPODA.** Bromley, S. W.—A bird in a spider web. 19, xix, 52-3. Cockerell, T. D. A.—The name of the spotted fever tick. 68, lix, 277. Hartzell, A.—Observations on the habits of a tarantula in captivity. 105, xxix, 187-9.

Carbonell, J. J.—Contribucion al estudio de las terafosas argentinas. 96, vi, 263-282; vii, 46-49, 106-110. Cockerell, T. D. A.—(See under General). \*Ewing, H. E.—New tarsonemid mites. 10, xxvi, 66-9. Ewing, H. E.—Our only common N. Am. chigger, its distribution and nomenclature. 59, xxvi, 401-3. Savory, T. H.—New evidence of the relationship between the spiders *Liphistius* and *Segestria*. 11, xiii, 472-3. Steding, E.—Zur Anatomie und Histologie von *Halarachne otariae* n. sp. 104, cxxi, 442-493. Vellard, J.—Etudes de zoologie. Araneidae—Note preliminaire. Un nouveau genre d'araignees. (Arch. Inst. Vital Brazil, ii, 1-32; 33-40).

**THE SMALLER ORDERS OF INSECTA.** Cleveland, L. R.—(See under Physiology). Doane, R. W.—Turret-building Termites. (Nat. His., New York, xxiv, '98-100). Hoke, G.—The anatomy of the head and mouth parts of Plecoptera. 70, xxxviii, 347-85. McDunnough, J.—Distributional notes on Canadian dragonflies. 4, lvi, 72-3. Priesner, H.—Beitrage zur morphologie der jugendstadien der Thysanopteren. (Sitz. Akad. Wissens. Wien., Math.-Naturw. Klas. cxxxii, 1-18).

Cockerell, T. D. A.—(See under General). Ewing, H. E.—On the taxonomy, biology, and distribution of the biting lice of the family Gyropidae. 50, lxiii, Art. 20. Ferris, G. F.—The mallophagan family Menoponidae. 64, xvi, 55-66. Kennedy, C. H.—Notes and descriptions of naiads belonging to the dragon-fly genus *Helocordulia*. 50, lxiv, Art. 12. Lestage, J. A.—Notes critiques sur les Campsurus (Ephemeroptera). 33, 1924, 113-24. \*McDunnough, J.—New Ephemeridae from New England. 151, v, 73-6. Navas, L.—*Crisopidos neotropicos*. (Rev. Chilena H. Nat., xxvii, 110-6). \*Claassen, P. W.—New sps. of North American Capniidae (Plecoptera). 4, lvi, 43-8.

**ORTHOPTERA.** Criddle, N.—Notes on the early stages of grasshoppers. 4, lvi, 49-53. Wille, J.—Ein neues tibialorgan der Orthoptere *Rhipipteryx chopardi*. 52, lviii, 243-53.

**HEMIPTERA.** Puri, I. M.—Studies on the anatomy of *Cimex lectularis*. 64, xvi, 84-97. Webster, R. L.—Some notes on *Empoasca flavescens* (Cicadellidae). 105, xxix, 195-8.

Blanchard, E. E.—A new aphidian tribe from Argentina. Aphid notes, pt. IV, Argentine sps. of the subtribe Aphidina. 96, vii, 24-45; 120-25. Bruner, S. C.—A new *Enicocephalus* (Heteroptera). 19, xix, 39. Cockerell, T. D. A.—The name of the lac insects. 5, xxxi, 47-8. Cockerell, T. D. A.—(See under General). \*DeLong, D. M.—Some new Cicadellidae from the southern U. S. 6, xxxii, 63-70. Esaki, T.—On the curious Halophilous water strider *Halovelia maritima* (Geridae). 19, xix, 29-34. Guyton, T. L.—A taxonomic, ecologic and economic study of Ohio Aphididae. 82, xxiv, 1-30. \*Mason, P. W.—A new genus and species of aphids. 10, xxvi, 49-52. Muir, F.—A new genus of the family Achilixiidae (Homoptera). 4, lvi, 33-4. Porter, C. E.—Datos para la zoologia medica de Chile. Description de un nuevo coc-

cido Chileno. (An. Zool. Aplicada, vii, 1920, 16-34. \*Robinson, W.—Some n. sps. of *Erythroneura* (Cicadellidae). 4, lvi, 58-62. de la Torre Bueno, J. R.—On a few Heteroptera from Massachusetts. 19, xix, 48-51. \*Van Duzee, E. P.—The genus *Erythroneura* in California. (Homoptera). 61, xiii, 231-36. \*Woodruff, L. B.—Critical observations in the membracid genus *Cyrtolobus*. 6, xxxii, 1-62.

LEPIDOPTERA. Bell, E. L.—A new locality for *Copaodes minima*. *Libythea bachmani* in Long Island. 19, xix, 43. Champlain, A. B.—How butterflies pass the winter. (Nature Mag., Apr. 1924, 223-4). Engelhardt, G. P.—The Saturniid moth *Coloradia pandora*, a menace to pine forests and a source of food to Indians in eastern Oregon. 19, xix, 35-7. Fischer, E.—Wie kommen die sturzpuppen sich aufhängen ohne hinunterzufallen? 116, xxxvii, 51-2. Karstens, H.—Schmetterlinge als Schmuck- und Ziegegenstände. 114, xli, Nr. 1, 4. Mellows, C.—Altitudes at which Lepidoptera occur. 9, lvii, 90-1. Poulter, S.—A study of the white marked tussock moth. 105, xxix, 165-7. Wolff, H.—Gartenblumen für d. schmetterlingsfang. 141, xvii, 190.

Braun, A. F.—The Chambers specimens of *Tineina* in the collection of the American Entomological Society. 2, xlix, 347-58. Comstock, J. A.—Studies in Pacific coast L. The rediscovery of a "lost species." 139, xxiii, 13-6. Coolidge, K. R.—California butterfly notes—II. 19, xix, 44-7. Hampson, G. F.—Descriptions of n. gen. and sps. of Trinidad and other S. Am. Noctuidae. 11, xiii, 425-54. Joicey & Talbot—Descriptions of four new butterflies. 9, lvii, 37-40. Jordan, K.—On the saturnoidean families *Oxytenidae* and *Cercophanidae*. 71, xxxi, 135-93. Lindsey, A. W.—Iowa microlpidoptera. 105, xxix, 157-61. \*McDunnough, J.—Some new Canadian Argynnid races. 4, lvi, 42-3. Riley, N. D.—A new *Lycaenid* butterfly from Costa Rica. 9, lvii, 88-9. Riley, N. D.—A useless name. [Notice of the genera established by d'Almeida in *Etudes sur les Lep. du Bresil*, pt. I of *Melanges Lepidopterologiques*, 1922]. 9, 1924, 67-8. Stichel, H.—Kolumbische *Heliconius*. 51, 1923, 260-70.

DIPTERA. Campbell & Davidson—Notes on aphidophagous *Syrphidae* of southern California. 139, xxiii, 3-9. Hadwen & Fulton—On the migration of *Hypoderma lineatum* from the skin to the gullet. 64, xvi, 98-106. Johnson, C. W.—Notes on *Muscina pascuorum* during 1923. 5, xxvi, 17-8. Neri, F.—Sui significato delle variazioni dell'arma-

tura mascellare in Anopheles maculipennis. (Atti d. R. Accad. d. Fis. in Siena, xiv, 433-43). **Pavlovsky u. Stein**—Die Gastrophilus larve als gastparasit in der menschenhaut. **64**, xvi, 32-43. **Thienemann, A.**—Geschichte der Chironomus forschung von Aristoteles bis zur gegenwart. **51**, 1923, 515-40. **Worthley, H. N.**—The biology of Trichopoda pennipes. **5**, xxxi, 7-16.

\***Alexander, C. P.**—Undescribed sps. of nematoceros D. from North America and Japan. **15**, xii, 81-4. New sps. of two winged flies from western N. A. belonging to the family Tipulidae. **50**, lxiv, Art. 10. **Bequaert, J.**—Notes upon Surcouf's treatment of the Tabanidae in the genera insectorum and upon Enderlein's proposed new classification of this family. **5**, xxxi, 24-40. **Bonne, C.**—Note on Culex flavipes. **15**, xii, 85. **Borgmeier, T.**—Novos Phoridae Brasiliiros. (Bol. Mus. Nac., Rio de Janeiro, i, 51-59). \***Brues, C. T.**—Notes on some New England Phoridae. **5**, xxxi, 41-4. **Cockerell, T. D. A.**—(See under General). **Curran, C. H.**—On the generic position of Asilus cacophilus. **6**, xxxii, 73. \***Curran, C. H.**—Notes on the genus Pipizella, with descriptions of n. sps. (Syrphidae). **2**, xlix, 339-45. Synopsis of the genus Chrysotoxum with notes and description of n. sps. (Syrphidae). **4**, lvi, 34-40. Rhagoletis symphoricarpi, a new trypaneid from British Columbia. **4**, lvi, 62-3. New species of Syrphidae. **151**, v, 79-82. **Dyar, H. G.**—A new Sabethid from Brazil. Note on Culex tarsalis. **15**, xii, 92; 95-6. **Dyar & Shannon**—Notes on Sabethids from Panama. **15**, xii, 85-91. \***Garrett, C. B. D.**—On British Columbian Mycetophilidae. I. **15**, xii, 60-7. **Goetghebuer, M.**—Etude critique des Chironomides de la collection Meigen. **34**, v, 120-9. \***Greene, C. T.**—New sp. of Mythicomyia and its relationship with a n. g. **10**, xxvi, 60-4. \***Johannsen, O. A.**—A n. sp. of Dixia from California. **5**, xxxi, 45-6. \***Malloch, J. R.**—A new sp. of Canacea from the United States. (Ephydriidae). **10**, xxvi, 52-3. Exotic Muscaridae. XII. **11**, xiii, 409-24. A new N. Am. species of Amiota. **19**, xix, 51-2. \***Melander, A. L.**—New sps. of Platypalpus occurring in New England. **151**, v, 83-7. \***Shannon, R. C.**—Nearctic Caliphoridae. Lucilini. **15**, xii, 67-81. \***Turner, R. L.**—A new mosquito from Texas. **15**, xii, 84.

**COLEOPTERA.** **Chittenden, F. H.**—The return of Lep-  
tinotarsa juncta to the District of Columbia. **19**, xix, 37.  
**Flint, Chandler & Glenn**—The apple flea-weevil, Orchestes

pallicornis (Curculionidae). 93, xv, Art 1. Frost, C. A.—*Chrysobothris viridigripennis* in Canada. 19, xix, 34. Jacques, H. E.—Brood A of the may beetles extends its range in Iowa. 105, xxix, 163-4. Lengerken, H. V.—Prothetelie bei coleopteren-larven. 52, lviii, 179-85. Porter, C. E.—*Dos longicornios raros o poco conocidos*. (Rev. Chilena H. Nat., xxvii, 52-3). Wusthoff, W.—Ueber das präparieren kleiner kaefer. 124, iv, 29-32 (Cont.).

Aurivillius, C.—Neue oder wenig bekannte *C. Longicornia*. 87, xv, N. 25. \*Blaisdell, F. E.—Studies in the Melyridae. II. 2, xlix, 315-37. Blatchley, W. S.—The Chrysomelidae of Florida. 39, vii, 33-9 (Cont.). Buchanan, L. L.—On the systematic position of the carabid, *Stereocerus haematopus*. 4, lvi, 40-2. \*Burke, H. E.—Notes on genus *Buprestis* with description of one n. sp. 10, xxvi, 70-2. Cockerell, T. D. A.—(See under General). Hohne, W.—Neue Cyclocephalen. 51, 1923, 345-73. Kleine, R.—*De Brenthidarum Musaei Nationalis Pragae specibus novis*. 53, i, 48-54. Leng & Davis—List of the *C.* of Staten Island, New York. 74, ii, 1-82. \*Manee, A. H.—Ecological observations on Rhynchophora in Southern Pines, S. C. 19, xix, 40-3. \*Notman, H.—A new xantholinid swarming on gravestones on Staten Island and a new Trogophloeus (Staphylinidae). 6, xxxii, 71-2. Obenberger, J.—Une serie de nouveaux genres de Buprestides. 53, i, 13-47. \*Swaine, J. M.—The allies of *Ips confusus* in western America (Ipidae). 4, lvi, 69-72.

HYMENOPTERA. Rabaud, E.—Le retour au nid de *Vespa sylvestris*. (La Feuil d. Nat., xlv, 7-11). Weiss, H. B.—Parasitic H. from New Jersey. 6, xxxii, 73-4.

Bluthgen, P.—Beitrag zur systematik der bienengattung *Halictus*. 146, 111, 63-64 (Cont.). Brethes, J.—Sur quelques hymenopteres du Chili. (Rev. Chilena H. Nat., xxvii, 124-8). Cockerell, T. D. A.—Expedition . . . to the Gulf of California in 1921. The bees (II). 61, xii, 529-60. Cockerell, T. D. A.—(See under General). Friese, H.—Neue formen der bienengattungen *Centris-Epicharis*. 146, iii, 19-22. Girault, A. A.—The N. American sps. of *Emersonopsis*, *Amestocharis*, *Euderus* and *Miromphalomyia*. (Chalcididae). 15, xii, 93-5. Mann, W. M.—Notes on Cuban ants. 5, xxxi, 19-23. Pfankuch, K.—Die typen der Gravenhorst'schen gattungen *Phytodietus* und *Ischnocerus*. ✓

146, iii, 41-51. **Schmiedeknecht, O.**—A short summary of the section *Tryphonides prosopi*. (Ichneimonidae). 9, 1924, 45-8. \***Viereck, H. L.**—Descriptions of new reared H. from Nova Scotia and British Columbia. 4, lvi, 64-9.

### SPECIAL NOTICES

**The Macrolepidoptera of the World.** *Fauna americana*, Pts. 133-35, English edition, have just appeared. These parts continue the treatment of the HesperIIDae, and include the genera from *Thespis* to *Hylephila*.

We have received Numbers 1, 2 and 3 of Volume I of the **Monthly Common Insect Magazine, 1923**, edited by Motojiro Suzuki, Hanazono Entomological Laboratory, Hanazono-Taniguchi, Kyoto, Japan. The first number contains 48, the second 38, the third 41 pages, the first a 4-color plate of Japanese *Lucanidae*, the second a 4-color plate of Japanese Diurnal Moths (*Chalcosiinae*), the third a color plate of Japanese Longicorns. Subscriptions are 4 yen, post free, and should be sent to the Editor. Excepting the statements above quoted from the cover, the explanation of Plates II and III, and a brief article in number 3, everything about and within the journal is in Japanese and a closed book to us. We hope it may be of great service in its own country.

### A Reply to Dr. Kinsey.

EDITOR, *Entomological News*: As students of Dr. MacGillivray, who are working on the outlines contained in his *External Insect-Anatomy*, may we be allowed space to reply (unknown to Dr. MacGillivray) to a review of this book by Dr. Kinsey, published in the January, 1924, number of *Entomological News*? We represent the sufferers whom Dr. Kinsey has championed and, while thanking him for his efforts on our behalf, may we present certain phases of the question which he has overlooked?

According to his statement, "For the better part of a century taxonomy has been losing caste . . . . If there are adequate reasons for the decadence of systematics, they must lie in the way we systematists have been doing things, and the sooner we learn to do them differently the sooner taxonomy will engage the interest and esteem of other biologists." As we see it, taxonomists have put forth a vast amount of conflicting literature through trying to co-ordinate end-points of development or ultimate types without working systematically through the steps along which these types have severally evolved. There

has been no common basis in their training or methods, so that it is rare to find any two thinking alike, and still more rare to find any two publishing alike, on the same material.

As Dr. Kinsey maintains, what are needed in the training of future systematists or taxonomists, are "worth-while . . . principles employed in making keen distinctions;" the power "to recognize scant differences, to utilize obscure and varied data, to co-ordinate conflicting evidence, to know the inadequacies of conclusions, the necessity for wary judgments." In no better or more fitting words could he have defined the value of MacGillivray's *External Insect-Anatomy*. Any student with any inclination for entomology cannot help but acquire such a training and powers by working through the manual or even selected parts of it; it is precisely the method required to teach students "to recognize scant differences, to utilize obscure and varied data." Furthermore, it is the only volume relating to insect morphology and taxonomy, of which we are aware, that concisely develops this analytical method. The subject matter is of a nature which demands that the instructor presenting it be adequately trained, the kind of instructor who knows better than to present a beginner with a minute discussion of the thorax, instead of starting at the beginning of the book.

We are told that the "meat and dessert of this new course . . . are words, big words, new words, strange and fearful words." It is very obvious that Dr. Kinsey has not read enough of the book to perceive what the author sets forth in his preface and which speaks from every page, namely, the promotion of a uniform system of terminology. It is the first time that the morphology of a series of widely differing insects has been treated as a whole, and the system employed is, of necessity, one of an exacting and uniform nature. It gives to Entomologists a system analogous to that used to so great an advantage by chemists. To the man in the street, "tummy" is a popular name for stomach; to a chemist, Acetophion is a trade or popular name for monoaceticacidester of salicylicacid . . . truly a formidable name to the student taking chemistry for the first time. But who would give such a term to a freshman in chemistry without first grounding him on the principle on which the term is built up? To a chemist, every syllable of this terrible word means something very definite. In the same way, to a student who works through *External Insect-Anatomy* from the beginning, such terms as meso-coxa-cava, meso-trocasuture (the hyphens are ours) bring to mind something very definite and intelligible. All the other terms employed by the author are perfectly in keeping with his system.

Even if Dr. MacGillivray's intensive system of terminology be not generally adopted in its entirety, his system of instruction certainly provides students with an analytical training in morphology and taxonomy more thorough and complete than any other system yet produced. It is a training and system which has already brought forth results, and, as students of several grades of entomological standing, we find that we can assimilate *External Insect-Anatomy* in the hours assigned, without burdening our souls or wearying our bodies. In the case of men already engaged in active entomological work, there are some, no doubt, who may find this book apparently very cumbersome and perplexing; to students acquiring a knowledge of morphology for the first time, as we are, it presents no such hardships as Dr. Kinsey anticipates.

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*Present Students of Dr. MacGillivray.*


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## Doings of Societies.

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

Meeting of September 27, 1923. Director Philip Laurent in the chair; ten persons present.

GENERAL.—The spring excursion to Castle Rock was discussed and exhibits made; Mr. Cresson reported the discovery of two new species of Diptera in his collection. Dr. Calvert exhibited a photograph of the bronze tablet commemorating the services to natural sciences and the British Museum, of F. D. Godman and O. Salvin. Dr. Calvert called attention to several recent criticisms of the Comstock-Needham wing venation terminology, which brought forth general discussion on the merits and defects of that system.

LEPIDOPTERA.—Dr. Skinner exhibited lepidopterous larvae which were sent to the Academy as being injurious to dahlias in cultivation; he could not determine the species. Mr. Hornig exhibited larvae of *Chlorippe clyton* in a breeding jar. He also exhibited specimens of *Colias amphidusa* var. *keewaydin*, captured in the city September 10th; also specimens of *Vanessa j-album*, captured here August 28th. Mr. Laurent reported the

capture, by Arthur H. Napier, of *Eurytius amphidusa*, on September 2nd, on the meadows in the lower part of Philadelphia. The speaker stated that to the best of his knowledge, this was the first record for this butterfly in Philadelphia or its vicinity.

ODONATA.—Mr. Laurent exhibited a pair of *Celithemis cponina*, which he had collected on Deal Lake, near Palatine, New Jersey, on July 27, 1923, when this species was very common. The male has the bands on the wings complete, while in the female the nodal band was broken into two distinct spots on both front and hind wings. The pterostigmal band of the female was very narrow (2.5 mm., maximum). Mr. Laurent presented this female to the collection of the Academy. Dr. Calvert made an interesting communication on the genus *Philogenia*, showing the specific differences in the genitalia of some of the species. Dr. Calvert also reported the presentation of the type of *Enallagma pallidum* Root, to the collection by its describer, Dr. F. M. Root.

COLEOPTERA.—Mr. Haines reported digging up a colony of *Copris carolina* at Riverton, New Jersey.

ORTHOPTERA.—Mr. Hornig exhibited specimens of *Gryllus domesticus* and reported finding them in large quantities in some houses in West Philadelphia; he said that they were observed swarming in masses at night, apparently coming from nearby dumps.

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Meeting of November 15, 1923. Director Philip Laurent presiding; eight persons present.

GENERAL.—Dr. Skinner spoke about the trouble which the last tariff law has given the students of entomology, and the inconvenience it has given him on consignments sent to the Academy, especially when the same were addressed to individuals in the Academy. The speaker also told of the measures he has taken in trying to remedy the situation.

The death, November 7, of Mr. Philip Nell, a Contributor, was announced, and on motion it was voted that a letter of regret and condolence be sent to his sister.

Mr. R. T. Davis was elected a Contributor.

LEPIDOPTERA.—Dr. Skinner called attention to the latest volume of *Etudes de Lepidopterologie Comparee*, by Charles Oberthür, a copy of which was exhibited. He considers this one of the finest entomological works at present published, and that the quality of the illustrations cannot be surpassed; it not only figures the insects but in numerous cases photographs of the habitats of types are given. The illustrations of the Boisduval types of American species, presented in several of the earlier

parts, have made possible the identification of those species, many of which were not thoroughly understood.

DIPTERA.—Mr. Cresson exhibited the Academy's collection of the dipterous family Micropezidae, containing some 350 specimens, representing 90 species and 25 genera. This represented a growth since 1900 from 100 specimens, 5 genera and 11 species, when the speaker began the study of this family.

The annual meeting of December 10, 1923. Director Philip Laurent in the chair; eight persons present.

The Treasurer's report showing a balance of \$67.47 was read and on motion referred to the audit committee. The treasurer's report of the Entomological News account was also read, showing a deficit of \$334.16. This condition was discussed by Dr. Calvert, who showed that the deficit was more apparent than real, being mainly due to the delay in the renewals which usually come in early.

On motion the meetings for 1924 will be called at 7.30 P. M. on the following dates: Fourth Thursdays of January, May, September, third Thursday of November, and second Monday of December.

On motion a committee on Excursions was voted, consisting of Messrs. Williams, Rehn and Cresson, Jr., appointed by the chair.

The following officers and committee were elected to serve during the ensuing year: *Director*, Philip Laurent; *Vice-Director*, Roswell C. Williams; *Secretary*, James A. G. Rehn; *Treasurer*, Ezra T. Cresson; *Recorder*, Ezra T. Cresson, Jr.; *Conservator*, Henry Skinner; *Publication Committee*, E. T. Cresson, Philip P. Calvert and E. T. Cresson, Jr.

ODONATA.—Dr. Calvert made an interesting communication on the distribution of the species of the odonate genus *Philogenia*, followed by general discussion on the distribution of insects.

E. T. CRESSON, JR., *Recorder*.

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## OBITUARY.

With regret we record the deaths of HERBERT CAMPION at London, England, January 24; of Dr. L. PERINGUEY at Capetown, February 20; and of Prof. A. D. MACGILLIVRAY, at Urbana, Illinois, March 24. We hope to present notices of their work in entomology in later issues of the NEWS.

## 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.

**Lepidoptera. Hesperidae** (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.

**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 isocratia* ♂, *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.

**For Exchange.**—Living pupae of *Automeris io* and *Papilio asterias* and unnamed coleoptera from India for *Catocala* or *N. A. coleoptera*. Mrs. Robert Milde, Lewiston, Minnesota.

**For Exchange.**—I have for exchange live pupae of *Sphinx Chersis*, for other pupae or Lepidoptera in papers, Southern specimens. V. Tykal, 2412 S. Harding Ave., Chicago, Ill.

**Will pay cash** for specimens of rare and unusual **Scarabaeidae** (named—Leng's Catalogue). Send list and prices to Wm. C. Wood, 51 Fifth Ave., New York, N. Y.

**Wanted**—*Psyche*, Vols. I, XI, XIII, and Bulletin, Brooklyn Entomological Society, Vols. I, II, III. H. C. Severin, State Entomologist, Brookings, South Dakota.

I have living pupae of *io*, *imperialis*, *regalis* and others, also caterpillars of *Eupanthia deflorata* and spp. of Coleoptera for exchange. Address V. Harnach, 47 West College St., Asheville, N. C.

**Correspondence invited** from all those interested in Hungarian insects; Coleopt., Lepidopt., Hymenopt., Hemipt., etc.—Prof. Charles Sajo, Oerszentmiklos, (Komitat Pest) Hungary.

**Will exchange** lepidoptera of Pennsylvania for those from other parts of the continent. Frank H. Chermock, 1308 Tell Street, N. S., Pittsburgh, Pa.

**Wanted:** Living pupae of American silk-producing moths. W. S. Lowe, 35 Craven St., W. C. 2, London, England.

**Wanted:** For cash. Bred or perfect caught specimens, of *Sphinx luscitiosa*, *Paonias astylus*, and *Deidamia inscriptum*. Bred specimens of other species of Sphingidae, of the rarer sorts, would also be desirable. John M. Geddes, 331 High St., Williamsport, Pa.

**Wanted**—American sawflies, Tenthredinoidea, in exchange for other insects, chiefly Coleoptera. Correspondence may be in English. D. Dovnar-Zapolsky, P. O. Box 573, Agricultural Experimental Station, Entomological Section, Rostov on Don, Russia.

**Have** a number of pamphlets and books on *N. A.* and exotic *Cerambycidae*. Will exchange these for certain families of *Heteroptera* and *Tabanidae*. G. Chagnon, P. O. Box 521, Montreal, Canada.

# RECENT LITERATURE

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## DIPTERA.

- 839.—Landis (E. M.).—A tabular account of the structural differences between the four larval instars of *Culex pipiens*. (Trans., 49, 25-42, 1923) ..... .35

## COLEOPTERA.

- 844.—Davidson (W. M.).—Biology of *Scymnus nubes* Casey. (Trans., 49, 155-163, ill., 1923) ..... .20

## LEPIDOPTERA.

- 842.—Braun (A. F.).—Microlepidoptera: notes and new species. (Trans., 49, 115-127, 1923) ..... .25
- 843.—Skinner & Williams.—On the male genitalia of the Hesperiidæ of North America. Paper III. (Trans., 49, 129-153, ill., 1923) ..... .30

## NEUROPTERA.

- 841.—Dodds (G. S.).—Mayflies from Colorado. Descriptions of certain species and notes on others. Trans., 49, 93-114, 2 pls., 1923) ..... .50

## ORTHOPTERA.

- 840.—Rehn (J. A. G.).—North American Acrididæ. Paper 3. A study of the *Ligurotettigi*. (Trans., 49, 43-92, 2 pls., 1923) ..... 1.00
- 845.—Hebard (M.).—Studies in the Dermaptera and Orthoptera of Colombia. Paper III. Orthopterous family Acrididæ. (Trans., 49, 165-313, 8 pls., 1923) ..... 3.25

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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.

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**Wanted**—Second-hand sets in good condition of Howard, Dyar and Knab's "Mosquitoes of North and Central America and the West Indies," 4 v., 1912-1917, published by the Carnegie Institution, Washington, D. C. Will persons having copies they are willing to sell please communicate with the

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# ENTOMOLOGICAL NEWS

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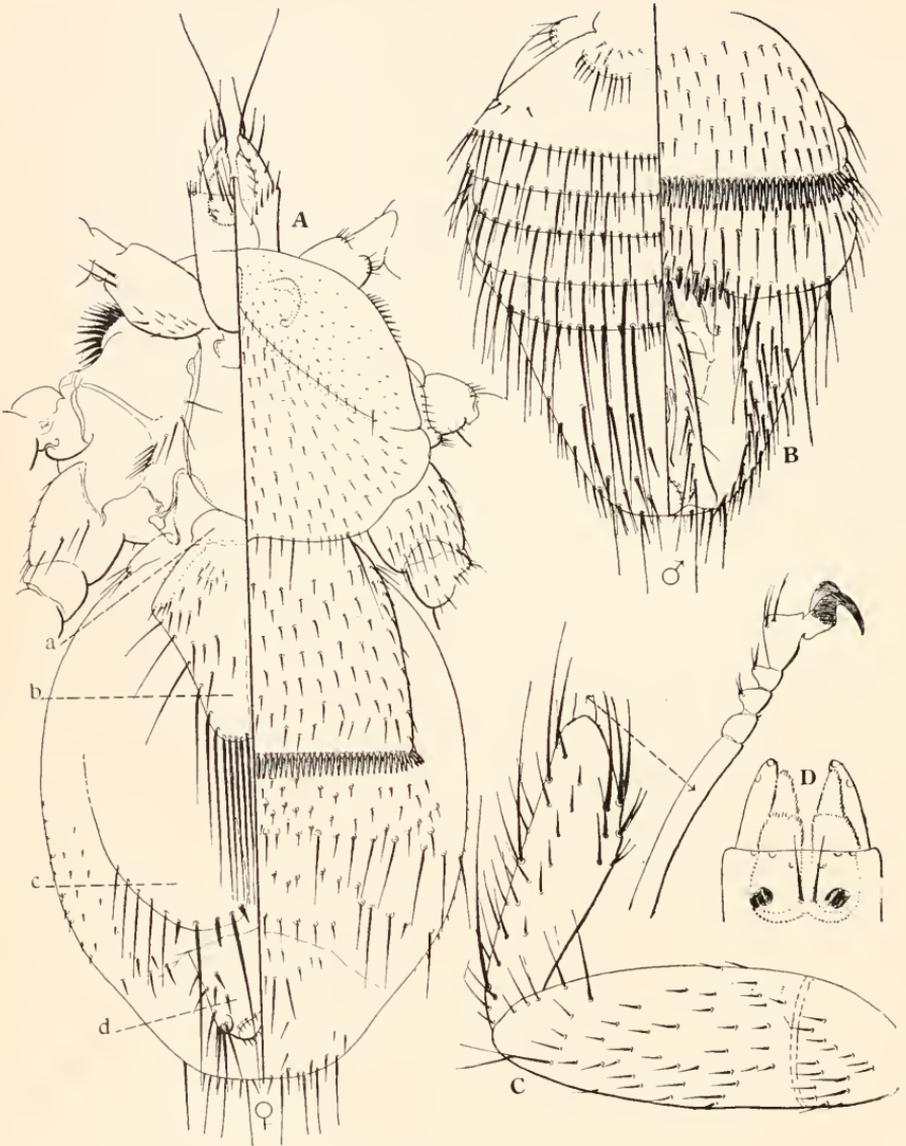
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Of the Entomological Section of The Academy of Natural Sciences of Philadelphia, and of The American Entomological Society will be held at 7.30 o'clock P. M. on the following dates during 1924: January 24, February 28, March 27, April 24, May 22, September 25, October 23, November 20, and Dec. 8.

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BASILIA SPEISERI (RIBIERO). A, FEMALE; B, ABDOMEN OF MALE; C, ANTERIOR LEG; D, EYES. IN FIGURES A AND B THE LEFT HALF IS THE DORSAL, THE RIGHT HALF THE VENTRAL, ASPECT.—FERRIS.

# ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXV

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## CONTENTS

Ferris—The New World Nycteribiidae (Diptera Pupipara).....	191	Editorial—The Ages of Some Existing Entomological Journals.....	216
Coolidge—The Life-History of <i>Mitoura loki</i> Skinner (Lepid.: Lycaenidae)	199	Lacroix—The Occurance of an Important European Parasite in North America (Hymen.: Elachetidae).	217
Chamberlin—Preliminary Note upon the Pseudoscorpions as a Venomous Order of the Arachnida.....	205	Entomological Literature.....	218
Aldrich—The Muscoid Genus <i>Genea</i> in North America (Dipt.).....	210	Doings of Societies—The American Entomological Society (Lep., Col.)	222
Curran—On the Identity of the Genus <i>Ernestia</i> R. D. (Tachinidae Dipt.).	214	Obituary—Alexander Dyer MacGillivray .....	224
		Correction.....	228

### **The New World Nycteribiidae (Diptera Pupipara).**

By G. F. FERRIS, Stanford University, California.

(Plate III and Text figure 1.)

The bat-infesting family Nycteribiidae, of the Diptera Pupipara, seems to be very weakly represented in the Western Hemisphere. Up to the present time but eight species have been described from North and South America together, while from the remainder of the world approximately sixty have been recorded. This disparity has been noted by Speiser and Scott, the two recent authorities upon the group, and that it actually expresses a biological condition is attested by the experience of the present writer.

Some years ago I examined the alcoholically preserved bats in the United States National Museum, going over the entire collection. The examination was quite fruitful, so much so that the resulting collection of bat parasites is probably among the largest now extant. The American bats were naturally well represented in the material examined, yet from them but three species of Nycteribiids were obtained. It became very evident

in the course of the examination that the American bats are actually much less infested, both in regard to the number of individuals as well as the number of species of parasites than are the Old World bats. The actual center of abundance seems to be in the region of the Indian Ocean, as the two authors mentioned have previously noted.

In presenting a report upon the available American material of the Nycteribiidæ, I am taking advantage of the opportunity to give a resumé of the group as represented in the New World. The material upon which the report is based has come largely from the bats in the National Museum, although certain material from other sources is available. Representatives of all the species obtained from the National Museum will be deposited in the collections of that institution. The remainder of the material is in the Stanford University collection.

#### THE NEW WORLD GENERA.

The New World species of this family have been referred to under five generic names, *Nycteribia*, *Penicillidia*, *Cyclopodia*, *Basilis* and *Pseudelytromyia*. Of these I am recognizing but two, *Basilis* and *Nycteribia*. The reasons for rejecting the others will be discussed in connection with the last two genera.

These two genera may be recognized by the following key, which is based upon the work of Speiser and Scott.

1. With distinct thoracic and abdominal ctenidia; tibiae not ringed.
2. Eyes present, two-faceted.....*Basilis*.  
Eyes entirely lacking.....*Nycteribia*.

#### Genus *Nycteribia* Latr.

Two North American species, *N. mexicana* Bigot and *N. antrozoi* Townsend, originally described in this genus, are now referred to *Basilis*. Two South American species, *N. flava* Weyenberg and *N. bellardii* Rondani, are retained in it, for the present at least, although in the case of the former the position is doubtful.

*Nycteribia bellardii* Rondani.

1878. *Nycteribia bellardii* Rondani, Ann. Mus. Civ. Genova 12:152.

1901. *Nycteribia (Acrocholidia) bellardii* Rond., Speiser, Arch. f. Naturgesch. 67 (1):46.

Records. From *Phyllostoma* sp., Brazil.

Notes: Speiser (ref. cited) has redescribed the female of this species. Its position as a member of the genus *Nycteribia* may be regarded as fairly definite.

#### **Nycteribia flava** Weyenberg.

1881. *Nycteribia flava* Weyenberg, Ann. Soc. Cientif. Argentina 11:104.

1901. *Nycteribia (Acrocholidia) flava* Wey., Speiser, Arch. f. Naturgesch. 67 (1):62.

Records. From *Vespertilio (Vesperugo) velatus*, Argentina.

Notes: Speiser has merely listed this species, apparently with doubt, under the sub-genus *Acrocholidia* of *Nycteribia*. I have not seen the description.

#### Genus **Basilia** Ribiero.

1903. *Basilia*, Ribiero, Archivos do Museo Nacional do Rio de Janeiro 12:175.

1907. *Pseudclytromyia*, Ribiero, ibid. 14:233.

1908. *Basilia*, Speiser, Zeits. f. Wiss. Ins. Biologie 13:437.

1913. *Cyclopodia*, Brethes, Bol. del Museo Nacional de Chile, pp. 1-4, figs.

The genus *Basilia* is distinguishable from *Penicillidia* only by the fact that in the former the eyes are two-faceted, while in the latter they are one-faceted. This distinction holds and may possibly be valid, although I am somewhat inclined to be dubious as to its importance. Actually *Penicillidia dufouri* (Wesw.), the type of *Penicillidia*, is not so very different from the forms referable to *Basilia* and I have, in the case of some other members of the family, seen some evidence that the character of the eyes is likely to be misleading. However, I am accepting the genus *Basilia*. On the other hand the genus *Pseudclytromyia*, as Speiser has pointed out, seems not at all worthy of separation from *Basilia*.

Brethes (ref. cited) seems to have been very much confused as to generic characters in this group, inasmuch as he placed *Basilia* as a synonym of *Cyclopodia*. There is no evidence that *Cyclopodia* occurs in the New World.

A discussion of the generic characters of the genus *Basilia*

may not be out of place and may be illustrated by reference to the figures of *B. speiseri* (Ribiero) (Plate III).

In the four species examined by me there is a rather close adherence to a certain general type. The head appears to be normally rather elongate and slender, although in some specimens it is somewhat conical, probably because of distortion. It is almost destitute of setæ except for a very few between and in front of the eyes and along the cephalic margin. The eyes are usually distinctly two-faceted, although in some specimens the facetting is somewhat obscure, possibly because of an unfavorable angle of view. The palpi are characteristically slender and tipped by a long seta and several other shorter setæ.

The thorax is in general somewhat wider than long, without any markedly distinctive characters. The thoracic ctenidia are well developed and contain numerous teeth. The legs (Pl. III, Fig. C) have the femur and tibia slightly flattened, the latter strongly haired, the setæ on the inner margin especially stout and arranged in two or three series on the apical half.

The abdomen of the female, as in all the members of the family, is difficult to describe because of the extensive membranous areas and the difficulty of homologizing the parts. After a careful comparison of the four species available I have adopted the view that there are four dorsal areas which may be homologized throughout. These four areas appear as the tergites of individual segments but that they are so is extremely doubtful. It is possible that they are really compound, being formed by the fusion of two or more segments. In order to avoid an expression of opinion as to which segments they may represent I am simply referring to them as tergites *a*, *b*, *c* and *d*. Tergite *a* (the basal tergite) varies from a very small piece in *B. speiseri* to one occupying nearly one-third of the dorsal aspect of the abdomen in *B. antrozoi*. Tergite *b* is divided by a longitudinal median suture into two lobes which may be approximate as in *B. speiseri* and *B. forcipata* or very widely separated as in *B. corynorhini*. The apices of these lobes are usually beset with long setæ but are not so in *B. corynorhini*. Tergite *c* consists of a pair of lobes separated by a median membranous area as in *B. speiseri*, *corynorhini* and

*antrozoi* or fused into a single piece as in *B. forcipata*. It is characteristically tipped by long setae. Tergite *d* is a part of the apical segment which bears the anus. At times this segment may be so retracted that it is scarcely visible from the dorsal aspect.

The ventral side is even more difficult to describe definitely because of the greater membranous areas. There are seven pairs of spiracles, these borne along the lateral margins and usually somewhat difficult to distinguish because of their small size and the numerous setae and tubercles. The basal sternite bears a ctenidium with as many as sixty teeth.

The male is similar to the female in the form of head and thorax, but as in all the members of the family, the abdomen is very different. There are seven very evident segments visible dorsally and there are seven pairs of spiracles but not more than five sternites can be recognized. The terminal segment is very broad and blunt and in all the species examined the forceps are long and slender. Specific characters are very poorly marked and the recognition of species from this sex when not associated with the female is very dubious. Species should not be described from the males alone.

### ***Basilia ferruginea* Ribiero.**

1903. *Basilia ferruginea* Ribiero, Archivos do Museo Nacional do Rio de Janeiro 12:175-9; pl. (Des. of male).

1907. *Basilia ferruginea* Rib., Ribiero, *ibid.* 14:231-2. (Des. of female).

*Records.* From *Vespertilio aurantus*, Minas Geraes, and *Atalapha frantzii*, Rio de Janeiro, Brazil.

Notes: The description of the male given by Ribiero is accompanied by an excellent figure, but unfortunately that of the female is not and will scarcely permit its positive recognition. As I have pointed out this practically precludes the identification of the species.

### ***Basilia mexicana* (Bigot).**

1885. *Nycteribia mexicana* Bigot, Ann. Soc. Ent. France (6) 5:245.

1902. *Penicillidia mexicana* (Bigot), Speiser, Zeits. f. syst. Hym. und Dipt. 2:171-2.

*Records.* From undetermined host in Mexico.

Notes: Speiser (ref. cited) has redescribed the type of this species but it is very doubtful that the species can be recognized from this redescription. This author regarded the species as possibly the female of *B. antrozoi* (Townsend) but at the best this was merely a guess. I am referring it to *Basilia* simply on the basis of probabilities, although there is no information as to the character of the eyes.

***Basilia antrozoi* (Townsend).**

1893. *Nycteribia antrozoi* Townsend, Jn. N. Y. Ent. Soc. 1:79. (desc. of male).

1902. *Penicillidia mexicana* (Bigot), Speiser, Zeits. f. syst. Hym. und Dipt. 2:172.

1916. *Penicillidia antrozoi* (Townsend), Ferris. Ent. News 27:434-5; pl. 22, f. 1-2. (Desc. of male and female).

*Previous records.* Recorded by Townsend from *Antrozous pallidus* in New Mexico and by Ferris from *A. pallidus pacificus* in California.

*Specimens Examined.* Those upon which the previous record by Ferris was based and the following: from *Antrozous pallidus pacificus*, Dulzura, Calif. (U. S. N. M.) and Stanford University, Calif. (J. C. Chamberlin): *A. pallidus minor* and *Myotis californicus*, Santa Anita, Lower California, Mexico (U. S. N. M.); *Corynorhinus macrotus pallescens*, East Painted Cave, Texas (U. S. N. M.); *Nyctinomus cynocephalus*, New Orleans, La. (U. S. N. M.).

Notes: While this species appears to be characteristically a parasite of *Antrozous*, the records given above indicate its occurrence on other hosts, unless there has been some mixing.

***Basilia corynorhini* (Ferris).**

1916. *Penicillidia corynorhini* Ferris, Ent. News 27:435-6; pl. 23, f. 3.

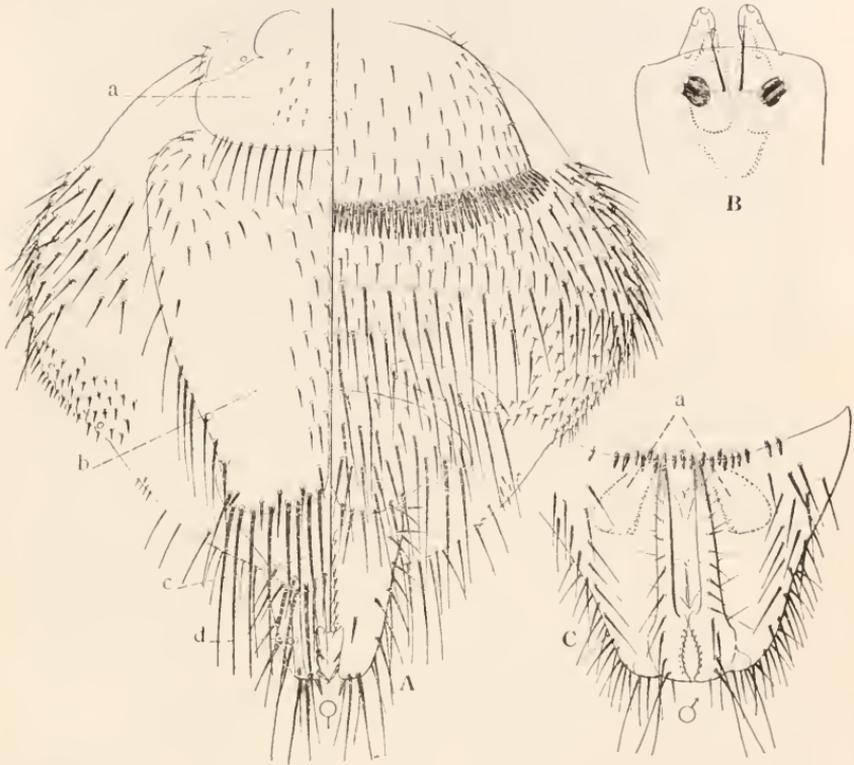
*Records.* Known from a single female from *Corynorhinus macrotus pallescens*.

Notes: I have nothing to add to the original description.

***Basilia forcipata* n. sp., Text-fig. 1.**

*Specimens examined.* Holotype (a female) and allotype and one paratype male from *Myotis californicus quercinus*, Covina, Calif. (A. B. Howell): a single female from *Nyctinomus cynocephalus*, New Orleans, La. (U. S. N. M.): four females from *Myotis thysanodes*, Cloverdale Hills, New Mexico

(U. S. N. M.), one female from the same host at Hacienda La Parada, San Luis Potosi, Mexico and one from the same host at Old Fort Tejon, Calif. (both U. S. N. M.).



Text Fig. 1.—*Basilia forcipata* n. sp. A, abdomen of female, the left half the dorsal, the right half the ventral aspect; B, eyes; C, terminal abdominal segment of male from ventral aspect.

♀.—Length 2 mm. *Head* with the normal characters of the genus, the eyes (Fig. B) deeply pigmented and distinctly two-faceted. *Thorax* without distinctive characters.

*Abdomen* (Fig 1:A) with the apparent first tergite (a) quite large and with a row of setae along the posterior margin; second tergite (b) much elongate, occupying the greater part of the dorsal aspect of the abdomen, slightly narrower at the apex than at the base, divided longitudinally by a faint median suture; the surface with numerous small setae, the lateral margins with slender setae which become longer toward the apex,

the apex with a row of about eight long, stout setae on each lobe. Third tergite (*c*) quite short and broad, partially concealed by the second, with a cluster of three or four long and several smaller setae at each apical angle. Terminal segment (*d*) quite strongly chitinized, deeply divided into two rather slender lobes each of which bears three or four moderately long setae at the apex, several stout setae along the inner margin and a series of quite long setae along the outer margin.

Basal sternite occupying perhaps one-third of the length of the abdomen, beset with numerous short setae and with a ctenidium of approximately sixty teeth. The connexivum caudad of the basal sternite bears two distinct transverse rows of long setae and is thickly beset with short setae which extend somewhat to the dorsal aspect. Caudad of these setae is a pair of small, oval plates, each with a number of moderately long setae. Caudad of these is a short, broad plate with numerous slender setae and caudad of this the terminal segment.

♂.—The male is of the type common to the genus, so very closely resembling that of *B. speiseri* that it is scarcely distinguishable. It seems to be characterized chiefly by the presence on the terminal segment of a pair of internal chitinous structures (Fig. 1 *C.a*) of doubtful homology. Length 2 mm.

*Basilia speiseri* (Ribiero). Pl. III.

1907. *Pseudelytromyia speiseri* Ribiero, Archivos do Museo Nacional do Rio de Janeiro 1:233-5; pl. 23; pl. 24, f. 2-4.

*Previous records.* From *Atalapha frantzii*, Quinta de Boa Vista, Rio de Janeiro, Brazil.

*Specimens examined.* Eleven females and ten males from *Myotis nigricans*, Sipurio, Costa Rica (U. S. N. M.).

Notes: The description and figures given by Ribiero are sufficient to permit the reasonably certain determination of the species, but as it has been used as the type of a genus I am here figuring and describing it in somewhat more detail.

♀. (Pl. III, Fig. *A*).—With the general characters of the genus as described. Abdomen with the basal tergite (*a*) very small and inconspicuous, without setae. Second tergite (*b*) occupying about one-third of the length of the abdomen, divided by a faint median suture into two lobes, each of which bears six to eight, long, slender setae at the apex and a few slender setae along the margin. Third tergite (*c*) composed of two well separated, broad lobes which are destitute of setae except along the posterior margin where there are two or three very long and two or three short, stout setae and along the lateral margin where

there are a few slender setæ. Tergite four (*d*) short, the apices of the inconspicuous lobes with three or four stout setæ.

Basal sternite occupying nearly one-half the length of the abdomen, the ctenidium with approximately sixty teeth. Remainder of the ventral side entirely membranous. Four transverse rows of setæ of various lengths may be distinguished and the surface is sparsely beset with small, scattered setæ.

♂. (Pl. III, Fig. *B*).—The male presents no specially distinctive characters and I am unable to indicate any positive characters by which it may be separated from the male of *B. antrozoi* or, on the basis of Ribiero's figure, from the male of *B. ferruginæ*. From the male of *B. forcipata* it may be separated as indicated in the description of the latter.

### *Basilia silvæ* (Brethes).

1913. *Cyclopodia silvæ* Brethes, Bol. del Museo Nacional de Chile, pp. 1-4, figs.

Notes: The original description of this species is not available to me. I am referring it to *Basilia* on the basis of a statement by Scott<sup>1</sup> to the effect that Brethes had placed *Basilia* as a synonym of *Cyclopodia*, which it certainly is not and on the basis of a strong probability that *Cyclopodia* is not represented in the New World.

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## The Life-History of *Mitoura loki* Skinner (Lepid.: Lycaenidae).

By KARL R. COOLIDGE, Hollywood, California.

*Mitoura loki*, known only from Southern California, was described from specimens taken by W. S. Wright, at Mt. Springs, San Diego County, California, July 5th, 1906, and this type locality appears to be the only habitat thus far recorded. On May 31st, 1920, I caught a worn female of *loki* in Mint Canyon, about fifty miles northeast of Los Angeles, a region very similar to that in which the species was discovered. This past season *loki* was found to be plentiful in this locality and long series were netted by local collectors.

On April 29th, I took twenty specimens, mostly fresh females. The males were more or less worn, indicating that the species had been in flight a week or more. Mint Canyon leads into

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<sup>1</sup>Scott, H. Parasitology 9: 606. (1917.)

Palmdale, where begins the Mohave Desert, and it is here that the Juniper belt becomes a conspicuous part of the flora, though isolated clumps of Juniper are to be found but a few miles out of Los Angeles.

California Juniper (*Juniperus californica* Carr) is a bushy shrub two to fifteen feet high, or sometimes a tree up to twenty-five feet in height. It is at home principally in the arid desert foothills, being most abundant on the western Mohave Desert, especially along the desert slopes of the Sierra Madre, Sierra Liebre, Tehachapi and San Bernardino ranges. Southward, the Juniper belt continues along both slopes of the San Jacinto Mountains into Lower California; northward, in the Sierra Nevadas to Kern River Valley, and at scattered intervals along the inner Coast Range as far north as Mt. Diablo, in Contra Costa County; westward, to the San Rafael Mountains. A narrow belt also occurs in Lake County. It is quite possible that *loki* will be found to occur throughout the entire range of its food-plant.

Three female *loki* were confined with sprigs of Juniper on April 29th, and on the following day five eggs were laid. A time record of the transitions follows:

Eggs laid April 30th.	Passed third moult June 16th.
Hatched May 9th.	Passed fourth moult June 28th.
Passed first moult May 20th.	Suspended July 8th.
Passed second moult June 4th.	Pupa disclosed July 11th.

As Mr. Wright's specimens were taken in July, and mine in April, I suspected that there might be two broods, and so visited Mint Canyon on a number of occasions throughout July. No imagoes were encountered, however, and as my pupae also failed to disclose, I am now satisfied that there is but one brood and that the flight of this extends over a considerable period of time.

The eggs are placed on the tips, or close to the tips, of the food-plant, sometimes tucked in between the chinks of the overlapping scales. In all cases where I found the eggs in nature, the concealment was very poor, the eggs showing up conspicuously against the dark green coloration of the food-plant.

In hatching, the young larvae escape by eating out rather

large holes in the summit or side of the egg, more often the latter, and once free from the shell do not devour any more of it. The habits of the larvae are very similar to those of other species of *Mitoura*. They attack only the tips of the sprigs of Juniper, the first thoracic segment covering the head while feeding as though with a cowl. During the moulting periods the larvae crawl back a considerable distance from the tips.

*The Egg.*—In shape a greatly depressed echinoid, with the summit but slightly depressed and as broad as the base. The micropyle not greatly depressed, .10 mm. in diameter, of a deeper green than rest of egg; the micropyle rosette composed of about a dozen nearly uniform round cells, .02 mm. in diameter, outlined in but scarcely raised yet distinct delicate lines.

Surface of egg profusely studded with large elevated conical protuberances, .02 mm. in height and .04 mm. in breadth at base, connected with one another by fairly distinct, slightly irregular ridges, which run up the protuberances as buttresses. These conical protuberances, with their connecting ridges, form quadrate or subtriangular cells, averaging .04 mm. in diameter, and not disposed with any definite regularity. The surfaces of the cells minutely punctate.

Color, a very delicate pale green, with the raised net-work white. Diameter .76 mm. Height .42 mm.

*Larva, First Instar.*—Head smooth, shining, pale brown, .24 mm. in width; ocellar field black; frontal triangle outlined in reddish brown; mouth parts red brown.

A supralateral series of papillae, one to a segment on either side, located on anterior margin of segment and bearing a short, straight, sharp, colorless, spiculiferous hair, but .06 mm. in length. A laterostigmatal series of papillae, one to a segment on either side, located in line with the supralateral series and bearing hairs of about the same length. Two laterodorsal conical papillae on either side, with the arising hairs .60 mm. in length, colorless, spiculiferous, arcuate. These papillae are nearly equal, centrally located on the segments, .04 mm. in height, of the body ground color except the summit, which is fuscous-ringed.

Substigmatally, four fuscous papillae, bearing outwardly directed, fairly straight, sharp, colorless, rather heavily spiculiferous hairs, .20 mm. in length. Between the laterodorsal series of papillae and the stigmata two smooth naked hemispherical lenticles, the inner one the larger, .02 mm. in diameter; the outer .01 mm. in diameter, and a little back of the larger.

On the last compound segment a curving series of similar lenticles, slightly unequal in size, just ahead of a circular coriaceous depression. On first thoracic a similar but lozenge-shaped shield, laterally produced. Stigmata obovate, .009 mm. in diameter, with a fine fuscous ring.

Color of body a rather deep lemon yellow, somewhat tinged with green along the dorsal area. As the larva feeds it becomes more and more of a dark green, with irregular blotchings of reddish brown, until finally the original coloration is entirely obscured. Ventral surface and prolegs slightly brighter yellow than above; legs very pale subhyaline shining yellow. First thoracic segment pallid.

Length, at birth, 1.18 mm. Width at first thoracic segment .32 mm. Width at anal segment .28 mm.

*Second Instar.*—Head smooth, shining, pale red brown, .60 mm. in width; ocellar field black.

Whole body bristling with numerous straight sharp spiculiferous hairs, arising from narrow red brown tubercles, .02 mm. in height, or less for the smaller hairs. These hairs varying in size, the longest .30 mm. in length, the shortest .06 mm. They are nearly all reddish brown tinged, only a few being colorless. Spiracles obovate, .02 mm. in diameter, with a fine brown ring. Dorsal shield pale brown, subtriangular.

Body now green, irregularly mottled with blotchings of reddish brown, but as the stage proceeds these blotchings fade into deep green. Substigmatically, the green coloration is replaced by a more vivid yellow green, to the naked eye appearing as a fairly well defined stripe, and becoming more and more yellowish, with less green, as the instar advances. Prolegs and ventral surface pale gray green; legs very pale reddish brown, subhyaline.

Length 2.60 mm. Width at first thoracic segment .65 mm. Width at second thoracic .80 mm. Width at anal segment .54 mm.

*Third Instar.*—Head smooth, shining, pale brown, .88 mm. in width; ocellar field black.

Whole body, as in previous stage, bristling with numerous straight sharp spiculiferous hairs, arising from red brown tubercles. The hairs averaging .28 mm. in length, mostly reddish brown tinged, only a few being colorless. Spiracles obovate, .035 mm. in diameter, with a fine brown ring. Dorsal shield pale brown, subtriangular.

Body in color deep green. The infrastigmatal yellow band more strongly developed, increasingly so as the stage develops. Prolegs and ventral surface a pale gray green; legs subhyaline pale reddish brown.

Length 3.40 mm. Width at first thoracic .90 mm. Width at anal segment .80 mm.

*Fourth Instar.*—Head smooth, shining, pale brown, 1.20 mm. in width; ocellar field black; frontal triangle and mouth parts fuscous.

Whole body as before, bristling with numerous sharp, straight, spiculiferous hairs, varying in size, some as short as .08 mm., others up to .35 mm., and arising from narrow red brown tubercles. Hairs prominently reddish brown tinged, quite heavily infuscated at tips, a few hairs colorless. Spiracles obovate, .045 mm. in diameter, with a fine brown ring. Dorsal shield pale brown, subtriangular.

Body in color deep green, laterally with irregular blotchings of a still deeper green. The crenate infrastigmatal yellow band conspicuous, and increasing in prominence as the instar proceeds. The dorsal ridge bordered on either side with a line of green-yellow, not as prominent as the infrastigmatal stripe. Ventral surface and prolegs bluish green; legs very pale reddish brown, subhyaline.

Length 4.20 mm. Width at first thoracic segment 1.30 mm. Width at anal segment 1.15 mm.

*Fifth Instar.*—Body largest anteriorly, tapering only slightly posteriorly, but rapidly on final two abdominal segments. Anal segment well rounded and at extreme tip subtruncate. Body rather strongly hunched, falling off abruptly at posterior margin, with three median depressions: a dorsal, very slight; one lateral, more distinct; the third much deeper and connecting with the one above so as to form a C, open anteriorly, and in the deepest part of which the spiracles are situated. On second thoracic the two upper depressions run together into a transverse sulcus.

Head smooth, shining, pale brown, 1.40 mm. in diameter; ocellar field black; frontal triangle and mouth parts fuscous.

As before, whole body bristling with numerous straight, sharp, spiculiferous hairs, arising from rather high but narrow tubercles, averaging .04 mm. in height with the issuing hairs varying in size, from .12 to .40 mm. in length. For the most part the hairs are strongly tinged with reddish brown, only a few, and these usually the shorter ones, being colorless. Spiracles broadly obovate, pallid, with a fine brown ring, .08 mm. in diameter. Dorsal shield of first thoracic rather deep, pale brown, lozenge-shaped with emarginate sides.

Body in color dark velvety green, considerably deeper green than the sprigs of Juniper. The yellow sublateral dashes conspicuous, slightly oblique, more or less tinged with green; the

dashes sublunate, largest anteriorly, on first thoracic more or less obscure. The infrastigmatal band also composed of yellow dashes, but here straighter and slenderer, and forming more of a continuous band. But as the instar goes on, both of these series of dashes change from yellow to white. Half way between, on posterior edge of segments, a short, straight, greenish white bar, not at all conspicuous. Ventral surface and prolegs concolorous with above; legs pellucid yellow green basally, fuscous tipped.

Length 11. mm.; at maturity 14.50 mm. Width at first thoracic segment 3.10 mm. Width at anal segment 2.60 mm.

*Chrysalis*.—Viewed from above: Thorax shorter and considerably narrower than abdomen, scarcely narrowing at junction to abdomen; narrowing considerably anteriorly, well arched, head prominence not sharply breaking regularity of curve, basal wing tubercles weak. Abdomen regularly curved, broadly rounded at the posterior segment.

Viewed laterally: Abdomen considerably higher than highest point of thorax. The junction between the thorax and abdomen indicated by a well-rounded hollowing. Thorax most prominent just back of middle of mesothorax, curving thence forward and downward rapidly. Abdomen roundly arched, highest at third and fourth segments. Posterior abdominal segments sloping a little more rapidly than thoracic segments, the last abdominal segment posteriorly being perpendicular. Ventrally flattened.

Whole body marked with an interlacing net-work of raised lines, not disposed in any regularity of pattern, and with the points at the intersections sometimes slightly raised so as to form minute naked warts. These raised lines slightly darker than ground color, low and equal, forming rather large cells, which are profusely sprinkled with minute ovate punctulations. Another series of larger warts, in the cells formed by the raised lines, or on the lines themselves, rather profusely and irregularly scattered, .02 mm. in diameter and concolorous with body. These larger warts give rise to short, sharp, spiculiferous hairs, generally very straight, only a few slightly curving, varying in size, some as long as .20 mm., others but .10 mm. The hairs dark brown in color. Spiracles long oval, luteous, white lipped, 1.4 mm. in length.

Color a rich wood brown, the abdomen blotched somewhat with ferruginous, but not conspicuously so. Length 8.50 mm. Greatest width of abdomen 4.30 mm. Greatest width of thorax 3.20 mm. Greatest height of abdomen 4. mm. Greatest height of thorax 3. mm.

## **Preliminary Note upon the Pseudoscorpions as a Venomous Order of the Arachnida.**

By JOSEPH CONRAD CHAMBERLIN, Stanford University,  
California.

Recently in the course of my studies upon the morphology of the Pseudoscorpions, I discovered what appear to be, with little doubt, the poison ducts of these animals and the point of their debouchement.

This discovery is of particular interest, inasmuch as they have heretofore been generally regarded as a non-venomous order of the Arachnida. Support of this view was largely of a negative character. They do not possess the caudal poison sting of the true scorpions and those glands which are almost surely the homologues of the poison glands of the spiders, are here modified into silk-secreting organs. These facts coupled with their small size and consequent inability to inflict spectacular injuries have largely contributed to this belief. Since the galea would eliminate the possibility of the silk secretion serving also as a venom (in most of the species at least), there remain but two effective ways in which they could function as venomous organisms.

