













# ENTOMOLOGICAL NEWS

VOLUME XLII, 1931



HENRY SKINNER  
1861-1926



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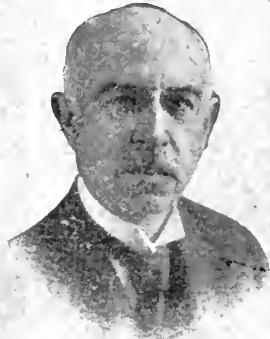
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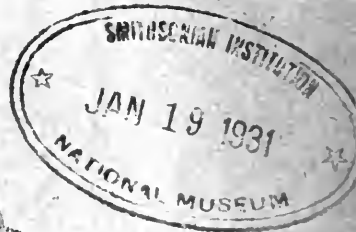
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No. 1



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