In the first place we have the possibility of the saliva or some saliva-like secretion serving this purpose. This is rendered improbable, however, when we consider that the powerful pedipalpi typically reduce the prey to helplessness before it is even brought near the oral apparatus.

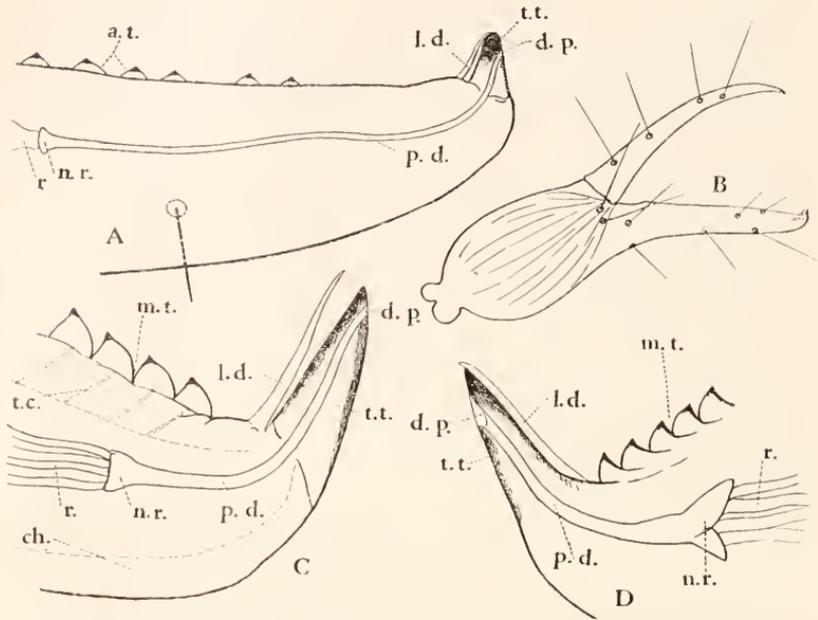
Then, as a final hypothesis, there is the possibility that the poison apparatus is situated at the tips of the fingers of the powerful chelate pedipalpi.

Consequently it is of more than ordinary interest to be able to report positive evidence of ducts debouching just at the point postulated by this third hypothesis.

A detailed description is unnecessary, the accompanying figures being self-explanatory. There are a number of points common to all types observed and these may be briefly noted.

The poison duct itself consists of a slender tube of variable length which debouches by means of a small pore situated on the outer curve of the terminal tooth of the finger, and just pos-

terior to its apex. Its posterior termination is a bulbous enlargement the *nodus ramosus*, from which posteriorly depart from one to four or five slender tubes, the *ramulus* or *ramuli*.



A—*Chelanops macrochelatus*, Tip of movable finger showing the poison apparatus of the Cheliferine type.

B—*Obisium carolinensis*, Lateral aspect of hand of pedipalpus showing diagrammatically the extent of the musculature and the arrangement of the tactile setae. Also the relative size and position of the poison ducts.

C—*Obisium carolinensis*, Tip of fixed finger showing the poison apparatus of the Obisiine type.

D—*Idcobisium* sp., Tip of fixed finger. Note peculiar modification of *nodus ramosus*.

Abbreviations: m. t.—marginal teeth; a. t.—accessory teeth; p. d.—poison duct; n. r.—*nodus ramosus*; r.—*ramulus* or *ramuli*; t. t.—terminal tooth; d. p.—debouchement of poison duct; l. d.—lamina defensor of terminal tooth; ch.—chitin; t. c.—“tooth canal,” running to base of marginal tooth through chitin of finger.

These ramuli probably immediately enter, and are surrounded by glandular tissue, although this latter point is not certain. As shown in fig. B, the musculature leaves sufficient space for such tissue even allowing for the ectoderm and the considerable amount of nervous tissue necessary to supply the long tactile setae and sense spots of the figures. An interesting structure is

found just posterior of the terminal tooth, which may possess some function in connection with the poison apparatus. This structure, which is here designated the *lamina defensor*, consists of a slender, translucent, blade-shaped process, usually a trifle longer than the terminal tooth and often closely appressed thereto.

The demonstration of the above described structures is very simple. Material which has been killed in alcohol and subsequently cleared in carbol-xylene shows them perfectly, without dissection of any sort.

They are definitely present in the Cheliferinæ and the Obisiidæ. My investigations are not complete but apparently they are absent in the Cheiridiinæ, the Garypidæ, the Feællidæ and the Chthoniidæ.

In the Obisiidæ (Figs. B, C & D) the poison duct is very short, the nodus ramosus being close to the terminal tooth, and the poison ducts occur only in the fixed finger of each hand. In the Cheliferinæ (Fig. A) the poison duct is elongate and the nodus ramosus is situated far from the posterior tooth, while the ducts occur in all four fingers.

There is no doubt about the presence of these ducts and, as a corollary, of the glands. The poisonous nature of their secretion then is the only questionable point and there are in the literature statements giving strong circumstantial evidence of its positive venomous character.

In the first place we have the observations of Bachausen. I quote verbatim the summary of these observations as given by Berger, 1905, pp. 412-413.

"Thus Prof. C. Berg reports that Bachausen in South America found a pseudoscorpion attached to the leg of a blow-fly and hanging free. He noticed after several hours that the legs of the fly became stiff. The next morning the fly was dead and the 'scorpion' sucked full under some scraps of paper. Bachausen next hungered a number upon moss under a glass and then gave them some small flies. The pseudoscorpions soon appeared and began to attach themselves to the legs of the flies by one pedipalp. . . . The legs of the flies soon became stiffened and when the flies died they dragged them into concealment. A tabanus is reported as dying much slower than the other flies. On the other hand, Muhlhausen does not find that

the fly's leg was stiffened by a *Chelifer cancroides*, which held fast for fifty-six hours or until it was drowned in a drop of milk. Nor did the microscope show any evidence of injury to the fly's leg. It occurs to me, however, that *C. cancroides* is one of the smaller species and consequently was not able to injure the fly's leg as an individual of a larger species could have done."

As to the exception reported by Muhlhausen, *Chelifer cancroides* does possess the poison apparatus here described and I can only reiterate Berger's comment, that it was probably due to the fact that the animal was unable to penetrate the hard chitin of the fly's leg. This also shows that the tiring effect of the pseudoscorpion upon the fly is not sufficient to explain the early death of the flies reported by Bachausen. Certainly the poisoning effect seems to be a slow one, but nevertheless truly existent. It is impossible to imagine a mere mechanical injury to a fly's leg causing its death in a few hours.

A second bit of evidence as to their truly venomous nature is given to us by Emile André, one of the few observers to state a positive belief in the poisonous nature of these animals. In 1908 he reported the case of a woman of Geneva who was bitten three times by a specimen of *Chelifer cancroides*, twice on the thigh and once on the back. The animal itself was captured in this latter situation. The bite caused a sharp, though slight, transient pain. Later the injured spot gave rise to a small, bluish, red-centered swelling which was painful upon pressure and at a higher temperature than the surrounding skin. He adds that the patient had immediately bathed the injured part with "une solution de sublimé au millième" and that it was possible that this had aggravated in some measure, the original injury. The first bites caused more severe pain than the last, probably on account of the diminished quantity of "saliva or venom" introduced into the wound.

The following paragraph is a free translation of his conclusions.

"Nevertheless it seems probable by reason of the above related facts, that a quantity of venom or saliva had been introduced into the little wound and for this reason we suppose that the chelicerae performed the function and not the palpi,

which as is generally known, do not possess a venomous apparatus. Furthermore it is probable that the chelicerae entered simultaneously and pinched the victim's skin."

While it is not impossible that some groups of the Pseudoscorpions (the non-galeate forms) could inflict a poisonous wound with the chelicerae, assuming the secretion of the silk glands to possess toxic properties in addition to their primary qualities, it would be impossible in those groups possessing chelicerae with a specialized spinneret or galea. In this connection it is interesting to note that the Chthoniidæ lack the galea and also the palpal poison apparatus and hence might well be studied with this possibility in mind. On the other hand the Obisidæ which also lack the galea, possess the palpal poison apparatus in a well developed form. *Chelifer cancrivorus* being a galeate form is incapable of inflicting a poisonous injury with the chelicerae and hence André's suggestion must be ruled out, the more so, since we now know that the pedipalpi in this form *do* possess the means of inflicting the venomous wound.

In view of the above presented evidence it seems fairly certain that:

The Pseudoscorpions may or may not, depending upon the group, possess a well developed poison apparatus situated in two or all of the fingers of the pedipalpi, again depending upon the group under consideration. This conclusion is supported by definite and positive physiological evidence of a circumstantial nature. The situation and character of this poison apparatus is, so far as known, unique among the Arachnida and serves to further accentuate the isolated position already held by this order.

*List of papers cited in the text* and some others having a bearing on the venomous nature of the pseudoscorpions. I have not examined those marked with an asterisk.

- 1893—BERG, C. Pseudoscorpioniden kniffe. Zool. Anz. Bd. 16.  
 \*1894—MUHLHAUSEN, HESS. Ueber Pseudoscorpioniden als Räuber. Zool. Anz. Bd. 17.  
 1905—BERGER, E. W. Habits and Distribution of the Pseudoscorpionidae, etc. (Cites Berg and Muhlhausen). Ohio Naturalist. Vol. 6; pp. 412-413.  
 1908—ANDRE, EMILE. Sur la piqure des Cheliferes. Zool. Anz. Bd. 33, pp. 289-290.  
 \*1909—ANDRE, EMILE. Les Faux Scorpions et leur morsure. Geneve Bul. Inst. Nat. pp. 277-280.

**The Muscoid Genus *Genea* in North America (Dipt.).**

By J. M. ALDRICH, United States National Museum,  
Washington, D. C.

Rondani established the genus *Genea* in 1850 (Nuov. An. Sci. Nat. Bologna, ser. iii, vol. ii, p. 172), with the type and sole species *maculiventris*, new, from Venezuela. He dedicated it to "my very dear friend and master lately deceased, Professor Joseph Gené." The accent should be on the second syllable, and it might well have been spelled *Genaea* to bring this out. Rondani's description is masterly and sufficient, and, on account of its inaccessibility, I translate it entire from the Latin.

"Genus **GENEA** mihi.

Third and fourth veins of the wing reaching the costa separately, the fourth curved, not angulate, and thence arcuate outwardly; hind crossvein more distant from the anterior one than from the bend of fourth. Antennae of ordinary length, reaching almost to the epistoma, inserted on the front well above the middle of the eyes, the third joint three times the second. Arista a little tomentose or with very short pilosity, the second joint short but distinct. Eyes bare. Frontal bristles not continuing upon the face. Proboscis filiform, quite elongated. Palpi cylindrical and long, reaching to the middle of the proboscis and distinctly beyond the epistoma. Abdomen with only marginal macrochaetae, not provided with forceps or large and stout appendages nor curved under. See figures 4-5. Related to *Myobia* and *Fischeria*.

"Species ***Genea maculiventris*** mihi, Patria Venezuela.  
Length: 7 mm.

Male. First two antennal joints and base of third fulvescent, remainder of the third black. Arista very briefly pilose, black. Face a little whitish-sericeous. Front fulvescent, the bristles in two rows. Facial ridges with hardly a single bristle above the vibrissae; some bristles around the peristome; frontals hardly produced below the root of the antennae. Palpi and proboscis pale at base, the latter blackish apically, the former with small black hairs above and below. Thorax lutescent, middle of the dorsum black, pleura with a small blackish spot and others on pectus, metathorax blackish in middle. Scutellum lutescent. Abdomen lutescent, the second segment above with a triangular black spot behind, and a black dot at either side on the hind edge; third segment with a median black vitta dilated behind

and a small black spot on the hind edge at each side; fourth segment with two small lateral black spots behind. First abdominal segment without macrochaetae, second with two marginals, third and fourth with several marginals. Legs lutescent, tarsi black. Wings subhyaline; first longitudinal vein wholly setulose above, third setulose to the small crossvein."

The National Museum has a Brazilian specimen, female, one of the old H. H. Smith collection that was purchased by Dr. Williston and afterwards secured by the American Museum of Natural History, from which Townsend obtained it. The exact locality is "Piedro B."\* It agrees perfectly with the description, and is very close to *texensis* Townsend. The black spots of the abdomen are smaller in all of our North American specimens except the one from Mexico, identified as *longipalpis* Van der Wulp, and we have none with the proboscis quite so elongated and slender, though the difference in this is not great. On the whole, after much consideration, I think it best to regard *texensis* and *longipalpis* as distinct species for the present, but further material may enable us to unite them with *maculiventris*.

In the table of Coquillett's Revision, *Genea* runs readily to *Leskiomima*, from which it separates by having long palpi; unless the proboscis is greatly retracted, the palpi project far beyond the epistoma in a very characteristic manner. Both *Leskiomima* and *Genea* have elongate form, yellow color, first vein hairy, arista pubescent, ocellar bristles small to minute and identical chaetotaxy. *Leskiomima* has but one described species, *tenera*. In this the male has long claws and pulvilli, and has no orbitals.

*Genea* has perhaps four species, but two may be synonyms. Besides the type species already noted these are the following:

***Genea analis* Say.**

*Devia analis* Say, Jour. Acad. Nat. Sci. Phil., vi, 1829, 177; Comp. Works, ii, 367.

*Leskiomima tenera* Wiedemann (in part), Coquillett, Revis. Tachin., 1897, 67 (the specimen from Chester Co., Pa.).

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[\* Possibly Piedra Blanca, Bolivia, four miles west of Corumbá, Brazil. H. H. Smith, quoted in Ann. Carnegie Museum, Pittsburgh, vi, p. 77. 1909.—Ed.]

Say's description being readily accessible, I will merely state that his specimen was a yellow fly 8.75 mm. long, evidently with the arista at least pubescent or he would not have called it *Dexia*, and he adds the important note, "The proboscis and palpi are much elongated."

Coquillett misidentified the species in his Revision and made it out the same as his own *Myobia depile*, there referred to the genus *Leskia*, while he placed a female belonging to *analis* in his lot of *Leskiomima tenera*, along with two specimens of the species later described as *texensis*. *Analis* in this mistaken sense was split up by Townsend into *Myobiopsis similis* and *Leskiopalpus calidus* (Proc. U. S. N. M., vol. 49, 1916, 628, 629); the latter of these is a synonym of *depile* Coquillett, as pointed out by Smith in Proc. Ent. Soc. Wash., xix, 1917, 125. All this, however, has nothing to do with the true *analis* as I make it out.

The National Museum contains the following material assigned by me to this species:

One male, Chain Bridge, Virginia, VIII, 3, 1923 (Aldrich); one female, same place and collector, VI, 25, 1923; one female, Great Falls, Virginia; IX, 20, 1917 (C. T. Greene); one female, Plummer's Island, Maryland, IX, 29, 1912 (P. R. Myers); one female, same, VIII, 5, 1914 (Shannon); one female, same, VIII, 18, 1912 (Malloch); one female, Chain Bridge, Virginia, on *Ceanothus*, VI, 23, 1916 (Greene); one female, Chester County, Pennsylvania, VIII, 25, 1895 (C. W. Johnson); and one female, Lafayette, Indiana, IX, 9, 1916 (Aldrich).

The differences between this and *texensis* are discussed below.

#### **Genea texensis** Townsend.

*Dejcaniopalpus texensis* Townsend, Proc. U. S. N. M., Vol. 51, 1916, 312.

*Leskiomima tenera* Wiedemann (in part), Coquillett, Revis. Tachin., 1897, 67 (the two specimens from New York City).

Townsend described the species from a single female labeled "Tex.," failing to observe two more specimens among Coquillett's set of *Leskiomima tenera*. The following material assigned by me to this species is in the National Museum:

One male, Virginia across the river from Washington, bred

by Pergande (No. 3661) from a Lepidopterous larva sp. (*Botys* sp.) which "curiously rolls up the terminal leaves of a fern into a perfect ball," VII, 3, 1885; one female, Texas, type of the species; two females, New York City, VIII, 8, 1890 (E. B. Southwick); one female, Pocono Lake, Pennsylvania, VII, 11, 1911 (Greene, in the Walton coll.); and one female, Ithaca, New York (Banks).

It will be observed that we have a single male of *analisis* and the same of *texensis*. The capture of the male of *analisis*, on Aug. 3, 1923, absolutely ruined the first draft of the present paper, which was committed to a single North American species of *Genca*, at least in the United States. This male proved conclusively that the material must be distributed between two species, a fact which could not be established from females alone.

The two males differ in the following characters:

That of *analisis* is larger (8.75 mm., exactly as given by Say); its front is .23 of the headwidth by micrometer, and has no orbitals; the claws and pulvilli are long on all the tarsi; the width of the third antennal joint is 5 and the length 15 by micrometer.

The male of *texensis* is smaller (6.5 mm.); the front is .30 of the headwidth, and has two pairs of orbitals; the claws and pulvilli are all small; the width of the third antennal joint is 6 and the length 13 by micrometer.

I can make out no other differences of any significance at all. The ones noted are sexual characters and would not show in the female, except size and the shape of the third antennal joint. Size of course is variable and may mislead; the three females first mentioned under *analisis* are large like the male, all the rest smaller and agreeing in this respect with *texensis*. I have depended most on the shape of the third antennal joint for placing the females; some agree with the respective males so as to leave little doubt of their relations, but several are intermediate and I am not quite sure to which they belong.

Rondani's statement that the frontals are in two rows in his male shows that orbitals were present, and his species is more nearly related to *texensis* than to *analisis*.

***Genea longipalpis* Van der Wulp.**

*Myobia longipalpis* Van der Wulp, *Biologia*, Dipt., II, 1890, 138.

A female identified as this by Townsend is in the National Museum. He placed it naturally under his *Dejeaniopalpus*. It is from San Rafael, Vera Cruz, Mexico, Mar. 8 (Townsend). It has a slightly shorter proboscis than our female of *maculiventris*, but is probably the same species. It seems prudent to see the male before definitely dropping the name into synonymy. Both of these specimens have a large, triangular median black spot on both second and third segment, the apex of the spot reaching to the front edge of the segment.

Obviously the genus *Dejeaniopalpus*, type *texensis*, is a synonym of *Genea*.

Brauer and Bergenstamm seem to be in error (*Zweifl. Kais. Mus.*, VI, 1893, 132) in making *Spathipalpus* Rondani (type *philippii* Rondani from Chile), a synonym of *Genea*. The Chilean species has the frontals extending upon the face, according to the description, and the palpi are spatulate. It is a black species, and may be a Dejeaniine with hairy first vein.

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**On the Identity of the Genus *Ernestia* R. D.  
(Tachinidae, Dipt.).\***

By C. HOWARD CURRAN, Ottawa, Ontario.

In his "Revision of the Nearctic Species of the Tachinid Genus *Ernestia* R. D." (*Can. Ent.*, Sept. 1921, p. 199 etc.), Dr. J. D. Tothill pointed out certain characters separating the various groups which he included under this genus. The chief characters of the subgenus *Meriana*, as outlined by him in the revision, were the absence of discal macrochaetae on the second abdominal segment and hairy parafacials. Neither of these characters can be regarded as of generic value in most cases, and they were not so considered by Tothill. Perhaps the most significant statement, from a generic standpoint, is the indication

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\* Contribution from the Division of Systematic Entomology, Entomological Branch, Dept. of Agric., Ottawa.

of primitive posterior (inner of Tothill) claspers, as these possess no "keel" in *Meriana*. The type species of *Ernestia* (*E. rudis* Fallen) has the same type of genitalia, while the majority of the species enumerated by Tothill have the posterior claspers more or less strongly keel-shaped.

A study of species treated by Tothill proves that there are two very easily separated genera which may be distinguished as follows:

The genus *Ernestia* ss. is devoid of a group of fine hairs on the metanotal slopes immediately below the inner base of the squamae, and the posterior forceps are normally simple.

The genus *Mericia* R. D. (the species not included above) possess a group of fine hairs on the metanotal slopes immediately below the inner base of the squamae; posterior genital forceps usually carinate.

It is quite evident that the species placed in the sub-genus *Meriana* really belong to the genus *Ernestia*, while practically all those considered under the subgenus *Ernestia* belong to the genus *Mericia* as limited above.

The genus *Ernestia* therefore includes, as far as I am acquainted with them, the following species, *rudis* Fall. (type), *radicum* Mg., *flavicornis* Br., *chalybea* Coq.? and *nigrocornea* Coq.?

*Mericia* includes those species listed by Tothill on p. 203, of the *Canadian Entomologist* for September, 1921, under the sub-genus *Ernestia*.

The genus *Meriana* is therefore a synonym of *Ernestia*. *Metaphyto* is evidently not separable from *Ernestia* and should be considered a synonym. By the use of the character indicated as separating *Mericia* and *Ernestia* we are able to definitely isolate the former from other allied genera, this undoubtedly being a step in the right direction in the classification of this difficult group.

While dealing with the subject, I wish to point out that the genus *Bombyliomyia* has the lower squamae long pilose above, a character I have not noted in other genera.

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., JUNE, 1924.

## The Ages of Some Existing Entomological Journals.

A writer in the business and financial section of *The Public Ledger* (Philadelphia) for April 19, 1924, said:

Fifty years is a variable quantity. It is the major part of a man's life, an era for a nation, a passing moment in geology. For a magazine it is a ripe and venerable age. Few technical journals have reached it. Engineering News-Record reached that age this week.

This remark reminded us that the present year is witnessing the fiftieth volume of the *Transactions of the American Entomological Society*. The American Entomological Society is the metamorphosed Entomological Society of Philadelphia, organized February 22, 1859, incorporated in April, 1862, the name changed in February, 1867. Under its original name, the Society published six volumes of the *Proceedings of the Entomological Society of Philadelphia* from 1861 to 1867. With the change in its title, the first volume of the *Transactions* was begun in June, 1867, so that with the fiftieth volume appearing in 1924, the number of volumes is seven less than the number of years (57) during which the series has been appearing, a correspondence of years with volumes not obtaining in the earlier years. One member of the original Publication Committee of 1861 is still a member of that committee to-day—the founder of the Society, the veteran hymenopterologist, Ezra Townsend Cresson.

The *Proceedings-Transactions* is the oldest existing purely entomological journal in the Americas to-day. Next in chronological order come *The Canadian Entomologist*, 56 volumes, begun in 1868; the 53 Annual Reports of the Entomological Society of Ontario (the first in 1871); *Psyche*, 31 volumes, begun in 1874; *Bulletin of the Brooklyn Entomological Society*, 19 volumes, 1878-1885, 1912 on; *Proceedings of the Entomological Society of Washington*, 26 volumes, begun in 1884; *Journal of the New York Entomological Society*, 32 volumes, begun in 1893; *Journal of Economic Entomology and Annals of the Entomological Society of America*, each 17 volumes, both begun in 1908.

It may be of interest to contrast these with the dates of commencement of the older, existing, or recently existing, European entomological journals, as given by Mr. Banks, in Bulletin 81 of the Bureau of Entomology, U. S. Dept. of Agriculture (1910), but here arranged chronologically:

- 1832. Annales, Société Entomologique de France, Paris.
- 1835. Transactions, Entomological Society of London.
- 1840. Entomologische Zeitung, Stettin.
- 1857. Berliner Entomologische Zeitung.
- 1858. Tijdschrift voor Entomologie, The Hague.
- 1860. Annales, Société Entomologique de Belgique, Brussels.
- 1861. Horae Societatis Entomologicae Rossicae, Petrograd.
- 1864. Entomologists' Monthly Magazine, London.
- 1864. The Entomologist, London.
- 1865. Mitteilungen der schweizerischen entomologischen Gesellschaft, Berne.
- 1869. Bolletino della Società Entomologica Italiana, Florence.
- 1880. Entomologisk Tijdskrift, Stockholm.
- 1881. Deutsche Entomologische Zeitschrift, Berlin.
- 1882. Revue d'Entomologie, Caen.
- 1882. Wiener Entomologische Zeitung.

#### The Occurrence of an Important European Parasite in North America (Hymen.: Elachertidae).

While attempting to follow the life history of the spotted cut-worm (*Agrotis c-nigrum* L.) on the cranberry, the writer encountered several parasitic insects. Specimens of some hymenopterous parasites were sent to Dr. L. O. Howard for identification, and were turned over by him to Mr. A. B. Gahan. Mr. Gahan's final determination brought to light the first record of *Euplectrus bicolor* Swederus (Elachertidae) in this country. The specimens were reared by the writer from a loose, matted mass of silken filaments surrounding a dead larva of *Agrotis c-nigrum*. The larva and the cocoon-like structure were found on a cranberry bog which was heavily infested with spotted cut-worm larvae in the town of Kingston, Massachusetts, during the latter part of July, 1923. The adults emerged July 26, 1923. Dr. Howard states that this is an important parasite of cut-worms in France and Italy, and that no record of its appearance in North America has heretofore been established.—DON S. LACROIX, Amherst, Massachusetts.

## 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.

Papers of systematic nature will be found in the paragraph at the end of their respective orders. Those containing descriptions of new genera and species occurring north of Mexico are preceded by an \*.

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.

1—Proceedings of the Academy of Natural Sciences of Philadelphia. 7—Annals of the Entomological Society of America, Columbus, Ohio. 10—Proceedings of the Entomological Society of Washington, D. C. 14—Proceedings of the Zoological Society of London. 20—Bulletin de la Societe Entomologique de France, Paris. 22—Bulletin of Entomological Research, London. 24—Annales de la Societe Entomologique de France, Paris. 36—Transactions of the Entomological Society of London. 41—Bulletin de la Societe Entomologique Suisse, Bern. 61—Proceedings of the California Academy of Sciences, San Francisco. 64—Parasitology, London. 68—Science, Garrison on the Hudson, N. Y. 69—Comptes Rendus, des Seances de l'Academie des Sciences, Paris. 77—Comptes Rendus des Seances de la Societe de Biologie, Paris. 82—The Ohio Journal of Science, Columbus. 89—Zoologische Jahrbucher Jena. 95—Annales des Sciences Naturelles, Zoologie, Paris. 100—Biological Bulletin of the Marine Biological Laboratory, Woods Hole, Mass. 104—Zeitschrift fur Wissenschaftliche Zoologie, Leipzig. 114—Entomologische Rundschau, Stuttgart. 115—Societas Entomologica, Stuttgart. 138—American Museum Novitates, New York. 141—Internationale Entomologische Zeitschrift, Guben. 143—Stettiner Entomologische Zeitung.

**GENERAL.** Arnold, J.—Grau ist alle theorie. 141, xviii, 11-12. Binder, und Haase.—Vom sammler zum lokalfautisten. 141, xviii, 2-3. Cornetz, V.—Les insectes paralyseurs (La Nature, Paris, 1924, 252-54). Sherborn, C. D.—Index animalium, Sec. 2, Pts., II-III, Aff-Bail. Weiss, H. B.—Insect food habits and vegetation. 82, xxiv, 100-6.

**ANATOMY, PHYSIOLOGY, MEDICAL, ETC.** Cleveland, L. R.—The physiological and symbiotic relationships between the intestinal protozoa of termites and their host. . . 100, xlvi, 203-27. Feuerborn, H. J.—Der dipterenflügel nicht meso—, sondern metathoracal? Eine neue morphogenetische deutung des dipteren thorax. 89, xlii, Anat., 529-46. Gadeau de Kerville, H.—Consequences de la ligature de la tete, avec ou sans decapitation, chez les vers a soie du murier (*Sericaria mori*) au moment de la nymphose. 20, 1924, 69-70. de Gedroyc, M.—L'influence de lymphe des insectes sur le microbe de la race. 77, XC, 906-7. Noskiewicz et Poluszynski—Un nouveau cas de polyembryonie chez les insectes (*Strepsipteres*). 77, xc, 896-8. Uichanco, L. B.—Studies on the embryogeny and postnatal development of the Aphididae with special reference to the history of "symbiotic organ" or "mycetom" (*Phil. Jour. Sci.*, xxiv, 143-247). Zawarzin, A.—Ueber die histologische beschaffenheit des unpaaren ventralen nervus der insekten. 104, cxxii, 97-115.

**ARACHNIDA AND MYRIOPODA.** \*Chamberlain, R. V.—The spider fauna of the shores and islands of the Gulf of California. 61, xii, 561-694. Hirst, S.—On some new or little-known species of Acari. 14, 1923, 971-1000.

**THE SMALLER ORDERS OF INSECTA.** Krafka, J.—Morphology of the prolegs of trichopterous larvae. 7, xvii, 97-105. Mosely, M. E.—Scent organs in the genus *Hydroptila* (*Trichoptera*). 36, 1923, 291-4. Philpott, A.—(See under *Lepidoptera*). Vogel R.—Zur kenntnis des baues und der funktion des stachels und des vorderdarmes der kleiderlaus (*Pediculus vestimenti*). 89, xlii, Anat., 229-58.

\*Folsom, J. W.—New sps. of *Collembola* from New York State. 138, No. 108.

**ORTHOPTERA.** Bugnion, E.—Mantes et Empuses. Essais d'elevage appareil de la femelle. Confection de l'ootheque. Ecllosion des jeunes larves. (*Mem. Soc. Vaud. Sci. Nat.*, 1923, 177-243.) Plotnikov, V. I.—Some observations on the variability of *Locusta migratoria*, in breeding experiments. 22, xiv, 241-3.

**HEMIPTERA.** Holland, W. J.—The family name of the lace-bugs (*Tingitidae*). 7, xvii, 95-6.

\*Bergroth, E.—On the *Isometopidae* of No. Am. 143, iv, 3-9. Bruner, S. C.—Una nueva especie de la familia *Enico-*

cephalidae. (Mem. Soc. Cubana Hist. Nat. F. Poey, vi, 53-9.) \*Gillette & Palmer—New Colorado Lachnini. 7, xvii, 1-58. \*McAtee, W. L.—Notes on the genus *Dikranura* in the U. S. (Eupterygidae). 10, xxvi, 75-6. Silvestri, F.—Descripcion de un nuevo genero y tres especies nuevas de Ortheziinae de Espana y de Costa Rica. (Coccidae.) (Bul. R. Soc. Espanola Hist. Nat., xxiv, 169-76.)

**LEPIDOPTERA.** Eltringham, H.—On the tympanic organ in *Chrysidia ripheus*. 36, 1923, 443-58. Hock, K.—Ueber aberrationen bei schmetterlingen. 114, xli, 13-4. Ishimori, N.—Distribution of the malpighian vessels in the rectum of lepidopterous larvae. 7, xvii, 75-86. Philpott, A.—The genitalia in *Sabatinca* and allied genera with some observations on the same structures in the Mecoptera. 36, 1923, 347-66. Rangnow, H.—Beitrage zur symbiose zwischen *Lycaeniden* und Ameisen. 141, xviii, 10-11.

Clark B. P.—Twelve new Sphingidae. (Proc. N. Engl. Zool. Club, ix, 11-21.) Ford, E. B.—The geographical races of *Heodes phlaeas*. 36, 1923, 692-743. Oberthur, C.—Le genre *Agrias*. (Etud. Lep. Comp. Fasc. xxii, 11-84.) Skinner & Ramsden—Annotated list of the Hesperiidæ of Cuba. 1, lxxv, 307-21.

**DIPTERA.** Frew, J. G. H.—On the larval anatomy of the gout-fly of barley (*Chlorops taeniopus*) and two related muscids, with notes on their winter host-plants. 14, 1923, 783-822. Keilin, D.—On the life history of *Anthomyia procellaris*, and *A. pluvialis*, inhabiting the nests of birds. 64, xvi, 150-9. Mercier, L.—Malformations produites chez une mouche (*Calliphora erythrocephala*) par l'action des vapeurs de naphthaline; reaparition des anomalies dans une seconde generation elevee dans des conditions normales. 69, clxxviii, 1326-9. Saunders, L. G.—On the life history and the anatomy of the early stages of *Forcipomyia* (Ceratopogoninae). 64, xvi, 164-213. Verhein, A.—Die eibildung der Musciden. 89, xlii, Anat., 149-212. Vogel, R.—Kritische und organzende mitteilungen zur anatomie des stechapparats der Culiciden und Tabaniden. 89, xlii, Anat., 259-81.

Borgmeier, T.—Drei neue Phoriden aus Brasilien. 115, 13-15. Malloch, J. R.—A new species of *Conicera* from Porto Rico (Phoridae). A new gen. and sp. of Muscidae. 10, xxvi, 73; 74. \*Spuler, A.—North American genera and

subgenera of dipterous family Borboridae. 1, lxxv, 369-78.  
 \*Spuler, A.—Species of subgenera Collinella and Leptocera of *N. Am.* 7, xvii, 106-17.

**COLEOPTERA.** Bertrand, H.—Ecllosion de l'oeuf de quelques Chrysomelides. 20, 1924, 54-7. Bertrand, H.—Larve et nymphe d'*Halipilus lineaticollis*. Anomalies chez des larves et nymphes de coleopteres. 24, xcii, 323-38; 339-44. Scott, H. M.—Observations on the habits and life history of *Gallerucella nymphacae*. (Tr. Am. Micro. Soc., xliii, 11-16.) Van Vleck, H.—The flashing of fireflies. 68, lix, 379.

Horn, W.—Zur systematik, geographic, und lebensweise der Cicindelinae. 89, xlviii, Syst., 309-30. \*Mann, W. M.—Myrmecophiles from the western U. S. and Lower California. 7, xvii, 87-95. Maulik, S.—A new hispid beetle injurious to oil palms in Brazil. 22, xiv, 245-6. Mutchler, A. J.—A new sp. of Cicindelidae from Cuba. 138, No. 106. Reichensperger, A.—Neue sudamerikanische Histeriden als gaste von wanderameisen und termiten. 41, xiii, 313-36.

**HYMENOPTERA.** Barbey et Ferriere—Un cas interessante de parasitologie dans l'ecorce du pin sylvestre. (Bul. Soc. Vaud. Sci. Nat., lv, 77-81.) Bugnion, E.—Les organes bucaux de la scolie (*Scolia bifasciata*). 41, xiii, 285-313. Peacock, A. D.—On the males and an intersex-like specimen of the parthenogenetic saw-fly, *Pristiphora pallipes*. (Brit. Jour. Exper. Biol., i, 391-412.) Pham-tu-thien—Sur le regime alimentaire d'une espece de fourmis indochinoises (*Pheidologeton diversus*). 95, vii, 131-35. Santschi, F.—L'orientation siderale des fourmis. . . . (Mem. Soc. Vaud. Sci. Nat., 1923, 137-75.) Seyrig, A.—Accouplement des ichneumons. Observations sur la biologie des ichneumons. 24, xcii, 300; 345-62.

\*Cockerell, T. D. A.—Notes on the structure of bees. 10, xxvi, 77-85.

#### SPECIAL NOTICES

*Genera insectorum*, Fasc. 172, 1918, Coleoptera, Fam. Niponiidae, von H. Bickhardt. A copy of this suppressed fascicle has come to our notice. It contains 4 pp. and 1 col. plate. The family is represented by species from the oriental region only, but we think a notice of this part would be of interest.

## Doings of Societies.

### The American Entomological Society.

Meeting of October 25, 1923, Dr. Henry Skinner presiding, twelve persons present.

The Publication Committee reported papers accepted for publication by Messrs. Hebard, Blaisdell and Rehn.

The Property Committee reported the following additions to the library:

"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.

It was moved and carried that a committee of three be appointed by the President to consider the advisability of continuing the meetings of the Society through the year, conferring with the committee of the section on a similar subject.

There was discussion on the advisability of changing the time of calling the meetings from 8 o'clock to 7 or 7:30 o'clock. No action was taken, but it was to be considered again at a future meeting.

Dr. Skinner announced the death of Nathaniel C. Rothschild, speaking of his entomological career and his own personal recollections of his visit to Rothschild when in Europe. It was moved and carried that a letter of explanation be sent with his certificate of election as a Corresponding Member, to his family.

All of the nominees for Corresponding Membership of the Society, whose names were offered at the previous meeting, were unanimously elected.

LEPIDOPTERA.—Mr. Hornig stated that some cocoons of *Cynthia* moths, which he had collected in 1921 and had remained in a drawer, still contained live chrysalids. He also exhibited and presented to the Society prepared life histories of the southern butterfly *Calpodex ethlius* and the Florida fern caterpillar. Mr. Bayliss reported *Apatura clyton* common at Stroudsburg, Pennsylvania, about July 2, and mention was made by Dr. Skinner and Mr. Laurent of its occasional appearance in Philadelphia. Mr. Williams exhibited specimens of *Choranthus radians* and *hataiensis* and remarks were made by Dr. Skinner and Mr. Rehn on the distribution of the butterflies and other insects of the Antilles. Dr. Skinner exhibited boxes of moths of the genus

*Automeris*, many of which were collected by Mr. Huber in Nicaragua on his recent trip.

COLEOPTERA.—Mr. Cresson reported that *Phytonomus punctatus* F., the clover leaf beetle, was found August 30 in great numbers crawling along the curb of the Parkway, near the Academy. Were these injuring any other plant than clover? According to Smith, the beetle is full grown in May. Mr. Godine spoke of the French beetle with green and gold thorax, calling attention to the constancy in the percentage of the color varieties.

Annual meeting of December 10, 1923. Dr. Henry Skinner, President, in the chair, and ten members and visitors present.

Reports of the Treasurer, Publication Committee and Committee on Property were presented.

The Committee on Modification of the By-Laws reported as follows: That the meetings of the Society and of the Section be called at 7:30 P. M. instead of 8:00 P. M., and that the present agreement with the Academy be modified by striking out paragraph 5, so that a person may become a member of the Society who is not a member of the Academy.

It was moved that meetings for 1924 be held on the fourth Thursday of February, April and October and the second Monday of December.

Mr. Cresson added to the report of the Property Committee the receipt of photographs of Philip Nell and R. C. Williams, Jr., and the following additions to the cabinet: 4 paratypes *Cyrtopogon tacoma* Mel., 2 paratypes *Cyrtopogon aldrichi* Mel., 4 topotypes *Melandrea mandibulata* Ald. from A. L. Melander; 1 ♂ 1 ♀ *Panorpa nuptialis* Gers., Texas, from R. H. Painter.

Mr. Rehn moved that \$50.00 be transferred from the general funds to the *Entomological News*. This motion was carried.

The following officers and committee members were nominated for 1924:

*President*, Henry Skinner; *Vice-President*, J. A. G. Rehn; *Corresponding Secretary*, Morgan Hebard; *Recording Secretary*, R. C. Williams, Jr.; *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., *Chairman*, Morgan Hebard, Philip Laurent.

In each case the nominations were closed and on motion the Secretary cast a ballot and the above Officers and Committees were elected.

R. C. WILLIAMS, JR., *Recording Secretary*.

**OBITUARY.**

ALEXANDER DYER MACGILLIVRAY.

On March 24, 1924, Alexander Dyer MacGillivray, one of the most outstanding of present-day teachers of Entomology in America, passed to the Great Beyond. Although there had been repeated warnings that he was overtaxing himself, and he was never robust, his death came as a great shock to most of those who knew him. I last saw him at the Cincinnati Meetings in December, and found him full of plans for the future and insistent that he was feeling much better than he had before in recent years. It was very apparent then that he was far from well, but we had seen his rebound from similar conditions and did not realize that the end was near.

Dr. MacGillivray was born July 15, 1868, at Inverness, Ohio. He entered upon his undergraduate work at Cornell University in 1889 and developed an intensive interest in Entomology. With characteristic singleness of purpose, he turned to this study, which was destined to be his life work, and neglected some of the formal requirements of the undergraduate course. He registered sporadically and followed much his own bent in his work. The result was that when I first came to know him in the fall of 1898 he was technically still classed as a sophomore, although, apart from Slingerland, who gave a brief course in Economic Entomology, he was Professor Comstock's sole assistant in the strenuous teaching work of the Cornell Department of Entomology.

He came to see that he was making a mistake in neglecting his undergraduate work and, with that indomitable will which he possessed, he set about to meet the requirements which were before him. German had always been a bugbear to him and after my first semester, for nearly a year we spent three or more nights a week reading Van Rees, Kowalevsky, and some of the other great classics on metamorphosis. French he found easier, and not long after when his interest in Coccidae developed, he took up and mastered the Italian. I mention these merely to show the strength of his determination,—he often spoke of it himself as his "Scotch stubbornness."

In 1900 he took his Ph.B. degree and in 1904 his Ph.D. From 1900 to 1906 he was Instructor in Entomology and

General Invertebrate Zoology, and from 1906 Assistant Professor at Cornell. In 1911 he severed his connection of twenty-three years with Cornell University and took up work as Assistant Professor of Systematic Entomology at the University of Illinois. In 1913 he was made Associate Professor, and in 1917 he was advanced to a full professorship in Entomology, the position which he held at his death.

His doctorate thesis was *A Study of the Wings of the Tenthredinoidea, a Subfamily of Hymenoptera*. Aside from the collaborated work of Comstock and Needham, this intensive study was the most important of the earlier efforts to elaborate and apply to other orders the principles laid down by Professor Comstock in 1893, when he made his epochal studies of the wings of the Lepidoptera. Using a wealth of material, MacGillivray attempted "to trace the course of the changes wrought by natural selection" and "to apply the principles of descent to taxonomy." He was much interested in the consideration of the dynamical control of wing type, developing especially the thesis that "That wing is the most perfect mechanical device which approaches the closest to some type of truss."

A list of the published papers by Dr. MacGillivray includes eighty titles. It begins with a bibliographic catalogue of the Thysanura of North America, published in 1891, in the Canadian Entomologist. This was followed by a series of five papers under the general title, *North American Thysanura*, reviewing the groups and describing thirteen new species.

In 1893 appeared his first paper on the saw flies, a group which was to claim his chief attention throughout life. In this paper he lists thirty species of Tenthredinidae and Uroceridae from Olympia, Washington, fourteen of which were described as new to science. Something over 400 new species of Tenthredinoidea were described by him before he laid down his work. His most comprehensive study was that on the Tenthredinoidea of Connecticut, a contribution of 190 pages, published in the Bulletin of the Geological and Natural History Survey of Connecticut, in 1916.

His interest in the saw flies was not limited to mere species description, but he had done much upon the immature stages

of these forms, and had published several preliminary papers dealing with this phase of the subject. The greater part of it is included in a bulky manuscript on "Immature Stages of Insects." This work was projected as far back as 1903, when he published in the Bulletin of the New York State Museum his paper on *Aquatic Chrysomelidae, and a Table of the Families of Coleopterous Larvae*. He had brought together a wealth of new material which it is hoped can still be made available for publication.

About 1904, Dr. MacGillivray first offered a formal course on the anatomy and taxonomy of the Coccidae. Entering upon the work with his usual thoroughness and zeal, he soon prepared an extensive series of mimeographed notes which were distributed and a source of aid and stimulus not only to a considerable group of his own students but to a number of outside workers. In 1921 this material was finally brought together in book form under the title, *The Coccidae: Tables for the Identification of the Subfamilies and Some of the More Important Genera and Species together with Discussions of their Anatomy and Life History*.

This work upon the Coccidae has been harshly criticized and undoubtedly it contains much that is not acceptable to other specialists. Dr. MacGillivray was a man of pronounced views and he did not hesitate to put them forth. After careful study of a group he was prone to rearrange and revise it to meet his own ideas, and he was never chary in creating new generic and group names. To those knowing his long interest in the scale insects and his painstaking methods of work, the implication that the text was mainly compilation and that his acquaintance with the insects themselves was limited, seems wide of the mark, however debatable the opinions expressed may be.

In 1923, only a few weeks before the author's untimely death, appeared his *External Insect Anatomy, a Guide to the Study of Insect Anatomy and an Introduction to Systematic Entomology*. In many respects this is to be regarded as his most important published work. With a background of over thirty years of systematic work and a remarkably broad knowledge of insect groups, this little book presents a fund

of information which will be more and more appreciated as it is studied intensively. Unfortunately, it is cumbered by a nomenclature and a phraseology which is certain to prove irritating and which is likely to repel the casual student.

In neither it nor the coccid book is any attempt made to put the material in attractive form. Dr. MacGillivray had no patience with a prevalent viewpoint that work must be sugar-coated in order to justify itself. A favorite expression of his was that of "holding the student's nose to the grindstone." He attracted few general students and he held few supposedly interested in specializing who were not willing to pay the price.

This attitude is well illustrated by a typical statement in the preface to the coccid book:

"The fact that no figures are included in this Volume may appear to many as an error. The tables were prepared primarily for the use of students. Those who have had any experience in teaching know that most students will not undertake anything they are not forced to do. The omission of figures makes it necessary for them to study their specimens rather than figures."

More than one reader of this sketch will recall specific and personal experiences with this same viewpoint. For the purpose of orienting the graduate student in the departmental work, it was Professor Comstock's practice to require all entering upon the laboratory work to take the elementary course in morphology and wing venation. This course was MacGillivray's delight. He was no respecter of persons, unless it was to the extent that the teacher of years of experience and possibly a wide general acquaintance with the field of entomology, was likely to have the screws turned on him even more tightly than on the veriest tyro among the undergraduates. How some of them did rage and what indignation meetings were held over some insistence upon detail or upon conformity to what seemed a perfectly arbitrary requirement! And yet, wherever those men met in after years they delighted to recount these experiences and would close with the declaration that it was the most valuable drill which they had ever had in their biological work.

But those who were privileged to really know him, knew full well that this represented only one side of the man. Sen-

sitive to a degree, he valued friends and friendship to an extent that many did not realize. He was keenly interested in his students personally and his home was always open to them.

His love for children and his interest in them was a characteristic which was known to all of his close friends. Even to many of those who knew him intimately it will be a surprise to learn that among his cherished plans was the publication of a book of "Insect Stories" for children, and that a considerable amount of work had been done upon it.

Dr. MacGillivray was a member of the various technical societies in the field of zoology, but it was to the Entomological Society of America, during its earlier years, that he gave unstinted service. A charter member, he was second vice-president in 1911 and from 1911 to 1916 he served most faithfully and efficiently as secretary-treasurer. In recent years, owing largely to ill-health, he was seldom seen at the annual meetings.

During his days as a graduate student at Cornell he was one of the organizers and active supporters of a Biological Club which was almost a fraternity in its careful selection of members and in the *esprit de corps* which it developed among the chosen graduate students and the younger instructors. To MacGillivray its meetings were a delight, and filled much the same place as does a club for some men. In later years he derived especial pleasure from his membership in the Gamma Alpha Graduate Scientific Fraternity, because of the opportunity it afforded him for informal social contact with the younger men in the scientific field. To an extent unusual for the older men, he retained this contact and an active interest in the welfare of the society and its members.

In the passing of Dr. MacGillivray, the science of entomology loses a unique and an outstanding disciple. A large number of students who have come under his influence, and others who have been associated with him mourn the loss of a stimulating and valued helper and a true friend. WM. A. RILEY.

#### CORRECTION

Page 169, lines 5 and 12, for *Calochartus*, read *Calochortus*. Page 170, line 23, for *Betheliella calocharti* new species read *Betheliella calochorti* new species.

## 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.

**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 isocratia* ♂, *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.

**For Exchange.**—Living pupae of *Automeris io* and *Papilio asterias* and unnamed coleoptera from India for *Catocala* or N. A. coleoptera. Mrs. Robert Milde, Lewiston, Minnesota.

**For Exchange.**—I have for exchange live pupae of *Sphinx Chersis*, for other pupae or Lepidoptera in papers, Southern specimens. V. Tykal, 2412 S. Harding Ave., Chicago, Ill.

**Will pay cash** for specimens of rare and unusual **Scarabaeidae** (named—Leng's Catalogue). Send list and prices to Wm. C. Wood, 51 Fifth Ave., New York, N. Y.

**Wanted**—*Psyche*, Vols. I, XI, XIII, and *Bulletin*, Brooklyn Entomological Society, Vols. I, II, III. H. C. Severin, State Entomologist, Brookings, South Dakota.

**I have living pupae** of *io*, *imperialis*, *regalis* and others, also caterpillars of *Eupantheria deflorata* and spp. of Coleoptera for exchange. Address V. Harnach, 47 West College St., Asheville, N. C.

**Correspondence invited** from all those interested in Hungarian insects: Coleopt., Lepidopt., Hymenopt., Hemipt., etc.—Prof. Charles Sajo, Oerszentmiklos, (Komitat Pest) Hungary.

**Will exchange** lepidoptera of Pennsylvania for those from other parts of the continent. Frank H. Chermock, 1308 Tell Street, N. S., Pittsburgh, Pa.

**Wanted:** Living pupae of American silk-producing moths. W. S. Lowe, 35 Craven St., W. C. 2, London, England.

**Wanted:** For cash. Bred or perfect caught specimens, of *Sphinx luscitiosa*, *Paonias astylus*, and *Deidamia inscriptum*. Bred specimens of other species of Sphingidae, of the rarer sorts, would also be desirable. John M. Geddes, 331 High St., Williamsport, Pa.

**Wanted**—American sawflies, Tenthredinoidea, in exchange for other insects, chiefly Coleoptera. Correspondence may be in English. D. Dvornar-Zapolsky, P. O. Box 573, Agricultural Experimental Station, Entomological Section, Rostov on Don, Russia.

**Have** a number of pamphlets and books on N. A. and exotic Cerambycidae. Will exchange these for certain families of Heteroptera and Tabanidae. G. Chagnon, P. O. Box 521, Montreal, Canada.

**Buprestidae.**—Will determine and exchange Buprestidae of the world and exchange separata on this family. Dr. Jan Obenberger, Prague II., Václavské náměstí 1700, Museum, Czechoslovakia.

# RECENT LITERATURE

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## DIPTERA.

- 839.—Landis (E. M.).—A tabular account of the structural differences between the four larval instars of *Culex pipiens*. (Trans., 49, 25-42, 1923) ..... .35

## COLEOPTERA.

- 844.—Davidson (W. M.).—Biology of *Scymnus nubes* Casey. (Trans., 49, 155-163, ill., 1923) ..... .20

## LEPIDOPTERA.

- 842.—Braun (A. F.).—Microlepidoptera: notes and new species. (Trans., 49, 115-127, 1923) ..... .25
- 843.—Skinner & Williams.—On the male genitalia of the Hesperiidæ of North America. Paper III. (Trans., 49, 129-153, ill., 1923) ..... .30

## NEUROPTERA.

- 841.—Dodds (G. S.).—Mayflies from Colorado. Descriptions of certain species and notes on others. Trans., 49, 93-114, 2 pls., 1923) ..... .50

## ORTHOPTERA.

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# ENTOMOLOGICAL NEWS

Vol. XXXV

No. 7



GEORGE HENRY HORN  
1840-1897



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## STATED MEETINGS

Of the Entomological Section of The Academy of Natural Sciences of Philadelphia, and of The American Entomological Society will be held at 7.30 o'clock P. M. on the following dates during 1924: January 24, February 28, March 27, April 24, May 22, September 25, October 23, November 20, and Dec. 8.

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KLONEUS BABAYAGA.—SKINNER.

# ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXV

JULY, 1924

No. 7

## CONTENTS

Skinner— <i>Kloneus babayaga</i> (Lepid.: Sphingidae).....	229	Curran—New Species of <i>Ernestia</i> and <i>Mericia</i> (Dipt.: Tachinidae).....	245
Forbes—The Occurrence of <i>Nygmata</i> in the Wings of Insecta Holometabola.....	230	Smith—A New Species of Ant from Kansas (Hym.: Formicidae).....	250
Barnes and Benjamin—Note on <i>Phaedrotes piasus</i> Bdv. (Lepid.: Lycaenidae).....	232	Hoffmann—Handy Collecting Apparatus.....	253
Ferris—A Note on Some Hippoboscidae (Diptera Pupipara).....	234	Martin—Note on <i>Hydnobius matthewsii</i> Crotch. (Col.: Silphidae).....	255
A Chance for Lepidopterists.....	235	Editorial—Duty on Insects Again.....	256
Mickel—An Analysis of a Bimodal Variation in Size of the Parasite <i>Dasyntulla biculata</i> Cresson (Hymen.: Mutillidae).....	236	Entomological Literature.....	257
Crumb—Odors Attractive to Ovipositing Mosquitoes (Dipt.: Culicidae). . . . .	242	Review of Oberthür's <i>Etudes de Lepidopterologie Comparee</i> .....	262
Martin—Studies in the Genus <i>Mecas</i> (Coleop.).....	244	Obituary—Louis Albert Peringuey....	262
		“ Major Francis Wm. Cragg.....	262
		“ Arthur Hugh Jones.....	263
		“ Arthur Lester Lovett.....	263
		“ Thomas Nelson Annandale.....	264
		“ Herbert Campion.....	265

## *Kloneus babayaga* (Lepid.: Sphingidae).

By HENRY SKINNER.

(Plate IV.)

*Kloneus babayaga*, a very interesting sphinx moth, was described by me in this journal<sup>1</sup> as a new genus and species. It was captured by Mr. J. S. McKenzie, at the Eden Mine, Nicaragua, June 13th, 1922, and by him presented to the Academy of Natural Sciences of Philadelphia.

*Oberthurion harroverii* Clark<sup>2</sup> is a synonym of *K. babayaga*. The specimen of *babayaga* is a female and *harroverii* a male, and the latter was collected by David E. Harrower, July 21st, 1915, on the Chirripo River, Costa Rica, and presented to the Academy of Natural Sciences of Philadelphia.

The Proceedings of the New England Zoological Club, containing the description of *O. harroverii* bears the date, Cambridge, May 12, 1923, and the copy sent me bears the postmark, Boston, May 18th.

<sup>1</sup> ENTOMOLOGICAL NEWS, XXXIV, 138. 1923.

<sup>2</sup> Proc. New England Zoological Club, VIII, 58. 1923.

ENTOMOLOGICAL NEWS, containing the description of *Klonous babayaga*, was mailed at the post-office at Philadelphia, May 4, 1923.

The type of *Oberthurion harroverii* Clark was borrowed for study and description by B. Preston Clark, September 25, 1922, and has not been returned to the Academy of Natural Sciences of Philadelphia.

---

### **The Occurrence of Nygmata in the Wings of Insecta Holometabola.**

By WM. T. M. FORBES, Ithaca, New York.

(Plate V.)

It is well known that the majority of Trichoptera possess two small, apparently glandular spots on the wings, one located in the base of cell R4, and the other, somewhat less universally in cell M. Navas has christened these structures "nigmas," according to the reformed spelling of Spanish. In English we should follow the spelling of the Greek word and call them "nygmata" (singular "nygma"). The word means merely a spot or puncture, and that is all that is really known of them. On account of their presence near the center of the wing, and tendency to be absent in small species, one may suspect them of being moulting fluid glands for the imaginal moult, but I believe there is no evidence whatever on the case.

Finding that essentially the same structures are also present in the sawflies, I made a systematic search of the principal groups of insects, with the following result.

Nygmata are present in a large proportion of species of the Neuroptera (including the Planipennia), Trichoptera, Panor-pata, and the Chalastogastrous Hymenoptera. They are absent in all the Hemimetabola examined, and also in the Lepidoptera and Diptera. They are also absent from the wings of Coleoptera, but the question may be raised if some of the various structures on the elytra of Coleoptera may not be homologous.

The position of the nygmata is definite in any one group, but occasionally they are present or absent in closely related forms, especially in the Hymenoptera, where they are frequently weakly developed. The various families of an order have simi-

lar arrangements, but the various orders have less in common.

The following list summarizes their occurrence:

#### NEUROPTERA.

Sialidae: Cells R, R5, and M; sometimes more than one in a cell; sometimes none in cell M (fig. 2); absent in *Sialis*.

Ithonidae, Dilaridae, Polystoechotidae, Osmylidae (fig. 3), and the isolated genus *Porisma*; cells homologous to R4 and to R.

Psychopsidae: cell R only, and very close to base of wing.

Sialinae, Raphidiidae, Mantispidae, Sisyridae, Sympherobiidae, Hemerobiidae, Berothidae, Chrysopidae, Myrmeleonidae, Nemopteridae, Ascalaphidae, and Coniopterygidae: nygmata absent.

#### TRICHOPTERA.

Present in cells R4 and M; frequently absent.

#### PANORPATA.

*Panorpa* and *Panorpodes*: cells R, R5 and Cu (fig. 6).

*Bittacus*: cells R and R5 only (figs. 4, 5).

*Merope*: and apparently *Notithauma*: nygmata absent.

#### HYMENOPTERA.

Siricidae: second and third submarginal cells, median, third discoidal of Cresson (sometimes called first discoidal), submedian. Frequently with two nygmata in a single cell, and occasionally with three.

Nyelidae, Lydidae (fig. 1): second and third submarginal, median, first lanceolate. Weak and frequently absent in part.

Xiphydriidae: second submarginal and sometimes median only.

Tenthredinidae: second and third submarginals, or more often second submarginal only; median.

Blasticotomidae, Megalodontidae: second and third submarginals, median.

Cephalidae: at base of second submarginal only.

Oryssidae and Clistogastra: absent so far as examined.

It will be noted that the Hymenoptera have the most complete set of any single order. While the homologies of the cells to those in other orders is not at all certain, the following coincidences can be recognized: cell M (median), in Hymenoptera, Trichoptera and a few Sialidae, but not in other Neuroptera, or Panorpata; cell R5 (second submarginal ?), in Hymenop-

tera, Sialidae, and Panorpata, but not in Trichoptera; cell Cu (submedian) in Hymenoptera and Panorpata only; cell 2dA (lanceolate) in Hymenoptera only. The most persistent nygma in other orders is the one in cell R, but this is not to be expected in the Hymenoptera as almost the whole of that cell is obliterated by the fusion of R and M.

In the figures I have indicated the position of nygmata as closely as possible, but have exaggerated their size.

#### EXPLANATION OF FIGURES IN PLATE V.

1. Hymenoptera, Lydidae, *Lyda*.
2. Neuroptera, Sialidae, *Chauliodes pectinicornis*.
3. Neuroptera, Osmylidae, *Osmylus tuberculatus*.
- 4, 5. Panorpata, Bittacidae, *Bittacus* (with bases of wings, more enlarged).
6. Panorpata, Panorpidae, *Panorpodes*.

---

#### **Note on *Phaedrotus piasus* Bdv. (Lepid. : Lycaenidae).**

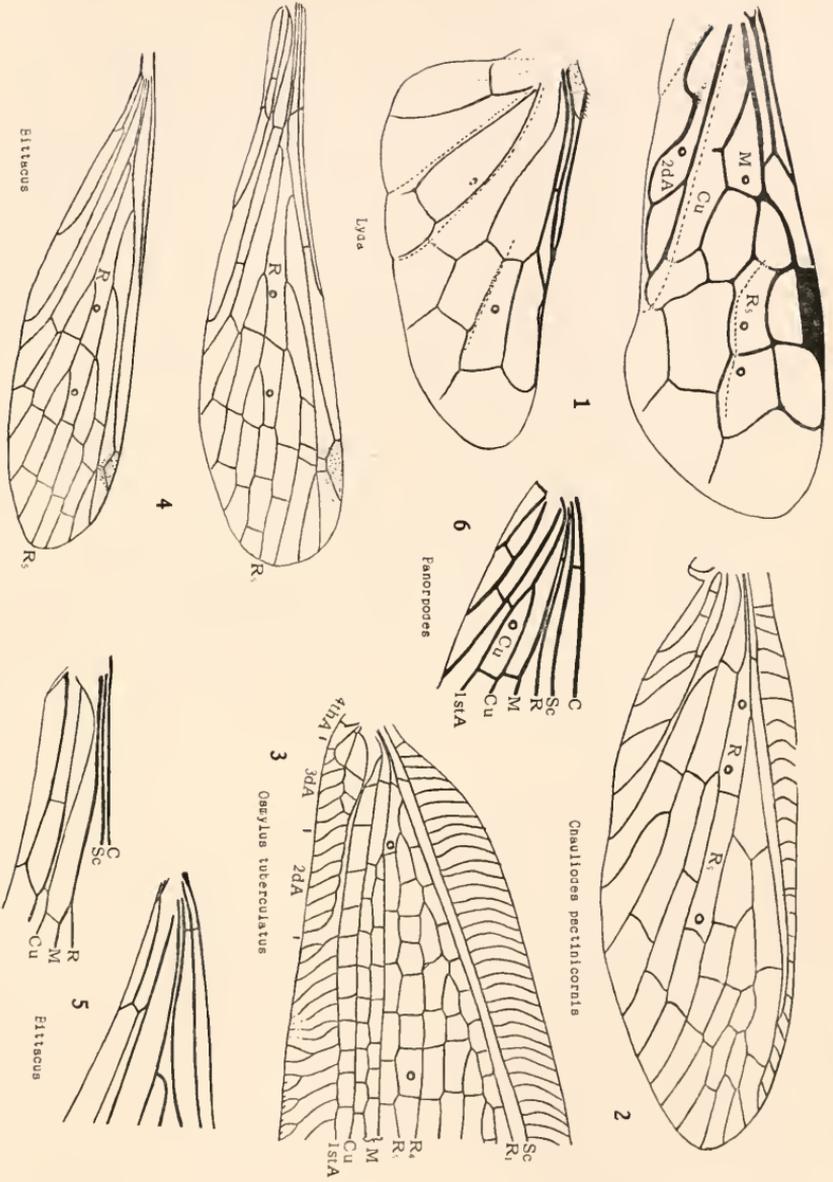
By WM. BARNES and F. H. BENJAMIN, Decatur, Illinois.

In a recent paper (1923 Ent. News XXXIV, 295-300) Mr. K. R. Coolidge requests that someone publish on the distinctions between the various races of *P. piasus*.

This has already been discussed by Dr. McDunnough (1914, Ent. Rec., XXVI, (9), 201).

There are obviously three races of the species. One is found in the mountainous regions of California, and has the underside pale grey, in general the white area rather diffuse and the subterminal lunules rather poorly defined, seldom showing any orange at the anal angle of the secondaries. This is *P. piasus piasus* Bdv., according to M. Oberthür's figure of Boisduval's type. Specimens must be compared with the types of *sagittigera* Feld., and *viaca* Edw. to be sure that these have been correctly placed. Felder's figure, however, seems to place the name; notes in a manuscript catalogue read: "Collected by Lorquin; locality indefinite; probably received thru Boisduval."

The type of *viaca* Edw. may be in the Carnegie Museum, but Dr. McDunnough evidently failed to find it. Notes read: "Type locality Sierra Nevada, California, ♂, ? Carnegie Museum." In view of the locality and original description and



NYGMATA IN WINGS.—FORBES.



in absence of any material actually compared with type, the name may tentatively rest under *P. pius pius*.

The name *lorquini* Behr. (listed in the "Additions and Corrections" of the Check List as *lorquini*) apparently also falls here, the types presumably destroyed.

*P. pius catalina* Reak. is the race from the vicinity of Los Angeles County, California. It is much darker grey below, the hind wing with the white less suffused and bordered by a s. t. band of well defined black crescents, which toward the anal angle are frequently bordered by yellow-orange. This race lacks ocelli to the submarginal lunules preceding the anal angle of the secondaries. A faint ocellus may be present at the anal angle. A specimen has been compared with the type of *catalina* in the Strecker Collection. M. Oberthür's figure of the type shows *rhaca* Bdv. to be a synonym.

*P. pius daunia* Edw. A specimen from "Colo. Bruce," is in the Barnes Collection marked "X. T. (Pittsburgh) J. McD." This race is very close to *catalina*, the main distinction being the presence of black ocelli on the hind wings distad of the submarginal lunules preceding the anal angle.

Quite naturally intergrades between the various races occur, and probably occasional aberrational specimens from any locality might be made to "fit" each name, but in general the various races breed true and are restricted. It is quite questionable if the authors would propose a name for *daunia* if no available name were in the literature, but the tendency seems to be to "split" each species of diurnal into as many races as possible, and once a name is proposed for a form which seems to have a different geographical distribution than another form, it seems advisable to retain the name to avoid further synonyms.

In fact, many names are retained in the Check List, and in all other lists, if the insect has not been properly identified or its correct status is unknown. The work of a cataloguer is not a revisional one and must necessarily be based mainly on published work. Consequently some names listed as synonyms will ultimately be assigned to racial rank, while others listed as species will prove to be synonyms.

## A Note on Some Hippoboscidae (Diptera Pupipara).

By G. F. FERRIS, Stanford University, California.

### *Ornithoctona* Speiser.

#### *Ornithoctona strigilecula* (Ferris).

1923. *Ornithomyia strigilecula* Ferris, Parasitology, 15:57-58; tf. 3-4.

Since the description of this species was published, certain material has been obtained which throws some light on the genus *Ornithoctona* and indicates the necessity of the change indicated above.

The genus was originally based upon the character of the antennae, which permitted its separation from *Ornithomyia*. The differences in the two genera, however, are not especially striking and the separation on this basis not very convincing, but the material now at hand reveals a character which very strongly reinforces that heretofore used. In my description of *Ornithomyia strigilecula* I called attention to the peculiar and apparently very distinctive transverse comb of setae on the basal segment of the posterior tarsi, a character that, as far as I am aware, had never been noted in any species. It now appears that this comb is characteristic of the species of *Ornithoctona*, it being present in two species from Borneo that are at hand and which will be described in a forthcoming paper to be published in the journal of the Sarawak Museum.

This character is very distinctive. None of the species of *Ornithomyia* that are available show anything of the sort, this segment of the posterior tarsi bearing merely a larger or smaller number of irregularly arranged, stout setae.

### *Ornithoica* Rondani.

In all, ten species have at various times been referred to this genus. It is entirely possible that there are more names than species and in fact, Austen<sup>1</sup> has indicated his belief that *O. exilis* (Walker) and *O. vicina* (Walker) are identical with *O. beccariina* Rondani, and in addition has expressed the suspicion that all of these are likewise identical with *O. confluenta* (Say).

<sup>1</sup>Austen, E. E. Notes on Hippoboscidae (Diptera Pupipara) in the Collection of the British Museum. Ann. and Mag. Nat. Hist. (7), 12:263. (1903).

Aldrich<sup>2</sup> accepts these views and in addition places *O. pusilla* (Schiner) and *O. promiscua* Ferris and Cole in the synonymy with *confluente* (or *confluens* as he would have it).

On this basis *O. confluente* becomes a species of practically cosmopolitan distribution, in itself a rather surprising thing for a form which is not known from any very wide ranging hosts. That the determinations upon which this synonymy is based are not to be relied upon is indicated by material now at hand. I have a single specimen of an *Ornithoica* from Borneo—which will be described in detail in the forthcoming paper mentioned above and which I take to be in all probability *O. beccarii*. It differs very markedly from *O. promiscua* at least, but the differences are such that a Dipterist working with his conventional pinned and shriveled material would almost certainly overlook them.

It is evident from this that the earlier determinations need to be revised. In this connection I would call attention especially to the facts in regard to *O. confluente*. In our description of *O. promiscua* Ferris and Cole, we expressed the belief that *confluente* is unrecognizable from the original description. Nor, as far as I am aware, has the species ever been redescribed from authentic—or for that matter, any other—material. Aldrich, however (ref. cited) without adducing any evidence whatsoever in support of his opinion, cavalierly reduces *O. promiscua* to synonymy with *confluente* as well as assigning to the latter numerous specimens from geographically widely separated regions. Until such time as *confluente* has been redescribed from material that may be regarded as authentic, it would appear quite reasonable and proper to maintain the distinctness of *O. promiscua*.

---

### A Chance for Lepidopterists.

Staudinger and Bang-Haas, Dresden, Blasewitz, Germany, have recently issued a price list of Lepidoptera. The specimens and species are sold in lots, representing the species in genera from various parts of the world. The prices are reduced and thus a good way is offered to start a collection at a reasonable cost.

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<sup>2</sup> Aldrich, J. M. Notes on the Dipterous Family Hippoboscidae. *Insector Inscitiae Menstruus* 11:79. (1923).

**An Analysis of a Bimodal Variation in Size of the  
Parasite *Dasymutilla bioculata* Cresson  
(Hymen. : Mutillidae).\***

By CLARENCE E. MICKEL,

Department of Entomology, University of Minnesota.

(Plate VI, and Text Figures.)

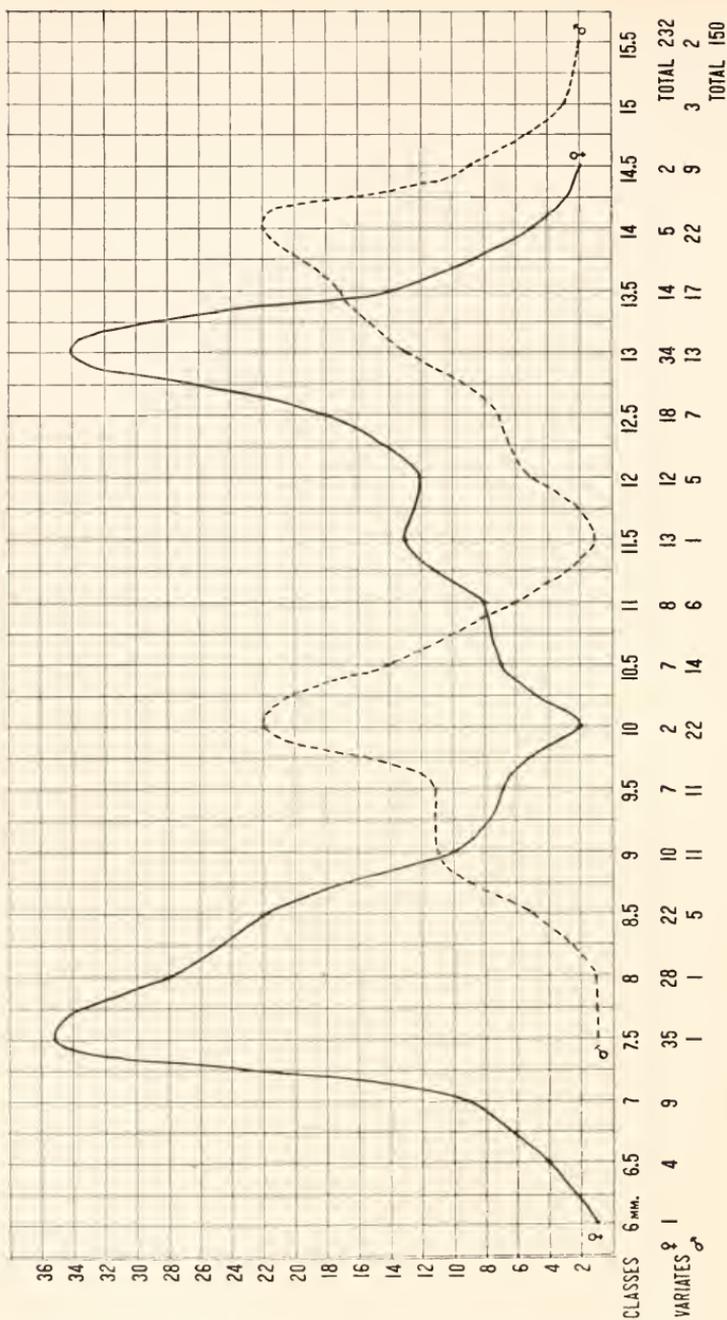
That there are variations in size among individuals of the same species of insect is well known among entomologists and has been the subject of a number of investigations. These have had as their object either the collection of data regarding the character and extent of the variations, or the demonstration of the causes for the phenomenon itself. The variations which are present in various species of animals and plants may be divided into two very fundamentally different classes; those which are genetic in character, and those of an ecological nature. Variations of the first class are due to some reaction that occurs in the germ plasm, while those of the second class are due to the effect of some stimulus in the environment, and are therefore ecological. The principal ecological factors which have been suggested as causes for variation in size are temperature, humidity, light, chemical stimuli and nutrition, the last-mentioned including both quantity and quality of food. An excellent review of the literature on this subject has been made by Bachmetjew (1907). In the case to be discussed the factors of temperature, humidity, light, chemical stimuli and quality of food apparently vary in a uniform manner, while the quantity of food is small in some cases and large in others.

The quantity of the food supply has been used by a number of authors to account for the variations in size which occur within the same species of insect. Koch (1856) studied the lepidopteron *Vanessa io* var. *joides* Dahl and concluded that it was a variety based on small specimens of *Vanessa io* and that their small size was due to the starvation of the larvae. Berlepsch (1860) performed an experiment with the larvae of queen bees and states that he was able to reduce the size of the

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FREQUENCY CURVE OF VARIATION IN SIZE OF MALE AND FEMALE OF *DASYMUTILLA BIOCULATA* CRESSON.—MICKEL.

queens by reducing the food supply of the larvae. Kleine (1867) states that worker bees of inferior size are produced from poorly fed worker larvae. Brehm (1869) reared a specimen of the dipteran *Anthrax semiata* or *morio* L. from the cocoon of a bumblebee. He thought the variations in the size of this species were due to different quantities of food which were available to the larvae. Stepanow (1882) found that the larvae of the bombyliid *Systoechus leucophaeus* Meigen had different sizes which he thought depended upon the quantity of food in the egg masses of the orthopteron, *Stauronotus raptor* Stevens, upon which the larvae feed. The adult flies also exhibited the same variation. Standfuss (1896) reared the larvae of *Aglia tau* L., a saturnid moth, on a subnormal amount of food and obtained adult moths which were much reduced in size. Bordage (1899) reports a similar experiment with *Atella pholanta*, a vanessid. Rudow (1900) observed the variations in size which are present in the species of various genera of the aculeate Hymenoptera and states that the quantity of food available to the larvae of these forms is undoubtedly the cause of the variations in size. Herms (1907) conducted some feeding experiments with a sarcophagid fly, *Lucilia caesar* L., in which he allowed the larvae to consume as much as they would, and varied the length of the time of feeding. These time periods varied from thirty-six hours, which seemed to be the lower limit at which adults could be secured, to an optimum period of from sixty to seventy-two hours. He obtained adult flies varying from a minimum size with thirty-six hours' feeding to the normal size which were fed for a period of sixty to seventy-two hours. Wodsedelak (1917) has carried on some interesting experiments with the larvae of a dermestid, *Trogoderma tarsale*, in which he has been able to vary their size from large to small by starving, and from small to large by feeding again. No data are available as to the effect of this sort of feeding on the adult beetles.

In all of the cases which have been reviewed it is obvious that the variations have to do with a single species. If a graph is made representing the frequency and range of any of these

variations the resulting curve is unimodal, that is, all of the specimens exhibiting variation group themselves progressively around the most abundantly represented form. If, however, the circumstances should be such that when a graph of the frequency and range of the variation is made, the resulting curve is bimodal, it is not so apparent that one is dealing with a single species. In fact, from an examination of museum specimens only, one might be led to the conclusion that two species were represented rather than one, and an investigation of the organism and its environment would be necessary before one could arrive at the true state of affairs. In cases of this kind the variation may appear to be discontinuous, but a study of the data seems to show that it is more correct to consider it as a continuous variation of the bimodal type, and such variations may well be designated as bimodal. It is conceivable that variations of this kind occur which may show curves with three or even more modes. Kellogg and Bell (1904) have mentioned the possibility of bimodal or even polymodal variations.

*Dasymutilla bioculata* Cresson offers a good example of variation which displays the bimodal characteristic. When a large number of individuals of this species are arranged in a gradatory series, the curve expressing the frequency and range of the differences in size is bimodal. The case is an interesting one because the variation in size can be definitely attributed to an ecological factor, and because it emphasizes the importance of a knowledge of the ecology of an insect to a taxonomist in determining specific limits.

*Dasymutilla bioculata* is a mutillid wasp, which is exceedingly abundant in the sand dune areas of Minnesota. My attention was first attracted to the species in making a collection of Mutillidae in a sand dune area two miles north of the city limits of Minneapolis in Anoka county. The principal collecting ground in this sand dune area is a blow-out (a depression blown out by the wind in areas of shifting sand) about ten acres in extent. During the season of 1922, nearly 1200 specimens of Mutillids were collected in this blow-out. Other species of Hymenoptera were also abundant, particularly two

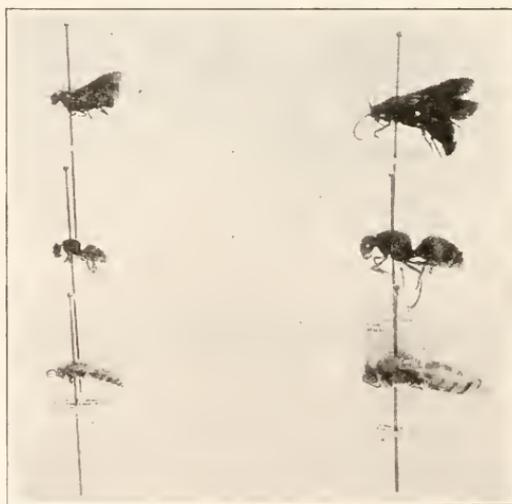
species of Bembicidae, *Bembix pruinosa* Fox and *Microbembex monodonta* Say, and the Sphecid wasp, *Sphex argentatus* Hart. In general, the hymenopterous fauna of the sand dune areas of Minnesota is very similar to that of the sand areas of Illinois, which has been discussed by Hart (1907). The collection of 1922 showed that the most abundant Mutillid in this blow-out was the male *Dasymutilla bioculata* Cresson, and the female *Dasymutilla chlamydata* Melander, which was described from specimens taken in the Illinois sand areas. When this material was worked over for classification, it was found that the 440 specimens of the female *chlamydata* could be separated into two series according to size, that is, those varying between 6.5 mm. and 10 mm. and those varying between 11 mm. and 15 mm. The 206 specimens of the male *bioculata* could also be separated into two similar series. No structural characters could be found for separating these two series, either in the female *chlamydata* or the male *bioculata*. The genitalia of the males in the two series were compared, but no differences could be found. Hart (1907) first suggested that *chlamydata* was probably the female of *bioculata*, but retained the name *chlamydata* for all his specimens. During the season of 1923 specimens of the female *chlamydata* and the male *bioculata* were reared from the same host and were successfully mated in the laboratory. Specimens were also taken *in coitu* in the field. *Dasymutilla chlamydata* Melander therefore becomes a synonym of *Dasymutilla bioculata* Cresson.

Knowing that the Mutillidae are parasitic upon wasps and bees, and that the species *Microbembex monodonta* Say and *Bembix pruinosa* Fox were the most abundant Hymenoptera in the blowout, it occurred to me that probably they were parasitized by one or more species of the Mutillids. It also seemed probable that *Dasymutilla bioculata* was the Mutillid concerned, parasitizing either one or the other, or both of the Bembicids.

I therefore collected 285 cocoons of *Microbembex monodonta* on May 29 and brought them to the laboratory. Eighty-five cocoons of *Bembix pruinosa* were collected on June 30 and brought to the laboratory. Each cocoon was placed in a glass

vial so that a definite record could be kept of each one. From the 285 cocoons of *Microbembex monodonta* I obtained 6 males and 5 females of *Dasyneutilla bioculata* ranging in size from 7 to 10 mm. From the 85 cocoons of *Bembix pruinosa* I obtained 1 male and 3 females of the same Mutillid ranging in size from 11 to 15 mm. When a recently emerged female of the latter group was placed with a male of the small series they mated immediately. The specimens taken in copulation in the field had the following length measurements: female, 6.5 mm. and male 11.5 mm.

The adults of *Microbembex monodonta* vary in size from 8 to 14 mm. while those of *Bembix pruinosa* vary between 16 and 19 mm. The same proportional differences exist in the size of the mature larvae of the two species. The larvae of *Dasyneutilla bioculata* parasitize the cocoons of both the small *Microbembex* and the large *Bembix* and entirely consume the Bembecid larvae before they enter the prepupal stage. The specimens of *bioculata* emerging from the cocoons of the small *Microbembex* vary in size from 6.5 to 10 mm., while those



Correlation in size between *Dasyneutilla bioculata* Cresson and its hosts *Microbembex monodonta* Say (left) and *Bembix pruinosa* Fox (right). In each vertical row: female above, male in the middle, host below.

which emerge from the large *Bembix* vary in size from 11 to 15 mm. Inasmuch as temperature, humidity, light, quality of food, and other ecological factors vary uniformly in this sand dune area, while we know that the quantity of food is considerably less in the *Microbembix* cocoons which produce the small *bioculata* than the amount of food in the *Bembix* cocoons which produce large *bioculata*, it seems justifiable and reasonable to conclude that the quantity of food available to the larvae of *Dasymutilla bioculata* is the factor which determines the size that the adult will be. The quantity of food may be either large or small according to the species of Bembicid which the Mutilid parasitizes.

As stated previously when a curve is plotted representing the frequency and range of the variation in size of a large number of specimens of *Dasymutilla bioculata* the curve will be found to be of the bimodal type. The first mode will represent the specimens which as larvae were parasites of *Microbembix monodonta* Say, and the second mode will represent the specimens which as larvae were parasites of *Bembix pruinosa* Fox. Thus it is clear that in this case at least, what appears from an examination of museum specimens to be a specific difference in size is in reality an ecological variation of the bimodal type, due to a difference in the quantity of the food supply. May not variations of this kind account for some of the supposedly specific differences which we encounter in other groups of insects?

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### **Odors Attractive to Ovipositing Mosquitoes (Dipt. : Culicidae).**

By S. E. CRUMB, United States Bureau of Entomology.

Experiments carried on in 1923 indicate that certain odors emanating from water exercise a strong influence upon mosquitoes with regard to the place chosen for oviposition. In these experiments, which were carried on at Clarksville, Tenn., dur-

ing the period August 3 to October 1, 1923, earthenware jars, usually of two-gallon capacity, were filled three-fourths full of water to which the odorate was added. But three or four jars each provided with a different odorate were exposed simultaneously in a series and one jar of the same size as the others was filled with an equal amount of tap water as a check. The jars were kept in a darkened place outdoors and were examined daily. The results obtained with the various odors are indicated below :

Odorate	No. Nights Run	No. Egg Masses
Hydrogen Sulfide .....	38	11
Old Yeast Infusion .....	23	33
Methane .....	8	2
Stale Urine .....	22	24
Check .....	52	0
Indol .....	10	0
Hay Infusion .....	4	0
Ethyl Mercaptan .....	2	0
Rich Earth .....	4	0
Skatol .....	11	0
Carbol Dioxide .....	6	0

It will be noted that the first five of the substances listed above seem to have attracted ovipositing mosquitoes, while the water check did not secure a single egg mass during the 52 nights that it was exposed. It seems probable that the attractive principles involved in these experiments are all products of bacterial action since hydrogen sulfide and methane belong to this class and the yeast infusion and dilute urine only became attractive after standing about a week when they had acquired a sewage-like odor. These preferences of the ovipositing mosquitoes are possibly correlated with the food habits of the larvae which may subsist largely upon bacteria or associated Protozoa.

Adults were bred in several cases from the egg masses secured in the above experiments and all were determined by Dr. H. G. Dyar as *Culex pipiens* Linn.

This work is being continued in the hope that we may be able to discover an attractant sufficiently powerful to concentrate a large share of the mosquito oviposition in a locality in a few receptacles where the eggs or larvae may be readily destroyed.

## Studies in the Genus *Mecas* (Coleop.).

By J. O. MARTIN, Berkeley, California.

On June 15, 1921, Mr. Vance S. Brown, Lumberman of the Lassen National Forest, collected for me, from *Artemisia tridentata*, a single specimen of a *Mecas*. The following summer I captured by beating the same shrub, which is the common sage brush, about twenty specimens of the same beetle. In Horn's table<sup>1</sup> to the genus *Mecas* this species runs to *inornata* (Say), but after a careful study of the literature of the genus I am convinced that a change is necessary, involving the *Saperda concolor* of LeConte. In 1824 Thomas Say described<sup>2</sup> the species *inornata* as a *Saperda* and distinctly states that it shows no trace of thoracic callosities. LeConte, in 1853<sup>3</sup>, described *Saperda concolor*, but his description does not differentiate it from *inornata*, except in the shape of the elytral termination. In looking over a series of *concolor*, I have noted specimens in which the apex of the elytra have a slight break in the outline which might excuse one for calling it sub-acute. Horn, in the above cited table, was, as far as I can find, the first one to place *inornata* in the genus *Mecas*. Le Conte himself says, in the same paper in which he described *concolor* (speaking of *inornata*), "This is possibly the male of *S. concolor*." It would seem therefore that *concolor* is a synonym of *inornata* and that the species of *Mecas* that has been called *inornata* is undescribed. I offer the following description and name.

### *Mecas bicallosa*, new species.

Body black, shining throughout, which, seen through the white vestiture, gives to the species a dark lead color; length 10-13 mm. Head moderately convex on occiput and front, with coarse deep punctures which average less than the diameter of a puncture apart; each of these large punctures with a long sub-erect seta clouded with black which is darker on the front; surface between the large punctures with numerous finer ones each bearing a recumbent white hair, shorter and finer than the setae and nearly concealing the surface, these hairs are

<sup>1</sup>Trans. Am. Ent. Soc. VII, 1878, p. 44.

<sup>2</sup>Jour. Acad. N. S. Phil. III, 1824, p. 407.

<sup>3</sup>Jour. Acad. N. S. Phil: Ser. 2, II, 1852, p. 155.

shorter on the front. Antennae about three-fourths the length of the body; basal joint similar in punctation and vestiture to head, third and fourth joints with white hairs at base becoming black distally, giving these points an annulated appearance and with fewer of the seta bearing punctures; the remaining joints black, not annulated.

Prothorax one-fifth wider than long, slightly narrower in front, moderately arcuate on the sides, more so in the males as a rule but variable in a series; punctuation and vestiture similar to that of the head, except that the sub-erect setae are cinereous in color; on either side of the median line at about the middle is a well marked glabrous callosity, there is also a tendency for a narrow glabrous condition along the basal half of the median line, very marked in some specimens, absent in others, apparently without regard to sex.

Elytra distinctly wider at base than thorax, with punctuation and vestiture the same as head and prothorax except that the coarse punctures have a roughly lineal arrangement and become wider apart toward the apical area.

Under surface of the body and legs clothed with recumbent white hairs and setae. Tarsal claws with a well marked tooth at about the middle which is slightly larger in the males. Fifth ventral segment of the female with a longitudinal suture like median line. The male lacks this line but has a strongly marked, roundly outlined, triangular depression. The males are as a rule less robust than the females and shorter.

Described from a series of twenty specimens taken at the base of Antelope mountain in Lassen County, California, on *Artemisia tridentata*. Type, a ♀ and allotype ♂ in the collection of the California Academy of Sciences.

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### **New Species of *Ernestia* and *Mericia* (Dipt. : Tachinidae).\***

By C. HOWARD CURRAN, Ottawa, Ontario.

Since Dr. J. D. Tothill's revision of the genus *Ernestia*<sup>1</sup>, considerable additional material has been accumulated by the Canadian National Collection and this is found to contain four well-marked new species which are described in the following pages.

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\* Contribution from the Division of Systematic Entomology, Entomological Branch, Dept. of Agric., Ottawa.

<sup>1</sup>Can. Ent., LIII, 1922.

As shown in a recent article in this journal<sup>2</sup>, the genus *Ernestia*, as understood by Tothill, contained two distinct genera. One of the species described below is a true *Ernestia*, the remainder belonging to the genus *Mericia*.

***Ernestia* (*Faustia*?) *fasciata* n. sp.**

Allied to *Ernestia* (*Metaphyto*) *genalis* Coq., but the posterior c'aspers have no keel and the wide parafacials are normally hairy; the posterior claspers end in a laterally compressed, slightly widened elongate knob. Length 9.5 to 11 mm.

♂. Front two and one-half times as wide as length of second antennal segment. Head silvery greyish pollinose, including the blackish frontal vitta in certain lights, the middle of the face and a stripe on the inner edge of the parafacials, expanding below, reddish in ground color; parafacials two-thirds as wide as middle of face with long, rather coarse hair. Antennae black, third joint one and one-third as long as second, the third joint rectangular, slightly over one and one-half times as long as wide; arista blackish, thick on basal half, tapering to a fine point from before the middle. Palpi black, the moderately broadened apical third reddish. Vibrissae situated well above the oral margin, sometimes not strongly differentiated from the stout accompanying bristles which are more abundant than usual.

Thorax black, the mesonotum thinly greyish pollinose (almost bare), leaving two narrow darker vittae on either side. Scutellum reddish with diffuse darker base and sides. No hairs beneath the inner end of squamae. Wings cinereous hyaline, the base semi-whitish, yet the sub-basal area is darkened by brown on the veins and the small crossvein is very distinctly clouded. Squamae white. Halteres fuscous yellowish. Legs black.

Abdomen shining black, the second to fourth segments with a narrowly interrupted, greyish pollinose fascia occupying somewhat more than the basal fourth. Posterior claspers tapering from base, the sides subparallel, the apex laterally compressed so as to form an oval knob from lateral view. Outer claspers stout, sub-triangular, one and one-half times as long as wide, their sides slightly convex, not acute at apex and with small straight spine. From one to three pairs of discals on second and third segments.

♀. Front three times as wide as length of second antennal segment, normally wholly pollinose, the apex of second and narrow base of third antennal segments reddish. Mesonotum more densely pollinose, leaving five or six darker, wider vittae.

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<sup>2</sup> Ent. News, XXXV, 214, 1924.

*Holotype*—♂, Cranbrook, British Columbia, May 9, 1922 (C. B. D. Garrett); No. 79, in the Canadian National Collection, Ottawa.

*Allotype*—♀, Okanagan Falls, British Columbia, April 24, 1919 (E. R. Buckell).

*Paratypes*—♂, Cranbrook, May 8, 2 ♂, May 10, 2♂, May 11, 1922 (Garrett); ♂, Penticton, British Columbia, May 10, 1919 (Buckell); ♀, Victoria, British Columbia, May 10, 1916 (R. C. Treherne).

This species is not separable from the genus *Ernestia*, notwithstanding the hairy face and wide parafacials. The genitalia are essentially the same. According to Tothill's key, the species belongs in the sub-genus *Faustia*, but I have no specimens of that genus for comparison. It apparently differs from *Faustia* in the hairy parafacials. However, in some specimens the hair is greatly reduced and is almost wanting in one.

#### ***Mericia triangularis* n. sp.**

Very similar to *M. aldrichi* Toth., but the front is wider and the long genital carina is flat, not acute on the posterior surface and the apex of the posterior claspers is not strongly curved; the carina is larger than in *nigropalpis* Toth., and the palpi reddish. Length, 9.5 mm.

♂. Front a little wider than the length of second antennal segment. Head silvery greyish pollinose. Antennae black; the apex of the second joint more or less reddish; third joint almost one and one-half times as long as second, not unusually wide. Arista black, thickened on basal half. Palpi reddish, their base brown.

Mesonotum thinly greyish pollinose, with five incomplete darker vittae; thorax bluish black in ground color. Scutellum scarcely reddish above. Several black hairs below inner base of squamae.

Wings greyish hyaline, the base slightly darkened. Squamae white, halteres blackish, with reddish base. Legs black.

Abdomen blue-black, the second to fourth segments thinly greyish pollinose, except a broadly interrupted apical fascia. Carina of posterior clasper long, triangular, the caudal surface flat, with just an indication of a sulcus at apex which is slightly widened. The outer claspers are not half as wide on apical as basal half, the apical portion very slightly tapering.

terminating in a long slender hook. Second and third segments each with one pair of discals.

*Holotype*—♂, Aweme, Manitoba, May 24, 1920 (P. N. Vroom); No. 799, in the Canadian National Collection, Ottawa.

***Mericia alberta* n. sp.**

Similar to *M. ampelus* Walk., but the carina is longer on caudal edge, the outer claspers are very much wider, scarcely tapering on the apical half, the front distinctly wider and the genital segments normally black, the ♀ without red on abdomen. Length, 10 to 11 mm.

♂. Front as wide as length of second antennal segment. Head silvery grey pollinose. Antennae black, the third joint one and one-quarter times as long as second, its apex somewhat oblique, the upper corner being rounded off; arista black, tapering from base of ultimate section. Palpi reddish, moderately broad throughout.

Thorax shining blue-black, the dorsum with five broad grey pollinose vittae. Scutellum reddish with dark base and sides. Several strong black hairs below inner corner of squamae.

Wings cinereous hyaline, the veins bordered with brownish. Squamae white. Halteres fuscous with paler knob and base.

Abdomen bluish black, the second to fourth segments greyish pollinose except on apical fourth. Genitalia as described above. Second and third segments with one pair of discals, the latter perhaps with a weaker pair in addition as one bristle is present.

♀. Front not twice as wide as length of second antennal joint. Apical half of second antennal joint reddish.

*Holotype*—♂, Banff, Alberta, June 30, 1922 (6,000 ft.), (C. B. D. Garrett); No. 698, in the Canadian National Collection, Ottawa.

*Allotype*—♀, same locality, August 16, 1922 (Garrett).

***Mericia fasciventris* n. sp.**

Front slightly over twice as wide, the parafacials as wide as length of second antennal segment; posterior claspers with triangular carina, gently concave behind and slightly beak-like on lower apex; outer claspers very wide on basal half, the apical half with slender almost parallel sides and a small curved apical hook. Female with the second antennal joint reddish, the apical third of the terminal abdominal segment similar in color. Length, 10 to 11 mm.

♂. Front twice as wide as length of second antennal segment. Head silvery greyish pollinose, including the broad blackish frontal vitta in certain lights; face reddish except on parafacials laterally and lower portion of cheeks. Antennae black, the apex of the second and base of third joint more or less reddish; third joint rather large, one and one-half times as long as the second. Palpi reddish with brown base.

Mesonotum greyish pollinose, leaving three wide black vittae, the median one of which is narrowly interrupted on much of its length by a slender pollinose vitta. Thorax shining black in ground color. Scutellum black, the apical half, or more, more or less clearly reddish, the whole greyish pollinose. Several conspicuous black hairs below the inner end of the squamae. Wings cinereous hyaline, the veins narrowly brownish. Squamae white. Halteres fuscous, with reddish base. Legs black.

Abdomen shining black, with more than the basal half of each segment greyish pollinose. Genitalia as described above. One pair of discals on second and third segments.

♀. Front two and one-half times as wide as length of second antennal segment. First two antennal joints reddish. Apical third or less of terminal abdominal segment reddish or obscurely so.

*Holotype*—♂, Aylmer, Quebec, June 1, 1923 (C. H. Curran); No. 797, in the Canadian National Collection, Ottawa.

*Allotype*—♀, Ottawa, Ontario (Mer Bleu), June 7, 1923 (A. Richardson).

*Paratypes*—♂, Chelsea, Quebec, May 30, 1923 (Richardson); ♂, Vernon, British Columbia, May 24, 1918 (W. Downes); ♀, Aweme, Manitoba, June 3, 1920 (P. Vroom).

The female is distinguished from *ampelus* Walker by the broad black base of the terminal abdominal segment. The male has the carina on the posterior claspers much as in *nigropalpis* Toth., but more pointed and the outer claspers are narrow on apical half, much as in *arcuata* Toth. Both these species have a narrow front. The carina in *aldrichi* Toth. and *longicarina* Toth. is much longer than in *fasciventris*, of different shape, and the outer claspers are quite different.

### ***Mericia campestris* n. sp.**

Allied to *M. arcuata* Tothill, but readily distinguished by the much broader outer claspers as they taper slightly from the middle to the apex, instead of being narrow on apical half, and the carina on the posterior forceps is less concave. Length, 11 mm.

♂. Head silvery greyish white pollinose with a yellowish tinge in certain lights. Antennae blackish, the apex of the second and base of the third, except above, reddish; third joint one-fourth longer than second; arista brown, vibrissae situated above the anterior oral tip a distance equal to two-thirds the length of the second antennal segment; palpi reddish. Eyes separated by not over half the length of the second antennal joint.

Mesonotum black, the lateral margin and obscure sub-dorsal vittae greyish pollinose: Scutellum reddish with narrow black base and sides.

Legs black. Wings lightly infuscated. Squamae white, halteres fuscous with part of knob and base reddish. Several fine pale brownish hairs beneath inner end of squamae.

Abdomen black, the third to fifth segments reddish on the broad sides, except the narrow apex of each; abdomen thinly greyish pollinose, the apices of the segments darker, the pollen appearing somewhat tessellate in certain views. Carina of posterior forceps long, triangular, its short end somewhat concave, the apex not at all flattened or widened; the outer forceps wholly broad, still broadened at the middle and narrowed to the acute apex which bears a short, curved hook. One pair of discs on second and third segments.

*Holotype*—♂, Aweme, Manitoba, May 20, 1920 (P. N. Vroom); No. 795, in the Canadian National Collection, Ottawa.

*Paratype*—♂, Aweme, May 28, 1921 (H. A. Robertson).

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### **A New Species of Ant from Kansas (Hym. : Formicidae).**

By M. R. SMITH, A. and M. College, Mississippi.

The writer has recently received a species of ant from Kansas, which appears to be new. The ants which belong to the genus *Pheidole* were found attacking the seed of sorghum at Manhattan, Kansas, by Professor W. P. Hayes. At a superficial glance one would be inclined to assign them to the species *vinelandica*, but a more careful study will bring out certain characters which are certainly distinct from those of *vinelandica*. The more important differences in the two are given in this paper. Because of the fact that this ant is apparently new and

also because of the fact that it has shown some tendency to become an economic pest in Kansas, the writer has drawn up the following description of this ant and named it *hayesi*, in honor of Professor Hayes, its collector.

***Pheidole hayesi* sp. nov.**

*Soldier.* Length: 2.5 mm-3 mm.

Head, excluding mandibles, somewhat longer than broad, about as broad behind as in front, with distinctly excised posterior border, a faint, yet definite, occipital furrow and prominently rounded angular lobes; sides sub-convex to convex. Eyes small, oval, slightly convex, considerably less than one-third the distance from the anterior to the posterior corners of the head. Mandibles not strongly convex, with two prominent apical and usually one or more small basal teeth. Clypeus flattened, smooth throughout, with a pronounced excision in the anterior border, the two edges of the excision forming angulate teeth. Antennal scapes reaching to about the middle of the head, slender, distinctly curved at the base. Club as long as, or longer than, the rest of the funiculus. Frontal area triangular, impressed. Mesonotum when viewed in profile appears flattened dorsally and angulate posteriorly. Meso-epinotal constriction deep, well pronounced. Epinotum with the base as long as, or longer than, the declivity, the former broadly grooved dorsally. The spines short, coarse, the tips reflexed outward and downward. Petiole longer than broad, the sides concave. Node flattened above or with a faint excision. Postpetiole less than twice as broad as the petiole, the sides angulate or conulate. Gaster smaller than the head, subspherical.

Mandibles shining, sparsely punctate and longitudinally striated basally. Clypeus, frontal area, and the posterior half of the head smooth and shining, the latter very noticeably so. Anterior half of the head subopaque, longitudinally striated, the striations in the regions of the eyes more parallel and well defined than elsewhere. Thorax anteriorly and laterally rugulose and subopaque; the dorsal surfaces of the pronotum and mesonotum somewhat smooth and shining. The petiole laterally and ventrally punctulate, subopaque. Postpetiole, dorsally, smooth and shining. Gaster polished and shining.

Hairs pale yellowish; rather coarse, sub-erect on head, antennae and legs, longer, more erect and of unequal length on thorax, petiole, postpetiole and gaster.

Ferruginous brown; legs lighter and more yellowish, gaster dark brown.

*Worker.* Length: 1.5 mm-2 mm.

Head, excluding the mandibles, about as broad as long, with convex sides and a faint emargination of the posterior border. Eyes barely anterior to the middle of the sides of the head. Mandibles with two definite apical and several small, irregular, basal teeth. Clypeus smooth, with straight, entire, anterior border. Antennal scapes reaching almost to the posterior corners of the head. Frontal carinae short. Frontal area well pronounced, sub-triangular, free from ridges. Thorax somewhat similar to that of the soldier but lacking the angular humeri. Petiole as in the soldier. Postpetiole less than twice as broad as the petiole, with the sides only faintly or slightly angular but not conulate as in the soldier. Gaster smaller than the head. Femora and tibiae of legs well developed.

Head with the exception of the antennae and cheeks distinctly shining, cheeks and antennae subopaque, the former with longitudinal rugae. Dorsal surface of the pronotum and the mesonotum smooth and shining. Epinotum and the pleurae of the mesonotum punctulate, opaque. Petiole and postpetiole smooth and shining dorsally, the sides subopaque. Gaster smooth and shining.

Hairs of the same color as in the soldier, over all portions of the body, numerous and erect on the scapes and funiculi of the antennae.

Dark brown, almost black, mouth parts and appendages lighter.

Described from eleven soldiers and five workers, all of which are in the writer's collection. These specimens were sent to the writer by Professor W. P. Hayes of the Entomology Department of the Kansas State Agricultural College, Manhattan, Kansas.

Professor Hayes found this species attacking sorghum seed at Manhattan. In a letter to the writer, he stated: "They construct small earthen mounds from one and three-fourths to two inches in diameter and often carry small bits of the attacked seed to the surface, where it is scattered over the mound." Because of this seed-eating habit this ant is assuming the role of an economic pest.

After a very careful study of this species the writer feels convinced that *hayesi* is more closely related to *Phcidole vinelandica* than to any other ant of this group. Not only is this true of the general size and shape of the ant, but it is also true of its

habits. The two species are so closely related that a further study of more specimens of *hayesi* from various localities may result in *hayesi* being given subspecific rank. The sides of the head in *hayesi* are more convex than those of *vinelandica*, the posterior angles of the head of the former are more angulate than are the corners of the head of *vinelandica*, which are very broadly rounded. The thorax of *hayesi* is anteriorly and laterally rugulose, the thorax of *vinelandica* is distinctly punctulate on the sides of the mesonotum and epinotum, and particularly on the dorsal surface of the epinotum. There are also other differences of minor importance. The shape of the head and the sculpture of the thorax are the two most outstanding differences in the two.

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### Handy Collecting Apparatus.

By WILLIAM E. HOFFMANN, Division of Entomology, University of Minnesota.

During the past season the writer found a large number of *Microvelia hinci* Drake and set about to get as many as possible. After an hour and more of real effort the catch was counted and found to number but a dozen. This was a real disappointment as this species had not been found in such numbers before and a large series was desired. The specimens for the most part were on the surface of water only one or two inches deep. A few of them were found on the mud at the edge of the water and many more of them ran from the water to the flat mud bank when disturbed. They are unlike *M. borealis* Bueno or *M. americana* Uhler in this respect, for these species will run out upon the water when disturbed. The *M. hinci* were found in a rather restricted area on this small pond, a strip some twelve or more feet in length. They were seldom found more than three feet from the water's edge. There was a dense growth of *Typha* here and because of this and also because of the shallow water, an ordinary water net was of little use. The collecting was given up for the day with the firm conviction that some better means of collecting must be devised to take this species in numbers.

The next morning while washing dishes in our combination kitchen and laboratory, the feasibility of using a large spoon for collecting, presented itself. Accordingly, a large spoon was selected from the culinary equipment and a hole three-quarters of an inch in diameter was made in the center of it. A piece of curtain scrim, the same as used for making insect nets, was fastened over the hole by means of strips of adhesive tape. That afternoon the pond was visited again and the new piece of apparatus given a trial. The results exceeded the most optimistic expectations. It was a simple matter to dip up the water upon which the *Microvelia* stood as the surface tension of the water offered but slight resistance to the dipping of the spoon. The scrim permitted the surplus water to pass through with a film of water remaining on the surface of the spoon sufficient to force the bugs into the live bottle when the spoon was up-turned. Since *Microvelia* are mounted to better advantage if not killed until a few minutes before one wishes to mount them, it is desirable to keep them alive until they are to be mounted. They may be placed in folds of damp cheese cloth, but as this is a slow and cumbersome method at best, it was decided to use a live bottle. The live bottle, however, soon became partly filled with water and had to be drained occasionally to prevent the bugs becoming water-logged. This difficulty was remedied before the next day's collecting trip by placing the bottle on an emery wheel and grinding a small hole in the bottom of it. This hole was covered with scrim in the same manner as the hole in the spoon.

In addition to *Microvelia hinci* Drake, *M. borcalis* Bueno, *M. albonotata* Champion, *M. buchoi* Drake, and *M. fontinalis* Bueno, nymphs and adults, were successfully collected with this apparatus. Often three or four were taken at a time. Only the nymphs of *M. americana* Uhler could be taken in this manner as the agile adults would soon swim beyond reach. The spoon works best in shallow water and especially if there is a great deal of vegetation or drift present. Late in the fall a pond was found which was drying up and only a small pool surrounded by barren mud banks remained. Here *Gerris* nymphs

and adults, *Notonecta* nymphs and adults, and adult *Buena*, *Plea*, Corixids, Hebrids, and *Microvelia*, as well as Hydrophilid, Dytiscid and Haliplid beetles were taken. This pool was so shallow that it was impossible to collect with an insect net.

The adhesive tape held securely for several months in spite of almost daily soaking in water. The spoon, however, may be made more permanent with but very little trouble, by soldering on a piece of wire gauze in the place of the scrim. This apparatus commends itself for use not only because it enables the collector to take certain forms with more facility, but because it is cheap and easy to make and not burdensome to carry.

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#### Note on *Hydnobius matthewsii* Crotch. (Col.: Silphidae).

On the morning of November 7, 1922, being then in Lassen County at an elevation of 6,500 feet, I awakened to find the ground covered by a fall of three feet of damp snow and just outside my cabin door, on the surface of the snow, took numerous specimens of two species of beetles. The first and most numerous was *Aphodius nevadensis* Horn. The second was an undoubted Silphid but would not fit into any of the tribes in Horn's Synopsis of the Silphidae in Trans. Am. Ent. Soc. VIII, 1880. Its characters, especially those of the antennae indicated the genus *Hydnobius*, but the fact that its anterior coxal cavities were open behind threw it out of the tribe Anistomini to which that genus belongs. Comparison with the description of *Hydnobius matthewsii*, by Crotch, showed it to be undoubtedly that species, and this determination was confirmed by Mr. H. C. Fall, to whom I sent specimens. On page 278 of the above cited paper, speaking of the genus *Dictha*, Horn says, "The side piece (epimeron) of the prothorax produced behind the coxae, but extremely slender, so as to be only a spine—the two not meeting in the middle," is I suspect, one of those cases in which the eyes have been deceived, as all the Anisotomini have the anterior coxae closed behind by the epimera, a fact which is sometimes demonstrable only by the separation of the thorax from the body. I have separated the thorax from the body in four specimens and find in each case a fairly wide separation of these sclerites. As *matthewsii* is the only *Hydnobius* in my collection I am unable to note as to its truth for other members of the genus. The specimens of which I took about fifty were all found within an eighth of a mile radius and outside of that limit I could find no others.—J. O. MARTIN, Berkeley, California.

# ENTOMOLOGICAL NEWS

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PHILADELPHIA, PA., JULY, 1924.

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## Duty on Insects Again.

In this Journal\* for last October we published a brief article on the question of the importation of insects by institutions and individuals and stated the Government regulations covering such matters.

Our article was suggested by a number of complaints from entomologists and our own unpleasant experiences. Different methods and different rates were charged in other places and in some insects came in free of duty.

We suggested that the U. S. Bureau of Entomology try to clarify the atmosphere and Dr. L. O. Howard, Chief of the Bureau, took a warm interest in the subject and said he would do all he could in relation thereto. It is, however, a matter for Congress. It may be that the cause of the trouble is the fact that there are quite a number of dealers in insects who sell them solely for art and decorative purposes.

Mr. J. R. de la Torre-Bueno, Editor of the Bulletin of the Brooklyn Entomological Society, sends the following: "Regarding duty on imported insects, while it may be true that it cannot be taken up with this session of Congress, I think it is time the entomological journals throughout the country ventilated the matter thoroughly so that when the proper time comes we may be ready to present a memorial to Congress on the subject, which memorial might well be presented and passed at the Washington meeting of the Entomological Society of America this year. It might also be well, if at the proper time, entomologists throughout the country addressed to their representatives in Congress an identical letter on the subject."

HENRY SKINNER.

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\*Ent. News, 1923, XXXIV, p. 244.

## 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.

Papers of systematic nature will be found in the paragraph at the end of their respective orders. Those containing descriptions of new genera and species occurring north of Mexico are preceded by an \*.

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. 8—The Entomologist's Monthly Magazine, London. 10—Proceedings of the Entomological Society of Washington, D. C. 11—Annals and Magazine of Natural History, London. 19—Bulletin of the Brooklyn Entomological Society. 33—Annales de la Societe Entomologique de Belgique, Brussels. 49—Entomologische Mitteilungen, Berlin-Dahlem. 50—Proceedings of the United States National Museum. 52—Zoologischer Anzeiger, Leipzig. 57—Biologisches Zentralblatt, Leipzig. 68—Science, Garrison on the Hudson, N. Y. 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. 80—Revue Suisse de Zoologie, Geneve. 85—The Journal of Experimental Zoology, Philadelphia. 93—Bulletin, Division of the Natural History Survey, Urbana, Ill. 101—Journal of The Linnean Society of London. 104—Zeitschrift fur Wissenschaftliche Zoologie, Leipzig. 107—Rivista del Museo de la Plata, Buenos Aires. 116—Entomologische Zeitschrift, Frankfurt A. M. 120—Annalen des Naturhistorischen Museums in Wien. 124—Bulletin de la Societe entomologique d'Egypte, Cairo. 138—American Museum Novitates, New York. 139—Bulletin of the Southern California Academy of Sciences, Los Angeles. 141—Internationale Entomologische Zeitschrift, Guben. 157—Abhandlungen der Zool.-Botan. Gesellschaft in Wien.

**GENERAL.** Bather, F. A.—The meaning of the terms "Binary" and "Binominal" as applied to biological nomenclature. 101, xxxvi, 29-35. Bruch, C.—Estudios mirmecolo-

gicos. Con la descripción de nuevas especies de dípteros (Phoridae) por los H. Schmitz, y Th. Borgmeier y de una araña (Gonyleptidae) por el Dr. Mello-Leitao. 107, xxvii, 172-220. **Campion, H.**—Obituary. 8, 1924, 69. **Cragg, F. W.**—Obituary of. 76, cxiii, 720-21. **Davis, J. J.**—Relation of insects to human life and to the sciences. (Proc. Indiana Ac. Sc., xxxiii, 287-97.) **Dingler, M.**—Insektenkasten mit glasboden. 141, xviii, 18-9. **Ochs, G.**—Wissenschaftliche ziele in der entomologie und spezialisierung. 116, xxxviii, 5-6. **Parshley, H. M.**—Latter-day horismology: A review. 19, xix, 95-99. **Robertson, C.**—Flower visits of insects, II. 5, xxxi, 93-111. **Torre-Bueno, J. R.**—On "N. Sp." (Editorial.) 19, xix, 99. **Trotter, A. P.**—The language (if any) of insects. 76, cxiii, 747. **Zukowsky, B.**—Wie ist zu sammeln. 141, xviii, 27-30 (Cont.).

**ANATOMY, PHYSIOLOGY, MEDICAL, ETC.** **Butschli, O.**—Vorlesungen ueber vergleichende anatomie. Lief. 4, Ernährungsorgane. Berlin. 380 pp. **Eidmann, H.**—Untersuchungen ueber die morphologie und physiologie des kaumagens von *Periplaneta orientalis*. 104, cxxii, 281-307. **Ford, N.**—A comparative study of the abdominal musculature of orthopteroid insects. (Trans. R. Canada. Inst., xiv, 207-320.) **Haldane, J. B. S.**—The possible existence of a growth-regulating substance in termites. 76, cxiii, 676. **Hanstrom, B.**—Ueber die histologie und vergleichende anatomie der sehganglien und globuli der araneen. (K. Svenska Vet.-Akad. Handl., lxi, No. 12.) **Hecht, O.**—Embryonalentwicklung und symbiose bei *Camponotus ligniperda*. 104, cxxii, 173-204. **Heller, J.**—Sur la transformation des matieres albuminoïdes pendant la metamorphose des lepidoptere. *Deilephila euphorbiae*. 77, xc, 1360-1. **Hoffman, W. A.**—The presence of an eversible gland in a midge. 10, xxvi, 144. **MacGillivray, A. D.**—Crampton on the labium of certain Holometabola. 10, xxvi, 133-41. **Minnich, D. E.**—The olfactory sense of the cabbage butterfly, *Pieris rapae*, an experimental study. 85, xxxix, 339-56.

#### ARACHNIDA AND MYRIOPODA.

\***Hirst, S.**—On a new mite of the genus *Chorioptes* parasitic on goats in the U. S. 11, xiii, 538. \***Jacot, A. P.**—Oribatid mites: *Euphthiracarus depressculus* and *E. flavus*. (Tr. Amer. Micro. Soc., xliii, 90-6.)

**THE SMALLER ORDERS OF INSECTA.** **Dodds, G. S.**—Ecological studies of aquatic insects. Adaptations of

mayfly nymphs to swift streams. (Ecology, v, 137.48.)  
**Willem, V.**—Observations sur "Machilis maritima." 78, lviii, 306-20. **Withycombe, C. L.**—Note on the economic value of the N., with special reference to the Coniopterygidae. 72, xi, 112-25.

**Calvert, P. P.**—The generic characters and the species of Philogenia (Odonata). 2, 1, 1-56. **Dietz, H. F.**—Notes on the Termites of Indiana. (Proc. Indiana Ac. Sc., xxxiii, 299-301.) \***Hood, J. D.**—A new Ankothrips from New Mexico. (Thysanoptera.) 19, xix, 66 8. **Lestage, J. A.**—Atalophlebia brieni sp. n. ephemere nouvelle du Bresil. 33, lxiv, 21-4. \***McDunnough, J.**—New Canadian Ephemeridae with notes, II. 4, lvi, 90-89 (Cont.). **Snyder, T. E.**—Description of a new termite from Porto Rico. 10, xxvi, 131-2. Descriptions of n. sps. and hitherto unknown castes of termites from America and Hawaii. 50, lxiv, Art. 6. \***Treherne, R. C.**—Thysanoptera known to occur in Canada. 4, lvi, 82-8.

**ORTHOPTERA.** **Morgan, W. P.**—Notes on the function of the forceps of earwigs. (Proc. Indiana Ac. Sc., xxxiii, 303-6.)

**HEMIPTERA.** **Hase, A.**—Ueber die stiche der wasserwanze Notonecta glauca. 52, lix, 143-55. **Poisson, R.**—Recherches sur le polymorphisme alaire chez les Hemipteres aquatiques. 78, lviii, 205-305.

\***Barber, H. G.**—Two new sps. of Cymus. (Lygaeidae.) 19, xix, 87-90. **Drake, C. J.**—A new sp. of Acanthocheila from Bolivia (Tingitidae). 19, xix, 94. **Knight, H. H.**—Atractotomus mali found in Nova Scotia. (Miridae.) 19, xix, 65. \***McAtee, W. L.**—Notes on a collection of Erythro-neura and Hymetta chiefly from Illinois, with descriptions of new forms. (Eupterygidae.) 93, xv, 39-44. \***McAtee & Malloch**—Some annectant bugs of the superfamily Cimicoideae. 19, xix, 69-83. **Ribaut, H.**—Etude sur le genre Triphleps (Anthocoridae). (Bul. Soc. Hist. Nat. Toulouse, li, 522-38.) **De la Torre-Bueno, J. R.**—A correction in Acalypta (Tingitidae). 19, xix, 93.

**LEPIDOPTERA.** **Bell, E. L.**—A new locality for Pamphila meskei. 19, xix, 86. **Emeljanoff, N.**—Intersexualitat bei Lymantria dispar, unter einwirkung der temperatur. 57, xlv, 106-10. **Grandi, G.**—Studi sullo sviluppo postembrionale delle varie razze del Bombyx mori. (An. R. Sc. Sup. Agri. Portici, xviii, 72 pp.)

\***Comstock, J. A.**—Studies in Pacific coast L. 139, xxiii, 51-2. **Mousley, H.**—Further notes on the Rhopalocera or butterflies of Hartley, Stanstead County, Quebec, 1923. (Can. Field-Nat., xxxviii, 82-3.) **Oberthur, C.**—Études de lepidopterologie comparee, Fasc. xxii. Le Genre Agrias, 11 col. pls. **Schaus, W.**—New sps. of Pyralidae of the subfamily Nymphulinae from tropical America. 10, xxvi, 93-130.

**DIPTERA.** **Aldrich, J. M.**—On the nomenclature in Diptera. 10, xxvi, 146. **Brolemann, H. W.**—L'hypopygium de *Pachyrhina pyrenaica*. (Bul. Soc. Hist. Nat., Toulouse, li, 472-521.) **Brues, C. T.**—Another "snow" phorid. 5, xxxi, 92. **Campbell & Davidson**—Notes on aphidophagous Syrphidae of southern California. 139, xxiii, 59-71. **Greene, C. T.**—The collection of immature stages of Diptera in the National museum (exclusive of Culicidae). 10, xxvi, 146. **Gruhl, K.**—Paarungsgewohnheiten der dipteren. 104, cxxii, 205-80. **Hearle, E.**—La lutte contre les moustiques a Banff, Alberta. (Le Natur. Canadien, 1, 210-13.) **Shannon, R. J.**—Notes on the maxillary teeth of Anopheles. 10, xxvi, 142-3. **Worthley, H. N.**—The biology of *Trichopoda pennipes*, a parasite of the common squash bug. (Tachinidae.) 5, xxxi, 57-77.

\***Alexander, C. P.**—The crane-flies of New York: Second supplementary list. 19, xix, 57-64. **Bruch, C.**—(See under General.) \***Dunn & Parker**—Fleas found on wild animals in Bitterroot Valley, Montana. (U. S. Pub. Health Serv., Reprint. No. 883.) \***Johannsen, O. A.**—A new chloropid subgenus and sp. from New York. 4, lvi, 89. \***Melander, A. L.**—Review of the dipterous family Piophilidae. 5, xxxi, 78-86. \***Melander & Argo**—A revision of the two-winged flies of the family Clusiidae. 50, lxiv, Art. 11. **Shannon, H. C.**—Some common flies little known in Maine. 10, xxvi, 146. \***Shannon & Dobrosky**—The No. American bird parasites of the genus *Protocalliphora*. (Jour. Wash. Ac. Sc., xiv, 247-53.)

**COLEOPTERA.** **Altson, A. M.**—On the genital system of *Lyctus brunneus*, with a note on *L. linearis*. 101, xxxv, 581-98. v. **Lengerken, H.**—Kopftransplantation an Coleopteren. 52, lix, 166-70.

**Bruch, C.**—(See under General.) **Cotton, R. T.**—The identity of *Sitophilus (Calandra) rugicollis*. 10, xxvi, 141. **Dobzhansky, T.**—Die weiblichen generationsorgane der Coccineliden als artmerkmal betrachtet. 49, xiii, 18-27.

**De la Escalera, M. M.**—Enumeracion de las espanolas de Dorcadion (Cerambycidae) del museo de Madrid, y descripcion de algunas formas nuevas. (Bol. R. Soc. Espanola Nat. Hist., xxiv, 191-200.) **Gibson, A.**—The occurrence of the ptinid beetle, *Niptus hololeucus*, in No. Am. 4, lvi, 74-6. **Holdhaus, K.**—Das Tyrrhenisproblem. Zoogeog. untersuchungen unter besonderer berucksichtigung der koleopteren. 120, xxxvii, 1-200. \***Knisch, A.**—Zwei neue nearktische Palpicornier (Hydrophilidae.) 124, iv, 55-6. **Reichensperger, A.**—Neue sudamerikanische Histeriden als gaste von wanderameisen und Termiten. 80, xxxi, 117-52.

**HYMENOPTERA.** **Davis, W. T.**—Oak apple galls destroyed by squirrels. 19, xix, 91-3. **Wheeler & Wheeler**—The use of a tool by a sphecid wasp. 68, lix, 486.

**Bruch, C.**—(See under General.) \***Cockerell, T. D. A.**—New anthophorid bees from Arizona and Wyoming. 138, No. 113. \***Cushman, R. A.**—On the genera of the ichneumon-flies of the tribe Paniscini, with descriptions and discussion of related genera and sps. 50, lxiv, Art. 20. **Enslin, E.**—Die blattwespengattung *Tenthredo* (*Tenthredella*.) 157, xi, 1-96. **Santschi, F.**—Nouvelles fourmis Bresiliennes. 33, lxiv, 1-20.

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### SPECIAL NOTICES.

**Les insectes parasites de l'homme et des animaux domestiques** par E. Seguy. Paul Lechevalier, Paris, 1924. 422 pp., 463 fig. This small octavo book is part xviii of the *Encyclopedie Pratique du Naturaliste*. Judging from the text, illustrations and the bibliography, it will be a very useful addition to the library of a student of this branch of entomology.

**The Macrolepidoptera of the World.** *Fauna americana*, pts. 136 to 141, include the family Hesperiiidae, genera *Erynnis* to *Thracides*, by M. Draudt; and Nymphalidae, genera *Halisidota* to *Hemihyalea*, by A. Seitz.

**Memorias de la Sociedad entomologica de Espana.** We are glad to announce the appearance of the first number of this new serial. It contains one article by R. P. Longinos Navas, entitled *Sinopsis de los Paraneuropteros (Odonatos) de la peninsula oiberica*, 68 pages, with some text figures.

**The Naturalists' Directory**, containing names, addresses and special subjects of study of professional and amateur naturalists of the United States and Canada. Samuel E. Cassino, Salem, Mass. \$5.00. Published April, 1924.

ETUDES DE LEPIDOPTEROLOGIE COMPAREE par CHARLES OBERTHÜR. Fascicule XXII, part I. Rennes, France. Imprimerie Oberthür, April, 1924. This part is dedicated to Jules Culot for his incomparable talent as an artist and Lepidopterist. Mr. Harold Powell has in this part, an interesting article on the migration flights of the Lepidoptera. The larger part of the number is taken up with the Nymphalid genus *Agrias*. This important paper by Mr. Oberthür comprises seventy-three pages of text, eleven plates and thirty-three figures in color and one half-tone plate with two figures. The colored plates by J. Culot are works of art and also true to nature. Mr. Oberthür has added immensely to our understanding of these lovely butterflies. There are not many species, but the species break up into a number of topomorphic forms. Some of them are a riot of beautiful colors—brown-black, blue, red, yellow, orange and green. The author gives a historical account of the genus and treats the literature in detail.—HENRY SKINNER.

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## OBITUARY.

LOUIS ALBERT PERINGUEY, whose name usually appeared as L. Peringuey, died February 20, 1924. He was of French descent. An obituary notice in *Nature* (London) for April 12th gives little information as to details of his life other than he had been connected with the South African Museum at Cape Town, since 1884, becoming Assistant Director under Mr. W. L. Sclater, and Director in 1905, a position held to his death. He had been general secretary of the Royal Society of South Africa and was president thereof from 1914 to 1918. He wrote extensively on South African Coleoptera—his chief work being a *Descriptive Catalogue of the South African Coleoptera*, 1893-98, which appeared in volumes 7 and 10 of the *Transactions of the South African Philosophical Society*. He published also on South African Mutillidae and Orthoptera, one of his latest entomological papers being on this last-named group in the *Annals of the South African Museum* (volume 15, 1916). In non-entomological fields he was the author of *The Stone Age in South Africa*.

*Science* for May 16, 1924, states: "Major FRANCIS WILLIAM CRAGG, the well-known entomological expert, who had been investigating typhus and relapsing fevers, recently left

Kassauli for Lahore, where typhus is prevalent, in order to study the disease. He contracted the disease himself and died on April 23. For some time past Major Cragg had been assistant director of the Central Research Institute at Kassauli." With Capt. Walter Scott Patton, Major Cragg was co-author of the well and favorably known *Text Book of Medical Entomology*, published by the Christian Literature Society for India in 1913. He was an M. D. of the University of Edinburgh.

<sup>albert</sup>  
~~ARTHUR~~ HUGH JONES, English lepidopterist, highly esteemed for his personal qualities, but who wrote little, died February 22, 1924, at Church Gate House, Wadhurst, Sussex. He was in the banking house of Drummond, was treasurer of the Second Entomological Congress at Oxford, 1912, and of the Entomological Society of London, 1904-17, and a vice-president of the Society in 1912 and 1918.

ARTHUR LESTER LOVETT, Professor of Entomology, Oregon Agricultural College, and Oregon State Entomologist, died at his home in Corvallis, Oregon, Friday, April 25, 1924, of septicaemia poison.

Born at Neal, Kansas, August 23, 1885, he was called from us in the prime of life and at the time he was attaining national recognition as a leader among economic entomologists. Graduated from Oklahoma Agricultural and Mechanical College in 1906, Prof. Lovett acted as Entomologist for that institution and as state inspector until 1911, when he came to the Oregon Agricultural College as Assistant Entomologist. In 1917 he became head of the department of Entomology and State Entomologist for Oregon.

He paid much attention to the Diptera, especially the family Syrphidae, in which group he has described many new species from the west. During the past few years, however, little time was devoted to systematic entomology, but his untiring labor along economic lines brought him wide recognition among the fruit growers and farmers of the Northwest. Prof. Lovett was the first to use spreaders for increasing the efficiency of sprays; this practice is now common throughout the country.

Professor Lovett's untiring labor in the field of science, his winning personality and upright character won for him a legion of friends who mourn deeply his untimely end. The Institution, the State, and the scientific world have lost a loyal worker, a true friend and a man whose place will not soon be filled.

Prof. Lovett was a fellow of the American Association for the Advancement of Science and had been a Vice-President of the American Association of Economic Entomologists and a member of the Editorial Board of the *Annals of the Entomological Society of America*. He was a member of the California Academy of Science, Pacific Slope Entomological Society, Western Society of Naturalists, Crop Pest Institute of America, the American Crop Pest Commission and of two National Honorary Fraternities, Gamma Sigma Delta and Phi Kappa Phi.

He is survived by a widow and two children, his parents, Mr. and Mrs. H. W. Lovett, of Fort Collins, Colorado, a brother, A. E. Lovett, of Yakima, Washington, and a sister, Mrs. P. N. Annand, San Mateo, California.

W. J. CHAMBERLIN.

THOMAS NELSON ANNANDALE, D. SC., F. R. S., Director of the Zoological Survey of India since 1916, died in Calcutta, April 10, 1924. He was born at Edinburgh in 1876, was educated at Rugby, Edinburgh University and Balliol College, Oxford, at which last he took his B. A. degree. He traveled in the Malay Peninsula in 1899, 1901-02 and 1916, and investigated the fauna of the Sea of Galilee in 1912. He joined the Service in India in July, 1904, as Deputy Superintendent of the Zoological and Anthropological Section in Bengal, and in 1906 became Superintendent of the Indian Museum, editing the *Records* and the *Annals* of the Museum since their inception in 1907. His writings, on various groups of invertebrates, include some notes on Indian species of the Dipterous genus *Phlebotomus* in volume IV of these *Records* (1910, 1911).

Dr. Annandale was very active in developing knowledge of the fauna of India by enlisting the aid of specialists to study the collections of the Indian Museum. A number of entomologists, including Americans, were among those to whom he successfully appealed.

HERBERT CAMPION, Temporary Assistant in the Entomological Department of the British Museum (Natural History) since 1921, died on January 24, 1924. He was born at 155 Sloane Street, London, S. W., England, on August 2, 1869. Frail physically, he never attended school, but overcame the difficulties and handicaps incident to acquiring an education "by his good brain, patience and great and constant love for his studies, coupled with the assistance and fellow-likings of his brother, Frederick William Campion, throughout his life." He became a shorthand clerk but in 1911 joined the newly established Imperial Bureau of Entomology until 1921, when his transfer to the British Museum occurred.

The two brothers Campion early became interested in the Odonata. Living at Walthamstow, Essex, a northeastern suburb of London, they were but a short distance from Epping Forest, which since 1882 has been "a free and inalienable public park and place of recreation" of about 5500 acres. This was a favorite collecting ground and for the seven years, 1903-1909, they gave an annual paper in *The Entomologist* on *The Dragonflies of Epping Forest*, in the familiar British style, with much local detail, forming a body of data on the distribution of a small number (about 20) species for successive years, which will surely be valuable for comparison with records of similar phenomena in other parts of the world.

In 1909 or 1910, their residence was changed to 58 Ranelagh Road, Ealing London, West, where his brother and sister continued to live after Herbert Campion's death. The series of papers on Epping Forest ceased and was replaced by *Notes on the Dragonfly Seasons* of 1910, 1911, 1912 and 1913 in the same journal, based on a number of varied localities visited by the authors and others. Besides notes on variations of several English species, these collecting years also furnished some of the material for two papers on Larval Water Mites as Dragonfly parasites (1909) and on the Prey of some Dragonflies (1914).

After becoming connected with the Imperial Bureau of Entomology, Herbert Campion's attention was directed to exotic Odonata and we have his articles on these insects from Tunisia,

West Africa, Dutch New Guinea, Australia, Macedonia and New Caledonia and on some Gomphines from South America. He also described (1916) a beautifully preserved fossil wing from the English Eocene as *Triacschna gossi*, and in the following year (1917) published notes on *Fabricius's Types of Odonata in the British Museum*. His morphological paper, *The Antenodal Reticulation of the Wings of Agrionine Dragonflies* was published in the *Proceedings of the Academy of Natural Sciences of Philadelphia* for 1913, the only one to appear first on this side of the Atlantic. In it he came to the conclusion that,

We have evidence of the former existence of at least seven antenodals, of which the second and fourth alone persist in the greater number of recent Agrioninae. In a hypothetical wing, including all the antenodal cross-veins of which indications have so far been afforded by morphology and tetratology, the fourth antenodal is that which coincides with the arculus, and this fact enables one to recognize it in all other Agrionine wings. . . . In our reconstructed wing, then, we have seven antenodal cross-veins, disposed in the following manner: Nos. 1, 2 and 3 placed before the level of the arculus; No. 4 coinciding more or less exactly with the arculus, and Nos. 5, 6 and 7 lying between the level of the arculus and the nodus.

In the year preceding his death his letters mention his working on East African Odonata and his hopes to describe certain interesting species from the Philippines, as well as the possibility of studying a large consignment from Java. Whether sufficient had been accomplished to permit of publication we do not know.

Mr. Campion was a kind and helpful correspondent and his connections with the British Museum made his assistance very valuable. In more than one case has the writer of these lines had the pleasure of printing acknowledgments of his aid. With keen regret we feel his departure and tender our sincere sympathy to his surviving brother and sister.

[The writer is indebted to Mr. F. W. Campion for the date and place of his brother's birth and for some other data. Some facts have been drawn from two obituaries in *The Entomologist* and in *The Entomologist's Monthly Magazine* for March. The greater part of the above notice, however, is based on Mr. Herbert Campion's published papers and one of his letters.]

PHILIP P. CÆVERT.

## 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.

**Wanted** in exchange or cash 1000 *Precis orithya* ♂, *Precis isorata* ♂, *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.

**For Exchange.**—Living pupae of *Automeris io* and *Papilio asterias* and unnamed coleoptera from India for *Catocala* or *N. A. coleoptera*. Mrs. Robert Milde, Lewiston, Minnesota.

**For Exchange.**—I have for exchange live pupae of *Sphinx Chersis*, for other pupae or Lepidoptera in papers, Southern specimens. V. Tykal, 2412 S. Harding Ave., Chicago, Ill.

**Will pay cash** for specimens of rare and unusual **Scarabaeidae** (named—Leng's Catalogue). Send list and prices to Wm. C. Wood, 51 Fifth Ave., New York, N. Y.

**Wanted**—*Psyche*, Vols. I, XI, XIII, and *Bulletin*, Brooklyn Entomological Society, Vols. I, II, III. H. C. Severin, State Entomologist, Brookings, South Dakota.

**I have living pupae** of *io*, *imperialis*, *regalis* and others, also caterpillars of *Eupantheria deflorata* and spp. of *Coleoptera* for exchange. Address V. Harnach, 47 West College St., Asheville, N. C.

**Correspondence invited** from all those interested in Hungarian insects: *Coleopt.*, *Lepidopt.*, *Hymenopt.*, *Hemipt.*, etc.—Prof. Charles Sajo, Oerszentmiklos, (Komitat Pest) Hungary.

**Will exchange** lepidoptera of Pennsylvania for those from other parts of the continent. Frank H. Chernock, 1308 Tell Street, N. S., Pittsburgh, Pa.

**Wanted:** Living pupae of American silk-producing moths. W. S. Lowe, 35 Craven St., W. C. 2, London, England.

**Wanted:** For cash. Bred or perfect caught specimens, of *Sphinx luscitiosa*, *Paonias astylus*, and *Deidamia inscriptum*. Bred specimens of other species of *Sphingidae*, of the rarer sorts, would also be desirable. John M. Geddes, 331 High St., Williamsport, Pa.

**Wanted**—American sawflies. *Tenthredinoidea*, in exchange for other insects, chiefly *Coleoptera*. Correspondence may be in English. D. Dovnar-Zapolsky, P. O. Box 573, Agricultural Experimental Station, Entomological Section, Rostov on Don, Russia.

**Have** a number of pamphlets and books on *N. A.* and exotic *Cerambycidae*. Will exchange these for certain families of *Heteroptera* and *Tabanidae*. G. Chagnon, P. O. Box 521, Montreal, Canada.

**Buprestidae.**—Will determine and exchange *Buprestidae* of the world and exchange *separata* on this family. Dr. Jan Obenberger, Prague II., Václavské náměstí 1700, Museum, Czechoslovakia.

**Wanted**—Connection with collectors who can furnish me early in the fall living and hibernating pupae of western and southern *Papilio* and *Saturniidae* and allied groups. Fertile eggs of *Apanteris* and *Catocala* also desired. Max Rothke, 1841 E. Elm St. (R. D. 2), Scranton, Pa.

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OCTOBER, 1924

# ENTOMOLOGICAL NEWS

Vol. XXXV

No. 8



GEORGE HENRY HORN  
1840-1897

PHILIP P. CALVERT, Ph. D., Editor.

E. T. CRESSON, JR., Associate Editor.

HENRY SKINNER, M.D., Sc.D., Editor Emeritus.

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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.

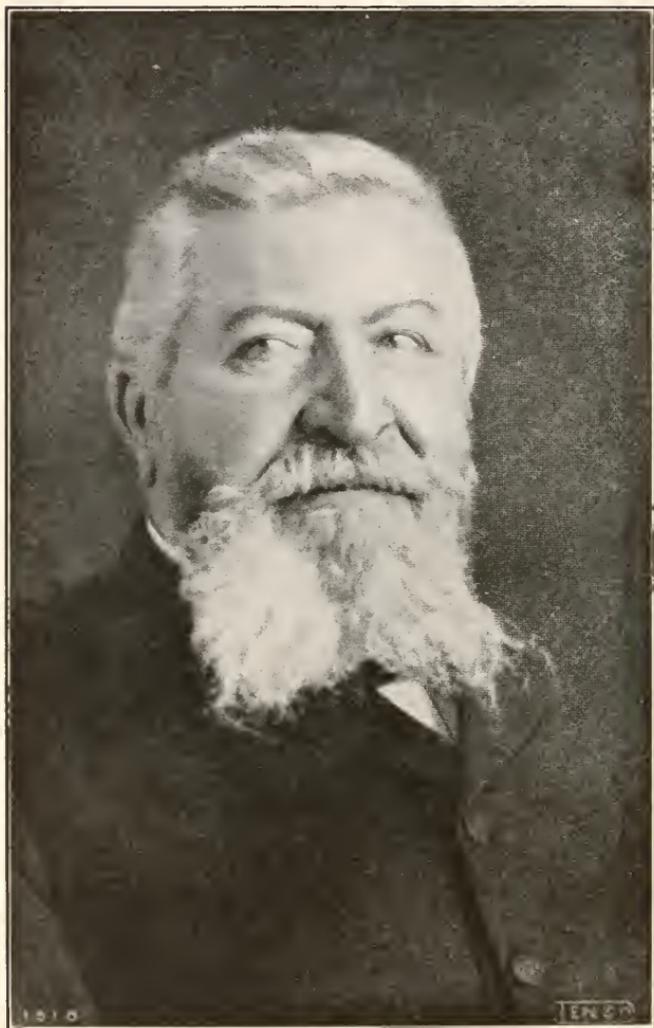
## STATED MEETINGS

Of the Entomological Section of The Academy of Natural Sciences of Philadelphia, and of The American Entomological Society will be held at 7.30 o'clock P. M. on the following dates during 1924: January 24, February 28, March 27, April 24, May 22, September 25, October 23, November 20, and Dec. 8.

Communications on observations made in the course of your studies are solicited; also exhibits of any specimens you consider of interest.

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.





CHARLES OBERTHUR.

# ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXV

OCTOBER, 1924

No. 8

## CONTENTS

Editorial—Obituary of Charles Oberthur.....	267	Professor and Mrs. Cockerell Visit the Pacific Islands.....	293
Reinhard—New Muscoid Diptera. ...	269	Holland—The Occurrence of <i>Eurhympara urticata</i> Linnaeus (Lepidoptera: Hydrocampinae) in Maine..	293
Trimble—The Azalea Leaf Miner (Lepid.: Tineidae).....	275	Entomological Literature .....	294
Hull— <i>Milesia</i> in N. America (Dipt.: Syrphidae).....	280	Doings of Societies—Northeastern Entomologists..	302
Hoffman— <i>Stilobezzia mallochi</i> and <i>Atrichopogon gilva</i> (Dipt.: Chironomidae, ).....	282	British Association for the Advancement of Science....	302
Garman—Odonata from Kentucky....	285	Obituary—Philippe Grouvelle.....	303
Alexander—Undescribed Species of the Genus <i>Tanypremna</i> Osten Sacken (Dipt.: Tipulidae).....	289	Jules Grouvelle.....	303
The Monument to J. Henri Fabre.....	292	Edmond Bordage.....	303
Parshley—General Catalogue of the Hemiptera.....	292	Frederick Merrifield .....	304
		David M. Castle.....	304

## CHARLES OBERTHUR.

(Portrait, Plate VII.)

CHARLES OBERTHUR, President du Conseil d'Administration de la Societe Anonyme des Imprimeries Oberthur, Ancien Maire de Monterfil, Ancien Adjoint au Maire de Rennes, President honoraire de la Chambre de Commerce de Rennes, Membre de la Societe Entomologique de France, Chevalier de la Legion d'honneur, Commander de Saint-Gregoire-le-Grand and a very distinguished Entomologist, died June first at his home 36, faubourg de Paris, Rennes, France.

Monsieur Oberthur was one of the greatest Lepidopterists the world has produced and his death has removed a student who was constantly contributing papers and books of the utmost value to science. He possessed a marvellous collection which ranked among the greatest extant.

He had a profound regard for the value of illustrations and carried this idea out during a long life time, having published

thousands of admirable illustrations by artists of the very highest ability. His studies probably began about 1864 and he published many papers in the various European journals devoted to such subjects, a total of more than fifty up to the year 1900.

In 1876 was commenced the superb work entitled *Etudes d'Entomologie*, with numerous colored figures, describing new and little known Lepidoptera from many parts of the world. This was continued until May, 1896, part XXI, and was kept up in the same sumptuous manner as in the beginning. The name of the publication was changed to *Etudes de Lepidopterologie Comparée*, with Vol. 1, 1904, and the last installment received was part I of volume XXII, devoted to the genus *Agrias*, with eleven plates and thirty-three beautiful figures.

M. Oberthur took an intense interest in the variation of the Lepidoptera and published many figures showing these variations, a notable example being *Observations sur la variation des Heliconia vesta et thelxiope*, with ten plates and 120 colored figures.

In *Etudes de Lepidopterologie Comparée*, Fascicule XI, bis, appeared an interesting study of the grand Lepidoptera of Australia, genera *Coscinocera* and *Xyleutes*, by Oberthur, Houlbert and Dodd. This is notable for having what are among the best half-tone plates of insects that we have ever seen. Another feature is the illustration of the habitats of the insects treated, also groups of the native Australians. In many of the recent volumes of his studies he gives pictures of the country and of the places where rare or interesting species have been found.

The Lepidopterists of America should be profoundly grateful to M. Oberthur for his kindness in publishing splendid figures of the Boisduval types of butterflies. Students here were very uncertain as to the identity of a number of species and the generosity of our deceased friend has cleared up some difficult problems. The figures mentioned are in Vol. ix, 1913. He also published figures of American species of butterflies and moths described by other authors here and in Europe.

Several years ago, in the *Etudes*, he published a series of 40 portraits of distinguished Lepidopterists and evidently intended

to continue this interesting collection, had he lived. He has been honored by many Societies, including honorary fellowship of the Entomological Society of London in 1908.

He was a remarkable man of intense enthusiasm for the study of the Lepidoptera and an activity in the work of sixty years is not common. He was an ideal correspondent and always willing to go to any amount of trouble to supply information. He loved all aspects of the study and published some poems on insect life, the work of other authors, that he admired. Many of the papers published in the *Etudes* were by the pens of other persons, but the publisher was the magnet and the guiding star around which they revolved. He was most generous in giving credit to everyone, including the artists.

M. Oberthur was born at Rennes, France, on the 14th of September, 1845, being nearly 79 years old at the time of his decease.

"Priez Dieu Pour Lui."

HENRY SKINNER.

---

### **New Muscoid Diptera.**

By H. J. REINHARD, Amherst, Ohio.

#### ***Frontina ferruginea* new species.**

♂ Eyes bare. Front at vertex one-third width of head, wider before, cinereous pollinose on the sides, with numerous fine hairs outside of the frontals. Vitta reddish-brown, about one-third width of front, split posteriorly enclosing ocellar area. Ocellar bristles present, directed forward and outward. Frontals in two rows, the three uppermost bristles in each row strong and directed backward, the others weaker, directed inward and decussate to base of antennae, where rows diverge extending downward on sides of face to or slightly below level with arista. No orbital bristles. Posterior orbits, cheeks, facial depression and sides of face, silvery-white. Face receding, sides narrow, bare below lowest frontals. Facial depression large and rather deep, ridges ciliate upward almost to lowest frontals. Vibrissae strong, cruciate, inserted on level with oral margin. Cheeks hairy below, narrow, width about one-fourth the eye-height. Antennae almost as long as face, basal joints yellowish, very short, third joint blackish, elongate, front border practically straight. Arista brownish-black, bare, thickened to middle.

second joint twice as long as broad. Proboscis very short, fleshy, labella large, blackish. Palpi yellow, curved upward, somewhat thickened beyond basal third, bearing short black bristles with several longer hairs on lower surface.

Thorax gray pollinose, with four distinct black vittae, the outer pair interrupted at suture and reduced to triangular spots in front, inner pair narrower, entire, ceasing about midway between suture and base of scutellum. Four post-dorsocentral and four sternopleural bristles. Scutellum black, grayish pollinose, three pairs of marginal bristles, besides a shorter, cruciate, apical pair directed almost vertically.

Abdomen reddish-yellow, with a distinct median black vitta, hind margins of third and fourth segments sometimes blackish. Bases of last three segments white pollinose, elsewhere subshining. Bristles marginal only. Segments one and two, each, with a median pair; three, with a complete row; four, with a sub-marginal row.

Wings hyaline, without costal spine, veins yellow. Third vein with two or three short bristles at base, all others bare. Apical cell open, terminating far before tip of wing. Fourth vein arcuate beyond bend, without stump or wrinkle. Hind crossvein a little curved, slightly approximated to bend of fourth. Calypteres white.

Legs blackish, basal joints and base of femorae sometimes yellowish. Middle tibiae with one large bristle on front edge near middle, hind tibiae outwardly ciliate. Pulvilli and claws short.

Total length 5.5-6.5 mm.

♀. Differs by having two pairs of orbital bristles, second antennal joint longer, third joint shorter and yellowish. Bristles on facial ridges usually not extending as high, and less densely pilose on sides of front outside of frontals.

*Type*: Male, deposited in the United States National Museum, Washington, D. C. Described from six male and three female specimens, collected at College Station, July, September, 1920, July, 1923 (H. J. Reinhard).

In Coquillett's key this species runs to *rileyi* Will. (*irrequieta* Walk. of authors). It resembles that form rather closely in coloration, but may be readily distinguished by the smaller size, elongate third antennal joint, facial ridges less diverging below, a pair of median marginal bristles on first two abdominal segments, etc.

**Oxynops robusta** new species.

♀. Black, shining, faintly pruinose. Width of head at vibrissae much shorter than at base of antennae. Eyes large, apparently bare, but with sparse, short hairs. Front at vertex two-thirds the width of either eye, sides shining black above, whitish pollinose below. Vitta velvety, brownish-black, narrowing behind where it divides on each side of ocellar area. No ocellar bristles. Two proclinate and two reclinate fronto-orbital bristles, the latter pair situated in a straight line with the inner verticals, and about equidistant from each other. Outer verticals not developed. Uppermost frontals weak, stronger downward, decussate to base of antennae, and extending on sides of face to apex of second antennal joint. Face slightly wider than front, sides bare, silvery, almost linear below. Facial depression large and deep, whitish, ridges diverging, bristly almost to base of third antennal joint. Vibrissae decussate, inserted on level with oral margin and slightly above lower corner of eye. Antennae almost reaching oral margin, black, basal joints short, front side of third joint straight. Arista black, slender, slightly thickened near base, second joint hardly longer than broad. Cheeks very narrow. Proboscis black, short and fleshy. Palpi black, spatulate, almost reaching tip of proboscis.

Thorax thinly white pollinose, more pronounced anteriorly to suture and on pleurae. Four dorsal vittae apparent anteriorly, obsolete posteriorly to suture. Four post-dorsocentral and two sternopleural bristles. Scutellum black, shining, thickly covered above with short, black erect hairs, marginal bristles three pairs, in addition to a shorter sub-erect apical pair.

Abdomen short, shining black, clothed with recumbent bristly hairs, white pollinose on narrow bases of last three segments. Without discal bristles. Segments one and two, each, with a median pair; three, with a complete row; four, with only short bristly hairs.

Wings considerably longer than abdomen, hyaline, faintly tinged with yellow near base. Costal spine not well developed, all veins yellow, bare, except third which has one or two black bristles near base. Apical cell open, ending shortly before wing-tip. Bend of fourth vein broadly rounded, without stump or fold. Hind crossvein nearly straight, nearer to bend of fourth than to small crossvein. Calypteres distinctly tawny.

Legs black, without strong bristles. Middle tibiae with one bristle on front side beyond the middle, hind tibiae evenly ciliate. Pulvilli very short, claws somewhat longer.

Total length 6.5 mm.

*Type*: A unique female, collected at College Station, Texas, April 25, 1923 (H. J. Reinhard), deposited in the United States National Museum, Washington, D. C.

Aside from the great disparity in size this species agrees fairly well with the genotype, *nitens* Coq., with the following differences: abdomen pollinose on bases of last three segments, front proportionately wider, no ocellars, four dorsocentrals, etc. In relationship this genus is near *Hypostena* (of Coquillett) and is erected mainly on reproductive and early stage characters.

*Pilatea albicincta* new species.

♀. Black, densely grayish pollinose. Eyes rather small, bare. Front at vertex nearly the width of either eye, rather prominent before, sides cinereous, practically destitute of weak hairs. Vitta black, occupying one-third width of front, slightly narrower behind, cleft in front of ocelli and extending linearly on either side. Ocellar bristles strong, directed forward and outward. Inner and outer verticals developed, directed backward, the latter about one-half as long as inner pair. Frontal rows diverging at base of antennae, extending downward on sides of face to apex of second antennal joint, upper two bristles in each row before verticals directed backward, others directed inward and decussate to base of antennae. Two pairs of proclinate orbitals present. Face, facial depression, cheeks, and posterior orbits cinereous pollinose. The latter broad below, almost linear at vertex, bordered behind by a fringe of alternating long and short black hairs. Face broader than front, sides moderately wide, bare beneath lowest frontals. Facial ridges diverging, not prominent, with only four or five bristles at the base. Vibrissae strong, cruciate, inserted a little above the front border of oral margin. Cheeks sparsely hairy, width nearly one-half the eye-height. Antennae distinctly shorter than face, basal joints short, yellowish, third joint nearly three times length of second, black, covered with grayish pubescence. Arista brownish-black, practically bare, slender, slightly thickened near base, penultimate joint hardly longer than broad. Proboscis short, labella large and fleshy, yellowish. Palpi yellow, slender, bearing numerous short black bristles and a number of long fine hairs near the middle on the under side.

Thorax gray pollinose, mesonotum faintly brassy, with four distinct vittae. Post-dorsocentral bristles four, sternopleural bristles three, the lowest of which may be hairlike. Scutellum black, densely pollinose except near base, with three pairs of

marginal bristles, the posterior pair divergent, reaching to base of second abdominal segment.

Abdomen somewhat conical, black, first segment faintly pollinose, last three segments with broad whitish cross-bands, narrow hind borders of the intermediate segments sub-shining. First segment with a lateral marginal bristle, and a median marginal pair; second, with a median marginal and discal pair and a lateral marginal one; third, with a discal pair and a row of marginals; fourth with a row of marginals and discals. Median discals erect and asymmetrically placed.

Wings grayish hyaline, veins yellowish, costal spine small. Third vein with three short bristles near base, all others bare. Apical cell narrowly open, ending shortly before wing-tip. Angle at bend of fourth vein broadly obtuse, without fold or wrinkle, vein beyond bend almost straight in approaching the third, curving outward near the tip. Hind crossvein strongly bent inward near the base, distinctly approximated to bend of fourth vein. Calypteres white.

Legs black, basal joints densely pollinose. Middle tibiae with one strong bristle at middle on front side, hind tibiae not ciliate. Claws and pulvilli short.

Total length 7 mm.

*Type*: A single female, collected at College Station, Texas, April 8, 1921 (H. J. Reinhard), deposited in the United States National Museum, Washington, D. C.

This species differs from *celer* Coq., in having wider cheeks, front more prominent before, parafrontals cinereous. From *unicolor* Tns., it may be distinguished by the wider cheeks, hyaline wings, etc.

### ***Sturmia chrysoprocta* new species.**

♂. Front prominent, at vertex almost as wide as either eye, sides silvery, clothed with fine black hairs outside of frontal rows. Vitta reddish-brown, distinct, enclosing ocellar area, before ocelli about equal to width of parafrontal. Eyes bare. Ocellar bristles present, proclinate. Outer vertical bristles weakly developed, inner pair and the uppermost frontal in each row strong, directed backward, other frontal bristles directed inward, decussate to base of antennae, where rows diverge extending downward on sides of face to level with arista. No orbitals present. Posterior orbits, cheeks, facial depression and sides of face, silvery on a yellow ground color. Face much wider than front, sides bare, about one-third the width of facial

depression. The latter rather flat, triangular in outline, ridges flattened near base, bearing several irregular rows of short bristles which extend upward to or slightly beyond apex of last antennal joint. Vibrissal angles somewhat approximated (vibrissae broken off near base, the remaining stumps indicate them strong and decussate as usual), inserted slightly above oral margin. Cheeks hairy, width about one-third the eye-height. Antennae two-thirds as long as face, entirely yellow, third joint one and one-half times as long as second. Arista yellowish, bare, short and thickened almost to tip, penultimate joint not longer than thick. Proboscis short, yellowish. Palpi yellow, slender, not thickened beyond base, bearing black bristles.

Thorax black, gray pollinose; with four dorsal vittae. Post-dorsocentral bristles four, sternopleurals four, surrounded by numerous long pilose hairs. Scutellum grayish pollinose, yellow on the apical half, with three pairs of marginal bristles, besides a shorter, sub-erect, cruciate, apical pair.

Abdomen conical, densely clothed with recumbent hairs, faintly pollinose, sub-shining. Last segment yellow, others blackish, venter rufous. Bristles marginal only. Second segment with a lateral pair and median pair; third, with a complete marginal row; fourth, with a sub-marginal row.

Wings normal, without costal spine, grayish hyaline, veins yellow. Apical cell open, ending far before wing-tip. Third vein with three bristles near the base, others bare. Bend of fourth vein rounded, without stump or fold, straight from bend to wing-tip. Hind crossvein slightly bent inward at the middle, much nearer bend of fourth than to small crossvein. Calypteres white.

Legs yellowish, bristly, middle tibiae with two or more bristles on front side near the middle, hind tibiae evenly ciliate. Front pulvilli nearly as long as last tarsal joint. Claws elongate, yellow, tips black.

Total length 9 mm.

*Type*: A unique male specimen, from Riley County, Kansas (Popenoe), deposited in the United States National Museum, Washington, D. C.

This species is congeneric in the strict sense, with *vanessae* Desv., the genotype. The short wholly yellow antennae will serve to separate it from most of our species in this genus.

## The Azalea Leaf Miner (Lepid. : Tineidae).<sup>1</sup>

By F. M. TRIMBLE, Bureau of Plant Industry, Harrisburg, Pa.  
(Plate VIII.)

### ECONOMIC IMPORTANCE.

The greenhouse azaleas are popular flowering shrubs used extensively for ornamental purposes during the winter months throughout the United States. The young plants are grown in the field, and with the approach of fall are placed in cool greenhouses, from which they are taken to be forced into bloom as needed. During this period they are usually planted in separate pots and kept pruned to some definite shape. These azaleas are also grown in many other parts of the world, and previous to the passage of the Federal Horticultural Board quarantine number thirty-seven, large quantities of many varieties were shipped into the United States from foreign countries.

The azalea leaf miner infests a large percentage of the many varieties and causes a great deal of injury, particularly while being forced in the hot, well lighted greenhouses. In some greenhouses it ranks as the major pest of azaleas, especially in those houses not fumigated regularly.

### HISTORY.

The azalea leaf miner was first observed in Holland in 1912 by Prof. Ritzema Bos, who found it infesting large numbers of young plants of *Azalea indica* which had just previously been imported from Japan.

In the winter of 1911 Dr. E. P. Felt, of New York, collected several specimens of this pest on azaleas, and in 1914 Mr. A. Busek described it as *Gracillaria azaleae*. However, Mr. Edward Meyrick in England declared it to be identical with *G. zachrysa* Meyrick, an apple pest of India and Ceylon. Mr. Meyrick corrected this in 1918 by stating that *G. azaleae* Busek was a synonym of *G. azaleella* Brants and was probably a native of Japan, notwithstanding the fact that it is very closely allied to the North American group of *Gracillaria superbifrontella* Clem. and allies.

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<sup>1</sup> *Gracillaria azaleella* Brants.

## HOST PLANTS.

This Microlepidopteron has not been found, as yet, to have attacked other plants than the varieties of ornamental azaleas and then only seriously injuring those varieties forced in greenhouses such as *Azalca verucucana*, *A. hinodegiri*, *A. grandiflora* and their varieties.

## DISTRIBUTION AND SPREAD.

Since 1911 this leaf miner has been taken in greenhouses throughout Pennsylvania and has been reported many times from other northeastern states and Canada, as well as during port inspection of imported nursery stock.

We may expect to find this pest in any greenhouse where azaleas have been imported in quantities, or where the parent plants are held over from year to year without being properly fumigated. While the azaleas are growing out-of-doors in the summer this small moth readily infests any clean stock nearby with almost the same rapidity as when retained in the greenhouse.

Injury is due to numberless larvae mining the leaves and skeletonizing the infolded tip portions. Such injured leaves turn yellow and soon drop. Under ideal forcing conditions, in a well lighted and heated greenhouse, injury is very rapid and within a few weeks many plants may be completely defoliated. The rate of defoliation depends chiefly on the variety of azalea infested. In comparison *A. hinodegiri* will lose its leaves much more quickly than the larger leaved varieties, such as *A. verucucana*.

With the smaller-leaved varieties a single larva often webs several leaves together and the plant is soon defoliated by relatively few larvae. In no case were larvae observed to web all the leaves on a terminal into a single chamber, or to mine the terminal twigs. No record of bud injury was found, but it is the effect of defoliation on the buds that causes a loss to the florist. When a large plant is only partly defoliated, that portion without leaves forces its buds open one to two weeks before the uninjured portion (see Plate VIII, fig. 5). This ruins the plant for the trade. It is possible, however, to sell some varieties when heavily budded and yet defoliated, because

under full bloom condition the leaves are practically covered over by the flowers (see Plate VIII, fig. 4).

#### DESCRIPTION OF THE INSECT.

*Eggs.* Creamy white in color, oblong, .75 mm. by 1.25 mm. and placed singly on the underside of the leaf close to the mid-rib where they are partially hidden in the pubescence.

*Larvae.* Full grown larvae are about 19 mm. in length, head usually large, depressed, yellowish, mouth parts well developed and the eyes apparently represented by a large, circular, brown spot. Thoracic legs well developed, thorax yellowish and with the region just above each leg marked by several distinct swellings. Abdomen apodal, yellowish, and with a distinct though irregular fuscous band on the penultimate segment. The newly born larvae are about .75 mm. long and spend approximately one-quarter of the caterpillar stage in a gallery mined between the upper and lower epidermis of the leaf (see Plate VIII, fig. 1). Later the larvae emerge and turn over the tips of the leaves, webbing each down with fine silken strands (see Plate VIII, fig. 2).

*Pupa.* Within a cocoon about 6 mm. long and 2 mm. in diameter, faintly suggesting the *Bucculatrix* cocoon, without distinct longitudinal ribs. The cocoon is a well defined silken structure usually lying longitudinally on the underside of the leaf, protected partially by the curled over tip or lateral margin of the leaf (see Plate VIII, fig. 3). Occasionally they may be found on small twigs wherever a little protection is afforded.

*Adult.* A small, delicate, close-winged moth with an alar expanse of 11-12 mm. The antennae are as long as the fore-wings and brownish-white. The labial palpi, with the second joint light golden yellow and terminal joint yellowish white with the front of the tip blackish brown, are conspicuous in front of the silvery white face. The head and thorax are light golden yellow mixed with dark purple. The fore-wings are yellowish with large purplish areas and a large yellow costal area beginning at the basal fourth and extending to near the apex, is widest at its basal fourth, but diminishes in width at the middle of the wing and covers less than one-third of the width of the wing. The purplish areas are more or less sprinkled with yellow scales on some specimens and on the costal edge is a series of minute purplish black dots. The hind wings are light pearly gray in color, frail, slender and heavily fringed with long hairs. The abdomen is dark silvery fuscous above and yellowish white beneath. The femora are dark purple in color; tarsi white with narrow black annulations at the joints; tibia of middle legs somewhat thickened with scales.

The adult is only capable of short flights made in a jerky motion and when in a resting position the moth has the fore-part of the body raised by the full length of the fore legs with the tip of the abdomen touching the leaf on which the moth is resting. In this position the third pair of legs are held close to the sides of the folded wings and support the weight of the body. The broods overlap extensively and vary in length from three weeks to two and a half months according to the temperature of the surrounding conditions.

#### NATURAL ENEMIES.

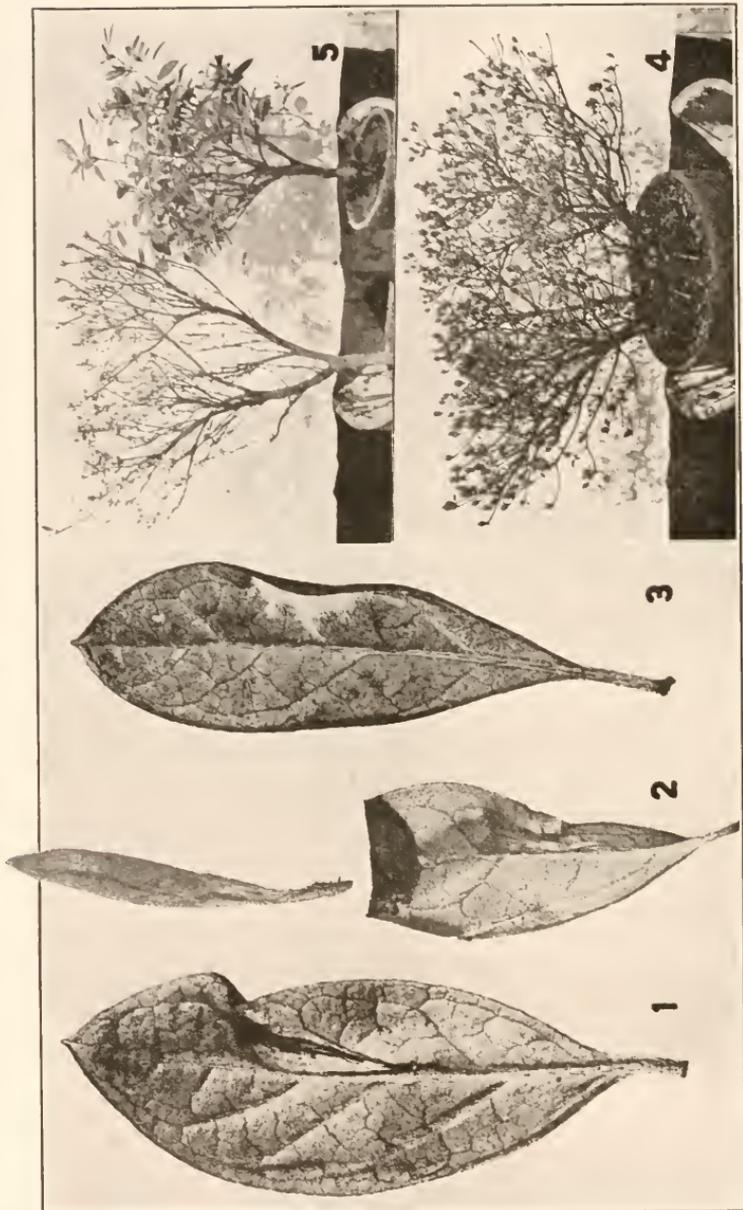
When the azaleas are out-of-doors in the summer the ravages of the leaf miner are checked and it is believed that the varying weather conditions are the chief factors in the destruction of many of the tender larvae and frail adults. However, the writer has observed the larvae of a *Chrysopa* sp. at work killing leaf miner larvae where some agency had previously torn the silk which held over the folded leaf tip. During many rearing experiments only one parasite was found to kill the leaf miner in the greenhouse and Mr. A. B. Gahan, of the U. S. Bureau of Entomology, identified this Chalcid parasite as belonging to the genus *Sympiesis*, closely allied to *S. massasoit* Crawford.

#### RECOMMENDATIONS FOR CONTROL.

Stomach poisons and contact insecticides used commonly in controlling greenhouse insects were given thorough trials under varying conditions and none of them gave satisfactory results. In not one count were more than 40% of the larvae killed. This is probably due to the fact that the eggs are well protected among the leaf hairs on the underside of the leaf, the small larvae are in galleries between the upper and lower epidermis of the leaf, and the older larvae are within well made folds of the leaf protected by a wall of silk. Even several hours' immersion in water would not kill the older larvae within their confines.

It was found that thorough fumigation of all plants with hydrocyanic acid gas while being kept in the cool greenhouse, previous to forcing, will kill 90 to 95% of the miners. Then by the use of regular nicotine sulphate fumigations in the forcing greenhouse, on alternate nights, the newly hatched larvae





AZALEA LEAF-MINER AND ITS WORK.—TRIMBLE.

can be quickly killed. In a private greenhouse the removal of all infested leaves by hand would quickly control the pest.

#### CONCLUSION.

The loss of leaves on azaleas in the greenhouse and consequent unfitness of the blooming plant for the trade is often due to the azalea leaf miner (*Gracillaria azaleella* Brant).

In the course of thorough investigation it was found that this leaf miner is a native of Japan and was imported into North America on azaleas from Belgium and Holland, where in turn it had been received from Japan on young plants. Fortunately, so far it has remained on its native host plants.

The characteristic injury caused by this insect appears soon after the plants are placed in the greenhouse for forcing. The leaves drop on being mined and skeletonized by the larvae, leaving the azalea a leafless shrub unfit for the trade.

Cyanide fumigation followed later by alternate night fumigations with nicotine sulphate will control the pest.

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#### EXPLANATION OF PLATE VIII.

- Fig. 1. Ventral side of azalea leaf showing primary gallery.  
 Fig. 2. Azalea leaves with tip and lateral margins folded.  
 Fig. 3. Usual location of cocoon on ventral side of leaf.  
 Fig. 4. Completely defoliated azalea with buds advanced in season. Plants still salable.  
 Fig. 5. Unsalable defoliated *Azalea verruviana* compared with uninjured plant.  
 (Photographs: 1, 2 and 3 by H. B. Kirk; others by the author.)

## Milesia in North America (Dipt. : Syrphidae).

By FRANK M. HULL, Ohio State University, Columbus, Ohio.

Several specimens of a *Milesia*, nearly allied to *virginiensis* Drury, but obviously quite distinct, have been in the writer's collection several years, and have attracted his attention to the genus. The species is close to *virginiensis*, but is distinguished by at least three characters that are constant. The scutellum is almost wholly yellow, and with only a very narrow black line basally. Secondly, they differ in the yellow maculation of the thorax, as described below. Lastly, the black transverse markings of the abdomen, and especially those of the second segment, are considerably narrower than in *virginiensis*. The wings are usually more heavily tinged with brown. The species seems to be slightly more southern in distribution.

It was at first thought that the form might be one of the older names listed in the synonymy of its more common ally. A careful examination of these older descriptions, including such as *M. limbipennis* Macq., *M. ornata* Fabr., *M. (Sphyrca) fulvifrons* Big., etc., fails to reveal any evidence that such is the case. It is rather difficult to obtain any satisfaction from such brief descriptions, but the scutellum of the species is quite distinct, and in the older descriptions, the scutellum where mentioned, is described as in *M. virginiensis*. A brief description of the form, together with a key to the four better known North American species, and notes on others are given below.

### *Key to Species of North American Milesia*

1. Scutellum widely black basally..... 2  
    Scutellum almost wholly yellow..... *scutellata* n. sp.
2. Humeral spots not connected with the two median yellow stripes of thorax, or very narrowly so..... 3  
    Humeral spots connected by a band with the two median yellow stripes of the thorax; the latter not continuous with the transverse "sutural" band..... *virginiensis* Drury
3. Median pair of yellow thoracic stripes continuous posteriorly, past the middle or "sutural" transverse band of thorax ..... *pulchra* Will.  
    Median pair of yellow thoracic lines not continuous posteriorly, past the middle or transverse band..... *bella* Town.

*Milesia scutellata* n. sp.

♂.—Antennae, face and front, golden yellow. Cheeks yellow,

with a black spot basally, on the orbits. Upper half of front and vertex black; lower half of front and occiput, yellow.

Thorax black, marked with yellow, similarly to *virginiensis*, but differing as follows: in that species there are two transverse, medianly interrupted, yellow bands on the thorax, the first between the humeri, the second just behind the suture. The median, broken ends of the humeral band are turned down and drawn out acutely to a point, but never continuous with the sutural or second band of the thorax: in *scutellata* the two bands are broadly connected in the middle, forming thus two U's, their open ends facing outward, laterally. Scutellum almost wholly yellow, with a narrow basal band of black. In *virginiensis*, some two-thirds of the scutellum, basally, are black.

Black markings of the abdomen similar to that species, but narrower. Legs nearly the same. Wings usually more heavily brownish. A trifle smaller than the average *virginiensis*.

♀.—Similar to the male. Front with a black median stripe.

*Type* male and five male paratypes, from Mississippi Agricultural and Mechanical College, in the author's collection. Two males and one female, from Florida and North Carolina, in the collection of Dr. R. C. Osburn. One female (allotype), from Louisiana, in the Ohio State University collection.

I have examined over two hundred and fifty specimens of the common form, and among them I find the above ten specimens, all of them quite constant. Williston mentions having a specimen from Carolina, similar to what I have described above. He describes the scutellum and abdomen, although he does not mention the bands of the thorax being connected.

The characters here used by the author have been carefully considered and inasmuch as they form two of the principal characters, by which the European species *crabroniformis* Fabr., and type of the genus, is distinguished, they are considered good. In that species the black of the abdomen is largely replaced by obscure reddish, the front of the female is wholly yellow, etc. *M. bella* Town., of this country, likewise has the bands of the thorax connected, as described.

*M. pulchra* Will. is really as close to *virginiensis*, as is *scutellata*.

### **Milesia profusa** Walk.

This species has not been recognized since it was described. The generic reference of the species is even a little doubtful, as

many of the older authors were in the habit of making *Milesia* a "dumping ground" for species. It was described as only eleven millimeters in length (I have seen *M. virginicensis* that were scarcely longer than this) and the abdomen black with two yellow spots on each side. It is not included in the key.

***Milesia bella* Townsend.**

*M. bella* Town., Annals and Mag. Nat. Hist., xix, p. 142.

*M. mida* Moody, Ent. News, xvi, p. 138.

Specimens of this species studied, are from Arizona, in the Ohio State University collection. *M. mida* Moody is, according to Professor J. S. Hine, and Moody himself, a synonym of *M. bella*.

***Milesia virginicensis* Drury.**

This species varies considerably in the breadth of the abdomen, nor is the greater breadth to be found in females only. The average size of the fly is about 20 mm.; they frequently attain a length of 24 mm., and I have three specimens of about 14 mm., length, and correspondingly slender. My material is from New Jersey, Pennsylvania, Ohio, Mississippi, Louisiana, Tennessee, and South Carolina. Also recorded from Nebraska, Wisconsin, Virginia, Florida, Georgia, New England and North Carolina.

***Milesia pulchra* Will.**

Information concerning the species has been drawn from the excellent description and figure to be found in the Biol. Centr. Americana.

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***Stilobezzia mallochi* and *Atrichopogon gilva*  
(Dipt. : Chironomidae.)**

By W. A. HOFFMAN, Dept. of Medical Zoology, School of Hygiene & Public Health, Johns Hopkins Univ., Baltimore, Md.

A recent examination of the Ceratopogoninae contained in the National Museum collection brought to light an unnamed specimen that roused my interest. It was readily shown to be conspecific with what Malloch termed *Hartomyia gilva* Coq. This species has been referred to by him first<sup>1</sup> as *Johannseniella*,

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<sup>1</sup>Bull. Ill. State Lab. Nat. Hist., vol. X, Article IV, 1914, p. 227.

then as *Hartomyia gilva*<sup>2</sup>; for which the following localities have been given: Ithaca, New York; Swarthmore, Pennsylvania, and Polk County, Wisconsin. At the time he was gathering data relating to the Chironomidae of Illinois, he had no access to the types of Coquillett, which comprise no inconsiderable portion of the described members of this group, insofar as North America is concerned. Therefore, the above-mentioned material was determined as *Hartomyia* (*Ceratopogon*) *gilva*, since the specimens before him corresponded closely to the original description.

A study of Coquillett's type of *Ceratopogon gilva* disclosed the fact that this form must be placed in Kieffer's genus *Atrichopogon*. *Hartomyia* Mall., on the other hand, is synonymous with *Stilobezzia* Kieff. The specimens considered by Malloch represent a new species. Owing to the unavoidable confusion that has arisen, the preferable procedure seems to be naming and describing this form. Mr. Cresson, of the Philadelphia Academy, and Dr. Johannsen, of Cornell University, kindly placed at my disposal two representatives, the one taken at Swarthmore, Pa., having been studied and identified by Malloch. The specimen in the collection of the National Museum, and that in Dr. Aldrich's personal collection, are at present not available.

***Stilobezzia mallochi*, new species.**

♀: Occiput, frons, clypeus, first segment, torus, and basal half of the third segment of antenna yellow. Eyes approximating each other at a point just above vertex. Palpi fumose, the two terminal segments more noticeably so; fourth segment little more than six-tenths the length of terminal one. Proboscis from above a grayish yellow, except the maxillae which are brown. The proboscis equal to the distance from its base to the vertex. Flagellum grayish brown, last five segments approximately equal in length to remainder of antenna. Six segments succeeding torus about equal in size, that is, slightly less than two and one-half times as long as wide; the length of the terminal member more than five times its width. From seventh segment on, more hairs are to be found on the individual segments, especially on the last five, those comprising the basal whorls of each segment, longer.

Greater portion of the mesonotum, shiny, rufous brown, a considerable, more or less square, humeral area creamy yellow.

<sup>2</sup> *Ibid.*, Article VI, 1915, pp. 340 and 343.

Along the medial line runs a row of well separated long black setae. Midway between it and the borders is a pair of similar rows, diverging slightly from the anterior region, being continued along the sides of the prescutellar depression. The courses of the latter are indicated by fine faintly yellow stripes. There is also a pair situated more laterally without the yellow background of preceding, which terminate before the wing bases. Scutellum bright shiny yellow, with a row of nine long black setae following somewhat the contour of the posterior border. Metanotum rufous, glabrous. Apical half of knob of halteres cream color, remainder yellow. Legs long without distinct spines, a uniform yellow, except coxae and knees, which are darker. Hind metatarsus twice the length of second segment. Fourth segment deeply bilobed (as is the case with the two anterior pairs), much shorter than the succeeding segment. The claws are dark brown, unequal in size, the outer member being sickle-shaped, more than twice as long as the inner one, and about equal in length to the fifth segment.

Wing without macrochaetae except a few in apical fifth. Vein R<sub>1</sub>, its branches, and vein M as far as the crossvein, thick, pale yellowish brown. Vein R<sub>4</sub> + 5 (third longitudinal) meeting costal margin a little beyond four-fifths of wing length. Second radial cell two and one-half times length of first. A small basal portion of vein M<sub>2</sub> has virtually disappeared. The forking of Cu is a trifle basal of the lower end of the radio-medial crossvein. The first anal vein nearly attains the lower margin.

Dorsum of abdomen a dirty though not dark grayish brown, scantily set with weak black hairs, those at side a little stronger. Lower and lateral surfaces more or less of an orange shade.

Length of body, 2.5 mm.; of wing, 2 mm.; width of wing, .65 mm.

♂: In general similar to female. Occiput dark brown. Antennal plumes golden yellow. The setae on the thorax and hairs on the abdomen are on the whole coarser. The hairs on the legs are likewise heavier. Claws subequal, those of hind tarsi three-fifths the length of terminal segment. Vein R<sub>4</sub> + 5 attaining costal margin a little before four-fifths of wing length. Second radial cell two and one-fourth times length of first.

Length 2.2 mm.; of wing, 1.88 mm.; width of wing, .58 mm.

Female *type* from Ithaca, New York, July; in Cornell University collection. Male type from Swarthmore, Pa., June 10, 1906 (Cresson); in collection of Academy of Natural Sciences, Philadelphia. The species is dedicated to Mr. J. R. Malloch, of the Bureau of Biological Survey, who has contributed materially to our knowledge of North American Ceratopogoninae.

## Odonata from Kentucky.

By H. GARMAN, Lexington, Ky.

This list is based upon collections accumulated incidentally while studying and collecting other insects in the past 30 years during which time the writer has been connected with the Kentucky University and Experiment Station. Kentucky is too hilly and its streams in great part too rapid to afford the best collecting ground for Odonata, but there are regions within the State, notably the bottomland along the Ohio, Mississippi, and other rivers where dragon flies are very numerous and where special effort in collecting would doubtless reveal the presence of many other species. As presented the list is merely a nucleus about which a more complete representation of our fauna may be gathered. Since the State has had but little attention from collectors the records may be of present interest to those giving attention to the distribution of American species. The determined nymphs seem to the writer of special interest because adult dragon flies are likely to be carried by storms long distances from their normal breeding grounds and hence the appearance of an individual or two in a locality may not be very satisfactory evidence as to the habitat of a species.

The arrangement and names used are those of Muttkowski's "Catalogue of the Odonata of North America." Most of the nymphs and part of the adults have been determined by Dr. Philip Garman of the Connecticut Experiment Station.

Additional records, not species, are to be found in Mr. E. B. Williamson's paper in the NEWS for January and February, 1923 (xxxiv, 7-8, 39-40), and in Prof. C. B. Wilson's (Proc. U. S. Nat. Mus. 43, 189-200, 1912), from both of which some quotations have been made below.

### ZYGOPTERA.

*AGRION ANGUSTIPENNE* (Selys).—Kentucky (Hagen, Synopsis of the Odonata of America); (Hagen, Psyche, V, p. 242, Bee Spring, Ky., Mus. Comp. Zool.).

*A. DIMIDIATUM* (Burm.).—Kentucky (Hagen, Syn. Neur. N. A.; Ky., Hagen, Psyche, V, 245, "Burmeister's Type").

*A. MACULATUM* Beauv.—Lexington, July 4, 1890; June

14-16, 1892; June 29, 1912; Clear Creek, Pineville, June 16, 1892; Aug. 31, 1911 (nymph).

*HETAERINA AMERICANA* (Fabr.).—Clay's Ferry, Fayette Co., July 17, 1893.

*LESTES DISJUNCTUS* Selys.—Lexington.

*L. EURINUS* Say.—Monticello, Aug. 6, 1918 (Williamson).

*L. RECTANGULARIS* Say.—Lexington; Indian Cr. Landing, 1911 (Wilson).

*ARGIA APICALIS* (Say).—Lexington, June 22, 1892; Tyrone, July 14, 1892.

*A. FUMIPENNIS* (Burm.).—Kentucky (Hagen).

*A. MOESTA* subsp. *PUTRIDA* (Hagen).—Straight Cr., Pineville, Oct. 21, 1911 (nymph).

*A. SEDULA* (Hagen).—Kentucky (C. B. Wilson).

*A. TIBIALIS* (Rambur).—Obion Cr., Hickman Co., Nov. 2, 1911 (nymph).

*A. TRANSLATA* (Hagen).—Kentucky (Wilson).

*A. VIOLACEA* (Hagen).—Lexington, June, 1892; High Bridge, Ky., Aug. 13, 1889.

*ENALLAGMA ASPERSUM* (Hagen).—Lexington, Aug., 1915 (Philip Garman); Monticello, Aug. 6, 1918 (Williamson).

*E. CIVILE* (Hagen).—Lexington, Aug. 22, 1889; Oct. 4, 1910; Sept. 17, 1915.

*E. EXSULANS* (Hagen).—Benson, July 31, 1915.

*E. GEMINATUM*, Kellicott.

*E. SIGNATUM* (Hagen).—Lexington, Sept. 26, 1896 (nymph).

*NEHALENNIA IRENE* (Hagen).—Lexington, June 29, 1916.

*ISCHNURA POSITA* (Hagen).—Lexington, Aug. 9, 1915; Sept. 3, 1915.

*I. VERTICALIS* (Say).—High Bridge, Ky., Aug. 13, 1889; Lexington, May 9, 1912 (nymph); Sept. 1 and 15, 1915.

*ANOMALAGRION HASTATUM* (Say).—Lexington, May 17, 1902; Aug. 28 and Sept. 17, 1915.

#### ANISOPTERA.

*TACHOPTERYX THOREYI* (Hagen).—Nat. Bridge, Ky., Aug. 8, 1897; Cumberland Falls, July 5-8, 1911 (C. B. Wilson).

*CORDULEGASTER OBLIQUUS* (Say).—Kentucky (Hagen).

*PROGOMPIIUS OBSCURUS* (Rambur).—Straight Cr., Pineville, Aug. 29, 1911 (nymph); Parkers Lake, July 9, 1911 (Wilson).

*HAGENIUS BREVISTYLUS* Selys.—Kentucky (Williamson, Dragonflies of Indiana).

*LANTHUS ALBISTYLUS* (Hagen).—Ky. (Howe, Proc. Bost. Soc. Nat. Hist., 36, 123, 1921).

*L. PARVULUS* (Selys).—Ky. (Howe, Proc. Bost. Soc. Nat. Hist., 36, 123, 1921).

*GOMPHUS AMNICOLA* Walsh.—Dayton, Ky., Chas. Dury (Specimen in New York Museum).

*G. CRASSUS* Hagen.—Kentucky (Williamson, Dragon flies of Indiana).

*G. LINEATIFRONS* Calvert.—Kentucky (Williamson).

*G. EXTERNUS* Hagen.—Kentucky (Hagen).

*G. NOTATUS* Rambur.—Cumberland Falls, July 5, 1911 (C. B. Wilson).

*G. PALLIDUS* Rambur.—Cloyd's Landing, Monroe Co., July 23, 1911 (C. B. Wilson).

*G. PLAGIATUS* Selys.—Burnside (Wilson).

*G. SPINICEPS* (Walsh).—Greasy Cr., Russell Co., July 17, 1917 (Wilson).

*G. VASTUS* Walsh.—Indian Cr. Landing, Russell Co., July 18, 1911 (C. B. Wilson).

*DROMOGOMPHUS SPINOSUS* Selys.—Kentucky (Hagen); Cumberland Falls, Parkers Lake, Burnside, 1911 (Wilson).

*BOYERIA GRAFIANA* Williamson.—Ky. (Muttkowski).

*BOYERIA VINOSA* (Say).—Left F. Straight Cr., Cary, Sept. 1, 1911 (nymph); Cumberland R., Pineville, Apr. 26, 1912 (nymph).

*BASIAESCHNA JANATA* (Say).—Straight Cr., Pineville, March, 1902 (nymph); Aug. 29, 1911 (nymph).

*ANAX JUNIUS* (Drury).—Sinkhole pond, Lexington, Dec. 16, 1889, and May 7, 1890 (nymphs); Nicholasville, July 19, 1890; Sept., 1922; Pond, Lexington, June 20, 1894 (nymph); Aug. 5, 1905; June, 1918; S. Elkhorn Cr., June 28, 1895 (nymph); Richmond, Sept. 19, 1906; Salt Lick, Sept. 21, 1915.

*AESHNA UMBROSA* Walker.—Jeffersontown, Aug. 5, 1918.

*EPIAESCHNA HEROS* (Fabricius).—Lexington, June 2, 1900; May 27, 1908; May 19, 1915; June 28, 1916; April 23, 1920; May 26, 1921; Jackson, Aug. 25, 1913.

*DIDYMOPSIS TRANSVERSA* (Say).—Nat. Bridge, Ky., May 9, 1914 (nymph from which adult emerged).

*MACROMIA ALLEGHANIENSIS* Williamson.—Ky. (Williamson).

*M. ILLINOIENSIS* Walsh.—Clear Cr., Pineville, June 16, 1892; Green R. between Greensburg and Mammoth Cave, July, 1894 (nymphs); Straight Cr., Pineville, Aug. 29, 1911 (nymphs); Ky. (Williamson).

*M. TAENIOLATA* Rambur.—Kentucky.

*EPICORDULIA PRINCEPS* (Hagen).—Burksville, July 30, 1911 (Wilson).

*NEUROCORDULIA OBSOLETA* (Say).—Cumberland R., Pineville, Aug. 31, 1911 (nymph).

*SOMATOCHLORA TENEBROSA* (Say).—Parkers Lake, July 9, 1911 (Wilson).

*LIBELLULA CYANEA* Fabr.—Along Clear Crs., Pineville, June 16, 1892.

*L. LUCTUOSA* Burm.—Lexington, Aug. 17, 1893; Brooklyn Bridge, Ky., Aug. 6, 1916.

*L. PULCHELLA* Drury.—Nicholasville, July 19, 1890; Lexington, Sept. 25, 1892; March, 1902 (nymph); Hickman, July 10, Aug. 26 and Aug. 27, 1913.

*PLATHEMIS LYDIA* (Drury).—Sinkhole pond, Lexington, Oct. 26, 1889, and April 7, 1890 (nymphs); Lexington, May 1, 1890; pond, July 1, 1891; Oct. 30, 1891 (nymph); pond, April 30, 1892 (nymph); Aug. 8, 1893; May 20, 1895; small streams, Aug. 5, 1897 (nymph); Hickman, July 10, Aug. 10 and 20, 1913.

*PERITHEMIS DOMITIA* (Drury).—Lexington, June 28 and July 1, 1892; July 17 and Aug. 3, 1894; Sept. 1, 1915; Hickman, Aug. 18, 1913.

*P. TENERA* (Say).—Madisonville, July 24, 1918 (Williamson).

*ERYTHRODIPLAX MINUSCULA* (Rambur).—Ky. (Hagen); Ky. (Williamson).

*ERYTHEMIS SIMPLICICOLLIS* (Say).—Nicholasville, July 19, 1890; Lexington, Aug. 17-Sept. 19, 1893; Aug. 19 and Sept. 19, 1915; Hickman, Aug. 26, 1913.

*SYMPETRUM RUBICUNDULUM* (Say).—Lexington, Sept. 20, 1892; Aug. 31, 1894; Aug. 20, 1904; Oct. 29, 1912; July 17, 1923; Bryan Station, Sept. 4, 1894.

*PACHYDIPLAX LONGIPENNIS* (Burm).—Nat. Bridge, Ky., July 21, 1912; Hickman, Aug. 26, 1913; Lexington, Aug. 19, 1915.

*LEUCORHINIA INTACTA* Hagen.—Fishing Cr., Creasy Cr., Indian Cr., Cloyd's Landing, 1911 (Wilson).

*CELITHEMIS EPONINA* (Drury).—Lexington, Aug. 17, 1893; Hickman, Aug. 18, 1913.

*PANTALA FLAVESCENS* (Fabr.).—Hickman, Aug. 26, 1913.

*P. HYMENAEA* (Say).—Cumberland Falls, July 7, 1911 (Wilson).

*TRAMEA LACERATA* Hagen.—Lexington, Sept. 1, 1890; Madisonville, July 24, 1918 (Williamson).

*T. ONUSTA* Hagen.—Lexington, May, 1905; Fishing Cr., July 15, 1911 (Wilson); Monticello, Aug. 6, 1918 (Williamson.)

## Undescribed Species of the Genus *Tanypremna* Osten Sacken (Dipt. : Tipulidae).

By CHARLES P. ALEXANDER, Amherst, Massachusetts.

The genus *Tanypremna* is a very characteristic one in the humid tropics of the New World. The genus has been compact and well-delimited, but the accession of two new species has rendered it necessary to divide the genus into three subgenera, two of which are described at this time.

### Genus *Tanypremna* Osten Sacken.

1886. *Tanypremna* Osten Sacken; Biol. Cent.-Americana, Dipt., vol. 1:19.

1914. *Tanypremna* Alexander; Journ. N. Y. Ent. Soc., 22: 206-215.

### Subgenus *Ceoneura* subgen. n.

Characters as in *Tanypremna*, s. s.; vein  $M_1$  deflected cephalad and fused with vein  $R_4+5$  for almost its entire length, the free portion of  $M_1$  represented only by a short, apparent cross-vein that closes a rectangular cell  $R_5$ ; that is about one-half longer than cell 1st  $M_2$ .

Type of the subgenus.—*Tanypremna* (*Ceoneura*) *idioneura* sp. n. (Neotropical Region).

### *Tanypremna* (*Ceoneura*) *idioneura* sp. n.

General coloration brown, variegated with darker; scutellum broadly whitish medially; pleura yellowish white, narrowly and obliquely lined with dark brown; legs dark brown, tibiae with a broad, white, sub-terminal ring; tarsi white except the basal three-fifths to four-fifths of metatarsi; wings subhyaline, the costal-region and wing-margin tinged with brown; veins  $M_1$  and  $R_4+5$  fused, enclosing a rectangular cell  $R_5$  above cell 1st  $M_2$ .

♀. Length 18.4 mm.; wing 10.8 mm.; abdomen alone 15 mm. Described from an alcoholic specimen.

Frontal prolongation of head very short, white; nasus very stout; palpi brown, the second and third segments largely white. Antennae short, the scapal segments pale, the flagellum brown. Vertex pale anteriorly, passing into dark brown behind.

Mesonotal praescutum brown medially, pale yellowish laterally; an indistinct median brown stripe that is crossed transversely by a pale band before mid-length of the sclerite; a capillary brown line extending to the anterior margin of the sclerite; a brown area at the humeral region; scutellum and median area of postnotal mediotergite broadly whitish, margined externally by dark brown, the lateral margins of the sclerite paler brown; postnotal mediotergite dark brown, the lateral

margins pale. Pleura yellowish white with a very narrow brown line running obliquely from the humeral region of the praescutum between the anepisternum and pteropleurite to above the mid-coxae; sternopleurite tinged with brown. Halteres brown, the base of the stem pale.

Legs with the coxae pale, the anterior face of the mid-coxa suffused with brown; trochanters yellow; tibiae dark brown with a conspicuous white ring (1.8 mm.) before the narrower (1 mm.) brown tip; basi-tarsi dark brown, the apical two-fifths (fore legs) to one-fifth (hind legs) pure white; remainder of tarsi pure white, only the terminal segment suffused with brown on its outer half; claws simple.

Wings subhyaline, the apical margin very faintly infuscated; cell *C* hyaline basally, passing into brown distally; cell *Sc* and the small stigma dark brown; veins dark brown. Venation: *Sc* long, *Sc*<sub>2</sub> extending to beyond mid-length of *R*<sub>2</sub>+<sub>3</sub>; cell *2nd R*<sub>1</sub> very small; *Rs* short, straight, shorter than *R*<sub>2</sub>+<sub>3</sub>; tip of *R*<sub>2</sub> persistent; *M*<sub>1</sub> fused with *R*<sub>1</sub>+<sub>3</sub> at about two-fifths the length of the latter, enclosing a rectangular or elongate cell *R*<sub>3</sub> above cell *1st M*<sub>2</sub>; cell *1st M*<sub>2</sub> pentagonal, narrowed distally; fusion of *Cu*<sub>1</sub> and *M*<sub>3</sub> short.

Abdominal tergites dark brown, indistinctly variegated with paler; sternites obscure yellow; ovipositor ferruginous.

*Habitat*.—British Guiana. *Holotype*: ♀, Kartabo, August 4, 1919 (*A. E. Emerson*). Type in the collection of Cornell University.

*Tanypremna idioncura* differs very notably from all the described species in its venation and leg-pattern. In the writer's key to the species of *Tanypremna* (*Journ. N. Y. Ent. Soc.*, 22: 207-208; 1914), the present species would run to the group containing *T. longipes* (Fabricius), *T. longissima* (Enderlein) and *T. manicata* Osten Sacken, differing from all in its diagnostic characters.

#### Subgenus **Tanypremnodes** subgen. n.

Characters as in *Tanypremna*, s.s., differing chiefly in the structure of the antennae. In the female, the basal four flagellar segments are weakly and irregularly pectinate, on the second the base produced into a slender branch that is nearly as long as the segment; the branch of the third segment is reduced to a small basal serration; fourth segment with a conspicuous basal enlargement only; terminal flagellar segments elongate, with long, conspicuous verticils that become longer distally. Tibial spurs apparently lacking in the unique type. Wings with the distal section of vein *R*<sub>2</sub> entirely atrophied.

Type of the subgenus.—*Tanypremna* (*Tanypremnodes*) *leucoplaca* sp. n. (Neotropical Region).

***Tanypremna* (*Tanypremnodes*) *leucoplaca* sp. n.**

General coloration pale brown; head dark orange; femora obscure yellow, the tips conspicuously blackened; tibiae black, the tips broadly white; tarsi black; wings strongly tinged with brownish yellow, the costal region darker brown; veins  $Sc_1$  and  $R_1$  close together at wing-margin.

♀. Length 22 mm.; wing 13 mm.; abdomen alone 18.5 mm.

Rostrum very short, yellow, the elongate palpi pale brown. Antennæ with the scapal segments brownish yellow; flagellum brown. Head dark orange, more saturated behind, somewhat paler in the vicinity of the tubercle.

Mesonotal praescutum pale brown with three yellowish brown stripes that are virtually confluent; remainder of mesonotum yellowish brown, the scutellum darker. Pleura obscure brownish yellow. Halteres dark brown.

Legs with the coxae brownish yellow; trochanters obscure yellow, femora obscure yellow, the tips conspicuously blackened; tibiae black, the extreme base obscure brownish yellow, the tips broadly white, occupying a little less than the apical third of the segment; tarsi black.

Wings with a strong brownish-yellow tinge, the costal region darker brown; stigma very small and vaguely delimited, brown; center of cells  $R$  and  $M$  with longitudinal pale centers; veins black, those in the base and costal region brown. Venation:  $Sc_1$  ending close to  $R_1$  at wing-margin;  $R_s$  relatively short, about two-thirds  $R_2 + s$ , oblique; distal section of  $R_2$  entirely atrophied; cell  $M_1$  large, its petiole shorter than  $m$ ; cell 1st  $M_2$  large, pentagonal; basal deflection of  $Cu_1$  longer than  $Cu_2$  alone; cell 2nd  $A$  of moderate width.

Abdomen dark brown, the caudal margins of the segments somewhat paler; sternites variegated with brown and obscure yellow.

*Habitat*.—Brazil. *Holotype*: ♀; Upper Rocana, Northern Para, June, 1918 (*S. M. Klages*). Type in the collection of the Carnegie Museum, Accession No. 6175.

This interesting crane-fly was included in extensive series of Tipulidæ sent to me for determination by Mr. Kahl, to whom I am greatly indebted for numerous favors. The present species is readily told from all other known species of the genus *Tanypremna* by the broad white tibial tips and the absence of white on the tarsi.

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., OCTOBER, 1924.

## The Monument to J. Henri Fabre.

The monument, for which subscriptions were asked in the NEWS for April last (page 144) was inaugurated at Sérignan, on July 27, 1924, under the presidency of M. Mangin, director of the National Museum of Natural History of Paris, according to a communication from M. H. de la Paillonne, Mayor of Sérignan. A picture postcard of the monument, issued for the occasion, represents Fabre seated on the stump of a tree, his wide-brimmed soft hat on his head, a cane in the right hand, while the left hand, resting on his right thigh, holds a magnifying glass. A. Maillard was the sculptor.

## General Catalogue of the Hemiptera.

The trustees of Smith College have agreed to undertake the publication of a catalogue of the Hemiptera of the world, as an item in the celebration of the fiftieth anniversary of the founding of the college. This work will appear in fascicles as the various specialists complete their portions.

At the last meeting of the American Association for the Advancement of Science (Cincinnati, 1923) a group of entomologists interested in the scheme suggested the organization of an editorial board for the catalogue as follows:

General Editor: Dr. G. Horvath, National Museum, Budapest, Hungary.

Managing Editor: Dr. H. M. Parshley, Smith College, Northampton, Mass.

Mr. H. G. Barber, Roselle, New Jersey.

Dr. E. Bergroth, Ekenäs, Finland.

Dr. C. J. Drake, Iowa State College.

Dr. W. D. Funkhouser, University of Kentucky.

Dr. H. B. Hungerford, University of Kansas.

Dr. H. H. Knight, Iowa State College.

Dr. Z. P. Metcalf, North Carolina State College.

Mr. J. R. de la Torre-Bueno, White Plains, New York.

Authorship of certain fascicles has been agreed upon and it

is expected that specialists in various countries will be found to complete the list. Perhaps what has always failed of completion as the effort of one or two authors will succeed as a work of international cooperation. The Latin, French, German, or English languages may be employed by authors. Persons interested in the catalogue are invited to communicate with the managing editor, either directly or through any member of the board.

The fascicles will be sold at a very moderate price, and it is hoped that individuals and institutions will make early indication of their intention (without legal obligation) to subscribe for the whole. Such subscribers will receive each fascicle promptly upon publication and thus assure themselves ultimate possession of the complete work.

H. M. PARSHLEY, Managing Editor, Smith College.

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#### Professor and Mrs. Cockerell Visit the Pacific Islands.

Professor T. D. A. Cockerell wrote from Boulder, Colorado, Sept. 4, 1924: "I had a splendid trip, five weeks in Hawaiian Islands, visited islands of Oahu, Kauai and Hawaii. My wife had a much longer trip, to Tahiti, Rarotonga, New Zealand, Fiji Islands, Tonga Islands, Samoa (three weeks) and Honolulu. The collections we got are not large, but we have some interesting things."

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#### The Occurrence of *Eurrhypara urticata* Linnaeus (Lepidoptera: Hydrocampinae) in Maine.

I have recently received for identification from Mr. John C. Parlin, Principal of the Freedom Academy, Freedom, Maine, several specimens of Hydrocampine moths, which turn out to be *Eurrhypara urticata* Linnaeus. I have in my collection a small series of this pretty moth from Europe, purchased many years ago from the late Dr. Otto Staudinger, at a time when I had asked him to supply me with as complete a collection as possible of the Pyralidae of Europe. A reference to the Catalog of the Lepidoptera of the Palearctic Region, by Staudinger and Rebel (1901, pt. II, p. 50), gives the distribution of the species as "Europe (excepting the polar regions and (?Sicily), Asia Minor, Armenia, Western China, Amoorland."

Dyar in his "List of the Lepidoptera of North America" (1902) does not list the species. Barnes and McDonough, in their "Check-List of the Lepidoptera of Boreal America," p. 136, 1917, cite the species, but of course without reference to

locality. I have not had the time to thoroughly search through the entire literature of the subject, but, aside from the last mentioned citation, have failed to discover any reference to the species as occurring in North America. I am informed that on the occasion of a recent visit to the Carnegie Museum during my absence, my friend, Mr. W. T. M. Forbes, stated to Mr. Kahl that the species has been reported from Nova Scotia. The capture of the insect in some numbers during the past summer at Machias, Maine, therefore adds a new locality.

Whether the species has been recently introduced into America, or is indigenous, is a question. Being rather a conspicuous little moth, it appears singular that it should not have been noted long before this time, especially by such careful observers as Fernald, Scudder, Packard and others, who collected extensively in New England. The larva feeds upon nettles.—W. J. HOLLAND, Carnegie Museum, Pittsburgh, Pennsylvania.

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## 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.

Papers of systematic nature will be found in the paragraph at the end of their respective orders. Those containing descriptions of new genera and species occurring north of Mexico are preceded by an \*.

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. 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. 20—Bulletin de la Societe Entomologique de France, Paris. 21—The Entomologist's Record, London. 22—Bulletin of Entomological Research, London. 26—Boletin de la Sociedad Entomologica de Espana, Zaragoza. 39—The Florida En-

tomologist, Gainesville. 49—Entomologische Mitteilungen, Berlin-Dahlem. 50—Proceedings of the United States National Museum. 52—Zoologischer Anzeiger, Leipzig. 55—The Pan-Pacific Entomologist, San Francisco. 68—Science, Garrison on the Hudson, N. Y. 69—Comptes Rendus des Seances de l'Academie des Sciences, Paris. 70—Journal of Morphology, Philadelphia. 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. 89—Zoologische Jahrbucher, Jena. 90—The American Naturalist, Lancaster, Pa. 92—Archives de Zoologie Experimentale et Generale, Paris. 94—The American Journal of Science, New Haven, Conn. 98—Annals of Tropical Medicine and Parasitology, Liverpool. 100—Biological Bulletin of the Marine Biological Laboratory, Woods Hole, Mass. 104—Zeitschrift fur Wissenschaftliche Zoologie, Leipzig. 106—Anales de la Sociedad Cientifica Argentina, Buenos Aires. 108—Journal of Genetics, Cambridge, England. 118—Die Naturwissenschaften, Berlin. 119—Proceedings of the National Academy of Sciences of the U. S. A., Washington, D. C. 134—Annales de Biologie Lacustre, Brussels. 141—Internationale Entomologische Zeitschrift, Guben. 144—Proceedings of the Pacific Coast Entomological Society, San Francisco. 150—Jenaische zeitschrift fur naturwissenschaft, Jena. 151—Occasional Papers of the Boston Society of Natural History.

**GENERAL.** Crampton, G. C.—The phylogeny and classification of insects. 13, xvi, 33-47. Davis, W. T.—Cicada-killing wasps and flies. 6, xxxii, 113. Gerhardt, U.—Versuch einer vergleichenden analyse des mannlichen geschlechtstriebes der tiere. (Zeit. f. d. Ges. Anat., Abt. 3, xxv, 661-95.) Hanna, G. D.—Insects in the California tar traps. 68, lix, 555. Heikertinger, F.—Erwiderung an H. H. Kärny, betreffend die "Anwendung der nomenklaturregeln." 49, xliii, 109-10. Herrera, M.—Guia para visitar la coleccion de los aracnidos, miriapodos e insectos . . . (Secret. Agr. y Fomento, Mexico, 1923, 200 pp.) Lovett, A. L.—Obituary note. 12, xvii, 421-2. Lutz, F. E.—Apparently non-selective characters and combinations of characters, including a study of ultraviolet in relation to the flower visiting habits of insects. (An. N. Y. Ac. Sci., xxix, 181-283.) MacGillivray, A. D.—Obituary note. 68, lix, 503. Moscher & Holbrook—A device for inflating larvae. 12, xvii, 408-11. Prell, H.—Ueber das ausschlupfen von insekten aus inadä-

quaten kokons. 52, lix, 241-56. **Reed, C. T.**—Insects simulate birds in flight. (Guide to Nat., xvii, 45.) **Tillyard, R. J.**—Kansas permian insects. Pt. 3, The new order Prothymenoptera. 94, viii, 111-22. **Turner, C. H.**—An appreciation by A. G. Pohlman. The scientific work of. A list of papers published. By P. Rau. (Trans. Ac. Sc. St. Louis, xxiv, No. 9, 7-18.) **Turner, C. H.**—Tropisms in insect behavior. The psychology of "playing possum." (Trans. Ac. Sc. St. Louis, xxiv, No. 9, 19-26; 46-54.) **Walsh, G. B.**—The passage of apterous insect parasites, etc., from host to host. 8, 1924. 143-4. **Weiss & West**—The insects and plants of a salt marsh on the costal plain of New Jersey. 6, xxxii, 93-104.

**ANATOMY, PHYSIOLOGY, MEDICAL, ETC.** **Blunck, u. Speyer**—Kopftausch und heilungsvermogen bei insekten. 104, cxxiii, 156-208. **Bonnier, G.**—Contributions to the knowledge of intra- and inter-specific relationships in *Drosophila*. (Acta Zool., v, 1-122.) **Bretschneider, F.**—Ueber das gehirn eines barenspinners. (*Callimorpha dominula*, die jungfer.) 150, lx, 147-73. **Buys, K. S.**—Adipose tissue in insects. 70, xxxviii, 485-528. **Christophers, S. R.**—The tracheation and venation of the wing of the mosquito. (Indian Jour. Med. Res., xi, 1103-18.) **Crozier, W. J.**—Wave length of light and photic inhibition of stereotropism in tenebrio larvae. (Jour. Gen. Phys., vi, 647-52.) **Cunningham, J. T.**—Transplantation of heads of insects. 76, cxiv, 124. **Duncan, C. D.**—Spiracles as sound producing organs. 55, i, 42-3. **Engel, E. O.**—Das rectum der dipteren in morphologischer und histologischer hinsicht. 104, cxxii, 503-33. **Geiser, S. W.**—The differential death rate of the sexes among animals, with a suggested explanation. (Wash. Univ. Stud., Sc. Ser., xii, 73-96.) **Hingston, R. W. G.**—The evolution of the faculty of communication in ants. (Rep. Proc. Fifth Ent. Meet., Pusa, 289-95.) **Hollande, A. C.**—Les spirochetes des termites; processus de division formation du schizoplaste. 92, lxi, 23-34. **Hyde, R. R.**—Inbreeding, outbreeding, and selection with *Drosophila melanogaster*. 85, xl, 181-215. **Keilin, D.**—On the appearance of gas in the tracheae of insects. (Pro. Cambr. Phil. Soc., Biol. Sc., i, 63-70.) **Kuhl, W.**—Eine methode zur herstellung von rasiermesserschnitten fur topographische ubersichtsbilder durch ganze insekten beliebiger grosse, ohne vorherige chitinaufweichung. (Zeit. Wiss. Mikroskopie, xl, 369-73.) **Lengerken, H.**—Prothetelie bei coleopterenlarven. (Meta-

thelie.) 52, lix, 323-30. **de Luna, M.**—Sur la presence d'un ovaire accessoire chez *Drosophila melanogaster*. 69, clxxviii, 2274-6. **Mavor & Svenson**—Crossingover in the second chromosome of *Drosophila melanogaster* in the F<sub>1</sub> generation of X-rayed females. 90, lviii, 311-15. **Mercier, L.**—*Geomyza sabulosa*, microdiptere a ailes reduites; perte de la faculte du vol chez cette espece selon le processus drosophilien. 69, clxxix, 221-3. **Nath, V.**—Cell inclusions in the gametogenesis of Scorpions. 76, cxiv, 52. **Orlov, J.**—Die innervation des darmes der insekten. (Larven von Lamellicorniern.) 104, cxxii, 425-502. **Pictet, A.**—La genetique experimentale dans ses rapports avec la variation et l'evolution. (Verh. Schweiz. Naturf. Ges., ciii, 133-68.) **Schulze, H.**—Über die putztatigkeit von *Habrobracon*; zugleich ein beitrage zur sinnesphysiologie und psychologie dieser schlupwespe. 52, lix, 313-23. **Seiler, J.**—Neue ergebnisse der chromosomenforschung. (Vehr. Schweiz. Naturf. Ges., cii, 84-94, 1921.) **Seitz, A.**—Zur phylogenie des insektenstammes. 144, xli, 21-2. (cont.) **Seurat, L. G.**—Moeurs et evolution d'un Tipulide a larve et nymphe marines. (Bul. Soc. Hist. Nat. Afrique du Nord, 1924, 113-21.) **Tanaka, Y.**—A new sex linked mutation in the silkworm *Bombyx mori*. (Jour. Dept. Agr., Kyushu Imp. Univ., i, 135-50.) **Tonkov, V.**—Zur mikroskopischen anatomie der rectaldrusen bei den insekten. (Rev. Russe. Ent., xviii, 69-80.) **Weber, H.**—Das grundscheema des pterygotenthorax. 52, lx, 17-37; 57-83. **Wenyon, C. M.**—Microscopic parasites and their carriers. (Pro. R. Inst. Gr. Britain, xxiii, 503-21.) **Wright, W. R.**—On the function of the oesophageal diverticula in the adult female mosquito. 98, xviii, 77-82. **Zawarzin, A.**—Zur morphologie der nervenzentren. Das bauchmark der insekten. 104, cxxii, 323-424.

**ARACHNIDA AND MYRIOPODA.** **Barnes, H. F.**—On the occurrence of mites on crane-flies. 8, 1924, 135-7. **Bertin, L.**—Les terrieres des araignees. La Nature, 1924, 330-54. **Chodziesner, M.**—Beitrage zur kenntnis der zecken mit besonderer berucksichtigung der gattung *Hyalomma*. 89, xlvi, Syst., 505-72. **Cleaves, H. H.**—Spiders' ballast. (Nature Mag. iv, 48-9.) **Emerton, J. H.**—Recent collections of Canadian spiders. 4, lvi, 122-4. **Thuringer, J. M.**—A note on migration of myriapoda. 68, lx, 83.

\***Chamberlain, J. C.**—The Cheiridiinae of North Am. 55, i, 32-40. \***Emerton, J. H.**—New California spiders. 55, i,

29-31. \*Ewing, H. E.—A new mite from the lung sac of a rattlesnake. 10, xxvi, 179. Petrunkevitch, A.—On families of spiders. (An. N. Y. Ac. Sc., xxix, 145-180.)

**THE SMALLER ORDERS OF INSECTA.** Alverdes, F.—Über das verhalten von libellen- und eintagsfliegenlarven. 118, xxviii, 575-6. Freund, L.—Zur literatur über lause (Anoplura). (Naturw. Zeit. Lotos. lxx, 243-47.) Jucci, C.—La differenziazione de le caste ne la societa dei Termitidi. (Mem. R. Accad. Naz. Lincei, Cl. Sci. Fis., xiv, 500 pp.) Klugh, A. B.—Dragon flies and damsel flies. (Nature Mag., 1924, 107-9.) Lall, H.—External genitalia of Lahore dragonflies. (Rep. Proc. Fifth Ent. Meet., Pusa, 369-77.) Lenz, F.—(See under Diptera). Macnamara, C.—The food of Collembola. 4, lvi, 99-105. Samal, J.—Etude morphologique et biologique de *Perla abdominalis*. 134, xii, 229-72. Stumper, R.—Une termitiere singuliere. La Nature, 1924, 351-2. Watson & Hubbell—On a collection of Thysanoptera from Honduras. 39, vii, 60-2.

Hood, J. D.—A new Seriothrips injurious to cotton. 4, lvi, 149-50. Longinos Navas, R. P.—Crisopidos de Cuba. 26, vii, 51-3.

**ORTHOPTERA.** Koncek, S. K.—Zur histologie der ruckendrusse unserer einheimiscen Blattiden. 104, cxxii, 311-22. Lucas, W. J.—Hibernation of *Forficula auricularia*. 9, 1924, 140-1. Rau, P.—The biology of the roach, *Blatta orientalis*. (Trans. Ac. Sc. St. Louis, xxv, No. 9, 57-79.) Rostand, J.—Sur l'intersexualite chez les phasmes. 77, xci, 448-9.

Caudell, A. N.—*Amblycorypha brachyptera*. 10, xxvi, 180.

**HEMIPTERA.** Fernald, H. T.—Giant water bug attacks trout. (Nature Mag., iv, 49.) Ferris, G. F.—The nymphs of two sps. of Chermidae. 55, i, 24-8. Patch, E. M.—The summer food plants of the green apple aphid. (Bul. Maine Agr. Exp. Sta., 313.) Ringuelet, E. J.—Contribucion al estudio de la "*Pulvinaria flavescens*." 106, xcvii, 61-80.

de Costa Lima, A.—Nota sobre as especies do genero *Eucalymnatus*. (Coccidae). (Arch. Esc. Sup. Agr. Med. Vet. Nictheroy, vii, 35-42.) Green & Laing—Descriptions of some apparently new non-diaspidine Coccidae. 22, xiv, 415-19. \*Hungerford, H. B.—A new *Mesovelvia* with some biological notes regarding it. 4, lvi, 142-44. \*Van Duzee, E. P.—Characters of two No. Am. Chermidae. 55, i, 22-3.

**LEPIDOPTERA.** **Blackmore, E. H.**—L. not previously recorded from British Columbia. Rare and uncommon L. taken in British Columbia during 1923. (Rep. Prov. Mus. N. H., Br. Col., 1923, C, 19-25.) **Burrows, C. R. N.**—Upon the suggested relationships of Psychids. 21, 1924, 81-5 (cont.) **Ford, L. T.**—Lepidoptera and bats. 9, 1924, 140. **Shepherd, J.**—Mass production. 9, 1924, 141-2. **Tulloch, J. B. G.**—The hibernation of *Pyrameis atalanta*. 9, 1924, 139. **Wynne, A.**—Lepidoptera and bats. 9, 1924, 164.

\***Barnes & Benjamin**—A new sphingid from Nevada. 10, xxvi, 166. \***Davis, W. T.**—A northern form of the butterfly *Neonympha areolatus*. 6, xxxii, 105-8. \***Hall, G. C.**—Notes on *Polygonia j-album*, *Creyonias alope*, *Phyciodes tharos*, *Heodes epixanthe* and *Euphydryas gilletti*. 6, xxxii, 109-12. **Lathy, P. I.**—Notes on the genus *Agrias*. 11, xiv, 144-56. **Moreau, E.**—Description de *Papilio maroni* de Guyane Française. 20, 1924, 93-6. **Niepelt, W.**—Neue formen exotischer Rhopaloceren. 141, xviii, 49-50. **Schaus, W.**—A new moth injurious to cocconut palm (*Limacodidae*). 10, xxvi, 180. **Schaus, W.**—New sps. of moths in the U. S. Nat. Mus. 50, lxxv, Art. 7. \***Skinner & Williams**—On the male genitalia of the *Hesperiidae* of North America. Paper IV. 2, 1, 57-74.

**DIPTERA.** **Lenz, F.**—Eine konvergenzerscheinung beim gehausebau der Chironomiden- und der Trichopterenlarven. 52, lx, 105-111. **Melin, D.**—Contributions to the knowledge of the biology, metamorphosis and distribution of the Swedish Asilids, in relation to the whole family of Asilidae. (Zool. Bidr. Fran Uppsala, viii, 1-317.) **Ramachandra Rao, Y.**—The genitalia of certain anthomyiid flies. (*Atherigona* spp.). (Rep. Proc. Fifth Ent. Meet., Pusa, 330-35.) **Saunders, L. G.**—An unusual case of sexual dimorphism in *Ceratopogonine* midges. 8, 1924, 133-4. **Thompson, W. R.**—Recherches sur les dipteres parasites. Les larves des Sarcophagides. 78, liv, 313-463.

**Aldrich, J. M.**—A n. g. and sp. of two-winged flies of the family Chloropidae injuring manihot in Brazil. 50, lxxv, Art. 21. \***Allen, H. W.**—Notes on Miltogramminae with descriptions of two n. sps. 151, v, 89-92. \***Cole, F. R.**—Notes on the dipterous family Asilidae, with descriptions of n. sps. 55, i, 7-13. \***Curran, C. H.**—A n. sp. of *Nothosympycnus* with synopsis of Canadian sps. Seven n. sps. of *Rhaphium*.

(Dolichopodidae). 4, lvi, 108-10; 133-41. **Enderlein, G.**—Beitrage zur kenntnis der Platystominien. (Mitt. Zool. Mus. Berlin, xi, 97-153.) \***Johnson, C. W.**—A review of the New England species of *Chysotoxum*. 151, v, 97-100. \***Malloch, J. R.**—Two new cordylurid flies from the Pacific coast. 55, i, 14-15. \***Shannon, R. C.**—Change of preoccupied name. 10, xxvi, 178. \***Van Duzee, M. C.**—A new western Dolichopodid. 55, i, 43-4. \***Van Duzee, M. C.**—N. sps. of the dipterous family Dolichopodidae. 151, v, 101-6. **Wheeler, W. M.**—Two extraordinary larval myrmecophiles from Panama. 119, x, 237-44.

**COLEOPTERA.** **Arendsen Hein, S. A.**—Studies on variation in the meal worm, *Tenebrio molitor*. 108, xiv, 1-38. **Bondar, G.**—Biologia do genero *Collabismus* (Curculionidae). (Arch. Esc. Sup. Agr. Med. Vet., Nichtheroy, vii, 23-4.) **Good, H. G.**—Notes on the life history of *Prionocyphon limbatus*. (Helodidae). 6, xxxii, 79-84. **St. George, R. A.**—Studies on the larvae of N. A. beetles of the subf. *Tenebrioninae* with a description of the larva and pupa of *Merinus laevis*. 50, lxx, Art. 1.

**Barber, H. S.**—New Ptiliidae related to the smallest known beetle. 10, xxvi, 167-78. \***Blaisdell, F. E.**—Studies in the Melyridae. III. 55, i, 15-21. \***Casey, T. L.**—Additions to the known C. of North America. (Mem. of the Coleoptera, xi, 347 pp.) \***Chittenden, F. H.**—New sps. and var. of *Sphenophorus* with notes on certain other forms. 10, xxvi, 145-59. **Csiki, E.**—Coleopterorum catalogus. Pars 77: *Serropalpidae*, 62 pp. \***Fall, H. C.**—New sps. of North Am. Hydrobiini. 6, xxxii, 85-92. **Heller, K. M.**—Ein neuer *Leptinopterus*. (Lucanidae). 49, xiii, 63-4. **Knisch, A.**—Coleopterorum catalogus. Pars 79: *Hydrophilidae*, 306 pp. **Olsufiev, G.**—*Silphopsyllus desmanae* gen. et sp. nn., parasite du rat musque. (Leptinidae). (Rev. Russe Ent., xviii, 81-90.) **Pic, M.**—Melanges exotico-entomologiques. Fasc. 41. \***Swaine, J. M.**—N. sps. of the genus *Phloeosinus*. 4, lvi, 144-9. \***Van Dyke, E. C.**—N. sps. and subsps. of *Cychnini* from western No. Am. (Carabidae). 55, i, 1-6. \***Wallis, J. B.**—Two n. sps. of *Coelambus* (Dytiscidae). 4, lvi, 105-8. **Weise, J.**—Coleopterorum catalogus Pars 78: *Chrysomelidae: Galerucinae*, 225 pp.

✓ **HYMENOPTERA.** \***Hase, A.**—Beitrage zur kenntnis des geschlechtslebens mannlicher schlupfwespen. Arb. Biol. Reichs. f. Land- u. Forstw., Berlin, xii, 339-46.) **Plath, O. E.**

—Miscellaneous biological observations on bumblebees. 100, xlvii, 65-78. **Turner, C. H.**—The homing of the H. (Trans. Ac. Sc. St. Louis, xxiv, No. 9, 27-45.)

**Cockerell, T. D. A.**—Descriptions and records of bees.—Cl. 11, xiv, 179-85. **Duncan, C. D.**—*Dolichovespa diabolica* and its supposed var. *fernaldi*. 55, i, 40-2. \***Fouts, R. M.**—New bethylid and serphoid parasites from No. Am. 10, xxvi, 159-66. \***Fouts, R. M.**—Revision of the No. Am. wasps of the subfamily *Platygasterinae*. 50, lxiii, Art. 15a. \***Gahan, A. B.**—Some new parasitic H. with notes on several described forms. 50, lxxv, Art. 4. \***Mickel, C. E.**—A revision of the Mutillid wasps of the genera *Myrmilloides* and *Pseudomethoca* occurring in America north of Mexico. 50, lxiv, Art. 15. \***Viereck, H. L.**—Descriptions of new H. in the Canadian Nat. Coll., Ottawa. 4, lvi, 110-12.

#### SPECIAL NOTICES.

**L'Abeille**, Journal d'Entomologie, publie par la Societe Entomologique de France. We note the continuation of this long interrupted journal under the direction of R. Jeannel. It had not been issued since 1914. The present number is No. 1 of Tom. XXXII, and is large octavo size, containing a paper of 160 pp., by R. Jeannel: Revision des "Choleva" Latreille.

**Aphididae of Formosa**, Part 1-2. By Ryoichi Takahashi. Published by the Agr. Exp. Station, Gov. of Formosa, Taihoku, Formosa. American students may find this work of interest. It is in English; includes notes on many species occurring in North America and other parts of the World. Copiously illustrated with line cuts.

**Memoirs of the Coleoptera** by Thos. L. Casey, Part XI, 347 pp. This part of the well known memoirs contains many descriptions of new forms in several families of this order.

**Pan-Pacific Entomologist**. Published by the Pacific Coast Entomological Society in co-operation with the California Academy of Sciences. No. 1 of Vol. 1 has just appeared, and contains many papers describing new North American species, all of which are noted above. The numbers of this new journal are to be issued quarterly, and are intended to supply the need of an organ to represent the entomologists of the west coast region in their special branch of scientific research. The subscription price has been fixed at \$2.00 per year, and the support of all entomologists upon the threshold of the great Pacific region is solicited.

## Doings of Societies.

The Fifth Annual Summer Meeting of the Northeastern Entomologists, a section of the American Association of Economic Entomologists, was held at Philadelphia, Pennsylvania, and vicinity on Wednesday, Thursday and Friday, July 30 and 31 and August 1, 1924. Members and others interested gathered in the morning of July 30 at the Japanese Beetle Laboratory, Riverton, New Jersey, inspected the work there, had luncheon at the Riverton Country Club, where they listened to reports by Mr. Loren B. Smith and his associates of the Laboratory, and then visited peach, apple and cherry orchards near by, where excellent opportunity was afforded to witness the attacks of this insect as well as the protection afforded by arsenate of lead spraying against it. The same day at 8 P. M. a joint meeting with the Entomological Section of the Academy of Natural Sciences of Philadelphia was held in the Academy's building, at which addresses were made by the Hon. J. M. McKee, Deputy Secretary of Agriculture of Pennsylvania, President A. F. Burgess on his recent trip to the Pacific Coast and Mr. J. L. King on his experiences in Japan in search of parasites of the Japanese beetle.

On July 31, leaving Frankford, Philadelphia, at 8.30 A. M., visits were made by automobile to the Field Laboratory, Pennsylvania State College at Bustleton, the Fleming farm at Andalusia, the Willow Grove Joint Station of the Federal Bureau of Entomology and Penna. Bureau of Plant Industry, the DeKalb Nurseries, at Penn Square, and the Heyman orchard near West Chester, all in Pennsylvania, viewing various economic entomological projects in operation. Supper was at Westtown, as guests of the Chester-Delaware County Fruit-growers' Association.

On August 1, proceeding from West Chester, Penna., where most of the party spent the night, via Wilmington, Delaware, and (by ferry) Pennsgrove, New Jersey, to Bridgeton, the peach orchards of the Seabrook Farms were visited for the Oriental peach bud moth, Glassboro for potato injuries and thence to Camden where the party broke up.

This enjoyable and instructive session was planned and guided by Prof. H. E. Hodgkiss and Director C. H. Hadley (Bureau of Plant Industry) for Pennsylvania, and Prof. T. J. Headlee for New Jersey, to whom, and to the speakers mentioned, and those in charge of the various stations and farms, the thanks of the participants are due.

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As was widely announced in the daily press and elsewhere, the British Association for the Advancement of Science held

its Ninety-second Annual Meeting in Toronto, Canada, August 6-13. The *Journal of Scientific Transactions* of the sessions, date July 7, 1924, a pamphlet of 107 pages, listed the papers to be presented, many of them accompanied by abstracts. The titles relating to Entomology follow. Presidential address by Maj. Gen. Sir David Bruce on Prevention of Disease (published in *Science* for Aug. 8, pp. 109-124). The following seven were scheduled for Section D. Zoology: F. A. Potts—Intracellular Digestion in Invertebrates; Dr. J. W. Heslop Harrison—On Hybrids between British and Canadian Lepidoptera; A. D. Peacock—Sexuality in the Saw-fly (*Pristiphora pallipes* Lep.), a study in the evolution of parthenogenesis; Dr. F. A. Dixey—On scent-distributing structures in the Lepidoptera; Prof. A. E. Cameron—Some Tabanidae of Saskatchewan, their parasites and hitherto undescribed pre-imaginal and imaginal stages; Prof. E. M. Walker and Miss Norma Ford—Some features in the anatomy of Grylloblata, a primitive Orthopteroid insect; J. M. Swaine—The factors determining the distribution of North American bark beetles; and the following for Section K. Botany: Dr. J. M. Swaine—Forest protection from insects.

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## OBITUARY.

PHILIPPE GROUVELLE died August 2, 1923, at the age of 72 years. He was secretary of the Entomological Society of France 1904-1913 and a specialist in Coleoptera. (Bull. of that Society 1923, No. 15.)

JULES GROUVELLE, also a Coleopterist and member of the same society, died November 6, 1923, in his 83rd year. (Bull. cit. 1923, No. 17.)

The death of EDMOND BORDAGE, date not given, was announced at the meeting of the same society on February 13, 1924. He worked for a long time in the laboratories of Alphonse Milne-Edwards and Emile Blanchard in the Museum of Natural History (Paris) and was for some years director of the experimental garden in the Island of Reunion. He published on autotomy and regeneration in the Phasmodidae and, under the title *Notes biologiques recueillies a la Reunion*, very varied observations on the instincts of the Spheginae, the habits of Evaniidae and Chalcididae parasitic on certain roaches, descriptions of Coccidae injurious to cultivated plants, acclima-

tation of species foreign to that island, etc. On his return to France, in 1908, he became chef de travaux in the laboratory of evolution, a position which he refused to leave when higher posts more suited to his merits were offered to him. He was not ambitious and preferred a modest situation which permitted him to work in peace. He was an excellent naturalist who published little because he was scrupulous and meticulous, but whose work, which remains entire, is of the greatest interest. (President F. Picard, *Bull. cit.* 1924, p. 33.)

FREDERICK MERRIFIELD died May 28, 1924, at Brighton, England, at the age of 93 years. Son of a barrister of the Middle Temple and of Mary Philadelphia Merrifield, "a lady of great mental power and versatility, an accomplished naturalist and well known during her lifetime as a leading authority on the Algae, he undoubtedly derived [from her] the love of nature in all its aspects which was characteristic of the whole of his prolonged life." He was called to the bar in November, 1853; in later years he was clerk of the peace for Brighton.

Between 1887 and 1897 he conducted researches on the modification of Lepidoptera when reared under various conditions of temperature and of other surroundings, undertaken in the first instance on behalf of the late Francis Galton. They include the changes which may be induced by heat and cold acting upon the two generations of *Vanessa (Araschnia) levana-prorsa*. His results were published in the Transactions of the Entomological Society of London and are summarized by Dr. F. A. Dixey in *Nature* for Dec. 23, 1897, pages 184-188, and to a certain extent by himself in his paper *Experimental Entomology. Factors in Seasonal Dimorphism*, read to the First International Congress of Entomology, at Brussels, 1910, and published in the Memoirs thereof (pp. 433-448). Merrifield was President of the Entomological Society of London for 1905 and 1906. (*Ent. Mo. Mag.*, July, 1924.)

DR. DAVID M. CASTLE, well known for his work on Coleoptera, a long-time member of the American Entomological Society and of the Feldman Collecting Social, died in Philadelphia, August 6, 1924. We hope to publish a more extended notice in our next number.

## 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.

**Wanted**—American sawflies, Tenthredinoidea, in exchange for other insects, chiefly Coleoptera. Correspondence may be in English. D. Dvornar-Zapolsky, P. O. Box 573, Agricultural Experimental Station, Entomological Section, Rostov on Don, Russia.

**Have** a number of pamphlets and books on N. A. and exotic Cerambycidae. Will exchange these for certain families of Heteroptera and Tabanidae. G. Chagnon, P. O. Box 521, Montreal, Canada.

**Buprestidae**.—Will determine and exchange Buprestidae of the world and exchange separata on this family. Dr. Jan Obenberger, Prague II., Václavské náměstí 1700, Museum, Czechoslovakia.

**Wanted**—Connection with collectors who can furnish me early in the fall living and hibernating pupae of western and southern Papilio and Saturniidae and allied groups. Fertile eggs of Apanteris and Catocala also desired. Max Rothke, 1841 E. Elm St. (R. D. 2), Seranton, Pa.

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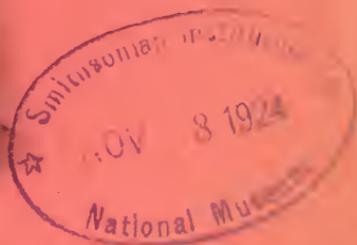
# ENTOMOLOGICAL NEWS

Vol. XXXV

No. 9



GEORGE HENRY HORN  
1840-1897



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## STATED MEETINGS

Of the Entomological Section of The Academy of Natural Sciences of Philadelphia, and of The American Entomological Society will be held at 7.30 o'clock P. M. on the following dates during 1924: January 24, February 28, March 27, April 24, May 22, September 25, October 23, November 20, and Dec. 8.

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DR. DAVID MacFARLAND CASTLE.

# ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXV

NOVEMBER, 1924

No. 9

## CONTENTS

Editorial—David MacFarland Castle. 305	Patch—Aphids with Branched Cornicles (Homop.)..... 331
Coolidge—Life History of <i>Heodes heloides</i> Bdv. (Lepid.: Lycaenidae). 306	Tillyard—A Unique Resting Place for a Fossil Insect (Odonata). . . . . 333
Hood—New Thysanoptera from the United States..... 312	de la Torre Bueno— <i>Gaditanus</i> , being Additional Words on Tingitidae (Heteroptera)..... 333
Root—Notes on Dragonflies (Odonata) from Lee County, Georgia, with a Description of <i>Enallagma dubium</i> , new species..... 317	Entomological Literature..... 334
Wiley—On the Biology of <i>Curicta drakei</i> Hungerford (Heteroptera, Nepidae) . . . . . 324	Review of Felt's Manual of Tree and Shrub Insects..... 342
	Doings of Societies—Entomological Society of France..... 324

### Dr. David MacFarland Castle.

(Portrait, Plate IX.)

DR. DAVID MACFARLAND CASTLE died August 15th, 1924, at his home, 2007 Arch Street, Philadelphia, following an illness of several months. He was in his eighty-second year.

Dr. Castle was born October 7th, 1842, at Lower Paxton Township, Dauphin County, Pennsylvania, and was graduated from Palmyra Academy in 1862. He later attended Hahnemann Medical College, in Philadelphia, graduating in the class of 1873.

For a number of years he was in charge of Hahnemann College dispensary and was Assistant Professor and Lecturer on Obstetrics.

As well as I can remember I became acquainted with Dr. Castle in 1874 or '75, when he visited my grandfather, Mr. Henry Feldman. I well remember the doctor's early collec-

tions, kept in cigar boxes which were highly polished and decorated with colored flowers cut from magazines and periodicals. During the Centennial Exposition, in 1876, the doctor and myself would visit on Friday afternoons the various entomological exhibits of foreign countries and buy gorgeous, colored insects at the Brazilian exhibit.

Dr. Castle never published any papers in entomology, devoting his entire time to field work, and became the possessor of much reliable information, which he imparted to his associates. The doctor made many collecting trips to his favorite Florida, and his rich captures were divided among his entomological friends.

In December, 1887, Dr. Castle was appointed Chairman of a Committee to draft a Constitution and By-Laws of the newly-formed Feldman Collecting Social. He served as Secretary of the Social from January, 1889, to January, 1893, and as President from January, 1898, to January, 1901.

He was a member of the Academy of Natural Sciences of Philadelphia, the Entomological Section of the Academy, and the American Entomological Society.

His death is a great loss to the members of the Feldman Social, whose meetings he never failed to attend. To have known him was a great privilege.

H. W. WENZEL.

---

### **Life History of *Heodes helloides* Bdv. (Lepid. : Lycaenidae).**

By KARL R. COOLIDGE, Hollywood, California.

*Heodes helloides* is the common "Copper" butterfly of the west, ranging everywhere from along the seashore up into the high mountains. About Los Angeles two species of butterflies are commonly seen disporting about the city lawns; one being *Hylephila phylacus* and the other *helloides*.

Here it makes its first appearance in early March; about the middle of April comes another brood; in late June another is in full flight; a fourth in July. Then from August to November, when the butterfly is far more abundant than in earlier

months, as near as I can judge, three more broods occur, making seven in all. Hibernation is passed in the chrysalis state. The food-plants are:

**POLYGONACEAE:** *Polygonum* sp.—In the cities, on the lawns and in parks, on *P. aviculare* Linn., the notorious wire-grass. No doubt any species of *Polygonum* will suffice as food, and I have found eggs or larvae on *P. lapathifolium* Linn. and *P. hydropiperoides* Michx.

*Rumex* sp.—Probably also any of the numerous species of this genus are satisfactory as food-plants. In Southern California I have located the following definitely: *P. persicarioides* Linn., *P. conglomeratus* Murr., *P. crispus* Linn., and *P. hymenosepalus* Torr., this latter the canaigre of commerce.

*Oxytheca spergulina*.—This and the following on the authority of Miss Ximena McGlashan (Diurnal Food-Plant Chart, 1913).

**ONAGRACEAE:** *Gayophytum diffusum*.—Small flowered evening primrose.

A time record of the transitions follows:

Eggs laid May 25th and 26th.	Larvae passed third moult
Hatched June 4th.	June 28th.
Larvae passed first moult June 17th.	Larvae passed fourth moult July 7th.
Larvae passed second moult June 23rd.	Suspended July 15th.
	Pupae disclosed July 17th.
	Imagoes emerged July 27th.

The young larvae invariably escape by eating out roundish jagged holes in the summit of the egg, about .30 mm. in diameter, only devouring enough of the shell to make their egress.

They attack both upper and lower surfaces of the leaves, but perhaps show a preference for the lower side. In the first stages the larvae bite roundish holes into the leaves, eating only about half-way through the parenchyma, and also ploughing narrow furrows along the surface. But after the second moult they eat clear through the leaf, and following the next moult will devour the leaf at its edge. The larvae are sluggish, remaining on a leaf for a considerable length of time, even after it has dried up, apparently too lazy to venture forth for fresher food, and completely riddling a leaf before leaving it. Pupation occurs in debris about the base of the food-plant.

*The Egg.*—In form tiarate, a little more rounded above than below, with the base broadly truncate. The micropyle in a deep circular depression, with abrupt walls, .08 mm. in diameter, dark green, showing rather prominently to the naked eye. The micropyle rosette occupying the whole floor of the cavity and consisting of a central roundish cell, .001 mm. in diameter, with a group of larger circular or suboval cells surrounding it. The network of these micropylar cells exceedingly minutely raised and very indistinct.

The surface of egg covered with a raised white network, the walls of which average about .015 mm. in thickness. This network divides itself into mostly subquadrate or triangular cells, about .04 mm. in their greatest diameter. The cell walls, at their junctures, enlarge into the usual rounded conical protuberances, which produce the effect of stellate ridges. On the sides the cells are disposed with some regularity, the protuberances prominently six-rayed, but as the micropylar region is approached and reached the arrangement becomes more and more confused, the rays diminishing and the cells becoming oval and roundish, and much smaller. The surface of all the cells delicately punctuate. The protuberances about .03 mm. in height, with the connecting cell walls mounting to about half this height.

Color of egg a delicate pale green, after three or four days of incubation fading into a chalky white; the raised network and protuberances glistening white. Height, .36 mm. Breadth, .66 mm.

*Larva, First Instar.*—Head smooth, shining, pale amber brown; ocellar field blackish fuscous; edge of labrum and mouth parts tinged with ferruginous. Diameter of head, .24 mm.

Body largest anteriorly, well rounded posteriorly, a little depressed above and very much so below. First thoracic segment with a double row of colorless, pointed, spiculiferous hairs projecting over the head, some as long as .36 mm., others but .16 mm. Other segments with a subdorsal row of hairs, two to a segment, arising from slender but high fuscous papillae, .04 mm. in height. The central hair long, .40 mm. in length, .02 mm. in diameter at base, curving sweepingly posteriorly. The second hair posterior and a little outside the first, much shorter, only .10 mm. in length, nearly straight, depressed, also projecting posteriorly. Both these hairs colorless, tapering to a fine point and minutely spiculiferous. A ventrostagnatal row of hairs, three to a segment on either side, projected from low slender tubercles. The first hair .12 mm. in length; the second .16 mm.; the third but .06 mm. These hairs fairly straight, colorless, pointed, spiculiferous, projecting posteriorly. A series of sub-

dorsal, circular, crateriform papillae, one to a segment on either side, .02 mm. in diameter, centrally located. A similar but smaller infrastigmatal series of papillae, also centrally located. Stigmata oval, .015 mm. in length, with a fine fuscous ring.

Color, a rather vivid lemon yellow, with a whitish sheen especially prominent dorsally. But as the larvae feed they become more and more greenish, until at the end of the instar they are a uniform grass green. Ventral surface, legs and prolegs bright lemon yellow. Length 1.14 mm. Width at first thoracic segment .34 mm.; width at anal segment .28 mm.

*Second Instar.*—Head smooth, pale amber brown, .44 in diameter, with the ocellar field black and the mouth parts reddish.

On first thoracic segment a heavy fringe of hairs arising from tubercles concolorous with body; these hairs project over the head, are colorless, sharp, spiculiferous, and vary in length from .10 mm. to .30 mm. On the anal segment a similar fringe, but not as profuse. Laterally, just above the spiracles and a little back of them, a short, rather stout, sharp, straight hair, but .10 mm. in length and densely spiculiferous; in line with this a second similar hair, on hind edge of segment. Substigmatally, along ventral ridge, a number of colorless, sharp, spiculiferous hairs, averaging .18 mm. in length. First subdorsals now .36 mm. in length, arising from pale green tubercles, .02 mm. in diameter at base and but slightly higher; the hairs curved as before, spiculiferous and infuscated. Second subdorsals .18 mm. in length. Spiracles round, .02 mm. in diameter, with a pale brown ring.

Color of body, pale green. Dorsally, on either side of line of dorsal vessel, a white streak, wide, but not connected in the form of a continuous definite stripe, and not at all prominent; and on either side of this an illy defined, poorly connected, yellowish, crenate stripe. Along ventral ridge a sordid white stripe. Ventral surface and prolegs pallid green; legs subhyaline, pale yellow brown.

Length, 3.50 mm. Width at first thoracic segment .90 mm.; width at anal segment .80 mm.

*Third Instar.*—Head smooth, pale amber brown, .64 mm. in diameter; ocellar field black; mouth parts fuscous.

Ventral ridge with a fringe of numerous irregular hairs, arising from minute tubercles. These hairs vary in size from .10 mm. to .30 mm., are coarsely spiculiferous, pointed, and nearly all are colorless, with only a few, especially the hairs as in previous stage subdorsally, tinged with fuscous. The tubercles from which they arise very delicate pale green, sometimes fuscous tinged, and averaging about .03 mm. in height and diam-

eter at base. First thoracic and anal segments with fringes of colorless sharp hairs as along ventral ridge. Spiracles round, .04 mm. in diameter, with a pale brown ring, conspicuous against the body ground color.

Color of body, grass green. Stripes as in second instar, but still inconspicuous. In some examples a rather prominent ventrostigmatal stripe of bluish white develops, and the line of the dorsal vessel may be of a deeper green than rest of body. Ventral surface concolorous with body; prolegs blue green; legs subhyaline, pale yellow brown.

Length, 4.70 mm. Width at first thoracic segment 1.20 mm.; width at anal segment 1 mm.

*Fourth Instar.*—Head smooth, pale amber brown, 1. mm. in diameter; ocellar field black; mouth parts infuscated. A few hairs on lower front face, sharp and colorless; several .25 mm. in length, a number but .10 mm. long, and a few very short ones only .04 mm.

Body rather thickly covered with numerous, irregularly scattered, sharp hairs, arising from minute tubercles; these hairs varying in size, from .20 mm. in length down to .10 mm. They are rather coarsely spiculiferous, for the most part colorless, with only a few infuscated. The tubercles from which they arise very minute, about .017 mm. in height and diameter at base, and concolorous with body. Along ventral ridge, and extending around first thoracic and anal segments, the hairs are much longer, some .40 mm. in length, and arranged in a rather dense fringe. In addition to warts projecting hairs, numerous, irregularly scattered, spiny, bulbous processes, glistening white, .04 mm. in height. Spiracles round, .06 mm. in diameter, with a pale brown ring.

Color of body, grass green. Stripes as before, and in addition, a rather fine, yellowish, infrastigmatal stripe, weak and inconspicuous usually, but occasionally well developed, and sometimes blue-white. Ventral surface concolorous with body; prolegs blue green; legs subhyaline, pale yellow brown.

Length, 5.80 mm. Width at first thoracic segment 1.60 mm. Width at anal segment 1.30 mm.

*Fifth Instar.*—Head 2.30 mm. in diameter, pale amber brown, smooth, except for a few sharp colorless hairs on lower frontal face, several of these .30 mm. in length, shorter ones down to .10 mm. Mouth parts reddish fuscous; eyes white in a black field.

Viewed from above, elongate elliptical, rounded anteriorly, a little more bluntly than posteriorly, and but scarcely tapering posteriorly. Ventrally flattened, with the legs and prolegs short and stout.

As before, body rather thickly covered with numerous irregularly scattered sharp hairs, arising from minute tubercles; these hairs varying in size from the longest, .60 mm., down to others but .20 mm. The tubercles from which they arise very small, the largest only .02 mm. in height and diameter at base, and concolorous with body. The hairs mostly colorless, only a few infuscated, and all coarsely spiculiferous. Hairs along ventral ridge, and extending around first thoracic and anal segments longer than elsewhere, in a rather dense fringe. Numerous irregularly scattered, spiny, bulbous processes as before, glistening white, .045 mm. in height. Spiracles subovate, .14 mm. in length, pallid, with a fine brown ring.

Color of body, grass green. An infrastigmatal yellowish stripe, as in previous stage, still weak and inconspicuous. On either side of dorsal line, except on first thoracic and anal segments, a poorly connected, fine, streak-like line of bright yellow, too weak to be at all prominent. On the sides a line of yellow oblique dashes, even less conspicuous. Ventral surface concolorous with above; prolegs blue green; legs subhyaline pale yellow brown.

Length, at start of instar, 9.6 mm.; at maturity, 14. mm. Width at first thoracic segment 2.30 mm.; at maturity, 2.70 mm. Width at anal segment 2. mm.; at maturity, 2.40 mm.

*Pupa*.—Viewed from above, the sides, from one end of wing cases to the other, straight except for a slight divergence at abdominal segment four, where the greatest width occurs. Thorax from basal wing tubercles only slightly decreasing to anterior extremity, which is quite sharply truncate. Abdomen elliptical well rounded posteriorly.

Viewed laterally, the highest point is thoracic segment three, sloping rapidly thence forward, but dipping only slightly at point of junction with abdomen. Abdomen arched, evenly rounded to last segment, which drops off abruptly and is nearly perpendicular. Ventrally, uniformly flattened.

Body covered with a very delicate, scarcely perceptible tracery of very low, equal, raised lines, crossing irregularly and forming rather large irregular, angular cells; at the junction of these lines a slight enlargement takes place so as to form a low naked wart. Tracery concolorous with body. Within the tracery cells, profusely and irregularly scattered, are very pale greenish low warts giving rise to glistening white fungiform bristles; these bristles vary slightly in size, averaging .08 mm. in length; their stalks .018 mm. in diameter at base, straight for three-fourths their distance, then suddenly expanding into flattened infundibuliform discs, .06 mm. across, with their horizontal

edges fringed with fleshy ciliate lobes. These bristles lacking on the ventral surface, except for a short distance from both anterior and posterior ends. Hooklets of cremaster .08 mm. in length, long and slender, their stems equal, but expanded at extremities into mushroom-like saucers, .04 mm. across; in color rather bright reddish brown.

Spiracles elongate oval, elevated, white, with a rather sharp concolorous ring, .12 mm. in length, .06 mm. across; to the naked eye with an aureous tinge. Basal wing prominences low, broadly rounded elevations, glistening white, .12 mm. in height and of the same diameter at base.

Color of thorax, grass green; of abdomen, yellow green. Wing cases pale cream colored, with some blackish fuscous streaks on outer borders. Tongue case infuscated with weak, brownish streaks. Tongue and antennal cases outlined in weak brown. A fine black dorsal streak, on thoracic segments heavier than abdominally, and on abdominals containing a rather heavy point. At point of junction of thorax and abdomen the dorsal line slightly enlarged, and on either side of it here, laterally on mesothorax, a rather long, wavy, black streak. On first thoracic, on either side of dorsal line, a fine black point. Suprastigimataly, on abdominal segments, in line with wavy streaks of mesothorax, a weak series of brown points, two to a segment in an oblique row. Between dorsal line and lateral points of abdomen, a subdorsal series of very weak black points, almost obscure, one to a segment placed posteriorly.

Length, 10.5 mm. Greatest width of thorax, 4. mm.; greatest width of abdomen, 4.50 mm. Greatest height of thorax, 4. mm.; greatest height of abdomen 3.75 mm.

---

### **New Thysanoptera from the United States.**

By J. DOUGLAS HOOD, University of Rochester.

(The types of the new species described below are in the author's collection).

#### **Sericothrips nubilipennis sp. nov.**

♀ (macropterous).—Length about 1 mm. Color nearly uniform pale yellow, with a pair of large brown spots at center of prothorax and another somewhat smaller pair on metascutum; antennæ concolorous with body, excepting sides of 2, which are slightly darkened, and distal two-fifths of 4, distal half of 5, and all of 6-8, which are dark blackish brown; fore wings nearly uniform dark blackish brown, slightly paler at

extreme tip, just beyond scale, and also along anterior margin in basal fifth; legs concolorous with body; ocellar pigment deep red.

Head about 1.7 times as wide as long, about as broad across eyes as behind them, surface without noticeable sculpture, bristles as usual in the genus. Eyes rather large and rounded, equal in width to their interval, pilose. Antennæ about three times as long as head. Mouth cone only slightly surpassing base of prosternum.

Prothorax decidedly longer than head and about 1.7 times as wide as long, sides broadly rounded; pronotum with the usual, raised, anastomosing, transverse lines and with the single large bristle at posterior angles straight, pale, and not prominent. Fore wings with all bristles dark in color and readily visible; costal margin with 26 bristles; principal vein with a basal group of three, then with 20, the last one rather more widely separated than the others; posterior vein indicated by two widely spaced bristles near tip of wing; hind wings with dark median line except at tip and base.

Abdomen rather slender but distinctly wider than pterothorax, without color markings of any kind; sides with the usual pubescence, which is missing from median portion; all bristles slender, pale, and very inconspicuous.

Measurements of holotype: Length 1.00 mm.; head, length about 0.084 mm., width 0.143 mm.; prothorax, length about 0.107 mm., width 0.180 mm.; pterothorax, width 0.225 mm.; abdomen, width 0.255 mm.; fore wings, length 0.690 mm.; width at middle, 0.030 mm.; near base, 0.060 mm.

Antennal segments	1	2	3	4	5	6	7	8
Length (microns) . . .	21	36	42	43	40	46	10	13
Width (microns) . . . .	24	26	19	18	17	16	7	5
Total length of antenna, 0.25 mm.								

Described from one female taken by Mr. W. L. McAtee, of the U. S. Biological Survey, and the writer at Plummer's Island, Maryland (in the Potomac River above Washington, D. C.), from willow, October 5, 1913.

A very pretty and unusually colored species, easily known by the dark wings.

### *Sericothrips sambuci* sp. nov.

♀ (macropterous).—Length about 1.1 mm. Color uniform pale yellow, nearly white, without body markings of any sort; antennæ light gray, with segment 1 nearly clear white, 2 somewhat infuscate, 4 dark gray in distal third, 5 dark gray in distal

half or more, and 6-8 nearly uniform dark gray; wings with veins and fringes slightly yellowish, otherwise colorless except for a very light shading at basal third; legs concolorous with body; ocellar pigment bright red.

Head about 1.75 times as wide as long, somewhat broader across eyes than behind them, surface without noticeable sculpture, bristles as usual in the genus. Eyes relatively small, rounded, widely separated, only a little more than half as wide as their interval, pilose. Antennæ about three times as long as head, segments as usual in this group of the genus. Mouth cone short, not at all prominently tipped with black, barely attaining base of prosternum.

Prothorax decidedly longer than head and about 1.5 times as wide as long, sides broadly rounded; pronotum with the usual raised, anastomosing, transverse lines and with the single large bristle at posterior angles nearly straight and colorless. Fore wings with all bristles pale in color and inconspicuous; costal margin with about 26 bristles; principal vein with a basal group of three followed by about 20, the distal one or more rather widely separated; no additional bristles in a second series at tip of wing; hind wings without median dark line.

Abdomen rather slender, but decidedly wider than pterothorax, without color markings; sides with the usual pubescence, which is missing from median portion; all bristles slender, pale, and very inconspicuous.

Measurements of holotype: Length 1.13 mm.; head, length 0.090 mm., width 0.158 mm.; eyes, length 0.054 mm., width 0.041 mm., interval 0.075 mm.; prothorax, length 0.123 mm., width 0.180 mm.; pterothorax, width 0.255 mm.; abdomen, width 0.315 mm.; fore wings, length 0.750 mm., width at middle 0.036 mm., greatest subbasal width 0.075 mm.

Antennal segments	1	2	3	4	5	6	7	8
Length (microns) . . .	18	39	52	50	43	51	12	15
Width (microns) . . . .	26	28	22	20	20	17	8	6
Total length of antenna,	0.28 mm.							

Described from five females taken by Mr. W. L. McAtee and the writer at Bladensburg, Maryland, September 7 and 20, 1913, from the under surface of leaves of *Sambucus canadensis* L. Larvæ were abundant at the time.

For more than ten years this species has been in my collection, but I have hesitated to describe it because of its evident close relationship to *S. albus* Jones, a Californian species described from specimens taken on *Sambucus* and weeds. The

present insect differs decidedly from *albus*, however, in having a much shorter and more blunt mouth cone, which is not prominently tipped with black. In *albus* this structure is slender and acutely prolonged at the tip, reaching well onto the mesosternum.

#### **Neurothrips** gen. nov.

Depressed, dull above, glabrous beneath. Head not elongate, decidedly swollen behind eyes, somewhat narrowed at base, cheeks with prominent, bristle-bearing tubercles; vertex with a deep vertical groove, anterior ocellus directed forward; eyes large, closely faceted. Fore femora enlarged in both sexes, often with a large subapical tooth as in *Acanthothrips*; fore tarsi strongly armed in both sexes. Wings of both pairs broad in basal fourth, apical three-fourths abruptly and decidedly narrowed, with sides parallel; median vein prominent in both fore and hind wings, extending nearly to tip. Abdomen with a narrow, but deep, longitudinal dorsal furrow for the reception of the wings. Terminal bristles longer than tube.

Genotype: *Acanthothrips magnafemoralis* Hinds.

Though related to *Acanthothrips*, this genus is abundantly distinguished by the character of the wings, and the presence of an abdominal groove for their reception. Two species, one of which is undescribed, are known to the writer.

The species of this genus are remarkable for the coloration of their dorsal surface—a pleasing combination of bright red, black, and snow-white into a sequence of spots so intricate and involved as to defy description. The appendages and the tip of the abdomen are ringed with black and pale yellow. They are prowlers, living on the trunks and branches of trees, where their coloration blends them well into their environment and makes them difficult indeed to detect.

#### **Elaphrothrips parallelus** sp. nov.

♀ (macropterous).—Length about 3.4 mm. Color dark blackish brown or black, darkest in last three or four abdominal segments; trochanters, both ends of fore tibiae, and fore tarsi, somewhat paler; segment 2 of antennæ yellowish in apical half, except inner surface which is concolorous with basal part of segment; segment 3 yellow, infuscate at extreme apex; 4 yellow in basal two-thirds; 5 yellow in basal two-fifths; remainder of antennæ blackish brown; wings of both pairs entirely colorless.

Head about 2.8 times as long as greatest width, narrowest just behind eyes, widest at basal third, and with a short, collar-like widening at extreme base, just behind a distinct constriction; vertex conical, produced, apex attaining base of antennæ but not surpassing the frontal costa, which is distinctly notched between antennæ; dorsal and lateral surfaces finely striate, sparsely set with short, subequal, inconspicuous bristles; interocellar bristles long, but shorter than postoculars, both pairs pointed. Eyes somewhat more than one-sixth as long as head, distinctly flattened at sides, distance across them less than greatest width of head. Ocelli small; anterior ocellus occupying extreme vertex; posterior ocelli distinctly in advance of center of eyes. Antennæ slender, eight-segmented, about 1.25 times as long as head, of the usual form and structure, except that segments 5 and 6 are obliquely truncate at apex; segments 3-5 clavate; 6 and 7 pedicellate; 8 lanceolate, pedicellate, shorter and stouter than usual, less than three times as long as greatest width. Mouth cone short, broadly rounded, reaching somewhat beyond middle of prosternum.

Prothorax about one-third as long as head and (inclusive of coxæ) about 2.3 times as wide as long, median thickening distinct, surface with a few faint lines of sculpture; usual bristles all present, the outer pair at posterior angles much the longest but distinctly shorter than postoculars, others subequal to coxal. Pterothorax subrectangular, longer than wide, slightly narrower than prothorax across coxæ. Wings clear and colorless, of nearly equal width throughout, fore pair with about 20 accessory hairs on posterior margin near apex. Legs slender; fore tarsi with a short, acute, hooked tooth whose point is directed forward on a line parallel to the tarsus.

Abdomen slender, very little wider than pterothorax. Tube markedly short and stout, only 0.56 as long as head and only three times as long as basal width, less than half as wide at apex as at base, sides slightly convex, free from any noticeable bristles. Abdominal bristles pale yellowish, those on segment 9 surpassing tip of tube; terminal bristles five-sixths the length of tube.

Measurements of holotype: Length 3.38 mm.; head, length 0.690 mm., greatest width 0.246 mm., width across eyes 0.236 mm., width just back of eyes 0.207 mm.; eyes, length 0.123 mm., width 0.065 mm., interval 0.105 mm.; prothorax, length 0.198 mm., width (inclusive of coxæ) 0.461 mm.; pterothorax, length about 0.510 mm., width 0.458 mm.; abdomen, greatest width 0.534 mm.; tube, length 0.390 mm., width of base 0.131 mm., at apex 0.062 mm.

Antennal segments	1	2	3	4	5	6	7	8
Width (microns) . .	51	42	36	39	36	33	30	22
Length (microns) . .	60	84	210	169	141	99	69	64
Total length of antenna,	0.86 mm.*							

Described from one female taken by Dr. Alex Wetmore of the United States Biological Survey at Punta Gorda, Florida, February 3, 1919, in miscellaneous sweepings.

Readily separable from the North American species of the genus by the long head, the notched frontal costa, and the short, stout tube. The subequal width of prothorax, pterothorax, and abdomen makes the species readily recognizable to the naked eye.

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### **Notes on Dragonflies (Odonata) from Lee County, Georgia, with a Description of *Enallagma dubium*, new species.**

By FRANCIS METCALF ROOT, Department of Medical Zoology,  
School of Hygiene and Public Health, the Johns Hopkins  
University, Baltimore, Maryland.

During the summer of 1923, while working under Dr. S. T. Darling at the malaria research station maintained by the International Health Board at Leesburg, Georgia, I collected a number of specimens of Odonata in spare moments. This collection contains enough interesting material to be worthy of record, although in the Anisoptera, especially, only a small fraction of the entire fauna is represented.

Lee County is in the southwestern part of the state of Georgia, approximately one hundred miles from the Gulf Coast and one hundred and fifty miles from the Atlantic Coast. Despite this inland location, the Odonate fauna includes several species which, farther north at least, are usually considered sea-coast forms. *Ischnura ramburii*, for example, here replaces *I. verticalis*, and *Libellula auripennis* and *Celithemis ornata* are frequent. The same thing is evident in the mosquito fauna.

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\*The length of the antenna as given here is appreciably less than the total to be gotten by adding together the measurements given for the individual segments, because of the oblique truncation of the subapical segments.

In spring and fall, if not also in summer, *Anopheles crucians* is the commonest Anopheline of the county. This species, farther north, is usually a salt-marsh breeder.

Surface water is very abundant in Lee County. The underlying formation is limestone, and both deep and shallow "lime sinks," all holding more or less water, are a conspicuous feature of the topography. Appearing and disappearing streams, which bubble up as springs from some lime sink, flow rapidly for distances varying from a few feet to several miles, and then sometimes vanish below the surface again, are common. Two large creeks, the Kinchafoonee and the Muckalee, flow through the county and have various small "branches" as tributaries. Collections of standing water, collectively known as "ponds" to the inhabitants, are also abundant. This designation includes a great variety of water collections, such as large permanent ponds full of water-lilies and lotus; permanent cypress and gum swamps, semi-permanent wooded ponds and swamps which dry out almost or quite completely in the driest weather, cat-tail swamps formed by obstructions in small streams or old ditch systems, and a great variety of rain-ponds of all sizes, both in woods and in open fields, which are filled with water in spring and early summer, but are usually dry in late summer. Nearly every plantation includes several ponds of one sort or another, and some owners declare that more than half of their places is under water most of the summer.

The species of Odonata taken during my stay in Leesburg (June 20 to Sept. 15) are listed below. My thanks are due to Dr. P. P. Calvert and Dr. E. M. Walker for generous assistance in identifying some of the more difficult specimens.

As a note of interest to collectors, I might add that my only specimens of several species of high- and swift-flying Anisoptera were caught by hand after they had been more or less stunned by flying into the Ford car in which we visited the outlying plantations.

AGRION MACULATUM Beauvais—Fairly common all summer along small streams.

LESTES FORCIPATUS Rambur—Common all summer, especially about the semi-permanent wooded ponds.

- LESTES RECTANGULARIS Say—Three males, Hodge's plantation, Aug. 3.
- LESTES VIGILAX Hagen—Common about large ponds, July 25-Sept. 4.
- ARGIA APICALIS Say—Common along bank of Kinchafoonee Creek near Newsome's plantation, July 12.
- ARGIA BIPUNCTULATA Hagen—Two males, Smith's plantation, Sept. 5.
- ARGIA FUMIPENNIS Burmeister—Common along small streams and ditches during entire summer.
- ARGIA MOESTA PUTRIDA Hagen—Common all summer along Kinchafoonee Creek near Leesburg.
- ARGIA SEDULA Hagen—Common along bank of Kinchafoonee Creek near Newsome's plantation, July 12.
- ARGIA TIBIALIS Rambur—Taken along small rapid streams. Two males, Stock's plantation, July 6; two males, Bagley's plantation, July 25.
- ENALLAGMA DOUBLEDAYI Selys—One of the commonest damselflies of the region. Found throughout the summer in large numbers at nearly all permanent and semi-permanent ponds and swamps.
- ENALLAGMA DUBIUM new species—One male from a small lily-pond enclosed by cypress, Scrutchen's plantation, Aug. 24.
- ENALLAGMA GEMINATUM Kellicott—Not very common, found mostly at small lily-ponds. One male, Smith's plantation, July 13; one male, Pruitt's plantation, July 26; two males, Scrutchen's plantation, Aug. 24.
- ENALLAGMA SIGNATUM Hagen—Common at a single semi-permanent pond on Smith's plantation, Aug. 14.
- TELAGRION DAECKII Calvert—One male, June 29; one male, July 10; both in cypress swamps.
- NEHALENNIA INTEGRICOLLIS Calvert—Three pairs in copula taken and many others seen along the edges of a cypress swamp on Price's plantation, Aug. 22.
- ISCHNURA POSITA Hagen—Two males from small stream near Starkville, June 21.
- ISCHNURA PROGNATA Hagen—One male, July 10; one male, Aug. 3; both in cypress swamps.
- ISCHNURA RAMBURI Selys—Not uncommon about the larger ponds during the entire summer.
- ANOMALAGRION HASTATUM Say—The commonest and most widely distributed damselfly of the region. Found about all kinds of ponds, swamps, ditches, etc., throughout the summer.
- GOMPHUS sp?—Two males of a large yellow *Gomphus* which

- Dr. Calvert pronounced to be near *G. plagiatus*, but probably distinct, were taken in a brushy pasture on Smith's plantation, Sept. 3.
- ANAX JUNIUS Drury—Fairly common all summer about the larger ponds.
- ANAX LONGIPES Hagen—One male taken at a large pond on Walker Paul's plantation, July 3.
- CORYPHAESCHNA INGENS Rambur—One female caught in Ford car, July 10.
- MACROMIA TAENIOLATA Rambur—Seen often, throughout the summer, flying along the roads near Muckalee Creek. One female, Aug. 15 and one male, Sept. 1, both caught after flying into Ford car in this region.
- EPICORDULIA PRINCEPS Hagen—Not rare about the larger ponds.
- SOMATOCHLORA LINEARIS Hagen—One male caught along edge of a strip of woodland fringing a cypress swamp near Folltown, July 12.
- SOMATOCHLORA PROVOCANS Calvert—One female, July 7, caught when it flew into Ford car. According to Dr. Walker, this is the first female of this species to be recorded.
- SOMATOCHLORA sp?, near TENEBROSA Say—One female, July 6, caught when it flew into Ford car. The foregoing three specimens of *Somatochlora* were kindly determined for me by Dr. E. M. Walker.
- LIBELLULA AURIPENNIS Burmeister—Not uncommon about the larger ponds.
- LIBELLULA AXILLENA Westwood—Common, especially about wooded ponds.
- LIBELLULA CYANEA Fabricius—One male, Smith's plantation, July 7.
- LIBELLULA INCESTA Hagen—Common, especially about wooded ponds.
- LIBELLULA PULCHELLA Drury—This species, so common farther north, was not seen at all until one female was taken near Leesburg on July 26. Later several other specimens were seen at the same pond, but the species never became common.
- LIBELLULA SEMIFASCIATA Burmeister—One female, Smith's plantation, July 7.
- LIBELLULA VIBRANS Fabricius—Common, especially about wooded ponds.
- PLATHEMIS LYDIA Drury—Common all summer about small sunny ponds.
- PERITHEMIS DOMITIA Drury—Common all summer about the larger ponds.

- ERYTHRODIPLAX MINUSCULA Rambur—Common all summer about semi-permanent ponds.
- ERYTHEMIS SIMPLICICOLLIS Say—Common all summer about ponds.
- SYMPETRUM AMBIGUUM Rambur—Two males, Heath's plantation, July 6.
- PACHYDIPLAX LONGIPENNIS Burmeister—The commonest dragonfly of the region. Especially numerous about wooded ponds.
- CELITHEMIS ELISA Hagen—General specimens very numerous about several ponds on Walker Paul's plantation, July 12.
- CELITHEMIS EPONINA Drury—Not uncommon about certain large ponds on Smith's plantation at all visits.
- CELITHEMIS ORNATA Rambur—Although this species was common, the only specimens brought back were some taken at a large grassy pond on Usry's plantation on Aug. 6. Two of these specimens are typical *ornata*. In the other two the markings at the base of the hind wing are considerably reduced, in one only a narrow black band being left. The wings of this particular specimen really look more like a *Leucorhina* than a *Celithemis*. Since the fourth specimen is more or less intermediate between this condition and the typical *ornata*, it seems best to record them all under that species. A more extensive series would be required to decide whether these two aberrant specimens are extreme variants of *ornata* or something new.
- PANTALA FLAVESCENS Fabricius—Common, but flies high and is hard to catch. Specimens taken July 18, Aug. 6, Aug. 10, Sept. 3.
- PANTALA HYMENEAE Say—Occurs with the preceding species, but not quite so commonly. Specimens taken, July 2, July 18.
- TRAMEA CAROLINA Linne—Common, but flies high, as a rule. Specimens taken, June 29, July 12, July 23, July 26, Sept. 1.

**Enallagma dubium**, new species.

On Aug. 24, while collecting at a small lily-pond completely surrounded by cypress swamp, just across the road from the plantation house at Scrutchen's, I saw a small red-and-black damselfly resting on a lily-pad beside a male of *E. geminatum*. A sweep of the net captured the male *geminatum*, but not the other damselfly. A few minutes later the same individual, in all probability, was accidentally caught, without being seen, while I was striking at another *geminatum*.

As soon as it was removed from the net, this damselfly attracted my attention because of the brilliant, metallic, coppery-red color of its pale markings. In alcohol, this has since faded to an orange-yellow. It is a male *Enallagma*, and the appendages show that it belongs in the same group with *signatum*, *vesperum* and allied forms. Its closest allies would seem to be *pictum* Morse and *concisum* Williamson, with which it shares the peculiarity of having the entire dorsum of the abdomen black, except for very narrow intersegmental rings. The outline of the superior appendages in profile view, superficially at least, resembles that of *signatum* more than it resembles either *pictum* or *concisum*. The color pattern is of the same general type as that of *pictum* and *concisum*, as given in the descriptions of Calvert and of Williamson, but the pale markings are rather more restricted. The pale band of the anterior surface of the frons is less extensive, the two basal joints of the antennae are black, there are no pale spots about the ocelli, the middle lobe of the prothorax is all black dorsally, the pale antehumeral stripe of the thorax is narrower than in the other species, and the dorsal black of the tenth abdominal segment extends farther down the sides than is indicated in the drawings of the other species.

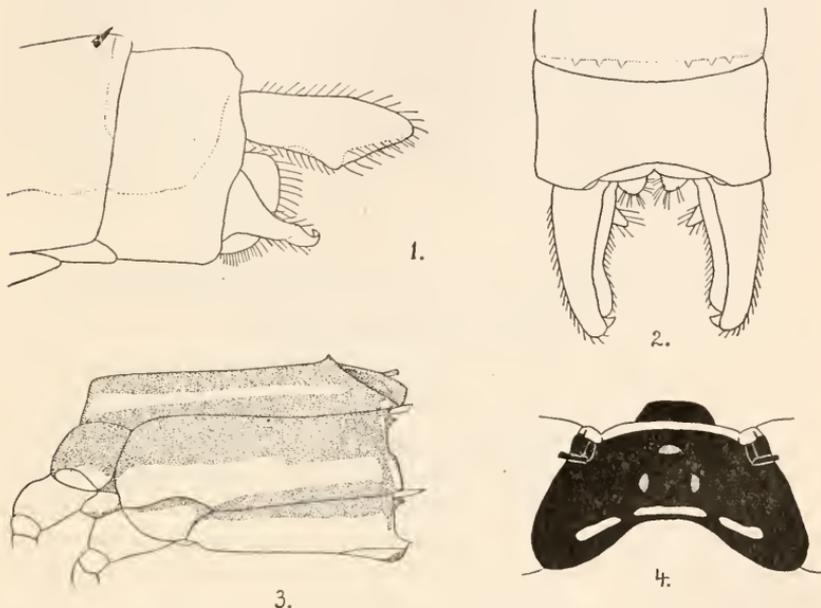
In view of these differences, it seems best to describe this specimen as a new species. I propose for it the name of *E. dubium*, in recognition both of the doubtful advisability of basing a new species on a single specimen and of the possibility that further study may indicate that *pictum*, *concisum* and *dubium* are all varieties of a single species.

Dr. Calvert has examined the specimen and believes it to be distinct from both *pictum* and *concisum*. I have requested him to deposit the single male type in the collection of the Philadelphia Academy of Natural Sciences.

♂. (Text figs. 1-4) Superior appendages in profile view with the apical margin only slightly shorter than the inferior margin, oblique, nearly straight, and not bilobed, but with the inferior apical angle slightly projecting; in dorsal view the intero-inferior lamella reaches the level, or nearly to the level, of the supero-internal, sub-apical hook. Nasus black. Frons:

pale color of the anterior surface reaching the level of and including the semi-detached sclerites which bear the antennae. Two basal joints of antennae black. No pale markings about ocelli. Pale postocular spots linear cuneiform, broadly separated by black from the pale color of the rear of the head below and narrowly separated from the pale line of the vertex.

Prothorax mainly black dorsally; a transverse orange bar anteriorly on anterior lobe, small indistinct orange spots laterally on posterior lobe, middle lobe without pale markings except for



Figures 1-4.—*Enallagma dubium* n. sp.  
 Figures 1 and 2.—Male appendages in lateral and dorsal views.  
 Figure 3.—Color pattern of thorax in lateral view.  
 Figure 4.—Color pattern of head in dorsal view.

the sides, which are yellow inferiorly. Width of black mid-dorsal thoracic stripe .62 mm., of pale antehumeral .1 mm. through most of its length, widening abruptly to about .2 mm. at anterior end, of black humeral about .49 mm. Second lateral thoracic suture with a black stripe its entire length, gradually widening posteriorly and with slight dorsal and ventral prolongations along the posterior margin.

Abdomen all black dorsally, except for narrow apical (1, 7-9) or basal (3-7) segmental orange rings. Sides and venter of abdomen orange to yellowish, with an indistinct mid-ventral dark stripe.

Wings hyaline, pterostigma light brown, border darker, surmounting less than one cell. Arculus slightly distad to second antecubital, limbs of arculus sub-equal. Upper side of quadrilateral about one third of lower side in front wing, one half of lower side in hind wing. Inferior sector of triangle arises in front of submedian crossvein (at a distance greater than the length of the crossvein) and ends at about the level of origin of the nodal sector. The superior sector of triangle ends between levels of origin of nodal and ultra-nodal sectors. Submedian crossvein between first and second antecubitals, slightly nearer to second. Fore wings with about eight postcubitals, hind wings with about seven. Nodal sector arises nearest fourth postcubital in both hind wings and one fore wing, nearest fifth in other fore wing. Ultra-nodal sector arises one cell proximal to inner brace vein of pterostigma in fore wings, and slightly distal to inner brace vein in hind wings. Three antenodal cells in both wings. Dimensions: Abdomen 20 mm., hind wing 12 mm.

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### **On the Biology of *Curicta drakei* Hungerford (Heteroptera, Nepidae).\***

By GRACE OLIVE WILEY, St. Paul, Minnesota.

(Plate X.)

The summer of 1922 was spent by the writer in Colorado County, Texas, where insects were collected, principally. Here were obtained a number of specimens of *Curicta drakei*, of the family Nepidae, a species only recently described by Dr. H. B. Hungerford. A sharp lookout had been kept for specimens belonging to this particular genus, since it was known that a specimen of *Curicta howardi* Montandon had been found at Victoria, Texas, about sixty miles distant.

Late in June two nymphs were found clinging to vegetation, along the bank of a large creek where the water was deep. A few days later this place was again visited and a thorough search made in the same pool, which proved fruitless. Skull creek was a good-sized stream, but during the summer the water was only running in places and was reduced to pools, some quite long and deep while others were small and shallow. It

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\*Contribution from the Department of Entomology, University of Minnesota.

was in one of these shallow pools nearby, that a number of nymphs in various instars and one adult were found. All of these specimens were placed in a container and taken home alive. The following morning there were a few adults, the last instar nymphs having changed during the night. This afforded an excellent opportunity to get the life history of these interesting and little-known bugs. Accordingly several pairs were isolated and in a few days mating was observed. Twelve days after the first mating, eggs were laid, which hatched after another twelve days had expired. At Dr. Hungerford's suggestion, drawings of the egg and the first instar nymph were made, which, along with some notes on their behavior, were sent in for publication.

Leaving for Kansas in the middle of September, the nymphs and adults, numbering more than one hundred, were placed in a light wooden box in their various containers, and carried on this trip. Along with *Curicta* were taken some live specimens of *Velia*, Naucorids, Belostomatids, Gelastocorids, a Coreid and a cockroach. Small glass containers were used, with gauze tied over the tops. Sand and a few pieces of water plants were placed in the bottom of the containers containing the aquatics, and these made rather wet. Occasional observations were made during the trip to make sure the insects were not too dry, and a little water was added from time to time. A supply of live food was taken, which consisted of small snout beetles obtained in large numbers from swamp willows. These made excellent food. Very few fatalities resulted from the trip.

A few weeks later the writer left Kansas for St. Paul, Minnesota. Again the Texan insects in their containers were placed in the wooden box with its small rope handles, and taken to this northern clime. In addition, some interesting Kansan insects were transported, including *Velia*, *Gerris*, *Microvelia* and Gelastocorids. These latter insects were collected by Mr. Wm. E. Hoffman and the writer the last of September. Very little had been said about the longevity of water bugs, so for this reason, as well as a desire to study some of their life histories in the laboratory, the bugs were kept alive.

*Curicta* adults were kept over winter, and the following

summer a number of these insects laid eggs from which young were again reared. The adults brought from Texas were kept segregated and have now passed the second winter successfully. Most of these are still alive and appear quite normal. An attempt will be made to rear nymphs from these specimens during the summer of 1924.

In the south there are, in all probability, two generations a year. Only one generation was obtained in the north, however. All of these bugs were found in Skull creek, except one nymph which was found in a pond at a distance of two miles from this creek. Pools of water located a few rods from the main creek abounded with them. These places were ideal breeding places for mosquitoes, but no mosquitoes or their larvae were found where *Curicta* was present. In the rearing work all sorts of insects were used as food, such as grasshoppers, stink-bugs, various species of beetles including blister-beetles, flies, meal-worms, membracids and mosquito larvae. It was quite a problem to procure food for these insects during the winter, as they were kept in a warm room and were more or less active. Many times when the bugs were hungry and no insect food was available, they were fed on small bits of raw beef.

Like *Nepa*, *Curicta* is a mud-loving bug and in coloration is very similar to the mud where it is found. When the adults were given mud, rotten wood, decayed vegetation and live water plants, the mud was always chosen for the deposition of the eggs. That the eggs are thus deposited out in nature the writer is fully convinced as a thorough search was made in wood, plants, etc., and none found. While in Texas a few eggs were found in one breeding cage, imbedded in very soft decayed water plant, but no mud or other material was available in this case.

#### RESPIRATION OF ADULTS.

In the adults the respiratory tube is open for its entire length, both above and below. It is somewhat similar to the ovipositor of some hymenopterous insects, or the maxillae or sucking tube of certain moths, in that the tube is in two separate parts with the inner side grooved. When placed together they form a tube

through which the insect draws air. These two parts can be rubbed against each other, that is, back and forth, therefore being somewhat retractile. This interesting habit was more often observed when the insects were preening themselves. Stroking the respiratory tube on either side with the posterior legs the insect would then rub the two parts of the tube together with a sliding motion, back and forth. The tube was often opened and closed. In the drawing (Pl. X, fig. 6) is shown a ventral aspect of the last segment with the respiratory tube opened. When the two halves of the respiratory tube are separated, each is found to be fringed with hairs for its entire length on both inner and outer edges. (Pl. X, fig. 6.) When the two halves of this tube are fitted together the double row of fringes along the edges meet to form a water-tight tube. In the drawing, the ventral part of the last abdominal segment, lying laterad to the ventral plate, is pulled back to show the interior entirely covered with fine hairs. The genital organs can be seen by lifting the tip of the ventral plate.

#### MATING.

Mating occurs almost every day from early spring until late in the summer. While no record was kept as to the length of time they remain paired, it must be for several hours. While mating the female will often take food when it is placed near.

#### OVIPOSITION.

In laying the eggs, the female lies with her body close to the mud and deposits the eggs in groups of from five to ten. These are placed close together with only the crown of filaments visible. These filaments vary in number from 12 to 17. The incubation period is 12 or 13 days. The egg becomes pink several days before hatching and the red eye-spots appear. In hatching the egg breaks transversely for about half its circumference on the prominent shoulder, just below the filaments.

#### NYMPHAL INSTARS.

*First Instar.* Average length 5.38 mm., width across eyes .75 mm., width across wing pads 1.50 mm., and across abdomen 1.55 mm.

The color of the newly hatched is coral or pink, this becoming straw-colored in a short time, and in several hours light brown with darker markings. On hatching the eyes appear dark reddish-brown, as is also the shield-like plate on top of the head, the spurs on the anterior femur and the grooves into which the anterior tibiae fit. One nymph was observed just after its head appeared through the egg shell; this egg was just above the water. As soon as the bug was able to extricate its anterior legs it moved them about, opening and closing the tibiae. Slowly it emerged, lying on its back, its head soon touching the water. The post-natal molt was cast and clung to the respiratory tube as the little bug crawled forth. It tried to free itself from this membrane by pushing it off with its posterior legs. When it had succeeded it turned over and slowly struggled to its unsteady legs. During the process of hatching the white nerves could be seen in the entire body, as well as the pulsation of circulation.

Structural peculiarities: Elongate, oval, somewhat flattened; much stouter in proportion to its size than in the other instars. Prothorax twice as wide as long; wing pads barely discernible. Respiratory tube appears to be a part of the last abdominal segment. No opening on the dorsal side of this tube except at tip. The structure of the respiratory tube differs greatly in the nymph from that of the adult. Average duration of the first instar, 14 days.

*Second Instar.* Average length 7.75 mm.; width across eyes 1. mm.; width across wing pads 2. mm.; width across abdomen, 2. mm. Color: Same as first instar.

Structural peculiarities: More slender in appearance than first instar. Prothorax somewhat longer in proportion than in first instar; wing pads visible, of same width as abdomen. Respiratory tube relatively longer. Average duration of this instar, 22.5 days.

*Third Instar.* Average length 10.50 mm.; width across eyes 1.21 mm.; width across wing pads 2.71 mm.; width of abdomen 2.45 mm. Color: Similar to the first and second instars.

Structural peculiarities: Much as in second instar. Length of prothorax two-thirds the width of base; wing pads wider than abdomen and reaching to the base of the second abdominal segment. Average duration of the third instar, 23.5 days.

*Fourth Instar.* Average length 13.94 mm.; width across eyes

1.50 mm.; width across wing pads 3.61 mm.; width of abdomen 2.98 mm. Color: Similar to the preceding instars.

Structural peculiarities: Much like preceding instars. Prothorax in length equal to three-fourths of width at base; wing pads wider and reaching to the base of the second abdominal segment. Average duration of the fourth instar, 23.5 days.

*Fifth Instar.* Average length 19.82 mm.; width across eyes 1.86 mm.; width across wing pads 5.47 mm.; width across abdomen 3.62 mm.

Color: Much the same as in the other instars, until a few days before becoming an adult, when the head, prothorax, median part of mesothorax and metathorax, last segment of abdomen, respiratory tube and legs as well as connexivum, become dark woody-brown. The wing pads are dark bronze-brown.

Structural peculiarities: Length of prothorax very little less than width at base. Wing pads reaching to center of the third abdominal segment. Average duration of the fifth instar, 46 days.

#### RESPIRATION OF NYMPHS.

On the ventral side of the nymph are two longitudinal troughs, each situated at about half way between the median line and the lateral margin of the abdomen, the troughs fringed on both edges with very fine silky hairs. In each trough the fringes are so placed as to slope toward the caudal end of the insect, the fringe of the outer edge composed of longer hairs and overlapping with the fringe of the inner edge. These troughs extend from the base of the abdomen to its apex, where the two meet and form the respiratory tube. The tube is also trough-like and fringed on its outer edges with long hairs, this fringe formed by a continuation of the long outer fringes of the abdominal troughs. The respiratory tube of the nymph appears to be formed by the last segment of the abdomen, being much shorter in the nymph than the adult. It is not retractile or capable of being rubbed together as in the adult stage. Although a dark line or marking appears on the dorsal median line, the tube does not open on the dorsal surface except at the very tip.

The nymphs, like the adults, spend a part of the time out of the water, lying flat on the ground, hiding under trash and

sticks, or standing with the head down and the abdomen reared high in the air.

Only occasionally do these bugs prey on their fellows. This may happen when no other food is available. Sometimes when hard pressed for food both young and adults have been observed to feed upon the eggs that were found in the water. These eggs were held by the two anterior legs and were turned around and around in a very clever manner, while the sharp beak was inserted in the egg at various places.

In Butler's "Biology of the British Hemiptera," Lefebure is quoted as observing how *Nepa* emits a milky fluid from "a small pair of glands lying between what he calls the appendicular glands and the oesophagus." The writer has observed that *Curicta* emits a similar milky fluid. This fluid appears to ooze from between the sutures on the sides on the head just back of the rostrum.

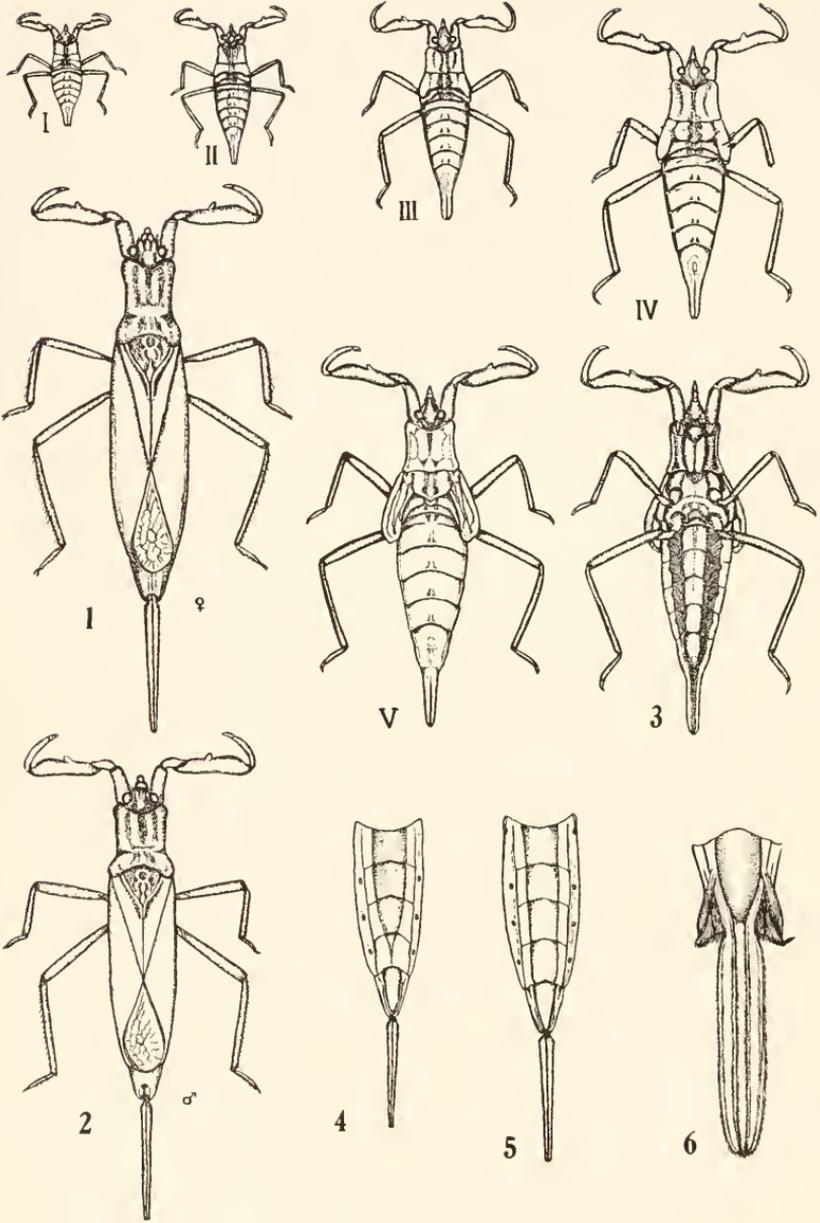
#### SUMMARY.

*Curicta drakei* has five nymphal instars. Duration of the first nymphal instar for eight nymphs, averaged 14 days; the maximum being 18 days and the minimum 12 days. Duration of the second nymphal instar for eight nymphs, averaged 22 days; the maximum being 31 days and the minimum 15 days. Duration of the third nymphal instar for eight nymphs, averaged 22 days; the maximum being 28 days and the minimum 11 days. Duration of the fourth nymphal instar for eight nymphs, averaged 23 days; the maximum being 29 days and the minimum 16 days. Duration of the fifth nymphal instar for eleven nymphs, averaged 40 days; the maximum being 50 days and the minimum 15 days.

Mr. Wm. E. Hoffmann also reared this species during the summer of 1923, with the same results.

Temperature surely has much to do with the rate of their development. Nymphs reared in Texas to the fourth instar, and those reared through the first and second instars in Minnesota, during the warmest weather, developed much more quickly than the older instars reared in cooler weather. One nymph spent only 15 days in the fifth instar, when kept in a warm room. The shortest period of development from the time of hatching to the adult was 93 days, while the longest was 145 days.





BIOLOGY OF CURICTA DRAKEI.—WILEY.

TABLE OF MEASUREMENTS.

	Length.	Width across eyes.	Width across wing-pads.	Width across abdomen.
First Instar.	ave. 5.38 mm. max. 5.50 mm. min. 5.	.75 mm.	1.50 mm.	ave. 1.55 mm. max. 1.66 mm. min. 1.50 mm.
Second Instar.	ave. 7.75 mm. max. 8. mm. min. 7.66 mm.	1. mm.	2. mm.	2. mm.
Third Instar.	ave. 10.50 mm. max. 11. mm. min. 10. mm.	ave. 1.21 mm. max. 1.25 mm. min. 1.12 mm.	ave. 2.71 mm. max. 2.75 mm. min. 2.50 mm.	ave. 2.45 mm. max. 2.50 mm. min. 2.25 mm.
Fourth Instar.	ave. 13.94 mm. max. 14.33 mm. min. 13.25 mm.	ave. 1.50 mm. max. 1.66 mm. min. 1.33 mm.	ave. 3.61 mm. max. 3.80 mm. min. 3.33 mm.	ave. 2.98 mm. max. 3.25 mm. min. 2.66 mm.
Fifth Instar.	ave. 19.82 mm. max. 21.25 mm. min. 18. mm.	ave. 1.86 mm. max. 2. mm. min. 1.75 mm.	ave. 5.47 mm. max. 6.25 mm. min. 5. mm.	ave. 3.62 mm. max. 4. mm. min. 3. mm.

## EXPLANATION OF PLATE X.

1. *Curicta drakei* Hungerford, adult female.
2. Adult male.
3. Ventral aspect, fifth instar nymph.
4. Ventral aspect of male abdomen.
5. Ventral aspect of female abdomen.
6. Ventral aspect of last abdominal segment with respiratory tube opened.
- I. First Instar Nymph.
- II. Second Instar Nymph.
- III. Third Instar Nymph.
- IV. Fourth Instar Nymph.
- V. Fifth Instar Nymph.

**Aphids with Branched Cornicles (Homop.).\***

By EDITH M. PATCH, Orono, Maine.

A collection of six aphids, remarkable as to their cornicle structure, was taken at Freeport, Maine, September 5, 1923, by my field assistant, Miss Edith Merchant. They were taken from dock (*Rumex* sp) and had been mounted for some time before I saw them.

They possess what is, so far as my experience or information goes, a unique structure, in that their cornicles are forked or branched in appearance.

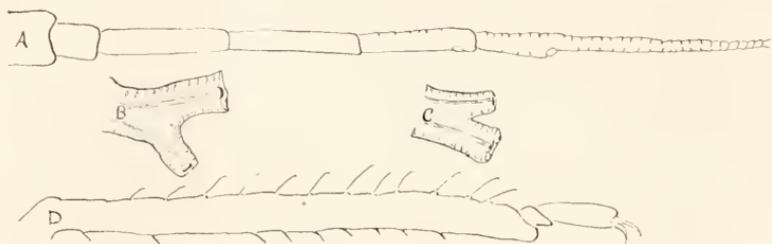
None of the specimens were mature, though one was so near its last molt that the loosened chitin of this individual reveals

\*Papers from the Maine Agricultural Experiment Station: Entomology, No. 113.

the fact that the cornicle of the mature form would be of the same type as that of the nymphs. The nymphs represent two different instars and all twelve cornicles are branched.

My own interpretation of this material was that it represented a strange new species of a strange new genus; and I prepared a description for publication on that basis.

While the paper was still in manuscript, however, I submitted it, together with specimens of the aphid, to a fellow aphidist who called my attention to the possible significance of the fact that each so-called "fork" of the cornicle was equipped with a muscle from the "lid" passing down to its attachment in the body in the manner usual for the single muscle of an ordi-



Figures A, B, and D, antenna, cornicle, and hind tibia of aphid in last nymphal instar. C, cornicle of younger nymph.

nary or "unbranched" cornicle. This raised the question as to whether the cornicle was, structurally considered, "branched" or whether it was "double." In other words, did these aphids really have a supernumerary pair of cornicles? The fact that their outer walls are fused for a certain distance, giving the appearance of a branched structure, does not affect this interpretation.

Except for the cornicles, these six nymphs resemble those of *Aphis abbreviata* closely. It is possible that future collections will solve the problem as to whether the forked (?) or double (?) condition of these cornicles constitutes a specific and generic difference; or whether this condition must be considered in the light of supernumerary organs in general.

Meanwhile a brief note concerning the six aphids which, from either viewpoint, are interesting is perhaps worth recording.

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., NOVEMBER, 1924.

## A Unique Resting Place for a Fossil Insect (Odonata).

Under the title "Tarsophlebiopsis mayi n. g. et n. sp., a Dragonfly found in the body-chamber of a Corallian Ammonite" (Geol. Mag., London, lx, 146-52, Pl. IV and 3 text figs., April, 1923), Dr. R. J. Tillyard describes three fragments of a dragonfly's wings, all embedded in the matrix of the body-chamber of an ammonite, found in the boulder clay of Hertfordshire, England. He says: "All three fragments clearly belong to one and the same insect and must have been washed into the body-chamber of the dead ammonite with the deposit which now forms its hardened matrix. That is to say, the geological age of the dragon-fly is the same as that of the ammonite, though in point of actual time it may be assumed that the ammonite died first, and decomposed and then the dragon-fly died and was washed away, its remains coming to rest within the body-chamber of the dead ammonite while it was being filled up by a muddy deposit."

This fossil is assigned to the family Tarsophlebiidae "confined as far as present knowledge goes to the Upper Jurassic (Malm) of Bavaria. The discovery of the fossil dealt with in this paper constitutes the first record of the family for England; for the Upper Jurassic material recently examined by me from the British Museum does not contain a single representative of this family, or any close relative of it; . . . the fragment of a wing named *Tarsophlebia westwoodi* by Giebel, from the Lower Lias of Cheltenham is not a *Tarsophlebia* at all, but belongs to an entirely distinct family, confined to the Lower Lias, which I intend to call Liassophlebiidae."

## Gaditanus, Being Additional Words on Tingitidae (Heteroptera).

Dr. Holland's remarks on "Tingitidae" bring up again a question of moment to entomologists, since it continues a lengthened discussion of latinity, which it endeavors to settle *ex cathedra*, on the plea that "the laws of priority do not have precedence over the laws of correct language."

The fundamental question to be answered is: Are names in biology convenient and arbitrary tags to designate material things, or are they a field for linguistics?

The great needs in nomenclature are stability and finality

<sup>1</sup>Ann. Ent. Soc. Am. XVII: 95.

which necessarily leads to the former. Biology presents a vast field, the surface of whose edges is barely scratched. Now if we discuss and argue about and reshape the terminology while the field continues untilled, we are certainly wasting precious productive moments in sterile labor.

Why should we vex ourselves with applying the canons of classic latinity to what are at best barbaric neolatinisms? And frequently are only arbitrary pronounceable combinations of letters in latinized form? Synonymy is already cluttered up with "emendations" of one kind or another, emendations the fruit of someone's passion for what amounts to preciousness. Why worry if the proper form is Tingidae, Tingididae or Tingitidae? They all stand for the same thing, and they are so understood by everybody.

Further, if we admit this principle of latinity as a criterion for family names, then it is quite open for anyone to change generic and specific names in *any* way. It has already been done. So conservative a man as Dr. E. Bergroth has changed Kirkaldy's *Anisops cdepol* to *A. kirkaldyanus* on the plea that the former is "unansehnlich." If this door be left open, stability, let alone finality, is gone.

A very proper question for the next Zoological Congress would be the final settlement of this question. In fact, the Internationaal Committee on Nomenclature should be now actively discussing it for definite, considered and final action.

J. R. DE LA TORRE BUENO, White Plains, New York.

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## 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.

Papers of systematic nature will be found in the paragraph at the end of their respective orders. Those containing descriptions of new genera and species occurring north of Mexico are preceded by an \*.

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.

1—Proceedings of the Academy of Natural Sciences of 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. 8—The Entomologist's Monthly Magazine, London. 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. 20—Bulletin de la Societe Entomologique de France, Paris. 22—Bulletin of Entomological Research, London. 24—Annales 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. 36—Transactions of the Entomological Society of London. 38—"Redia," Firenze, Italy. 50—Proceedings of the United States National Museum. 52—Zoologischer Anzeiger, Leipzig. 59—Journal of Agricultural Research, Washington, D. C. 64—Parasitology, London. 76—Nature, London. 82—The Ohio Journal of Science, Columbus. 89—Zoologische Jahrbucher, Jena. 95—Annales des Sciences Naturelles, Zoologie, Paris. 100—Biological Bulletin of the Marine Biological Laboratory, Woods Hole, Mass. 103—Biologisches Centralblatt, Leipzig. 111—Archiv fur Naturgeschichte, Berlin. 118—Die Naturwissenschaften, Berlin. 129—The Bulletin of the Hill Museum, Witley, Surrey, England. 138—American Museum Novitates, New York. 141—Internationale Entomologische Zeitschrift, Guben. 146—"Konowia," Wien. 147—Archiv fur Mikroskopische Anatomie und Entwicklungsmechanik, Berlin. 151—Occasional Papers of the Boston Society of Natural History. 156—Genetics, New York.

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1918.) **Marshall, J. F.**—An improved form of apparatus for "low power" insect photomicrography. 22, xv, 49-50. **Oberthur, C.**—Obituary. 8, 1924, 215-6; 9, 1924, 191-2. **Poulton, E. B.**—The relation between the larvae of the asilid genus *Hyperechia* and those of xylocopid bees. 36, 1924, 121-33. **Provancher**—L'étude des insectes. (Le Naturl. Canadien, li, 57-60.) **Schulz, W. A.**—Ein altes, verschollenes werk uber tiersystematik. 111, 1912, A, 9, 21-91. **Steineger, L.**—A chapter in the history of zoological nomenclature. (Smiths. Miscel. Coll., lxxvii, No. 1.) **Stichel, W.**—Für die sammelpraxis. 141, xviii, 81-2. **Treherne, R. C.**—Obituary. 12, xvii, 506-8. Obituary (with bibliography). 4, lvi, 151-3. **Watson, H.**—The application of the law of priority. 11, xiv, 328-337. **Weiss & West**—Insects and plants of a dry woods in the pine barrens of New Jersey. (Ecology, v, 241-53.) **Williams, C. B.**—An improved light trap for insects. 22, xv, 57-60.

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**Curran, C. H.**—Taxonomic and synonymic tendencies with especial reference to diptera. 29, liv, 20-24.

**Aldrich, J. M.**—Notes on some types of American Muscoid diptera in the collection of the Vienna Nat. Hist. Museum. 7, xvii, 209-18. \***Alexander, C. P.**—New or little known crane-flies from New England. 151, v, 115-8. **Borgmeier, T.**—Novos generos e especies de Phoridae do Brasil. (Bol. Mus. Nac. R. d. Janeiro, i, 167-202). \***Bromley, S. W.**—New robber-flies. (Asilidae). 151, v, 125-7. \***Brues, C. T.**—New and unrecorded American sps. of the family Phoridae. 5, xxxi, 155-61. \***Cockerell, T. D. A.**—An ancestor of the Agromyzidae. 9, 1924, 199-201. \***Curran, C. H.**—New Canadian D., with synopsis of the genus *Cynorhina*. 4, lvi, 193-6. **Curran, C. H.**—Concerning the availability of certain taxonomic characters and their significance. 5, xxxi, 167-9. **Curran, C. H.**—*Rhagoletis pomonella* and two allied species. 29, liv, 56-7. **Duda, O.**—Revision der europaischen u. gronlandischen sowie einiger sudostasiat. arten der gattung *Piophilila*. 146, iii, 97-113 (cont.). \***Dyar, H. G.**—A note on *Sabethes*. Notes on some *Sabethids* from Central America. Notes on the *Sabethids* of the West Indies. *Phoniomyia* and *Dendromyia*. A note on *Wyeomyia*. Note on the American *Aedes* of the *scapularis*-group. Some new mosquitoes from Colombia. Two new mosquitoes from California. Mosquitoes from Chile. The larva of *Aedes alleni*. The larva of *Aedes thelcter*. The larva of *Culiseta maccrackenae*. 15, xii, 97-100; 101-104; 104-107; 107-113; 113-117; 117-119; 119-124; 125-127; 128-131; 131-132; 132; 144. \***Ewing, H. E.**—Notes on the taxonomy and natural relationships of fleas, with descriptions of four n. sps. 64, xvi, 341-54. **Linder, E.**—Eine neue *Chiromyzide*, *Clavimyia alticola*. 52, lx, 160-1. **Lindner, E.**—*Rhagionidae neotropicae*. 146, iii, 65-75. \***Malloch, J. R.**—Three new sps. of *Agromyza* and synonymical notes. 4, lvi, 191-2. **Matheson, R.**—The genera of *Culicidae* of North Am. 4, lvi, 157-61. \***Shannon, R. C.**—A new *Cynorhinella* (*Syrphidae*). 151, v, 123-4. \***Spuler, A.**—North Am. sps. of the subgenera *Opacifrons* and *Pteremis* of the genus *Leptocera* (*Borboridae*). 5, xxxi, 121-35. \***Tothill, J. D.**—A revision of the Nearctic sps. of the genus *Gonia*. (*Tachinidae*). 4, lvi, 196-200.

**COLEOPTERA.** **Achard, J.**—Essai d'une subdivision nouvelle de la famille des *Scaphidiidae*. 33, 1924, 25-31. **Cutright, C. R.**—Bionomics of *Hippodamia tridecim-punctata*. 7, xvii, 188-92. **Dury, C.**—Notes on *Cyclrus* and the sad

misfortunes of an entomologist. 6, xxxii, 122-3. **Gorham, R. P.**—Notes on *Agriotes mancus*, at Dartmouth, N. S. 31, No. 9, 69-72. **Knaus, W.**—1923 collection and life history notes on *Strategus mormon*. A color form of *Cicindela repanda-unijuncta*. 6, xxxii, 124-5; 126. **Ochs, G.**—On the West Indian Gyrinidae and a n. sp. of *Gyretes* from northern Brazil. 138, No. 125. **Parker & Böving**—The blister beetle, *Tricrania sanguinipennis*—biology, descriptions of different stages, and systematic relationship. 50, lxiv, Art. 23. **Weiss, H. B.**—Galls on *Apion hibisci*. 6, xxxii, 126.

\***Blatchley, W. S.**—New C. from southern Florida, with notes on other interesting species. 4, lvi, 164-70. **Bryant, G. E.**—New species of *Phytophaga*. 11, xiv, 247-52. **Chittenden, F. H.**—The amaranth curculio, *Conotrachelus seniculatus*. 6, xxxii, 119-21. **Desbordes, H.**—Description de deux *Histerides nouveaux*. Description d'un *Lioderma nouveau* de l'Amérique du Sud. 20, 1924, 115-7; 122-3. **Obenberger, J.**—Kritische studien über die Buperstiden. 111, 1924, A, 3, 1-171. \***Schaeffer, C.**—On a few new and old *Chryso-melidae*. 6, xxxii, 138-45.

**HYMENOPTERA.** **Smulyan, M. T.**—Attacks of *Vespa communis* on *Hyphantria cunea*. 5, xxxi, 138-9. **Viehmeyer, H.**—Polymorphismus und ernährung bei den ameisen. 111, 1923, A, 12, 1-12.

**Compere, H.**—A preliminary report on the parasitic enemies of the citricola scale (*Coccus pseudomagnoliarum*) with descriptions of two new chalcicoid parasites. (Bul. So. Cal. Ac. Sci., xxiii, 111-23). \***Fenton, F. A.**—New parasitic H. of the subfamily *Anteoninae* (*Bethylidae*). 82, xxiv, 191-4. **Ferriere, Ch.**—Note sur deux nouveaux *Chalcidiens* *Phytophages* du Paraguay. 24, xciii, 1-21. \***Sandhouse, G. A.**—New North Am. species of bees belonging to the genus *Halictus* (*Chloralictus*). 50, lxv, Art. 19. \***Viereck, H. L.**—A remarkable ichneumonine. 4, lvi, 202. **Wheeler, W. M.**—A gynandromorph of *Tetramorium guineense*. 5, xxxi, 136-7.

#### SPECIAL NOTICES.

**Juan Fernandez and Easter Island**, The Natural History of. Vol. III, Zoology. Part 3, contains articles on: Ichneumonidae and Vespidae by Roman; Odonata and Orthoptera by Sjostedt; Coleoptera by Zimmermann, Weise, Fleutiaux, Lesne, Pic; Neuroptera by Esben-Petersen; Parasitic Hym.

by Brues; Formicidae by Wheeler; Gryllides by Chopard; Thysanura by Silvestri; Ternites by Emerson; Hemiptera by Bergroth; Myriapoda and Arachnida by Verhoeff and Berland.

---

MANUAL OF TREE AND SHRUB INSECTS. A General Account of the More Important or Common Insects Attacking Shade and Forest Trees and Shrubs and Woody Ornamentals. By EPHRAIM PORTER FELT, State Entomologist of New York. The Macmillan Company, New York, 1924, pp. 382.

As time goes on more interest is taken in plant life for ornamental purposes, and injurious insects are rapidly increasing and it is very important to save the trees and shrubs from destruction. People are becoming more observant and seeking information to remedy this evil. This work by Dr. Felt has 256 illustrations which add greatly to the value. We are pleased to see that he gives the reader some idea of the size of the insects discussed. In many publications the lay reader does not know from the illustration whether the insect is microscopic or an inch long. The 382 pages are on good paper and the descriptions are concise and admirable. If the reader wishes fuller accounts he is referred to Government and State reports. Control and remedial measures are given and keys to the injuries to indicate the probable culprit. The arrangement is good and the book will be very useful to those persons who do not have access to large entomological libraries.

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## Doings of Societies.

### Entomological Society of France.

At its meeting on December 12, 1923, the Entomological Society of France elected three honorary members, two French, Messrs. Charles Alluaud and Pierre Chretien, in place of Paul Mabilie and Achille Raffray, deceased, and one foreign, Dr. J. Reverdin, of Geneva, Switzerland, in place of Dr. David Sharp, deceased. Dr. L. O. Howard is now the only representative of the English-speaking countries among the fourteen honorary members of this Society.

The Budget of the Society for 1924, as modified at its meeting of February 13, 1924, estimated the receipts at 30,200 francs and the expenses at 34,100 francs.

## EXCHANGES

(Owing to lack of space in this number, the Exchange Notices are deferred until later.)



## THE AMERICAN RED CROSS WASHINGTON, D. C.

The Red Cross Roll Call will be held this year from Armistice Day to Thanksgiving,—November 11–27. The need is greater than ever before. There are, for instance, 35,000 disabled ex-service men in government and private hospitals today, as against 26,000 a year ago. The Red Cross has spent since the Armistice \$50,000,000 in relief for service and ex-service men. And there is Disaster Relief. In 43 years the Red Cross has spent \$33,000,000 in this work, and last year gave aid in 220 disasters, the greatest of which was the Japanese earthquake.

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# ENTOMOLOGICAL NEWS

Vol. XXXV

No. 10



GEORGE HENRY HORN  
1840-1897



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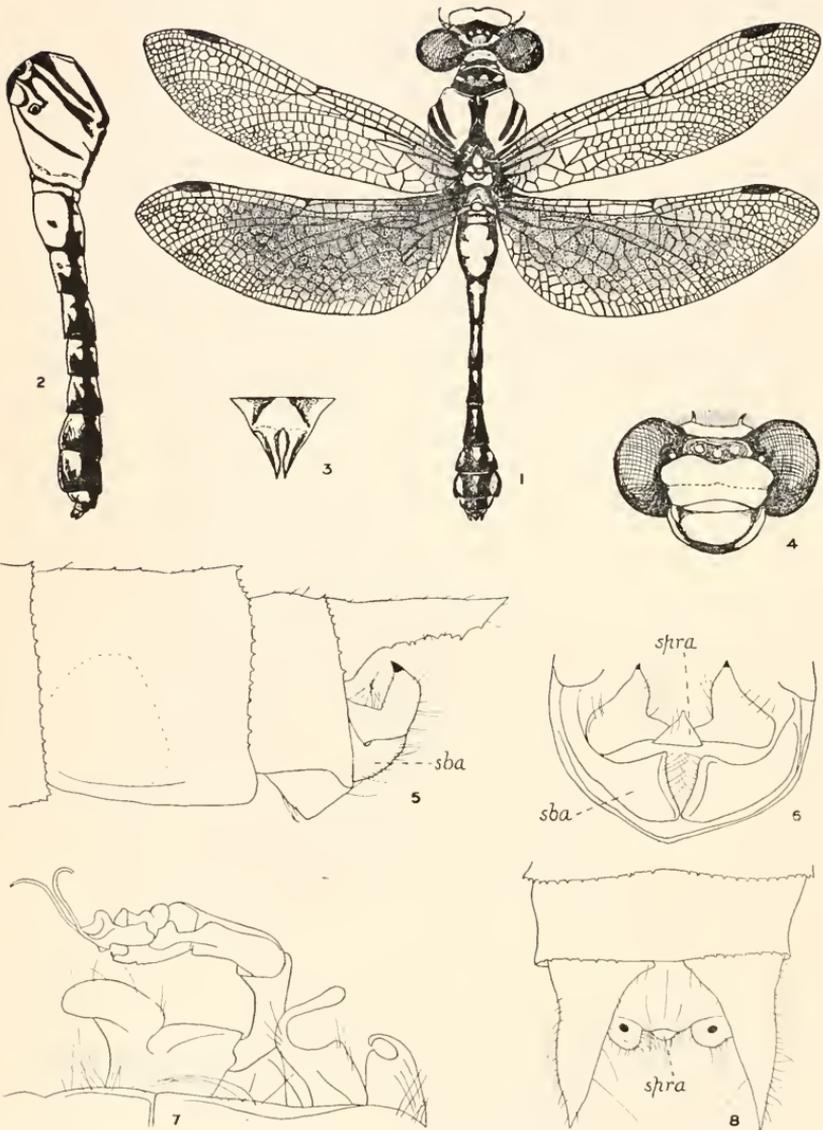
## STATED MEETINGS

Of the Entomological Section of The Academy of Natural Sciences of Philadelphia, and of The American Entomological Society will be held at 7.30 o'clock P. M. on the following dates during 1924: January 24, February 28, March 27, April 24, May 22, September 25, October 23, November 20, and Dec. 8.

Communications on observations made in the course of your studies are solicited; also exhibits of any specimens you consider of interest.

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.





OPHIOGOMPHUS HOWEI.—BROMLEY.

# ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXV

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No. 10

## CONTENTS

Bromley—A New <i>Ophiogomphus</i> ( <i>Aeschnidae</i> : <i>Odonata</i> ) from Mass.....	343	the Hemiptera of Connecticut.....	367
Calvert—The Supposed Male of <i>Ophiogomphus howei</i> Bromley ( <i>Odon.</i> : <i>Aeschnidae</i> ).....	345	Editorial—George H. Horn and Ezra T. Cresson.....	368
Cockerell—A Bee Collecting Trip to Chimney Rock, Wyoming.....	347	Torre Bueno—The Last Molt in <i>Lethocerus americanus</i> Say.....	369
Sandhouse—Description of a New Species of <i>Osmia</i> .....	351	Barnes and Benjamin—U. S. Records of <i>Pholisora ascalaphus</i> Staud., ( <i>Lepid.</i> , <i>Hesperiidae</i> ).....	370
Torre Bueno—Carbon Tetrachloride for the Entomologist.....	352	Rosewall—An Interesting Parasite of a Praying Mantis ( <i>Dip.</i> , <i>Orth.</i> ).....	370
Malloch—Two New <i>Phoridae</i> from the Eastern United States ( <i>Diptera</i> )...	355	Diptera of the Older Authors Studied by American Entomologists.....	372
Reinhard—A New Species of <i>Gonia</i> from Texas ( <i>Diptera</i> ).....	357	Committee on General Entomological Terms.....	372
Wood— <i>Polyommatus filenus</i> Poey ( <i>Lepid.</i> : <i>Lycaenidae</i> ).....	359	Felt—A Natural Freak ( <i>Coleop.</i> : <i>Coccinellidae</i> ).....	373
Weiss—Ratios between the Food Habits of Insects.....	362	Junior Scientific Aid ( <i>Entomology</i> )....	373
Carter—A New Species of <i>Psammophila</i> Dahlbom and the Allotype of <i>Psammophila valida</i> Cresson ( <i>Hymen.</i> )...	365	Robertson—Note on <i>Megachile centuncularis</i> (L.) Latr. ( <i>Hymen.</i> : <i>Megachilidae</i> ).....	374
Weiss— <i>Corythucha marmorata</i> Uhler on Seaside Goldenrod ( <i>Hemiptera</i> )	367	Entomological Literature.....	374
Britton—Additions and Corrections to		Obituary—Dr. Clara Southmayd Ludlow.....	379
		Obituary—Prof. William Albert Locy.....	380

## A New *Ophiogomphus* (*Aeschnidae*: *Odonata*) from Massachusetts.\*

By S. W. BROMLEY.

(Pl. XI, Figs. 1-4)

On June 1, 1922, a small *Ophiogomphus* was collected in Amherst, Massachusetts, by Howard Norwood, a student in Entomology, on the campus of the Agricultural College, in front of one of the buildings. In appearance it was quite unlike any species of this genus that had come to my notice.

Although but one individual, a female, has been obtained, it seems sufficiently distinct to merit description. It was at first referred to *O. aspersus* Morse, but is much shorter and more robust than that species, besides having its hind wings proportionately broader, with a large flavescent area which is lacking in *aspersus*. It differs also in the position and coloration of

\*Contribution from the Entomological Laboratory of the Massachusetts Agricultural College, Amherst, Mass.

the occipital horns and in the conformation of the vulvar lamina.

In *O. aspersus* the occipital horns are located back of the occipital ridge close to the compound eyes, and are brown in color. In *O. anomalus* Harvey, in addition to a pair similarly placed, there are two in the center of the occipital ridge, their bases closely approximate and tips contiguous. In the present species, the only occipital horns are a pair located on the ridge of the occiput, their bases widely separated and tips divergent, of the same color as the occiput with the exception of the tips, which are dark.

The species is named in honor of Dr. R. Heber Howe, Jr., whose writings on the Odonate fauna of New England have done much to encourage the study of this interesting order in this region. The description is made from the single individual taken June 1, 1922, which is in the collection of the Massachusetts Agricultural Experiment Station.

**Ophiogomphus howei** sp. n.

♀ Total length, 31 mm. Abdomen, 22 mm. Hind wing, length, 21 mm.; greatest breadth, 8 mm. Fore wing flavescent from base to slightly beyond the arculus. Hind wing flavescent over basal two-thirds of wing. Pterostigma brown margined with black. Rest of wing hyaline.

Head: Clypeus, genae, occiput and anterior aspect of frons, olive-yellow; vertex and posterior dorsal aspect of frons, black.

Head back of eyes, black dorsally; olive-yellow below.

Occipital horns located on ridge of occiput, separated, tips divergent; basally, olive-yellow, tips dark brown. Several rows of slender, black hairs along ridge of occiput.

Thorax in life, green, turning olive-yellow when dried, with brown markings. Prothoracic legs black, with exception of the femur, which is pale green below. Mesothoracic legs black with pale green line on posterior side of femur. Metathoracic legs black with proximal ventral portion pale yellow.

Abdomen black and olive-yellow. Vulvar lamina with slender lobes, the apical teeth of which are parallel. In contour they approach *O. colubrinus* Selys., a species entirely different in other respects.

EXPLANATION OF PLATE XI.

Fig. 1. Dorsal aspect, showing color pattern.

Fig. 2. Lateral aspect of thorax and abdomen, showing color

Figs. 1-4. *Ophiogomphus howei* n. sp., female, type. × 2.  
pattern.

Fig. 3. Vulvar lamina.

Fig. 4. Frontal aspect of head, showing position of occipital horns.

## The Supposed Male of *Ophiogomphus howei* Bromley (Odon. : Aeshnidae).

By PHILIP P. CALVERT, University of Pennsylvania,  
Philadelphia, Pa.

(Pl. XI, figs. 5-8).

In 1921, Mr. A. B. Champlain, Curator of Insects, Bureau of Plant Industry, Department of Agriculture, Harrisburg, Pennsylvania, placed in my hands some Odonata for identification. Among them was a small male *Ophiogomphus* from Lemoyne, Pennsylvania, which, after study, I labeled as "*Ophiogomphus* sp. near *anomalus* Harvey" and laid aside in the hope that additional material might be forthcoming. In December, 1922, Mr. S. W. Bromley asked me to examine the female from Amherst, Massachusetts, which he has now described in the preceding paper. I came to the conclusion that the Lemoyne male and the Amherst female were probably conspecific. By arrangement with Mr. Bromley I am now printing the description of the male following that of his female.

### *Ophiogomphus howei* Bromley.

♂. Differs from the description of the female type in having the flavescens area of the wings very faint (this perhaps due to the comparative youthfulness of this individual); no occipital horns; clypeus, genae, occiput and frons (except at the base, superiorly, of the last named) a clearer yellow than olive yellow; vertex and frons superiorly at base brown; head back of eyes brown dorsally, a clearer yellow below; thorax of a clearer yellow than olive yellow, markings brown, not black, of the form shown in Plate XI, fig. 1; mid-dorsal thoracic brown stripe .8 mm. wide, brown antehumeral .57 mm. wide; brown humeral .4 mm. wide, faintly divided lengthwise by a pale yellowish line along the suture; lateral dark thoracic markings not as distinct as in Pl. XI, fig. 2. Abdominal markings, as compared with Pl. XI, fig. 1, have the trilobed yellow on the dorsum of 2 not as deeply incised; postbasal widening of the dorsal olive yellow on 3 not evident; the dorsal olive yellow on 4 reaching to only one-third of the length of the segment; mid-dorsal stripe on 7 narrower (.25 mm. wide), one-third as long as the segment.

Length 34 mm., abdomen 24, superior appendages 1.27, hind wing 19 mm.

Differs from the male type of *Ophiogomphus anomalus* Harvey, as described in Ent. News, IX, p. 60, March, 1898, as follows:

Smaller; no dark line on fronto-clypeal suture, no dark bands on the clypeus (nasus and rhinarium) or on the labrum, except that the free margin of the latter has a narrow blackish brown stripe.

Antehumeral brown stripe not reaching the ante-alar sinus, hence not connected above with the mid-dorsal brown stripe and connected with the humeral by a point only at a short distance below its own upper end (= .8 mm. below the ante-alar sinus). Brown line on the upper and lower ends of the obsolete first lateral thoracic suture separated by an interval of 1.5 mm. Brown stripe on the second lateral thoracic suture complete but less distinct. Humeral brown stripe connected at its upper end with the mid-dorsal stripe by a brown line along the upper margin of the mesepisternum and by a narrow brown stripe with the line on the first lateral suture along the upper margin of the mesepimeron.

Wings pale yellowish in the basal half, especially in the hind wings, stigma very pale yellowish, probably immature.

Legs brown, first femora much paler (yellow) inferiorly than the others.

Abdomen blackish brown, mid-dorsal and lateral yellow stripes not confluent at the bases of the segments ["segments 3-9" in Prof. Harvey's description is probably an error for 3-7], mid-dorsal yellow stripe on 8 cuneiform, apex caudad, one-third as long as the segment, that on 9 reduced to a minute basal spot and absent on 10. Width of segment 8 at base 2.15 mm., abdomen somewhat distorted. Superior appendages luteous, tapering to the apex in dorsal view, more so on the outer (lateral) side, apex acute. The appendages are shown in Pl. XI, figs. 5, 6 and 8, the genitalia of segment 2 in fig. 7.

Compared with the description of *O. anomalus* in Ent. News XII, page 240 (Sept., 1901), the pit on the side of the ninth segment is in the brown area above the C-shaped yellow.

Described from a single male taken at Fort Washington, Lemoyne, Pennsylvania, May 20. Mr. Champlain wrote: "The unique male that you mentioned (5960b) was collected by H. O. Marsh at Lemoyne. Fort Washington is the name of a hill at Lemoyne, which during the Civil War was made into intrenchments for the protection of Harrisburg across the [Susquehanna] river."

Thanks to Mr. Champlain, this male has been placed in the collection of The Academy of Natural Sciences of Philadelphia.

EXPLANATION OF PLATE XI.

Figs. 5-8. Supposed male of *Ophiogomphus howei* Bromley.

Fig. 5. Left lateral aspect of the hind end of the abdomen; the dotted line on segment 9 shows the outline of the yellow spot.  $\times 17.3$ .

Fig. 6. Caudal aspect of the same, ventral parts only.

Fig. 7. Left lateral aspect of the genitalia of the second abdominal segment, penis extruded.

Fig. 8. Dorsal aspect of the hind end of the abdomen. In figs. 5, 6 and 8 the black-tipped apices of the inferior appendage furnish good landmarks for comparison; *sba*, subanal laminae; *spra*, supraanal lamina.

**A Bee Collecting Trip to Chimney Rock, Wyoming.**

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

**With the Description of a New Species of *Osmia*.**

By GRACE A. SANDHOUSE.

On the seventeenth day of May, 1924, my wife and I had the pleasure of visiting Chimney Rock, Wyoming, in the company of a group from the University of Wyoming. The party included Dr. and Mrs. E. B. Payson, botanists; E. C. Harrah, zoologist; C. L. Corkins, entomologist; Dr. J. E. Downey, psychologist; and several others. I had never collected an insect in Wyoming before, and the country visited, although in Albany County and only a short distance from the Colorado line, was unlike any I had seen. It consists of wide, dry valleys and plains, with a few small streams, and at the sides huge masses of red sandstone rock, carved into grotesque shapes, and with the stratification horizontal. The snail *Oreohelix cooperi* (W. G. Binney) was found in some abundance. The most conspicuous flower was *Mertensia humilis* Rydb., a very beautiful thing with deep blue bells, new to me in life. Curiously, it is so closely related to an alpine species that its distinctness as a species is questioned. The flora in general is that of the Transition Zone, and with Dr. Payson's help I made the following list of characteristic species:

*Yucca glauca* Nutt., *Fritillaria atropurpurea* Nutt., *Odoestemon repens* (Lindl.), *Delphinium nelsonii* Greene, *D. geyeri* Greene, *Cheirinia aspera* (Nutt.), *Astragalus caespitosus* (Nutt.), *Viola nuttallii* Pursh, *Betula fontinalis* Sarg., *Cercocarpus montanus* Raf., *Phlox glabrata* (E. Nels.), *Lithophragma bulbifera* Rydb. (form with pink flowers), *Townsendia exscapa* (Richards.), *Pediocactus simpsoni* (Engelm.), and *Tetradymia inermis* Nutt.

On the *Tetradymia* (det. Payson) were white wooly galls, resembling those found on *Atriplex*. The species is evidently new.

The bees were collected by Mr. Corkins and Mrs. Cockerell, while I hunted snails and various insects. The series is a small one, but contains some novelties. There can be no doubt that more extensive collecting in this region would bring to light a number of undescribed forms. There has never been a resident collector of bees in Wyoming, though Dr. Lutz has visited the State and obtained many interesting species, including seven forms which I have already published as new, while a few others are in course of publication.

*BOMBUS HUNTII* Greene. One female.

*ANTHOPHORA SIMILLIMA* Cresson. One male, with pure black eyes.

*TETRALONIA MEDICATA* Cockerell. One female, at flowers of *Mertensia humilis*. This species got its name from the fact that it was discovered at Medicine Hat, Alberta. By a curious coincidence, it was next found, by Dr. Lutz, at Medicine Bow, Wyoming.

*Andrena dolichotricha* new species.

♂. Length about 9 mm., anterior wing 8.4 mm.; black, moderately robust, the head and thorax with very long erect hair, which is entirely pale, but delicately tinged with ochreous, this tint perhaps most pronounced on the mesopleura.

Head large, facial quadrangle broader than long; clypeus shining, but very densely and distinctly punctured, and with no smooth line; mandibles ordinary, short, reddish at end; process of labrum truncate; malar space linear; cheeks flattened, covered with very long hair, but not angulate; vertex broad and dull; antennae black, long and stout, moderately shining, the flagellum submoniliform; third and fourth joints equal (each

320 microns), the third with very short reddish hair on outer side.

Mesothorax and scutellum shining, with strong but not dense punctures; the punctures on mesothorax tend to run in longitudinal lines; area of metathorax well defined, truncate behind, and with about sixteen distinct but obtuse longitudinal ridges; under the microscope the surface of mesothorax is seen to be tessellate between the punctures, not polished; tegulae piceous.

Wings long, hyaline, with a faint brownish tint, more pronounced at apex; stigma large, bright ferruginous; nervures dusky reddish; basal nervure meeting nervulus; second cubital cell receiving recurrent nervure a little beyond middle.

Legs mainly black, with long hair like that of thorax, but all the tarsi reddish apically, hind tarsi entirely red, and their tibia red at apex, or the legs may be entirely black, except the last joint of tarsi; hair on inner side of hind tarsi creamy white.

Abdomen shining, the surface under a lens appearing finely roughened, but not distinctly punctate; the whole surface covered with rather long, thin, erect, white hair, only forming bands, and these not very distinct, at sides of third and fourth segments; second segment depressed one-half; apex without special features.

Chimney Rock, Wyoming, May 17, 2 males (W. P. Cockerell and C. L. Corkins).

This is a member of Viereck's subgenus *Scapteropsis*, but not very similar to any known to me. In Bruner's table it runs straight to *A. sayi* Rob., and, although that is a very different species, with much larger head, longer mandibles and less hairy abdomen, there is apparently some relationship, as shown by a certain similarity in the area of the metathorax. Superficially, there is some resemblance to *A. tacitula* Ckll., but that is smaller, with distinctly punctured abdomen.

#### ***Andrena transnigra paysoni* new subspecies.**

♀. Wings dilute greyish (strongly reddish in *A. transnigra* Viereck); stigma slender, clear red with dark margin; face with abundant white hair; occiput with white hair; a band of light hair extending down front of mesopleura; hind femora with much long, pure white hair beneath.

Chimney Rock, Wyoming, May 17, 1 female, taken by C. L. Corkins on the ground in a dry place.

ANDRENA ERYTHROGASTRA (Ashmead). Three males, at willows.

PARANDRENA ANDRENOIDES (Cresson). Five males, 3 females, at willow.

PARANDRENA ANDRENOIDES BICOLOR Rob. Four females, at willow.

SPHECODES SOPHIAE Cockerell. One female, with head not so broad as in type. I have commented on the variability of *S. sophiae* in *Entomologist*, 1904, p. 232, and suspect that when the males are known the species as now understood may be divided into two or more.

NOMADA CIVILIS Cresson. One male.

NOMADA (s. str.), two species, males. These must await the time when the accumulated materials in this difficult group can be revised.

A new *Osmia* collected is described below by Miss Sandhouse. The types of the new forms are in my collection, but will later go to the U. S. National Museum.

Since we returned home, Professor Payson has sent species of *Andrena* and *Halictus* which he collected a few days later. The *Andrena* is a remarkable and very distinct species.

#### **Andrena metea** new species.

♂. Length about 10.5 mm.; intense black, with entirely black hair, long and erect on head and thorax; clypeus high, polished, weakly punctured, yellowish-white, with a pair of conspicuous black spots; facial quadrangle broader than long; labrum polished, elevated in middle (but without a distinct process), and beneath the elevation a large deep pit from which hairs project; malar space a well-developed shining band; third antennal joint about or almost as long as next two together.

Mesothorax and scutellum dull, with sparse weak punctures; area of metathorax triangular, dull, not plicate; anterior trochanters not modified; mesopleura dull; tegulae black.

Wings brownish hyaline; stigma rather slender, dark reddish; nervures fuscons; basal nervure meeting nervulus; second cubital cell broad, receiving recurrent nervure beyond middle.

Abdomen dullish, finely rugosopunctate, second segment depressed about a third. Under a lens, I thought I could see a spine on the hind trochanter, but it turned out to be a tuft of closely appressed (pencil-like) hairs.

Laramie, Wyoming, May 24, at flowers of *Astragalus caespitosus*; collected by E. B. Payson and E. C. Harrah. Nearest, apparently, to *Andrena maura* Vier., but easily known by the entirely black hair.

## DESCRIPTION OF A NEW SPECIES OF OSMIA. BY GRACE A. SANDHOUSE.

*Osmia corkinsi* Sandhouse, new species.

♀. 9-10 mm. long; blue-green, the face, mesothorax and scutellum quite brassy green; scopa black.

Head normal; inner orbits converging slightly below; face closely punctured, the punctures deeper on the supraclypeal area; pubescence black, except the hair of the front, is largely, and that of the occiput entirely, pale fulvous; antennae black; clypeus very dark blue-green, the anterior margin truncate but slightly concave; mandibles black, tridentate.

Dorsum of thorax very closely and rather coarsely punctured, the pubescence fulvous; disk of propodeum dull and very dark blue-green; tufts of hair behind wings fulvous; hair of pleura and sides of propodeum black; tegulae black, the anterior portion greenish and punctate, with some pale hair on the margin.

Wings hyaline; anterior wing about 6.5 mm. long; basal nervure meeting nervulus; second cubital cell little longer than the first on marginal, receiving first recurrent nervure about one-fourth from the base and the second recurrent nervure one-fifth from the apex.

Legs black; pubescence black, except for some reddish hairs on the anterior and middle basitarsi; hind tibial spurs weakly curved; hind femora obscurely metallic.

Abdomen rather broad, shining; bases of segments with piliferous punctures; punctureless apical margins of segments narrow; hair of first dorsal segment white except for patches of black at the extreme sides, of second segment black with some white intermixed, especially on the median base, of segments 3-6 black.

Chimney Rock, Albany County, Wyoming, May 17, (C. L. Corkins). The plant from which this specimen was taken was not recorded, but some pollen from the scopa was examined by Miss Pope, and showed the bee had visited *Astragalus* and *Mertensia*, probably *M. humilis*.

Paratype—Boulder, Colorado, May 26, at *Aragallus lambertii* (M. D. Ellis). This differs from the type only in having the face and tegulae bluer."

"Very similar to *subtrevoris* Cockerell, by the brighter hair on the scutellum; more closely punctured abdominal segments, with narrower punctureless apical margins; mesothorax and scutellum brassy green; tegulae metallic in front; basal nervure meeting nervulus, behind the nervulus in *subtrevoris*; some pale hair on front, entirely black in *subtrevoris*; the tongue is much shorter than that of *subtrevoris*."

### Carbon Tetrachloride for the Entomologist.

By J. R. DE LA TORRE BUENO, White Plains, New York.

The entomologist in the technique of the collection meets with certain problems. Two of these are pests and grease.

Heretofore, grease has been removed from insects by immersion in gasoline, benzine, chloroform or ether, all excellent solvents. Pests have been destroyed with carbon bisulphide.

Gasoline and benzine are highly inflammable. The latter is true also of carbon bisulphide, the vapor of which forms explosive mixtures with air and besides is poisonous to human beings.

Carbon tetrachloride ( $\text{CCl}_4$ ) is a universal liquid to replace all those mentioned. Chemically it is defined as a colorless mobile liquid much heavier than water. It boils at about  $170^\circ \text{F}$ . and freezes at  $13^\circ \text{F}$ . It evaporates rapidly at room temperature without leaving a residue. It is, in addition, an excellent solvent of oils; unflammable and non-poisonous to human beings. All these properties make it extremely useful and safe for entomological purposes.

When first introduced in 1864 it was used as an anesthetic. Unfortunately, in obscure heart cases it was attended with fatal results, leading to its abandonment. In late years, because of cheapness of production, it has come into varied commercial uses. To most people it is familiar as a cleaning fluid to remove spots; and as material for fire-extinguishers. In industry it is used as a solvent for oils and resins and as a degreaser. It removes oil and grease spots more rapidly than gasoline.

#### DEGREASING INSECTS.

Carbon tetrachloride has been used very successfully by me in degreasing bugs. Certain forms seem very liable to get greasy, especially well-fed specimens taken in late summer. Such greasy specimens are not only unsightly but also conceal minute characters by reason of the dirt that gathers on them. If such dirty insects are only dusty, they may be put pin label and all into a tightly covered small wide-mouthed bottle and *shaken*, without fear of breaking of legs and antennae. The dust will be washed off, and when the insect is dry it will be found beautifully clean. If only slightly greasy, about half

an hour will clean them, and they may be taken out and allowed to dry, which they do very quickly. If specimens are very greasy, they may be allowed to remain in tetrachloride overnight or even longer. This last is necessary where verdigris has attacked the pins. However, pinned insects should not remain too long in the liquid as it seems to have a solvent effect on brass pins. Some bugs neglected for a few weeks had the pins melted right off. The best practice is to degrease in one vessel and then pass through two others, to wash off the last traces of greasy tetrachloride.

This has not been tried by me on Lepidoptera, and tetrachloride, I have been told, changes the color of Orthoptera.

#### WASHING INSECTS.

Hard bodied insects may be *washed* in tetrachloride by means of a fine camel's hair brush. Mold on valuable specimens may thus be removed entirely. This washing should be done in three vessels. The dirty or moldy insect is thoroughly soaked in the first and the greater part of the dirt or mold removed. It is then transferred to the next, and gone over under the magnifying glass, and finally rinsed in the third vessel. I have done this to such minute insects as *Microvelia* with good results.

These washings, of course, destroy any pests.

#### DESTRUCTION OF PESTS.

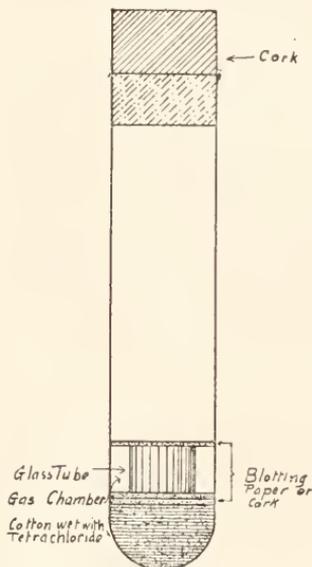
*Anthrenus* is always with us and others as well. Infested boxes may be disinfected by pouring in a little tetrachloride—say a teaspoonful—into the box and closing it. Even though the fumes do not at once kill the pests, and although they evaporate in a couple of days, the larvae of *Anthrenus* lose all interest and finally just naturally languish and perish without doing further injury. The tetrachloride also may be directly dropped on the injured insect without spoiling it.

This is excellent for private collections as tetrachloride is not only entirely safe, but it has a rather pleasant odor when pure. For museums it may have one part in four of the poisonous bisulphide, which makes it more deadly, but still relatively unflammable.

## TETRACHLORIDE KILLING BOTTLE.

In its simplest form, the tetrachloride bottle may be prepared by putting absorbent cotton wet with it (not soaked and dripping) in the bottom of any bottle or tube, holding it down with rounds of blotting paper or pieces of sheet cork fitting tightly within the inside diameter of the bottle. Such bottles or tubes may be made ready just before starting collecting and will last several days.

Much experimenting since before 1915 has resulted in my improved tetrachloride killing bottle. The foundation is, of course, the tetrachloride wet cotton. This is held down as



before mentioned. Above the blotting paper or cork is a space partitioned off from the rest of the bottle by another round of blotting paper or cork, in the case of small tubes. When the tubes are large, and in the case of bottles of greater diameter, a short piece of glass tubing about one-half to three-quarter inch long is put above the charge and the blotting paper or sheet cork rests on this, thus forming a gas chamber.

There is, of course, a reason for this. In very warm weather the tetrachloride evaporates rapidly and, naturally, the charge in the tube is very strong. But it also condenses at any decrease of temperature, thus wetting delicate insects. There is also great waste of the vapor. The gas chamber, however, retains this super-charged vapor and prevents it from so filling the bottle as to condense on the sides. Thus the insects remain dry and the tube lasts longer. (See figure.)

However, in actual collecting practice, it is well to put small and delicate insects into small tubes without a charge. Then the tetrachloride gas may be poured into the small tube from the

regular with full, if slow, effect. It is a most rapid killing agent for Diptera.

It is stated that the tetrachloride changes the color of delicate Orthoptera. I have not noted this. Doubtless, if it occurs, it is because the insects get wetted with the condensation. Tetrachloride of carbon sometimes contains excess free chlorine which, of course, is a powerful decolorizing agent.

Insects may be left in such a bottle overnight without stiffening.

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### Two New Phoridae from the Eastern United States (Diptera).

By J. R. MALLOCH, Biological Survey, Washington, D. C.

During the past three years collections have been made with a view to compiling a list of the Phoridae of the District of Columbia and amongst the material taken there are some specimens which belong to undescribed species, two of the most interesting of the latter being described herein. The types are in the author's collection.

#### *Aphiochaeta apicinebula* sp. n.

♀. Yellow, slightly shining. Basal abdominal tergite brown, next tergite very large, lemon yellow, third tergite small and pale, remainder of abdomen fuscous. Legs, including coxae, entirely yellow. Wings yellowish, veins pale brown, tip of costa darker, a slight but distinct narrow infuscation round apex of wing. Halteres yellow.

Frons subquadrate, with numerous short black hairs, central impressed line distinct, both series of transverse bristles convex, the inner bristle of anterior series about midway between outer one and the postantennal bristle, only one pair of postantennal bristles present; third antennal segment round, not very large; arista pubescent; mouth margin arched, protruded centrally almost as far as apex of third antennal segment; about four fine black bristles on lower part of sides of face; two strong bristles on lower part of occiput and some shorter bristles above them; proboscis stout; palpi normal, moderately bristled.

Scutellum with two bristles and two short basal setulae; mesopleura bare.

Second abdominal tergite very large, bare, covering at least half of dorsum; apex of abdomen furnished with a rounded scoop-like process which is slit in center at apex.

Fore tarsus a little longer than tibia, basal segment as broad as tibia; a few short black setulae on basal half of ventral surface of hind femur; mid and hind tibiae each with a complete series of posterodorsal setulae and a similar series of setulae on basal half or more of anterodorsal surface.

Costa to almost two-thirds of the wing length, fringe not longer than costal diameter, first section slightly shorter than second, third very short, not more than one-eighth as long as second; fourth vein leaving third at fork of that vein. Body length, 3 mm.

*Type*, Glen Echo, Maryland, July 23, 1922. *Paratype*, topotypical, June 15, 1924 (J. R. Malloch).

This species belongs to the same group as *subpicta* Malloch and differs from that species in color of wings, coxae and abdomen, as well as in chaetotaxy of frons and scutellum.

The most closely related American species appears to be *sulphuriventris* Borgmeier from Brazil, but that species, though colored much as *apicincbula*, has the second tergite deep black, halteres fuscous, wings more yellowish, lower pair of post-antennal bristles present but minute, the first costal division as long as next two combined, and the fork of third vein wider.

The most remarkable character possessed by the new species consists of a short series of about six black setulae near middle of posterior surface of hind tibiae. No other species known to me has these setulae.

Several years ago I erected the genus *Paraphiochaeta* for the reception of the species of *Aphiochaeta* which have two series of setulae on the hind tibiae. This genus has been considered as a synonym of *Phalacrotophora*, but I now believe the group is not entitled to separation and consequently describe the new species in *Aphiochaeta*. This attitude is strengthened by the fact that the Brazilian species compared above with *apicincbula* belongs to *Aphiochaeta* in the restricted sense and not to *Phalacrotophora*.

#### **Beckerina aliena** sp. n.

♀. Head yellow, frons darkened, becoming black at upper margin. Thorax tawny yellow. Abdominal tergites fuscous, narrowly yellow on hind margins. Legs yellow, apices of hind femora fuscous. Wings slightly grayish, noticeably so at apices. Halteres yellow.

Frons distinctly broader than long, central impressed line faint, surface with numerous short black setulae; upper series of four bristles straight, lower series with the inner bristles about midway between outer pair and the pair of stout divergent postantennal bristles; postocular bristles strong on lower portion, each cheek with two strong bristles; antennae normal; arista slender, almost bare.

Mesopleura bare; scutellum with four bristles, the median pair invading disc.

Abdomen conical, practically bare.

Hind tibia with a slight hirsute dorsal ridge which is not present in other species of the genus in North America.

Costal vein becoming thicker apically, first section about 1.5 as long as next two, second about twice as long as third; seventh vein much fainter than the others; costal fringe short. Body length, 1.5 mm.

*Type*, Glen Echo, Maryland, August 10, 1923 (J. R. Malloch).

The only other yellow colored species so far known from this country is *flavcola* Malloch, described from Illinois. In my key to the species of this genus published in Brooklyn Bulletin, Vol. XVIII, 1923, p. 32, the present species will run down to *flavcola*, which differs in having the thorax trivittate with reddish, and the scutellum with but two bristles.

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### A New Species of *Gonia* from Texas (Diptera).

By H. J. REINHARD, Amherst, Ohio.

#### *Gonia texensis* new species.

♂. Head, thorax and abdomen yellow in ground color. Eyes bare. Front prominent, covered with irregular rows of bristles, more than twice the horizontal eye-width, white pollinose, but when viewed in certain lights sub-shining and translucent. Ocellars, inner and outer verticals well developed, all directed posteriorly. Frontals in a single row on each side, decussate to base of antennae, lowest bristles on level with base of third antennal joint. Orbital bristles present. Checks, median depression and parafacials white pollinose. The latter at narrowest point three-fourths as wide as median depression, covered with short bristly hairs, and a row of stronger bristles on the lower half along the facial ridges. Antennae as long as the face, basal joints very short, yellowish, third joint blackish, elongate, front border practically straight. Arista yellowish,

bare, geniculate and thickened to tip, penultimate joint variable, usually as long as or longer than the third. Vibrissae decussate, slightly approximated and inserted nearly on level with oral margin. Median depression moderately large and very deep, ridges with three or four bristles above the vibrissae. Proboscis rather slender, labella small, yellowish. Palpi ordinary, yellow. Cheeks covered with whitish pubescence, width nearly one-half the eye-height. Beard dense, yellowish.

Thorax grey pollinose, with four black vittae when viewed from behind. Four posterior dorsocentral and four sternopleural bristles. Scutellum yellow, bristly above except along the narrow base, with three pairs of large marginal bristles directed backward, and two or three short sub-erect spine-like bristles at the apex.

Abdomen conical and rather slender, yellow, with a median black vitta. Bristles marginal only. First segment with a lateral pair; second with a lateral and a median pair; third and fourth with complete rows. Genital segments black, the second with numerous black hairs directed backward. Inner forceps united, expanded apically into a spoon-shaped structure which is slightly notched at the apex, covered with dense yellowish pubescence beneath, and a tuft of long black hairs above. Outer forceps shorter, shining black and thickly covered with hairs. Penis and claspers short and blunt. Fifth sternite deeply and widely cleft, without any special modifications.

Legs black, basal joints yellowish. Middle tibiae with three or four bristles on the outer front side, hind tibiae ciliate. Claws and pulvilli short.

Wings normal, infuscated along the veins and toward the costa. Third vein bristly half-way to small cross-vein, all others bare. Apical cell open, ending far before tip of wing. Fourth vein strongly arcuate beyond bend, without stump or fold. Calypteres white. Total length 9-12 mm.

♀. Similar to male, differing principally in having second antennal joint equal to about one-half length of third.

*Type*, male, deposited in the United States National Museum, Washington, D. C. Described from a long series of both sexes, collected at College Station, Texas. (H. J. Reinhard.)

In relationship this species is probably nearest to *angusta* Macquart, which in Aldrich's catalogue is listed as a synonym of *pallens* Wiedemann, described from Brazil. The genitalic characters will best serve to separate the species from its congeners in our fauna.

**Polyommatus filenus Poey (Lepid. : Lycaenidae).**

By WILLIAM C. WOOD, New York City.

In February, 1920, I took, at Jupiter, Florida, two specimens, a male and a female, of a small "blue," which for a long time I assumed to be the very common *Hemiargus hanno* Stoll. But the very different "facies" of these specimens finally suggested that they are something else, and an examination of Poey's original figures and description, which I was recently enabled to make through the kindness of Mr. Watson, seems to prove conclusively that they are the insect described by Poey as *Polyommatus filenus*. Poey's description, in Cent. Lep. Cuba, 1832 (Pl. 2), is as follows:

"*Polyommatus filenus*. The wings of the male, on the upper side, are a brilliant blue with brown border; those of the female brown, with the base blue; on the under side they are grey, with brown markings ('lignes') bordered with white; the inferiors have three black dots towards the base, and three ocellated spots, with brilliant blue pupils, near the anal angle; the outer one with tawny ('fauve') margin. The fringe is white."

My specimens agree closely with this very brief description, except that only one of the three "ocellated" spots on the under side of the hind wings has a noticeable blue pupil, and that the basal area of the fore wings in the female is grey, not blue. They resemble the figures in general aspect very closely. While the whole appearance is different from that of *hanno* Stoll, certain points of difference may be noted, as follows: First, as to color. The male of *hanno* is of a delicate violet blue, much like that of *comyntas*, while *filenus* is of a shining, silvery, almost metallic blue. The dark margins of the wings in *hanno* are very narrow and of uniform width throughout, while in *filenus* they are nowhere less than 1.5 mm. wide. The tips of the fore wings are heavily shaded, and the dark color extends along the costal margin nearly half-way to the base of the wing. The costal margin of the hind wings is heavily shaded from base to outer angle. Within the outer margin of the hind wings is a row of round dark spots of the same color as the marginal shading and touching it, giving the effect of dentation

inwardly. On the under side *hanno* and *filenus* are very similar. In *filenus* the three white-encircled black dots near base and costal margin of secondaries are larger and blacker than in *hanno*. The discal band of whitish spots crossing both wings is in *filenus* narrower than in *hanno*, and more distinctly bent downwards before ending at the anal angle. The submarginal row of brownish spots is much the same in both species.

In the female, *filenus* has the central area of the fore wings dark grey; of the hind wings deep metallic blue. The heavily shaded tip and costa of the fore wing, the shaded costa and the submarginal spots of the hind wing follow the pattern of the male, but the whole tone is dark and more obscure. On the under side the post-discal band of whitish spots is conspicuous and brilliant, and attains the costal margin of the fore wings, not becoming fainter costad as it does in *hanno*. On the hind wings this band is strongly angled at vein L R, wherein it differs greatly from *hanno*. Expanse of both sexes 21 mm.

The history of *hanno* Stoll, and of *filenus* Poey, may be briefly sketched as follows: (The order followed is from Skinner's Synonymic Catalogue, 1898).

*Hanno* Stoll, Suppl. Cram. 1791. The description is somewhat vague, and the figures (t. 39. f. 2, 2B) crude, but they can reasonably be considered to describe what is now called *hanno*. Habitat is given as Surinam and the Cape of Good Hope.

*Antibubastus* Hub., Zutr. Exot. Schmett., 1818. The figure of the upper side might be *hanno*, but that of the under side is very crude, and lacks the prominent spot near the anal angle of the secondaries which is the most striking feature of *hanno*. "From Georgia in Florida!"

*Hamo* Lucas., Sagra Hist. Nat. Cuba, 1856. The description of the male (p. 612) fits *hanno* pretty closely. That of the female would better apply to *filenus* Poey.

*Pseudoptiletus* Bdl.-Lec., Lepid. Am., Sept., 1833. The figures (t. 35) seem to me distinctly recognizable as *filenus* Poey.

(Dr. Barnes, in the "Contributions," Vol. III, No. 2, 1916, p. 108, states that the species here figured is certainly our Floridan one. I have seen these figures and cannot agree that they

represent *hanno*. They do resemble Poey's figures of *filenus* Poey.)

*Astenidas* Bdl., MSS. Lucas Sagra Hist. Nat. Cuba, 1856. The description of the male might pretty well be of *filenus*. That of the female is not recognizable to me, as mention is made of spots on the upper side of the wings.

*Filenus* Poey, Centuria Lepidop. Cuba, 1832. (Description repeated in full supra.)

The other references to *filenus* Poey are as follows:

Boisduval and Leconte, Lepid. Am., Sept., 1833. As mentioned above under *pseudoptiletes* the descriptions and figures are without doubt of *filenus* Poey.

Check List, Brooklyn Ent. Soc., 1882, p. 4. The name *filenus* is used to connote *hanno*.

Edwards, Catalogue of North American Lepidoptera, 1884, p. 65, name *filenus* is here used to connote *hanno*.

Aaron, Papilio, 1885 (p. 4). *Lycaena antibubastus*—Synonyms, *Lycaena filenus* and *Rusticus adolescens hanno* Hub.

French, Butterflies of the Eastern United States, 1886 (p. 294). *Lycaena filenus* Poey. His description of the male is plainly that of *hanno*. Of the female it is hard to say what is described, since he speaks of "the middle area of the basal half of both wings" as "washed with blue." Some females of *hanno* Stoll have this area shot with green dashes, and my specimen of *filenus* Poey ♀ has a blue central field on the secondaries only.

There seems to me to be no doubt that *filenus* Poey is a valid species, entirely distinct from *hanno* Stoll. It is probably rare in Cuba, as it certainly is in Florida. Otherwise its striking difference from *hanno* would surely have prevented the confusion which has, since 1884, sunk it into the synonymy of *hanno* Stoll.

I wish to record my indebtedness to Mr. Frank E. Watson, of the American Museum of Natural History, for his assistance, particularly with the literature referred to, and to my friend, Dr. Charles T. Ramsden, of Guantanamo, Cuba, for a series of *hanno* which he very kindly collected for me, for comparison with our native form, with which it agrees closely.

### Ratios between the Food Habits of Insects.

By HARRY B. WEISS, New Brunswick, New Jersey.

In the *Ohio Journal of Science* for March, 1924 (Vol. XXIV, No. 2, pp. 100-106) under the title "Insect Food Habits and Vegetation," the suggestion was made that when large areas embracing different types of vegetation are considered *in toto* and that when the numerical ratios between the insect species and the factors tending to reduce their numbers are considered as constant or at the most fluctuating within limits which do not allow of any serious disturbance of the natural balance, the ratios between the various types of food habits are approximately identical or vary but little in all such areas. This was based on a tabulation of the food habits of some 10,500 species listed from New Jersey and 400 species from different parts of the Western Arctic Coast of America as collected and reported by the Canadian Arctic Expedition. Since the publication of this paper, the insects of Connecticut, as listed by Dr. W. E. Britton (Bull. 31, Geol. & Nat. Hist. Survey of Conn.), have been tabulated in accordance with their food habits and the results of all three tabulations are shown in the following table.

	Number of Species	Phyto- phagous %	Sapro- phagous %	Harpacto- phagous %	Pollen Feeders, Para- sitic %	Misc. Species %
Western Arctic Coast of No. A.	400	47	27	14	10	2
State of N. J.	10,500	49	19	16	12	4
State of Conn.	6,781	52	19	16	10	3

The percentages shown in the table are strikingly similar and appear to bear out the suggestion made above concerning a fixed relation. The fact that the percentages for the Western Arctic Coast of North America based on 400 species are similar to those of New Jersey and Connecticut which are based on much larger numbers indicates that a representative sample was collected by the expedition. The 10,500 species listed from New Jersey tending as they do to represent the total number of species in that state can be considered as a more or less complete

count. The same thing can be said probably of the 6,781 species listed from Connecticut. Although I have no first-hand information, it is my impression that for many years, collections have been made in all orders in Connecticut with a view towards listing all of the species found there. Of course the term "complete count" is used relatively and numerous future additions, as for example in the parasitic Hymenoptera, would change the ratios.

The 400 species from the Western Arctic Coast of North America can be considered as a representative sample or a part from which it might be safe to draw conclusions as to the whole, in view of their similarity to New Jersey and Connecticut in the types of food habit percentages. The principle upon which such a conclusion is based is known as the law of statistical regularity, "that a moderately large number of items chosen at random from among a very large group are almost sure, on the average, to have the characteristics of the larger group." This does not imply a perfect resemblance between the sample and the large group. The statement that the 400 species referred to can be considered as representative is supported somewhat by the account of Dr. C. Gordon Hewitt, in the Report of the Canadian Arctic Expedition (1913-1918, Vol. III, Insects, Introduction), who wrote that the "collection of insects brought back by the expedition was a very representative one." If the insects were collected at random or an effort made to collect samples of everything in certain areas, which is its equivalent in deliberate selection, and no effort made to concentrate on some groups at the expense of others, then the sample may be said to be truly representative.

An effort was made to tabulate the insects from other areas, where it appeared that an attempt had been made to list all species, in order to determine if the types of food habit relationships were identical with those shown in the table. This was not successful, mainly because what appeared to be a complete count was found to be incomplete and what appeared to be a representative sample was found to be exactly the opposite. For example, in the list of the insects of Norway (*Enumeratio In-*

sectorum Norvegicorum, 1874-1880) by H. Siebke, which at first glance seemed promising, it was found that the parasitic Hymenoptera were missing. The list of the insects collected by the Harriman Alaska Expedition also appeared at first to fill the requirements of a truly representative sample, but it was found that some of the specialists, instead of confining their papers to the insects actually collected by the expedition, had augmented their lists by the inclusion of all known species in certain groups from Alaska. Although this practice resulted in a better picture of such groups, it destroyed the value of the list as a representative sample.

The recent list of the insects of Porto Rico (*Insecta Portoricenses*, Jour. Dept. Agric. Porto Rico, Vol. VII, No. 1) by George N. Wolcott, containing some 2200 species seemed to offer tabulation possibilities, but this list is, according to the author, "an attempt to summarize the records in literature of the occurrence of the insects in Porto Rico, together with the records of the collections at the two experiment stations" and some preliminary tabulation work indicated that the records of economic insects were perhaps comparatively more numerous than those of non-economic species, and this impaired the value of the list for my purpose, as it could not be considered either as a complete count or a truly representative sample.

The same objections applied to several other lists when an attempt was made to use them.

It should be understood that the apparent fixed relationships of food habit types as indicated in the table do not apply to relatively small areas where the types of vegetation are uniform. Here, the ratios between the various types of food habits (based on the species present, with the numerical ratios between the species and the factors tending to reduce their numbers considered as approximately constant) appear to vary in accordance with the type of vegetation. The questions of numerical abundance, etc., have been discussed in the paper referred to at the beginning of this article and need not be repeated here.

## A New Species of *Psammophila* Dahlbom and the Allotype of *Psammophila valida* Cresson (Hymen.).\*

By WALTER CARTER, Division of Entomology,  
University of Minnesota.

### *Psammophila valida* Cresson.

♂. Robust. Length 22 mm. Abdomen mostly red. Wings hyaline.

Head broad. Inner margins of eye slightly convergent at base of clypeus. Clypeus projecting over the mandibles, its apical edge free; anterior margin with a slight median notch; a line of distinct but irregular punctures around margin of clypeus, remainder finely granulate; clothed with appressed silvery pubescence mixed with dark hair which becomes silvery apically. Front, vertex, occiput and cheeks also pubescent, in addition rather thickly clothed with erect hair which is dark at base and pale apically. Front, vertex, occiput and cheeks sparsely but distinctly punctured.

Thorax covered with long erect white hair. Sides of prothorax striate posteriorly. Pronotum sparsely but distinctly punctured; sericeous. Mesonotum with fairly close distinct punctures; sericeous; a median impressed line extends to middle of disk. Pleura closely and deeply punctured, except mesepimeron which is rugose. Scutellum sparsely punctate. Mesonotum striato-punctate. Sides and posterior face of propodeum striato-punctate; disk rugosely striate, with a distinct raised median line which is much more evident anteriorly than on the posterior half.

Petiole with a few rather deep punctures at base; a few slight punctures to about the middle of petiole. Ventrally over the entire length of the petiole is scattered long whitish hair; dorsally only in the region of deep punctuation; sericeous, black.

Abdomen sericeous; red ventrally except apical sternite, the first segment is mostly red but dorsally there is scattered black. The second, third, and part of the fourth abdominal segments are red; apical dorsal abdominal segments black.

Wing nervures testaceous, stigma reddish brown, tegulae sericeous.

Legs black, pollinose. Hind coxae not extending beyond the petiole. A short blunt tooth on the inner margins of the fore coxae.

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\*Published with the approval of the Director, as Paper No. 492 of the Journal series of the Minnesota Agricultural Experiment Station.

*Allotype*, Lethbridge, Alberta, August 6th, 1923 (H. L. Seamans). Deposited in the Canadian National Museum, Ottawa. Six other specimens collected at the same time and place (H. L. Seamans and Walter Carter). One from Brooks, Alberta, July 27th, 1923. (H. L. S.).

One of these specimens has the second cubital cross vein of the right wing forked, making a small extra cell. There are also slight differences in the anterior margin of the clypeus between the specimens, some being more irregular than the allotype.

***Psammophila nicholi* nov. sp.**

♀. Slender. Length 17 mm. Distinctive because of its bright red legs and shining red abdomen. Body hairs white.

Head broad, shining. Clypeus convex, truncate, the truncation laterally with a distinct tooth; deeply punctured. Clypeus at sides and basally silvery pubescent. Front silvery pubescent. Front, vertex, occiput and cheeks with fine sparse shallow punctures. A small triangular area in front of fore ocellus impunctate. A distinct median impressed line from between antennae to fore ocellus. Antennal joints distinctly granulose (under high power, appear punctate). Scape pubescent, the pubescence intermixed with long erect white hair. Long erect white hair covers thorax, except dorsally, posterior to the pronotum; there, the hair is sparse, scattered and short.

Prothorax very finely and sparsely punctured; shining. Sides of prothorax with a few striae. Prothoracic lobes fringed with short white hair. Mesonotum shining, punctures distinct and well separated. Mesopleura rugoso-punctate. Scutellum shining; striated on posterior half, sparsely punctured anteriorly. Metanotum sparsely punctured; shining. Sides of propodeum rugose. Disk of propodeum striate, the striations oblique anteriorly and transverse posteriorly. A raised median line which is more distinct anteriorly, connects the striae. Postero-lateral angles of propodeum with sparse, appressed pubescence. Petiole black; a few scattered long white hairs at base; sparsely punctured at base.

Abdomen entirely red, shining.

Wings hyaline, nervures brown, stigma reddish brown.

Legs: Anterior coxae and trochanters with long white hair. On anterior tibiae this hair is pale golden. Tooth on interior margins of fore coxae digitiform. Legs, except coxae, line on anterior trochanters, middle trochanters partly, and most of hind trochanters, red.



# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., DECEMBER, 1924.

**George H. Horn and Ezra T. Cresson.**

The covers of the monthly issues of the NEWS for 1924 have borne the portrait of Dr. George H. Horn, one of the first Advisory Committee of this journal, from its establishment in 1890 until his death on November 24, 1897. On July 23, 1860, when a few months past his twentieth birthday, he became a member of the Entomological Society of Philadelphia, which had been organized February 22, 1859, by Ezra T. Cresson, James Ridings and George Newman. Horn, regarded as our second greatest American Coleopterist, ranking next to John Lawrence LeConte, was president of the American Entomological Society (the new name assumed by the Philadelphia Society in 1867) from 1866 to 1868 and again from 1883 to 1897.

George Henry Horn has been dead for twenty-seven years. Ezra Townsend Cresson, with whom Horn thus early became associated, was Horn's senior by nearly two years. On October 20, 1924, Ezra T. Cresson wrote this letter in that same clear and steady long hand which the older, and some of the younger, entomologists know well:

To the Members of The American Entomological Society.  
Dear Associates:

For fifty years I have had the honor of serving the Society as Treasurer. I have endeavored to fulfill this trust to the best of my ability, and now feel that this responsibility should be shouldered by another, especially as it has become impossible for me to give your accounts the attention they need. It is, therefore, with deep regret that I hereby beg leave to resign the Treasurership. On the other hand, I wish to express my sincere appreciation of the kind and thoughtful consideration which the Officers and Members of the Society have always tendered me.

Respectfully,

E. T. CRESSON.

"For fifty years!" The face of all the world is changed since 1874. And on December 8, 1913, "Mr. Ezra T. Cresson resigned the chairmanship of the Publication Committee of the Society, after having been a member of this body for more than fifty-two years, and for the greater part of this time its chairman." This and more is in the NEWS for April, 1914, and the Society "put on record its deep sense of obligation for this splendid achievement of our honored and esteemed member."

So for sixty-three years this patient, kind, mild-spoken man set up the type or read the proof of our *Transactions*, or kept the accounts and paid the bills of our Society, and much of the time did all these things—in the evenings when the ordinary day's work was done, or in such intervals of daylight when a little time could be snatched for the purpose—all voluntarily, unpaid, save in that esteem and love which his fellow enthusiasts and associates felt for him and will feel for him as long as their memories can hold the image of his life and personality.

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## Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE

### The Last Molt in *Lethocerus americanus* Say.

Hungerford in his *Biology of Waterbugs\** brings together what very little has been observed about these gigantic predaceous insects. Before 1906 I had seen the last molt in *Lethocerus americanus*, and as nothing seems to be available about this form my notes follow as made on the spot.

The nymphal skin splits lengthways along the prothorax, which is the first part of the mature insect to emerge. This slit gradually widens and the point of the scutellum comes out. By gradual heaving movements, the insect draws itself out of its skin. The color of the prothorax at this point is honey-yellow with two deeper longitudinal stripes.

The hemielytra as usual emerge folded up into a small compass and expand gradually as the insect draws them out of their sheaths. Before the wings expand, the pulsation of the dorsal vessel is visible through the dorsum. The wings proper (the second pair) are bluish-white when freshly expanded; the hemielytra yellowish-green.

\*Kans. Univ. Science Bulletin, XI, (Whole series XXI, No. 17), pp. 148-151, Dec. 1919. (Appeared in 1920.)

The caudal appendages are extruded and seem to be employed in pushing the bug out of its skin. At any rate, at such times as the insect strains to get out, they have an in-and-out-motion. The legs are closely drawn up against the body; the tarsi are closely appressed against the sides; and the fore-tibae folded on the femora. It separates the limbs from the body by heaving motions.

The nymphal tracheal linings are left as a tangle of white threads at the opening through which the bug emerged.

The duration of this molt was 17 minutes, during which the insect floats back up.—J. R. DE LA TORRE BUENO, White Plains, New York.

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#### U. S. Records of *Pholisora ascalaphus* Staud., (Lepid., HesperIIDae).

Skinner and Williams (1922), 1923, Trans. Am. Ent. Soc., XLVIII, 298, state that the Academy of Natural Sciences, Philadelphia, possesses a small series of old specimens of this species from near Corpus Christi, Texas, a new U. S. record, the specimens having been previously confused with *P. hayhurstii* (Edw.).

Examination of the Barnes collection series standing as *hayhurstii* revealed ten specimens of *ascalaphus*, as determined by Godman and Salvin and Skinner and Williams, from San Benito, Brownsville, San Antonio, and Houston, Texas.

Specimens from Kerrville and Black Jack Springs, Texas, appear referable to normal *hayhurstii*, which we also possess from Missouri, Kentucky, Tennessee, Illinois and Florida.

As intimated by Skinner and Williams, the genitalia are the best characters on which to sort *ascalaphus* from *hayhurstii*. Aside from the genitalia, the characters given by Godman and Salvin, (Biol. Centr.-Amer. Lep., Rhop., II, 432) do not seem to hold. We note a greater difference between the sexes of *ascalaphus* than those of *hayhurstii*, the males averaging much darker, the females more contrasting.

WM. BARNES and F. H. BENJAMIN, Decatur, Illinois.

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#### An Interesting Parasite of a Praying Mantid (Dip., Orth.).

A female praying mantid, *Stagmomantis carolina* Johannson, was collected on a Yankee Weed (*Eupatorium capillifolium* Small) near Baton Rouge, Louisiana, Oct. 27, 1922. The day was cold, and the insect appeared affected by the low tempera-

ture and was supporting itself mainly by grasping the plant with its raptorial prothoracic legs. The abdomen was distended as if filled with eggs, but this seemed peculiar since practically all female mantids collected at this time had deposited their eggs. The mantid was placed in a wire cage with a branch of Yankee Weed.

The following morning the mantid was in the same place and in practically the same position as when placed in cage. It was then taken out of the cage and placed on a white-topped table in sunlight. The head and prothoracic legs moved as if insect were reviving. Watching it closely, it was noted that something was moving in the prothorax, and when the insect was held up to the light one could make out what appeared to be a maggot making its way back and forth in the tube-like prothorax.

In the afternoon the parasitized mantid was again inspected, and the head and legs seemed to move as if by muscular action. When it was held up to the light again it was noted that the internal structures had been eaten out of the head, prothorax, and from as far into the legs as the maggots could make their way. The movement of the legs was due to the maggots passing the joints, and when a maggot would crawl into the head it, too, would move. It was this movement of the head which caused the observer to think that the mantid was going to revive when placed in the direct sunlight.

The distended condition of the abdomen appeared to be that of a normally developed gravid female; so it appears that the parasitic maggots ate the ovaries and eggs.

At 4 P. M. the mantid was placed in a glass dish on damp sand, and covered.

On the morning of the 29th (8 A. M.) the body except legs, wings, and part of the prothorax had changed to a brownish black color. Ten maggots emerged from the body of the mantid at 9.30 A. M., coming out of the abdomen through an opening in the thin chitinous wall between two segments. In ten minutes all the maggots had entered the sand.

The maggots were examined from time to time during the winter months, and as late as May 15, 1923, none had pupated.

On July 11, 1923, three adult flies emerged and by July 16, 1923, seven more had emerged.

The flies were identified by Dr. J. M. Aldrich as *Sarcophaga flavipes* Aldrich. Since he does not record a host for this Sarcophagid in his monograph on the "Sarcophaga and Allies," the above may be a new record.—O. W. ROSEWALL, Louisiana State University, Baton Rouge, La.

### Diptera of the Older Authors Studied By American Entomologists.

Dr. Aldrich has been receiving for examination some types of Diptera of the older authors from the Vienna Museum in Austria. The fourth lot of these types has just been received and is being examined. The first two lots have been reported on in the *Annals of the Entomological Society of America*. Among the specimens received in these various lots are several which were collected about 100 years ago, and which formed a part of the collection of von Winthem, in Hamburg, where they were studied and described by the dipterist Wiedemann. In spite of their age, most of these specimens are well preserved. It appears that, as far as known, several of the species, including some very striking forms, have never been captured since that time, and are even yet represented only by the single original specimens. The privilege of borrowing these types is very highly appreciated. (Monthly Letter of the Bureau of Entomology, U. S. Dept. of Agric., No. 124.)

Apropos of the above it may be stated that Mr. Cresson, of the Academy of Natural Science of Philadelphia, has also been a recipient of the generosity of the Vienna Museum, by the loan of its entire collection of the dipterous family Ephydriidae for study. The collection has been received in perfect condition and these microdiptera of the von Winthem collection are still in excellent preservation.

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### Committee on General Entomological Terms.

At the Cincinnati meeting the Entomological Society of America appointed a standing committee "to recommend for adoption by the Society a preferred usage respecting such general terms as appear to be current in conflicting and confusing forms." It will probably be agreed that we ought to have some uniformity in regard to the usage of such terms as brood, generation, larva, nymph, incomplete, gradual or simple metamorphosis, correct singular and plural forms of exuviae and a host of others that are continuously used in conflicting or confusing ways. It is believed that a good purpose would be served by a full discussion of these terms, and if possible, an agreement by all members of the society to follow some one usage for certain ones of them. All who are interested are urged to transmit their suggestions at once to one of the members of the following committee: E. M. Walker, Chairman, University of Toronto, Ontario; G. C. Crampton; W. M. Wheeler; A. L. Melander; and A. L. Quaintance.

### A Natural Freak (Coleop.: Coccinellidae).

A lady bug, or lady beetle, pierced by a pine needle, would seem nearly impossible under natural conditions, yet just such a specimen was sent to the State Entomologist of New York accompanied by the statement that the insect was alive when found and the needle attached to the twig. Moreover, this was on the top of an Adirondack Mountain near a cliff, remote from habitations, consequently this odd condition could not have been the work of children. An examination of the specimen showed that it had been neatly pierced by the pine needle, a portion, approximately one-quarter of an inch long, protruding from the under surface. There was no crushing or mangling, as would have been probable if the insect had been thrust upon the pine needle by a shrike. The neat entrance and exit of the needle and the color of the beetle showed that it had recently transformed. The probabilities are that the branch, swinging in the wind at the time the beetle was just issuing from the pupa, drove the somewhat old and stiff pine needle through the soft, developing insect and lifted it from an adjacent support. It is one of the curious accidents which might easily happen and generally escapes notice. A beetle transfixed in this manner might easily live several hours and possibly a day or two.

We have seen nothing of the kind before in spite of some thirty years' study of insect life. The victim of this odd accident was a fifteen-spotted lady beetle, *Anatis 15-punctata* Oliv.

E. P. FELT, Albany, New York.

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### Junior Scientific Aid (Entomology).

The United States Civil Service Commission announces the following open competitive examination:

An examination for junior scientific aid (entomology) will be held throughout the country on January 7, 1925. It is to fill vacancies in the Bureau of Entomology, Department of Agriculture, at an entrance salary of \$1,320 a year. Advancement in pay may be made without change in assignment up to \$1,680 a year. The duties of the position include scouting, inspection, assisting in the application of insecticides, and general field laboratory work. Competitors will be rated on technical questions, and education and experience. Full information and application blanks may be obtained from the United States Civil Service Commission, Washington, D. C., or the secretary of the board of U. S. civil-service examiners at the post office or custom house in any city.

✓ Note on *Megachile centuncularis* (L.) Latr. (Hymen.: Megachilidae).

In Smith's Brit. Mus. Cat. Hym. 1, 149, this bee is credited to North America, Hudson's Bay and Canada. In Dalla Torre's Catalogus Hymenopterorum 10: 423-5, Putnam, Packard, Gentry and Provancher are cited as American references. In Trans. Acad. Sci. St. Louis 7: 351, 1897, I have indicated *M. infragilis* as the male of *M. relativa*, described on the page preceding the former. In 1905 I received from Alfken a pair of *M. centuncularis* and since then have regarded *M. relativa* as the same. This species, cited as the type of *Anthemois*, is probably the type of *Megachile*, and to my way of thinking is the only local species belonging to that genus.—CHARLES ROBERTSON, Carlinville, Illinois.

## 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.

Papers of systematic nature will be found in the paragraph at the end of their respective orders. Those containing descriptions of new genera and species occurring north of Mexico are preceded by an \*.

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. 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. 15—Insecutor Inscitiae Menstruus, Washington, D. C. 19—Bulletin of the Brooklyn Entomological Society. 20—Bulletin de la Societe Entomologique de France, Paris. 21—The Entomologist's Record, London. 35—Proceedings of the South London Entomological and Natural History Society, London. 45—Zeitschrift fur wissenschaftliche Insektenbiologie, Berlin. 47—Neue Beitrage zur Systematischen Insektenkunde. Ed. by G. P. Hummler, Voslau. 50—Proceedings of the United States National Museum. 52—Zoologischer Anzeiger, Leipzig. 57—Biologisches Zentralblatt, Leipzig. 68—Science, Garrison-on-the-Hudson,

N. Y. 69—Comptes Rendus des Seances de l'Academie des Sciences, Paris. 70—Journal of Morphology, Philadelphia. 89—Zoologische Jahrbucher, Jena. 91—The Scientific Monthly, Lancaster, Pa. 99—Bulletin du Museum National d'Histoire Naturelle, Paris. 106—Anales de la Sociedad Cientifica Argentina, Buenos Aires. 111—Archiv fur Naturgeschichte, Berlin. 114—Entomologische Rundschau, Stuttgart. 116—Entomologische Zeitschrift, Frankfurt a. M. 124—Bulletin de la Societe Entomologique d'Egypte, Cairo. 128—Zeitschrift fur Induktive Abstammungs und Vererbungslehre, Leipzig.

**GENERAL.** Agersborg and Metcalf.—A proposed biographical entomological dictionary. 68, lx, 431. Becquaert, J.—Galls that secrete honeydew. 19, xix, 101-34. Davis, J. J.—Principles of insect control. 4, lvi, 203-6. Lenz, F.—Zur klarung der rassenfrage in der entomologie. (Mitt. Munch. Ent. Ges., 1923, 41-54.) Lutz, A.—A new method of enclosing and preserving small objects for microscopic examination. (A Folha Medica, i, No. 3, 14 pp.) Lutz, A.—Contribution aux methodes d'observations microscopiques et biologiques. (Ann. Biol. Lacustre, xi, 90-102.) Morstatt, H.—Bibliographie der pflanzenschutzliteratur. Das jahr., 1923. (Biol. Reichsan. f. Land-u. Forstw., Berlin, 176 pp.) Prell, H.—Ueber schutzrachten und mimikry 45, xviii, 336-45. Riley, N. D.—Age and area and some Rhopalocera. 35, 1923, 77-90. Root, F. M.—Parasitism among the insects. 91, xix, 479-95. Scholz, R.—Zum präparieren kleiner kaefer. 124, iv, 110-12. Cont. Sherborn, C. D.—Index animalium . . ., 1801-1850, Pt., 4, Bail-Byzos. Turner, H. J.—Nomenclature—1924. 21, xxxvi, 111-14.

**ANATOMY, PHYSIOLOGY, MEDICAL, ETC.** Bathellier, J.—Sur le developpement de Macrotermes gilvus, compare a celui de l'Eutermes matangensis. 69, clxxxix, 609-12. v. d. Brelje, R.—Die anhangsorgane des weiblichen geschlechtsganges der stechmucken. 52, lxi, 73-80. Cros, A.—Emission d'un spermatophore par divers coleopteres. (Bul. Soc. Sc. Nat. Maroc, iv, 98-103.) Dewitz, J.—Experimentelle untersuchungen uber die verwandlung der insektenlarven. 89, xli, Allg. Zool., 245-334. Dobzhansky, T.—Beitrage zur kenntnis des weiblichen geschlechtsapparates der coccinelliden. 45, xix, 98-100. Goldschmidt, R.—Erblichkeitsstudien an schmetterlingen IV. Weitere untersuchungen uber die vererbung des melanismus. 128, xxxiv, 229-44. Hering, M.—Der kopulationsapparat der schmetter-

linge. (Der Naturforscher, 1924, 254-66.) **Huettner, A. F.**—Maturation and fertilization in *Drosophila melanogaster*. 70, xxxix, 249-66. **Kastner, A.**—Beitrage zur kenntnis der lokomotion der Arachniden. I. Araneae. 111, 1924, A, 5, 1-19. **Meissner, O.**—*Paralipomena dixippica*. 116, xxxviii, 33-34. **Muttkowski, R. A.**—Studies on the blood of insects. III. The coagulation and clotting of insect blood. 19, xix, 128-44. **Oertel, R.**—Biologische studien uber *Carabus granulatus*. 89, xlviii, Syst., 299-366. **Rethfeldt, C.**—Die viviparitat bei *Chrysomela varians*. 89, Anat., xlvi, 245-302. **Ruschkamp, F.**—Instinktmodifikation in einer ameisenadoptionskolonie. 45, xix, 176-8. **Schulze, R.**—Uber mycetophilidenlarven. 89, xlviii, 433-62. **Schwartz, W.**—Untersuchungen uber die pilzsymbiose der schildlaus. 57, xlv, 487-528. **Stadler, H.**—Blutkiemen bei einer kocherbauenden Trichopterenlarve (*Lasiocephala basalis*). (Arch. f. Hydrobiol., xv, 250-2.) **Whiting, P. W.**—Defective and freak venation in the parasitic wasp, *Habrobracon juglandis*. (Univ. Iowa Studies, iii, 1-80.) **Wille, J.**—Die verschiedenen bewegungsarten des Rhipipteryx chopardi. 52, lxi, 49-72. **Wixforth, E.**—Der herzschlag der culicidenlarven unter natuerlichen und kunstlichen bedingungen. 111, 1924, A, 5, 193-240.

**ARACHNIDA AND MYRIOPODA.** **Gerhardt, U.**—Weitere studien uber die biologie der spinnen. 111, 1924, A, 5, 84-192.

\***Bishop, S. C.**—A revision of the Pisauridae of the U. S. (New York Sta. Mus. Bul., No. 252, 140 pp.) \***Crosby and Bishop**—Notes in the Opiliones of the southeastern U. S., with descriptions of n. sps. (Jour. Elisha Mitchell Sci. Soc., xl, 8-26.)

**THE SMALLER ORDERS OF INSECTA.** **Ewing, H. E.**—Lice from human mummies. 68, lx, 389-90. **Gotz, H. J.**—Zur nomenklatur der gattung *Aeshna*. (Mitt. Munchn. Ent. Ges., 1923, 37-39.)

**Handschin, E.**—Neue myrmecophile und termitophile Collembolenformen aus Sud-Amerika. 47, iii, 13-28. **Longinus Navas, R. P.**—Insecta nova. Ephemeroptera, Paraneuroptera, Plecoptera. (Mem. Pont. Accad. Roma. Nuov. Lincei, vi, 1-27.) \***McDunnough, J.**—New N. Amer. Ephemeroptera. 4, lvi, 221-26. \***Snyder, T. E.**—A correction (in *Nasutitermes*). 10, xxvi, 196. **Williamson and Williamson.**—The genus *Perilestes* (Odonata). (Univ. Mich., Mus. Zool., Misc. Pub., No. 14.)

**ORTHOPTERA.** Hebard, M.—The group Scyllinae as found in N. Am., with records and data on its occurrence in the U. S. 2, 1, 157-62.

**HEMIPTERA.** Hoffman, W. E.—Winter food for waterbugs in aquaria. 19, xix, 149-50. Olsen, C. E.—Distributional notes on Hemiptera. (No. 2.) (Cicadellidae.) 19, xix, 151-2. Parshley, H. M.—A note on *Aradus debilis* (Aradidae). 19, xix, 145-6. Parshley, H. M.—General catalogue of the Hemiptera. 19, xix, 154. Torre-Bueno, J. R.—Biological note on *Plea striola*. 19, xix, 146.

Ball, E. D.—The correct names of the leafhoppers infesting the apple and potato. 12, xvii, 594-600. \*Barber, H. G.—The genus *Arhapha* in the U. S. (Pyrrhocoridae). 4, lvi, 227-8. Lallemand, V.—Notes sur les Cercopides de l'Amerique Centrale et Meridionale de la collection de C. B. Williams et de la mienne. 11, xiv, 477-86. Osborn, H.—Neotropical Homoptera of the Carnegie Museum. (An. Carnegie Mus., xv, 383-462.) \*Robinson, W.—A correction (in *Erythroneura*). 4, lvi, 220. \*de la Torre Bueno, J. R.—The Nearctic Rhagoveliae. 2, 1, 243-52.

**LEPIDOPTERA.** Busck, A.—The C. H. Fernald collection of lepidoptera. 10, xxvi, 198. Engelhardt, G. P.—Eastern records for *Tornos scolopacinarius*. Field notes on western clear wing moths (*Aegeriidae*). 19, xix, 124; 125-7. Preece, W. H. A.—Notes on the Sphingidae of Sault Ste. Marie, Ontario. (Can. Field-Nat., xxxviii, 132.) Snodgrass, R. E.—The tent caterpillar. (Smiths. Report, 1922, 329-62.)

\*Barnes and Benjamin.—The N. Am. and Greenland species of *Sympistis*. 4, lvi, 212-15. Dyar, H. G.—Note on the larva of *Thyris maculata*. 15, xii, 192-3. \*Heinrich, C.—North American Eucosminae, notes and n. sps. (Jour. Wash. Ac. Sci., xiv, 385-93.) Kohler, P.—Fauna argentina. Th. I, Rhopalocera, 34 pp. (Sonderb. Zeit. Wissens. Insektenb., xviii, Heft 12.) Le Cerf, F.—Lepidopteres nouveaux de la collection du Museum (Rhopalocera). 99, 1924, 137-39. \*Schaus, W.—A new moth of the subfamily Phycitinae. 10, xxvi, 196. Seydel, C.—*Lymanopoda excisa decorata*, subsp. nov. 47, iii, 32. Skinner and Williams.—On the male genitalia of the Hesperiidae of N. Am., Paper VI. 2, 1, 177-208. Stichel, H.—Beitrage zur kenntnis der Riodinidenfauna Sudamerika. 45, xviii, 305-16, xix, 160-61. Stichel, H.—Zur systematik der Riodinidae. 47, iii, 1-3.

**DIPTERA.** Schjelderup-Ebbe, T.—Aufmerksamkeit bei mücken und fliegen. 116, xxxviii, 31-2. Turner, C. L.—Breeding habits and mutations in the moth-fly (*Psychoda*). 68, ix, 338-9. Vaney, C.—L'hypoderme du boeuf (*Hypoderma bovis*), ses degats, son evolution, sa destruction. (Rev. Gen. Sci., Paris, xxxv, 544-52.)

Aldrich, J. M.—Notes on N. Am. Tachinidae. 15, xii, 145-9. Aldrich and Weber.—Change in preoccupied names. (Tachinidae.) 10, xxvi, 195. Bonne, C.—The larva of *Aedes* (*Ochlerotatus*) *eucephaleus* and *A. hortator*. 15, xii, 169-70. Cole, Malloch and McAtee.—District of Columbia diptera: Tromoptera (*Cyrtidae*, *Bombyliidae*, *Therevidae*, *Scenopinidae*). 10, xxvi, 181-94. \*Cresson, E. T., Jr.—Studies in the dipterous family *Ortaliidae*, with descriptions of n. sps., mostly from N. Am. 2, 1, 225-41. \*Curran, C. H.—Some apparently new Canadian *Psychodidae*. 4, lvi, 215-20. Dyar, H. G.—The male of *Anopheles vestipennis*, 171. Note on *Aedes aloponotum* and other species of its region, 176-9. The American forms of *Aedes cinereus*, 179-80. Notes on *Aedes ventrovittis*, 181-2. Some new mosquitoes from Colombia. II, 183-6. 15, xii, 171-86. \*Dyar and Shannon.—The American species of *Uranotaenia*, 187-92. Some new sps. of American *Dixa*, 193-201. The American *Chaborinae*, 201-16. 15, xii, 187-216. \*Dyar and Shannon.—The American species of *Thaumatidae* (*Orphnephilidae*). (Jour. Wash. Ac. Sc., xiv, 432-4.) \*Garrett, C. B. D.—On British Columbian *Mycetophilidae*. II. 15, xii, 159-69. Malloch, J. R.—Descriptions of Neotropical two-winged flies of the family *Drosophilidae*. 50, lxvi, Art. 3. \*Van Duzee, M. C.—A revision of the N. Am. species of the dipterous genus *Chrysotus*. (Bul. Buffalo Soc. Nat. Sci., xiii, No. 3, 1-53.)

**COLEOPTERA.** Davidson, W. M.—Observations and experiments on the dispersion of the convergent lady-beetle in California. 2, 1, 163-75. Hayes and McColloch.—The biology of *Anomala kansana* (*Scarabeidae*). 12, xvii, 589-94. Lane, M. C.—Simple method of rearing wireworms (*Elateridae*). 12, xvii, 578-82. Shepherd, D.—Life history and biology of *Echocerus cornutus*. 12, xvii, 572-7. Verhoeff, K. W.—Zur biologie der *Lampyriden*. 45, xix, 79-88. Cont. Wichmann, H. E.—Ueber die geographische verbreitung der *lpiden*. 52, lxi, 14-18.

Achard, J.—Nouveaux *Chrysomelini* d'Amerique. 20, 1924, 133-6. Cotton, R. T.—A contribution towards the clas-

sification of the weevil larvae of the subfamily Calandrinae occurring in N. Am. 50, lxvi, Art. 5. **Hustache, A.**—Cuculionides de l'exploration Lizer-Deleteng au chaco bolivien. 106, xcvi, 267-84. **Portevin, G.**—Revision des Necrophorini du globe. 99, 1924, 83-7 (cont.). **Schaeffer, C.**—On *Casnonia picta* and *C. suturalis*. 19, xix, 147-8. **Zimmermann, A.**—Die Halipliden der welt. (Ent. Blatter, xx, 1-16. Cont.)

**HYMENOPTERA.** **Clausen, C. P.**—The parasites of *Pseudococcus maritimus* in California. Biological studies and life histories. (Univ. Cal., Tech. Bul., Ent., iii, 223-92.) **Criddle, N.**—Observations on the habits of *Sphex procerus* in Manitoba. (Can. Field-Nat., xxxviii, 121-3.) **Enslin, E.**—Ueber blatt-und holzwespen. 114, xli, 33-5. Cont. **Hayes, W. P.**—Two mutillids hyperparasitic on white grubs. (Scarabeidae). 19, xix, 153. **Herbst, P.**—Beitrage zur biologie der chilenischen arten der gattung *Centris*. 45, xviii, 345-50. **Lutz, F. E.**—Hunting stingless bees. (Natural Hist., N. Y., xxiv, 495-508.) **Reinhard, E. G.**—The life history and habits of the solitary wasp, *Philanthus gibbosus*. (An. Rep. Smiths. Inst., 1922, 362-76.) **Wasmann, E.**—Die larvenernahrung bei den ameisen und die theorie der trophallaxis. (Mem. Pont. Accad. Roma. Nuov. Lincei, vi, 67-87.)

\***Timberlake, P. H.**—The parasites of *Pseudococcus maritimus* in California. (Univ. Cal., Tech. Bul., Ent., iii, 223-92.)

### SPECIAL NOTICES

The *Macrolepidoptera of the World*, Fauna americana, Parts 151-152, English edition. The American Agaristidae are completed and the family Noctuidae is introduced.

## OBITUARY.

DR. CLARA SOUTHMAYD LUDLOW died in Washington, D. C., September 28, 1924. She was born at Easton, Pennsylvania, December 26, 1852, received the degree of B. S. in 1900, and of M. S. in 1901, from the Mississippi Agricultural College. In 1908 George Washington University gave her the degree of Ph.D., her thesis being on *The Mosquitoes of the Philippine Islands: The Distribution of Certain Species and Their Occurrence in Relation to the Incidence of Certain Diseases* (65 pages). Her earliest studies on the mosquitoes of these islands

appeared in the *Journal* of the New York Entomological Society for 1902 and 1903, and were continued in the *Canadian Entomologist* (1904, 1909) and *Psyche* (1911). Other papers on the Culicidae appeared in the *Canadian Entomologist* from 1904 to 1910, in *Psyche* from 1914 to 1920, and, in association with Dr. H. G. Dyar, in *Inscutor Inscitiae Menstruus* in 1921 and 1922. Her most extensive work was *Disease-bearing Mosquitoes of North and Central America, the West Indies and the Philippine Islands* (Bulletin No. 4, office of the Surgeon General, War Dept., Washington, 1914, 97 pages, 27 plates).

Dr. Ludlow was demonstrator of Histology and Embryology from 1907 to 1909, and instructor from 1909 to 1911, in George Washington University; lecturer on mosquitoes and disease, 1904 to 1910, anatomist 1916 to 1920 and entomologist from 1920 to her death, in the Army Medical Museum, Washington.

P. P. CALVERT.

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Professor WILLIAM ALBERT LOCY, head of the Department of Zoology at Northwestern University, Evanston, Illinois, died on October 11, 1924. He was born at Troy, Michigan, September 14, 1857, received the degrees of B. S. in 1881, of M. S. in 1884, and of honorary Sc. D. in 1906, from the University of Michigan, and of Ph. D. from the University of Chicago in 1895. He was professor of Biology at Lake Forest College from 1887 to 1889 and of Animal Morphology in the same institution from 1889 to 1896, in which latter year he went to Northwestern. In 1884 he published on the *Anatomy and Physiology of the Family Nepidae* (Hemiptera) in the *American Naturalist*, and in 1886 *Observations on the Development of Aglaena naevia* (Spider) in the *Bulletin* of the Museum of Comparative Zoology. His chief work, however, concerns the morphology and embryology of vertebrates. In later years he turned his attention to the history of zoology and his *Biology and Its Makers* (New York, Holt, 1908, third edition, 1915) and *Main Currents of Zoology* (same publisher, 1918) contain much of interest to the entomologist. He was president of the American Society of Zoologists in 1915.

P. P. CALVERT.

## INDEX TO VOLUME XXXV,

(\*denotes *new* genera, species or varieties)

ALDRICH, J. M. The muscoid genus <i>Genca</i> in North America .....	210
ALEXANDER, C. P. Undescribed crane-flies from Argentina. Part VIII. ....	61
Undescribed species of the genus <i>Tanyproctus</i> .....	289
BARNES & BENJAMIN. On the retention of ii or i in specific patronymic names .....	103
On the synonymy of <i>Polia nimbosa</i> .....	7
On the synonymy of <i>Prodenia eridania</i> .....	102
New species and forms of Lepidoptera (Heterocera)...	12
Note on <i>Phaedrotes piasus</i> .....	232
U. S. records of <i>Pholisora ascalphus</i> .....	370
BEARDSLEY, A. E., et al. A reply to Dr. Kinsey.....	186
BELL, E. L. An hermaphrodite hesperid.....	70
BENJAMIN, F. H. (See Barnes & Benjamin.)	
BISHOP, S. C. (See Crosby & Bishop.)	
BLATCHLEY, W. S. Some apparently new Heteroptera from Florida .....	85
BRIMLEY, C. S. Three supposed new species of <i>Ceraturgus</i> from North Carolina .....	8
BRITTON, W. E. Additions and corrections to the Hemiptera of Connecticut .....	367
BROMLEY, S. W. A new <i>Ophiogomphus</i> (Odonata Aeschnidae:) from Massachusetts (ill.) .....	343
CALVERT, P. P. The ages of some existing entomological journals (editorial) .....	216
Editorial: Manual of tree and shrub insects.....	342
Entomology at the convocation week meetings, December 27, 1923, to January 2, 1924 (editorial).....	66
Flying men and insects (editorial).....	101
George H. Horn and Ezra T. Cresson (editorial).....	368
Obituary: Clara Southmayd Ludlow, William Albert Locy .....	379

- Obituary: Charles Swinhoe; Canon Theodore Wood... 152
- Obituary: Louis A. Peringuey; Francis W. Cragg;  
Arthur H. Jones; Thomas N. Annandale; Herbert  
Campion ..... 262
- Obituary: Philippe Grouvelle; Jules Grouvelle; Edmond  
Bordage; Frederick Merrifield; David M. Castle.... 303
- Professor Jacques Loeb (editorial)..... 142
- Review: Nineteenth report, state entomologist of Minne-  
sota ..... 75
- Review: Report on certain arthropods of the Barbadoes-  
Antigua expedition ..... 75
- The supposed male of *Ophiogomphus howei* (Aeschni-  
dae) (ill.) ..... 345
- CAMPBELL, R. E. Notes on injurious southwestern Tene-  
brionidae ..... 1
- CARTER, W. A new species of *Psammophila* and the allo-  
type of *Psammophila valida*..... 365
- CHAMBERLIN, J. C. Preliminary note upon the pseudo-  
scorpions as a venomous order of the Arachnida..... 205
- CHAMBERLIN, R. V. A new leptodesmoid milliped from  
Nicaragua (ill.) ..... 174
- A new milliped of the genus *Orthomorpha*, immigrant  
from the Philippine islands (ill.) ..... 173
- CHAMBERLIN, W. J. Obituary: Arthur L. Lovett..... 263
- COCKERELL, T. D. A. A bee collecting trip to Chimney  
Rock, Wyoming ..... 347
- Fossil insects [Review: Handbuch der Entomologie,  
Lief. 5-7] ..... 28
- A new genus of bees from California..... 169
- COCKERELL & HARRIS. A new form of *Rhyrchites*..... 144
- COLE, F. R. Notes on Diptera of the syrphid genus *Sphe-  
gina* (ill.) ..... 39
- COOLIDGE, K. R. *Agraulis vanillae* on the Pacific Coast... 22
- The life history of *Brephidium exilis*..... 115
- Life history of *Heodes helloides*..... 306
- The life-history of *Mitoura loki*..... 199
- CRESSON, E. T., JR. Descriptions of new genera and species  
of the dipterous family Ephydridae. Paper VI. .... 159

Minutes of Entomological Section, Academy of Natural Sciences of Philadelphia (which see)	
CRESSON & REHN. Entomological literature. (See under General Subjects.)	
CROSBY & BISHOP. The genus <i>Cyptobunus</i> .....	104
CRUMB, S. E. Odors attractive to ovipositing mosquitoes.	242
CURRAN, C. H. New species of <i>Ernestia</i> and <i>Mericia</i> ....	245
On the identity of the genus <i>Ernestia</i> .....	214
EWING, H. E. Florida Proturans.....	44
FELT, E. P. A natural freak (Coccinellidae).....	373
FERRIS, G. F. The new world Nycteribiidae (ill.).....	191
A note on some Hippoboscidae.....	234
FORBES, W. T. M. The occurrence of nygmata in the wings of insecta holometobola (ill.) .....	230
FOX, C. L. A new lycaenid from the Pacific coast.....	140
FROST, S. W. Two little known leaf-miners of apple.....	132
GARMAN, H. Odonata from Kentucky.....	285
GARRISON, G. L. Rearing records of <i>Pollenia rudis</i> .....	135
GENTNER, L. G. Notes on North American Halticinae with descriptions of two new species and a new variety.....	164
GUNDER, J. D. Several new aberrant Lepidoptera from California (col. pl.) .....	153
HAYES & MCCOLLOCH. A new species of <i>Anomala</i> .....	138
HOFFMANN, W. A. <i>Stilobezzia mallochi</i> and <i>Atrichopogon gilva</i> .....	282
HOFFMAN, W. A. <i>Stilobezzia mallochi</i> and <i>Atrichopogon</i>	
HOLLAND, W. J. The occurrence of <i>Eurrhypara urticata</i> in Maine .....	293
HOOD, J. D. New Thysanoptera from the United States..	312
HOWARD, L. O. The bad collector (editorial).....	175
HULL, F. M. <i>Milesia</i> in North America.....	280
KINSEY, A. C. Review: MacGillivray's External insect anatomy .....	31
LACROIX, D. S. The occurrence of an important European parasite in North America.....	217
LENG, C. W. Obituary: Edwin A. Bischoff.....	114
LOTT, R. B. (See Weiss & Lott.)	
MCCOLLOCH, J. W. (See Hayes & McColloch.)	

- MALLOCH, J. R. A gynandromorph of *Odyneurus conformis* ..... 70  
 The American species of the drosophilid genus *Stegana*. 96  
 The North American species of the genus *Hoplogaster*.. 171  
 Two new Phoridae from the eastern United States.... 355
- MARTIN, J. O. Note on *Hydnobius matthewsii*..... 255  
 Studies in the genus *Mecas*..... 244
- MICKEL, C. E. An analysis of a bimodal variation in size of the parasite *Dasymutilla bioculata* (ill.)..... 236
- NAPIER, A. H. *Colias corytheme*—first recorded in Philadelphia, Pennsylvania ..... 176
- NEEDHAM, J. G. Entomological uses for yucca stems.... 19
- PARSHLEY, H. M. General catalogue of the Hemiptera... 292
- PATCH, E. M. Aphids with branched cornicles (ill.)..... 331
- REHN, J. A. G. (See Cresson & Rehn.)
- REINHARD, H. J. New muscoid diptera..... 269  
 A new southern tachinid fly..... 54  
 A new species of *Gonia* from Texas..... 357  
 Notes on Texas Sarcophagidae..... 127
- RILEY, W. A. Obituary: Alexander Dyer MacGillivray.. 224
- ROBERTSON, C. Color preference of bees..... 65  
 Note on *Megachile centuncularis*..... 374
- ROOT, F. M. Notes on dragonflies from Lee County, Georgia, with a description of *Enallagma dubium*, new species (ill.) ..... 317
- ROSEWALL, O. W. An interesting parasite of a praying mantid ..... 370
- RUDOLFS, W. Note on the mating of *Anopheles maculipennis* ..... 69
- SANDHOUSE, G. A. Description of a new species of *Osmia* 351
- SHANNON, R. C. *Muscina pascuorum* in Maryland..... 104
- SKINNER, H. Charles Oberthur (obituary) (ill.)..... 267  
 Duty on insects again (editorial)..... 256  
*Kloneus babyaga* (ill.) ..... 229  
 Loan of types (editorial)..... 22  
 Obituary: Nathaniel Charles Rothschild..... 76  
 Obituary: Philip Nell ..... 35  
 Review: Manual of tree and shrub insects..... 342

- SMITH, M. R. An annotated list of the ants of Mississippi,  
47, 77, 121  
A new species of ant from Kansas..... 250
- STRAND, E. Autobiographies of entomologists and arach-  
nologists wanted ..... 178
- TILLYARD, R. J. A unique resting place for a fossil insect 333
- TORRE BUENO, J. R., DE LA. Carbon tetrachloride for the  
entomologist (ill.) ..... 352  
Gaditanus, being additional words on Tingitidae..... 333  
The last moult in *Lethocerus americanus*..... 369
- TRIMBLE, F. M. The azalea leaf miner (ill.)..... 275
- TURNER, P. A. Review: External insect anatomy..... 111
- WEISS, H. B. *Corythucha marmorata* on seaside golden-  
rod ..... 367  
Obituary and bibliography: Edgar Leek Dickerson..... 35  
Ratios between the food habits of insects..... 362
- WEISS & LOTT. Notes on *Corythucha marmorata*, in New  
Jersey ..... 68
- WEISS & WEST. Notes on the false indigo lace bug, *Gel-  
chossa heidemanni*, in New Jersey..... 56  
Notes on the judas tree leafhopper, *Erythroncura aclys*  
in New Jersey ..... 129
- WENZEL, H. W. Dr. David MacFarland Castle (obituary)  
(ill.) ..... 305
- WEST, E. (See Weiss & West.)
- WILEY, G. O. On the biology of *Curicta drakci* (ill.).... 324
- WILLIAMS, R. C. Minutes of The American Entomolog-  
ical Society (which see).
- WOOD, W. C. *Polyommatus filenus* (Lycaenidae)..... 359
- WRIGHT, W. S. Lepidoptera Geometridae: Notes and  
descriptions ..... 91

## GENERAL SUBJECTS.

- Academy of Natural Sciences  
of Philadelphia, Entomologi-  
cal Section ..... 33, 188
- American Entomological So-  
ciety, Minutes ..... 222
- Animals attacked by insects,  
135, 191
- Autobiographies wanted ..... 178
- Bad collector ..... 175
- British association for the Ad-  
vancement of Science..... 302
- Carbon tetrachloride ..... 352
- Collecting apparatus ..... 253
- Convocation week meetings... 66
- Cleanup week in Pennsylvania. 144
- Duty on insects..... 256
- Entomological literature,  
23, 71, 105, 145, 179, 218,  
257, 294, 334, 374.
- Fabre, Monument to..... 144
- Flying men and insects..... 101
- Food habits of insects..... 362
- Fossil insect, Unique resting  
place ..... 333
- France, Entomological Society  
of ..... 342
- Holometobola, Nygmata in  
wings of (ill.) ..... 230
- House pests ..... 47
- Insects attacked by insects,  
47, 213, 217
- Journals, Existing entomologi-  
cal ..... 216
- Junior scientific aid..... 373
- Law, Entomologist at..... 143
- Northeastern entomologists,  
Meeting of ..... 302
- Nygmata in wings (ill.)..... 230
- Odors attractive to mosquitoes 242
- Patronymic names, Retention  
of ii or i ..... 103
- Philatelist, A. .... 178
- Plants attacked or visited by  
insects,  
1, 56, 68, 115, 129, 132, 164,  
169, 199, 244, 275, 306, 347,  
367, 370.
- Resting place for a fossil in-  
sect ..... 333
- Ratios between food habits of  
insects ..... 362
- Terms, Committee on general  
entomological ..... 372
- Types, Loan of..... 22
- U. S. civil service examination 373
- Yucca stems, Uses for..... 19

## OBITUARY NOTICES

- Annandale, T. N. .... 264
- Bischoff, F. A. .... 114
- Bordage, E. .... 303
- Campion, H. .... 190, 265
- Castle, D. M. (ill.)..... 304, 305
- Cragg, F. W. .... 262
- Dickerson, E. L. .... 35
- Grouvelle, J. .... 303
- Grouvelle, P. .... 303
- Jones, A. H. .... 263
- Loeb, J. .... 142
- Lovett, A. L. .... 263
- Mac Gillivray, A. D. .... 190, 224
- Locy, W. A. .... 380
- Ludlow, C. S. .... 379
- Merrifield, F. .... 304
- Nell, P. .... 35
- Oberthur, C. (ill.) ..... 267
- Peringuey, L. .... 190, 262
- Rothschild, N. C. .... 76
- Swinhoe, C. .... 152
- Wood, T. .... 152

## PERSONALS.

- Cockerell, T. D. A. .... 293
- Cresson, E. T. .... 368
- Fabre, Monument to ..... 292
- Horn, G. H. .... 368
- Sajo, C. .... 172
- Staudinger and Bang-Haas... 235

REVIEWS.

Barbadoes Antigua expedition, Report ..... 75  
 Felt's Manual of Tree and Shrub Insects ..... 342  
 Schroeder's Handbuch der Entomologie ..... 28  
 MacGillivray's External Insect Anatomy ..... 31, 111  
 Minnesota, Report of entomologist ..... 75  
 Ruggles' Report, state entomologist of Minnesota..... 75

GEOGRAPHICAL DISTRIBUTION.

Alabama: Hem., 85.  
 Arizona: Col., 1. Dip., 12, 91. Hym., 365. Lep., 12, 91, 159, 280.  
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 Colorado: Col., 144. Lep., 232.  
 Connecticut: Dip., 104.  
 Florida: Dip., 280. Hem., 85. Lep., 359, 370. Thy., 312. Prot., 44.  
 Georgia: Dip., 159. Odon., 317.  
 Idaho: Dip., 39. Lep., 12.  
 Indiana: Dip., 210.  
 Illinois: Hym., 370. Lep., 374.  
 Kansas: Col., 138. Dip., 269. Hym., 250.  
 Kentucky: Lep., 370. Odon., 285.  
 Louisiana: Dip., 191, 280, 370. Orth., 370.  
 Maine: Dip., 159. Lep., 293.  
 Maryland: Dip., 104, 159, 210, 355. Hym., 70. Thy., 312.  
 Massachusetts: Col., 164. Dip., 104, 159. Hym., 217. Odon., 343.  
 Michigan: Col., 164.  
 Mississippi: Dip., 280. Hym., 47.  
 Missouri: Lep., 370.

Montana: Arac., 104.  
 New Hampshire: Dip., 162, 171.  
 New Jersey: Col., 132. Dip., 104, 159, 280. Hem., 56, 68, 129, 367.  
 New Mexico: Dip., 191. Lep., 12.  
 New York: Dip., 104, 159, 282. Lep., 70, 275.  
 North Carolina: Dip., 8, 280. Hem., 85.  
 Ohio: Col., 132. Dip., 159, 280.  
 Oregon: Dip., 39.  
 Pennsylvania: Col., 132. Dip., 160, 210, 280, 282. Lep., 132, 176.  
 South Carolina: Dip., 280.  
 Tennessee: Dip., 280. Lep., 370.  
 Texas: Col., 164. Dip., 54, 127, 159, 191, 267, 357. Hem., 324. Lep., 12, 370.  
 Utah: Dip., 159. Lep., 12.  
 Vermont: Dip., 160.  
 Virginia: Dip., 159, 210.  
 Washington: Dip., 39, 159.  
 Wisconsin: Col., 164.  
 Wyoming: Hym., 347.  
 Canada: Dip., 245. Hym., 365. Lep., 7, 12.  
 Central America: Dip., 96, 191, 210, 289. Lep., 229. Arac., 174.  
 South America: Dip., 61, 210, 289.  
 Europe: Dip., 69.  
 Philippine Islands: Arac., 173.

ARACHNIDA.

*Chondrodesmus* (see *nicaraguae*).  
*Cyptobunus*, The genus..... 104  
 Leptodesmoid, A new..... 174  
*nicaraguae*\*, *Chondrodesmus* (ill.) ..... 174  
*Orthomorpha* (see *viatorica*).  
 Phalangida ..... 104  
 Pseudescorpions as a venomous order ..... 205  
*viatorica*\*, *Orthomorpha* (ill.). 173

## COLEOPTERA.

<i>abbreviata*</i> , <i>Glyptina</i> .....	166
<i>Anomala</i> (see <i>kansana</i> ).	
<i>bicallosa*</i> , <i>Mecas</i> .....	244
<i>Blapstinus</i> (see <i>rufipes</i> , <i>dilatatus</i> , <i>coronadensis</i> , <i>elongatus</i> , <i>pimalis</i> ).	
<i>brevis</i> , <i>Epitrix</i> .....	164
<i>brunnea</i> , <i>Glyptina</i> .....	167
<i>Chaetocnemis</i> (see <i>pulicaria</i> , <i>opulenta</i> , <i>splendida</i> ).	
<i>Coniontis</i> (see <i>subpubescens</i> , <i>muscula</i> , <i>globulina</i> ).	
<i>conjuncta*</i> , <i>Phyllotreta</i> (ill.) ..	168
<i>coronadensis</i> , <i>Blapstinus</i> .....	2
Curculionidae .....	132, 144
<i>dilatatus</i> , <i>Blapstinus</i> .....	2
<i>elongatus</i> , <i>Blapstinus</i> .....	2
<i>Epitrix</i> (see <i>parvula</i> , <i>fasciata</i> , <i>brevis</i> ).	
<i>erythrosoma*</i> , <i>Rhynchites</i> .....	144
<i>fasciata</i> , <i>Epitrix</i> .....	164
Freak, A natural (Coccinellidae) .....	373
<i>globulina</i> , <i>Coniontis</i> .....	3
<i>Glyptina</i> (see <i>brunnea</i> , <i>abbreviata</i> ).	
<i>Haltica</i> (see <i>polita</i> ).	
<i>Hydnobius</i> (see <i>matthevsi</i> ).	
<i>kansana*</i> , <i>Anomala</i> .....	139
<i>matthevsi</i> , <i>Hydnobius</i> .....	255
<i>Mecas</i> .....	244
<i>muscula</i> , <i>Coniontis</i> .....	3
<i>opulenta</i> , <i>Chaetocnemis</i> .....	166
<i>Orchestes</i> (see <i>pallicornis</i> ).	
<i>pallicornis</i> , <i>Orchestes</i> .....	134
<i>parvula</i> , <i>Epitrix</i> .....	164
<i>Phyllotreta</i> (see <i>conjuncta</i> ).	
<i>pimalis</i> , <i>Blapstinus</i> .....	4
<i>polita</i> , <i>Haltica</i> .....	164
<i>pulicaria</i> , <i>Chaetocnemis</i> .....	166
<i>Rhynchites</i> (see <i>erythrosoma</i> ).	
<i>rufipes</i> , <i>Blapstinus</i> .....	2
Scarabaeidae .....	138
Silphidae .....	255

<i>splendida*</i> , <i>Chaetocnemis</i> .....	165
<i>subpubescens</i> , <i>Coniontis</i> .....	3
Tenebrionidae .....	1
<i>Ulus</i> (see <i>crassus</i> ).	

## DIPTERA.

<i>acutangula</i> , <i>Orthostegana</i> .....	100
<i>affinis*</i> , <i>Stegana</i> .....	100
<i>agens*</i> , <i>Polytrichophora</i> .....	161
<i>alberta*</i> , <i>Mericia</i> .....	248
<i>albicincta*</i> , <i>Pilatea</i> .....	272
<i>alicna*</i> , <i>Beckerina</i> .....	356
<i>alpina*</i> , <i>Napaea</i> .....	163
<i>analis</i> , <i>Genea</i> .....	211
<i>Anopheles</i> (see <i>maculipennis</i> ).	
Anthomyiidae .....	171
<i>antrozoi</i> , <i>Basilina</i> .....	196
<i>apicincubula*</i> , <i>Apiochaeta</i> .....	355
<i>Apiochaeta</i> (see <i>apicincubula</i> ).	
<i>armatipes</i> , <i>Sphegina</i> (ill.) .....	41
Asilidae .....	8
<i>atrifrons*</i> , <i>Stegana</i> .....	99
<i>atrimana*</i> , <i>Stegana</i> .....	97
<i>aurifrons*</i> , <i>Cuphocera</i> .....	54
<i>aurulentus</i> , <i>Ceraturgus</i> .....	11
<i>Basilina</i> .....	193
(See also <i>ferruginea</i> , <i>mericana</i> , <i>antrozoi</i> , <i>corynorhini</i> , <i>forcipata</i> , <i>speciseri</i> , <i>silvae</i> ).	
<i>Beckerina</i> (see <i>alicna</i> ).	
<i>bella</i> , <i>Milesia</i> .....	280
<i>bellardii</i> , <i>Nycteribia</i> .....	192
<i>bridwelli*</i> , <i>Sphegina</i> (ill.) .....	42
<i>brunnea*</i> , <i>Stegana</i> .....	100
<i>californica</i> , <i>Sphegina</i> (ill.) .....	40
<i>californiensis</i> , <i>Hoplogaster</i> .....	171
<i>campestris*</i> , <i>Mericia</i> .....	249
<i>Canacca</i> (see <i>macateci</i> ).	
<i>Ceocwa*</i> .....	289
<i>Ceraturgus</i> (see <i>elizabethae</i> , <i>mitcheli</i> , <i>mabelae cruciatus</i> , <i>similis</i> , <i>dimidiatus</i> , <i>aurulentus</i> ).	
Chironomidae .....	282
<i>chrysoprocta*</i> , <i>Sturmia</i> .....	273

- cimiciformis*, *Clanoncurum* ... 163  
*Clanoncurum* (see *cimiciformis*).  
*coloptrata*, *Stegana* ..... 99  
*conciata*\*, *Polytrichophora* .. 161  
*conformis*\*, *Stegana* ..... 100  
*corynorhini*, *Basilina* ..... 196  
*cruciatu*s, *Ceraturgus* ..... 12  
Culicidae ..... 69  
*Cuphocera* (see *aurifrons*).  
*curvipennis*, *Stegana* ..... 97  
*Dicranomyia* (see *jujuyensis*,  
*globulicornis*, *patruelis*, *flavo-*  
*fascialis*).  
*dimidiatus*, *Ceraturgus* ..... 12  
Diptera of the older authors  
studied by American ento-  
mologists ..... 372  
*Discocerina* (see *xanthocera*).  
*Ditrichophora*\* ..... 159  
Drosophilidae ..... 96  
*elizabethae*\*, *Ceraturgus* ..... 8  
Ephydridae ..... 159  
*Ernestia*, Identity of ..... 214  
(See also *fasciata*).  
*exigua*\*, *Ditrichophora* ..... 159  
*externa*\*, *Lytogaster* ..... 162  
*fasciata*\*, *Ernestia* ..... 246  
*fasciventris*\*, *Mericia* ..... 248  
*ferruginea*, *Basilina* ..... 195  
*ferruginea*\*, *Frontina* ..... 269  
*flava*, *Nycteribia* ..... 193  
*flavipes*, *Sarcophaga* ..... 371  
*flavofascialis*\*, *Dicranomyia* .. 61  
*flavifrons*\*, *Stegana* ..... 98  
*forcipata*\*, *Basilina* (ill.) ..... 196  
*Frontina* (see *ferruginea*).  
*fuscibasis*\*, *Stegana* ..... 100  
*Genea* in North America ..... 210  
(See also *longipalpis*, *texen-*  
*sis*, *analis*, *maculiventris*).  
*gilda*, *Atrichopogon* ..... 282  
*globulicornis*\*, *Dicranomyia* .. 63  
*Gonia* (see *texensis*).  
Hippoboscidae ..... 234  
*Hoplogaster*, Species of ..... 171  
(See also *mollicula*, *nigritar-*  
*sis*, *morrisoni*, *californiensis*).  
*Hydrellia* (see *notiphiloides*,  
*morrisoni*).  
*idioneura*\*, *Tanypremna* ..... 289  
*infuscata*, *Sphegina* (ill.) .... 41  
*interrupta*\*, *Stegana* ..... 98  
*jujuyensis*\*, *Dicranomyia* .... 64  
*leucoplaca*\*, *Tanypremna* .... 291  
*loki*, *Mitoura* ..... 199  
*longipalpis*, *Genea* ..... 214  
*Lytogaster* (see *externa*).  
*mabelae*\*, *Ceraturgus* ..... 11  
*macateci*, *Canacca* ..... 164  
*maculipennis*, *Anopheles* ..... 69  
*maculiventris*, *Genea* ..... 210  
*madizans*, *Trimerina* ..... 163  
*magnifica*, *Stegana* ..... 98  
*mallochi*\*, *Stilobezzia* ..... 283  
Mating of *Anopheles* ..... 69  
*melanderi*\*, *Sphegina* ..... 43  
*Mericia* (see *campestris*, *fasci-*  
*ventris*, *alberta*, *triangularis*).  
*mexicana*, *Basilina* ..... 195  
*Milesia* (see *profusa*, *bella*,  
*pulchra*, *virginiensis*, *scutel-*  
*lata*).  
*mitcheli*\*, *Ceraturgus* ..... 9  
*Mitoura loki*, Life-history .... 199  
*mollicula*, *Hoplogaster* ..... 172  
*morrisoni*\*, *Hoplogaster* ..... 172  
*morrisoni*\*, *Hydrellia* ..... 162  
Mosquitoes, Odors Attractive  
to ..... 242  
Muscidae ..... 104, 135  
*Muscina* (see *pascurorum*).  
Musoid diptera, New ..... 269  
*Napaea* (see *alpina*).  
*nigrimana*\*, *Sphegina* (ill.) ... 41  
*nigrita*\*, *Stegana* ..... 97  
*nigritarsis*, *Hoplogaster* ..... 172  
*notiphiloides*\*, *Hydrellia* ..... 162  
*Nycteribia* ..... 192  
*Nycteribiidae* ..... 191

- occidentalis*, *Sphagina* (ill.).. 40  
*Ornithoetona* (see *strigilecula*).  
*Ornithoica* ..... 234  
*Orthostegana* (see *acutangula*).  
*Oxyrops* (see *robusta*).  
 Parasite of *Stagmomantis*.... 370  
*parilis*\*, *Ditrichophora* ..... 160  
*pascuorum*, *Muscina* ..... 104  
*patruelis*\*, *Dicranomyia* ..... 62  
*Philygria* (see *picta*).  
 Phoridae ..... 355  
*picta*, *Philygria* ..... 162  
*Pilatea* (see *albicincta*).  
*planifacies*\*, *Stegana* ..... 99  
*Pollenia rudis*, Rearing records 135  
*Polytrichophora*\* ..... 161  
*profusa*, *Milesia* ..... 281  
*pulchra*, *Milesia* ..... 280  
*Pupipara* ..... 191  
*robusta*\*, *Oxyrops* ..... 271  
*rudis*, *Pollenia* ..... 135  
*rufa*, *Sphagina* (ill.) ..... 41  
*Sarcophaga* (see *flavipes*).  
*Sarcophagidae* ..... 127  
*schildi*\*, *Stegana* ..... 99  
*scutellata*\*, *Milesia* ..... 280  
*silvae*, *Basilis* ..... 199  
*similis*, *Ceraturgus* ..... 12  
*speiseri*, *Basilis* (ill.) ..... 198  
*Sphagina*, Notes on (ill.).... 39  
 (See also *armatipes*, *bridwelli*, *californica*, *infuscata*, *melanderi*, *nigrimana*, *occidentalis*, *rufa*, *vittata*, *fusci-basis*, *conformis*, *affinis*, *brunnea*, *coleoptrata*, *uniformis*, *schildi*, *atrifrons*, *planifacies*, *magnifica*, *flavifrons*, *tempifera*, *interrupta*, *curvipennis*, *atrimana*, *tarsalis*, *nigrita*.)  
*Stilobezzia* (see *mallochi*).  
*strigilecula*, *Ornithoetona* .... 234  
*Sturmia* (see *chrysoprocta*).  
 Syrphidae ..... 39, 280  
*Tachinidae*..54, 210, 214, 245, 357  
*tacoma*\*, *Ditrichophora* ..... 160  
*Tanypternna* (see *idioncura*, *leucoplaea*).  
*Tanypternnodes*\* ..... 290  
*tarsalis*, *Stegana* ..... 97  
*tempifera*\*, *Stegana* ..... 98  
*texensis*, *Genca* ..... 212  
*texensis*\*, *Gonia* ..... 357  
 Tipulidae ..... 61, 289  
*triangularis*\*, *Mericia* ..... 247  
*Trimerina* (see *madigans*).  
*uniformis*\*, *Stegana* ..... 99  
*virginiensis*, *Milesia* ..... 280  
*vittata*\*, *Sphagina* (ill.) ..... 43  
*xanthocera*, *Discocerina* ..... 160
- ### HEMIPTERA.
- aclys*, *Erythroneura* ..... 129  
*americanus*, *Lethocerus* ..... 369  
*barberi*\*, *Ptochiomera* ..... 89  
*Carpilis* (see *Ptochiomera*).  
 Catalogue of the Hemiptera.. 292  
*cavicollis*\*, *Geotomus* ..... 85  
*cinctipes*, *Podops* ..... 88  
*Cnemodus* (see *hirtipes*).  
 Cornicles, Aphids with branch-  
 ed (ill.) ..... 331  
*Corythucha* (see *marmorata*).  
*Curicta drakei*, Biology of  
 (ill.) ..... 324  
*drakei*, *Curicta* (ill.) ..... 324  
*dubius*, *Podops* ..... 88  
*Erythroneura* (see *aclys*).  
 False indigo lace bug (see *Gelchossa heidemanni*).  
*Gelchossa* (see *heidemanni*).  
*Geotomus* (see *cavicollis*).  
*heidemanni*, *Gelchossa* ..... 56  
 Hemiptera of Connecticut,  
 Corrections ..... 367  
*hirtipes*\*, *Cnemodus* ..... 90  
 Judas tree leafhopper (see  
*Erythroneura aclys*).  
*Lethocerus* (see *americanus*).

- marmorata*, *Corythucha* ... 68, 367  
 Moulting of *Lethocerus* ..... 369  
 Nepidae ..... 324  
*Podops*, *Podops* ..... 88  
*peninsularis*\*, *Podops* ..... 87  
*Podops* (see *dubius*, *peninsularis*, *cinctipes*, *parvulus*).  
*Ptochiomera* (see *barberi*).  
 Tingitidae ..... 56, 68  
 Tingitidae, Additional words  
 on ..... 333
- HYMENOPTERA.**
- Acanthomyops* (see *Lasius*).  
*Acmatius* (see *Eciton*).  
*americanus*, *Camponotus* ..... 124  
*americanus*, *Lasius* ..... 122  
*analis*, *Iridomyrmex* ..... 83  
*Andrena* (see *metea*, *paysoni*, *dolichotricha*).  
 Ants of Mississippi ... 47, 77, 121  
*Aphaenogaster* (see *nigripes*, *mariae*, *fulva*, *harnedi*, *treatae*).  
*ashmeadi*, *Cremastogaster* ... 79  
*atkinsoni*, *Cremastogaster* .... 80  
*badius*, *Pogonomyrmex* ..... 52  
 Bee collecting ..... 347  
*Betheliella*\* ..... 169  
*bicolor*, *Euplectrus* ..... 217  
 Bimodal variation in *Dasymutilla* (ill.) ..... 236  
*bioculata*, *Dasymutilla* ..... 239  
*brucei*, *Prenolepis* ..... 122  
*brunnea*, *Pseudomyrma* ..... 48  
*calocharti*\*, *Betheliella* ..... 170  
*Camponotus* (see *fraxinicola*, *mississippiensis*, *impressus*, *pardus*, *paucidus*, *rasilis*, *decepiens*, *minutus*, *catyae*, *socius*, *ferrugineus*, *pennsylvanicus*, *americanus*, *castaneus*).  
*castaneus*, *Camponotus* ..... 123  
*catyae*, *Camponotus* ..... 125  
*centuncularis*, *Megachile* ..... 374  
*clara*, *Cremastogaster* ..... 80  
*Colobopsis* (see *Camponotus*).  
 Color preference of bees ..... 65  
*commutata*, *Pheidole* ..... 77  
*conformis*, *Odynerus* ..... 70  
*corkinsi*\*, *Osmia* ..... 351  
*crassicornis*, *Pheidole* ..... 54  
*Cremastogaster* (see *ashmeadi*, *missouriensis*, *atkinsoni*, *clara*, *laciniuscula*, *lincolata*).  
*curvispinosus*, *Leptothorax* ... 49  
*Dasymutilla bioculata*, Bimodal variation in (ill.) ..... 236  
*decepiens*, *Camponotus* ..... 125  
*dentata*, *Pheidole* ..... 77  
*Dolichoderus* (see *pustulatus*, *taschenbergi*, *mariae*).  
*dolichotricha*\*, *Andrena* ..... 348  
*Dorymyrmex* (see *flavus*, *niger*, *pyramicus*).  
*Eciton* (see *pilosus*, *opacithorax*, *schmitti*).  
 Elachertidae ..... 217  
*emeryana*, *Myrmica* ..... 52  
*Euplectrus* (see *bicolor*).  
*ferrugineus*, *Camponotus* ..... 124  
*flavidula*, *Pseudomyrma* ..... 49  
*flavus*, *Dorymyrmex* ..... 82  
*floridana*, *Pheidole* ..... 78  
*Formica* (see *fusca subsericeae*, *schaufussi*, *pallidiflava*).  
 Formicidae ..... 47, 77, 250  
*fortinodis*, *Leptothorax* ..... 49  
*fraxinicola*, *Camponotus* ..... 127  
*fulva*, *Aphaenogaster* ..... 51  
*fusca-subsericeae*, *Formica* ... 123  
*geminata*, *Solenopsis* ..... 78  
*grossa*, *Psammophila* ..... 367  
*guineense*, *Tetramorium* ..... 81  
 Gynandromorph of *Odynerus* 70  
*harnedi*, *Aphaenogaster* ..... 50  
*hayesi*\*, *Pheidole* ..... 251  
*humilis*, *Iridomyrmex* ..... 83  
*Hypoclinca* (see *Dolichoderus*).

- imparis*, *Prenolepis* ..... 121  
*impressus*, *Camponotus* ..... 126  
*interjectus*, *Lasius* ..... 123  
*Iridomyrmex* (see *humilis*, *analis*, *pruinosus*).  
*laeviuscula*, *Cremastogaster* .. 80  
*Lasius* (see *interjectus*, *americanus*).  
*Leptothorax* (see *bergandei*, *schaumi*, *fortinodis*, *curvispinosus*).  
*lincolata*, *Cremastogaster* .... 80  
*longicornis*, *Prenolepis* ..... 122  
*mariae*, *Aphaenogaster* ..... 51  
*mariae*, *Dolichoderus* ..... 81  
*Megachile* (see *centuncularis*).  
*Megachilidae* ..... 374  
*metca\**, *Andrena* ..... 350  
*minutus*, *Camponotus* ..... 125  
*minimum*, *Monomorium* ..... 51  
*mississippiensis*, *Camponotus*.. 127  
*missouriensis* *Cremastogaster* . 81  
*molesta*, *Solenopsis* ..... 79  
*Monomorium* (see *pharonis*, *minimum*).  
*morrisoni*, *Psammophila* ..... 367  
*Myrmica* (see *emeryana*).  
*nicholi\**, *Psammophila* ..... 366  
*niger*, *Dorymyrmex* ..... 82  
*nigripes*, *Aphaenogaster* ..... 51  
*Nylanderia* (see *Prenolepis*).  
*Odynerus* (see *conformis*).. 70  
*opacior*, *Ponera* ..... 48  
*opacithorax*, *Eciton* ..... 84  
*pallida*, *Pseudomyrma* ..... 49  
*pallide-fulva*, *Formica* ..... 123  
*pardus*, *Camponotus* ..... 126  
*pavidus*, *Camponotus* ..... 126  
*paysoni\**, *Andrena transnigra*. 349  
*pennsylvanicus*, *Camponotus* .. 124  
*pennsylvanica*, *Ponera* ..... 48  
*bergandei*, *Leptothorax* ..... 50  
*pharaonis*, *Monomorium* ..... 51  
*Pheidole* (see *vinelandica*, *crassicornis*, *vanecae*, *rufescens*, *pilifera*, *splendidula*, *floridana*, *tysoni*, *commutata*, *dentata*, *haycsi*).  
*pilifera*, *Pheidole* ..... 53  
*pilosus*, *Eciton* ..... 85  
*Pogonomyrmex* (see *baduus*).  
*Ponera* (see *pennsylvanica*, *opacior*).  
*Prenolepis* (see *longicornis*, *vinidula*, *brucei*, *imparis*).  
*pruinosus*, *Iridomyrmex* ..... 83  
*Psammophila* (see *valida*, *nicholi*, *morrisoni*, *grossa*).  
*Pseudomyrma* (see *flavidula*, *pallida*, *brunnea*).  
*pyramicus*, *Dorymyrmex* ..... 82  
*pustulatus*, *Dolichoderus* ..... 82  
*rasilis*, *Camponotus* ..... 126  
*rufa*, *Solenopsis* ..... 79  
*rufescens*, *Pheidole* ..... 53  
*schaufussi*, *Formica* ..... 123  
*schaumi*, *Leptothorax* ..... 50  
*schmitti*, *Eciton* ..... 84  
*seminole*, *Trachymyrmex* .... 52  
*sessile*, *Tapinoma* ..... 82  
*socius*, *Camponotus* ..... 124  
*Solenopsis* (see *molesta*, *rufa*, *xyloni*, *geminata*).  
*splendidula*, *Pheidole* ..... 78  
*Tapinoma* (see *sessile*).  
*taschenbergi*, *Dolichoderus* ... 81  
*Tetramorium* (see *guineense*).  
*Trachymyrmex* (see *seminole*).  
*treatae*, *Aphaenogaster* ..... 50  
*tysoni*, *Pheidole* ..... 78  
*valida*, *Psammophila* ..... 365  
*vanecae*, *Pheidole* ..... 53  
*vinelandica*, *Pheidole* ..... 54  
*vinidula*, *Prenolepis* ..... 122  
*xyloni*, *Solenopsis* ..... 79

## LEPIDOPTERA.

- Actinotia* (see *derupta*).  
*antibustus*, *Hemiarctus* ..... 360  
*Argynnis* (see *mammothi*).

- Agraulis vanillae* on the Pacific Coast ..... 22
- Anticarsia* (see *schausi*).
- ascalaphus*, *Pholisora* ..... 370
- astenidas*, *Hemiargus* ..... 361
- athabasca*, *Syneda* ..... 15
- Automeris* (see *zephyriata*).
- Azalea* leaf miner (see *Gracillaria azaleae*).
- azaleae*, *Gracillaria* (ill.) ..... 275
- babyaga*, *Kloneus* (ill.) ..... 229
- Brenthis* (see *zawonae*).
- Brephidium exilis*, Life history. 115
- brunnata*\*, *Stammodes* ..... 93
- Callipsyche* (see *nigroinita*).
- chinoi*\*, *Chlosyne* (ill.) ..... 157
- Chlosyne* (see *chinoi*).
- coenonymphata*, *Stammodes* ... 91
- Colias eurytheme*, Record of .. 176
- comstocki*\*, *Plebeius* ..... 140
- concoloralis*\*, *Hemeroplanis* .. 16
- Cosymbia* (see *piazzeria*).
- crokeri*\*, *Syneda* ..... 15
- derupta*, *Actinotia* ..... 103
- diabolica*\*, *Metalestra* ..... 17
- eldridgensis*, *Stammodes* ..... 93
- Epia* (see *jola*).
- eridania*, *Prodenia* ..... 102
- Euphdryas* (see *fieldi*, *foxi*, *pasadenae*).
- Eurhyphara urticata* in Maine. 293
- Eurymus* (see *unicitrina*, *weaverae*).
- eurytheme*, *Colias* ..... 176
- exilis*, *Brephidium* ..... 115
- externa*, *Leucania* ..... 102
- famiae*\*, *Zerene* (ill.) ..... 158
- fieldi*\*, *Euphdryas* (ill.) ..... 155
- filenus*, *Polyommatus* ..... 359
- foxi*\*, *Euphdryas* (ill.) ..... 155
- foxi*\*, *Venusia* ..... 95
- Geometridae* ..... 91
- Gracillaria* (see *azaleae*).
- hanno*, *Hemiargus* ..... 359
- helloides*, *Heodes* ..... 306
- Hemeroplanis* (see *concoloralis*).
- Hemiargus* (see *astenidas*, *pseudoptiletes*, *antibubastus*, *hanno*) (also see *Polyommatus*).
- Heodes helloides*, Life history 306
- Hermaphrodite hesperid* ..... 70
- Hesperiidae* ..... 370
- Hydrocampinae* ..... 293
- Hyssia* (see *marloffi*).
- jacintoi*\*, *Melitea* (ill.) ..... 154
- jola*\*, *Epia* ..... 12
- Kloneus babyaga* (ill.) ..... 229
- Leucania* (see *nigrofascia*, *externa*).
- linca*, *Noctua* ..... 102
- Lycanidae*,  
115, 140, 199, 232, 306, 359
- Lyonetia* (see *speculella*).
- mammothi*\*, *Argynnis* (ill.) ... 157
- manataaqua*, *Polites* ..... 70
- marloffi*\*, *Hyssia* ..... 13
- Melitea* (see *jacintoi*).
- Metalestra* (see *diabolica*).
- mystica*, *Polia* ..... 7
- mysticoides*\*, *Polia* ..... 7
- nigrofascia*, *Leucania* ..... 102
- nigroinita*\*, *Callipsyche* (ill.) . 154
- nimbosa*, *Polia* ..... 7
- Noctua* (see *linca*).
- Noctuidae* ..... 7, 102
- Nymphalidae* ..... 22
- pallidata*\*, *Stammodes* ..... 93
- pasadenae*\*, *Euphdryas* (ill.) . 155
- Phacdrotes* (see *piasus*).
- Phalaena* (see *phytolaccae*).
- Phalaenidae* (see *Noctuidae*).
- Pholisora* (see *ascalaphus*).
- phytolaccae*, *Phalaena* ..... 102
- piasus*, *Phacdrotes* ..... 232
- piazzeria*\*, *Cosymbia* ..... 94
- Plebeius* (see *comstocki*).
- Polia* (see *nimbosa*, *mystica*, *mysticoides*).
- Polites* (see *manataaqua*).

- Polyommatus* (see *filenus*).  
*Prodenia eridania*, Synonymy  
of ..... 102  
*prunata*\*, *Stammodes* ..... 92  
*pseudoptiletus*, *Hemiargus* .... 360  
*schausi*\*, *Anticarsia* ..... 16  
*speculella*, *Lyonetia* ..... 132  
Sphingidae ..... 229  
*Stammodes* (see *eldridgensis*,  
*bruncata*, *pallidata*, *coenonympinata*,  
*prunata*).  
*Syneda* (see *crokeri*, *athabasca*).  
Tineidae ..... 132, 275  
*unicitrina*\*, *Eurymus* (ill.) ... 158  
*urticata*, *Eurrhypara* ..... 293  
*vanillae*, *Agraulis* ..... 22  
*Venusia* (see *foxi*).  
*weaveonae*\*, *Brenthis* (ill.) ... 156  
*weaverae*\*, *Eurymus* (ill.).... 156  
*zephyriata*\*, *Automeris* ..... 12  
*Zerene* (see *fanniae*).

## ODONATA.

- Aeschnidae ..... 343, 345  
*Celithemis* (see *ornata*).  
Dragonflies from Lee County,  
Georgia ..... 317  
*dubium*\*, *Enallagma* (ill.) ... 321  
*Enallagma* (see *dubium*).

- howei*\*, *Ophiogomphus* (ill.),  
344, 345  
Odonata from Kentucky.... 285  
*Ophiogomphus* (see *howei*).  
*ornata*, *Celithemis* ..... 321

## ORTHOPTERA.

- Stagmomantis, Parasite of ... 370

## PROTURA.

- Accrentomon* (see *americanum*,  
*conurus*, *doderoi*, *floridanum*,  
*microrhinus*).  
*americanum*, *Accrentomon*.... 46  
*conurus*, *Accrentomon* ..... 46  
*doderoi*, *Accrentomon* ..... 46  
*floridanum*\*, *Accrentomon* ... 44  
*microrhinus*, *Accrentomon*.... 46

## THYSANOPTERA.

- Acanthothrips* (see *magnafemor-  
oralis*).  
*Elaphrothrips* (see *parallelus*).  
*magnafemorialis*, *Acanthothrips*  
..... 315  
*Neurothrips*\* ..... 315  
*nubilipennis*\*, *Sericothrips*.... 312  
*parallelus*\*, *Elaphrothrips* .... 315  
*sambuci*\*, *Sericothrips* ..... 313  
*Sericothrips* (see *sambuci*, *nubilipennis*).

## 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.

**Correspondence invited** from all those interested in Hungarian insects; Coleopt., Lepidopt., Hymenopt., Hemipt., etc.—Prof. Charles Sajo, Oerszentmiklos, (Komitat Pest) Hungary.

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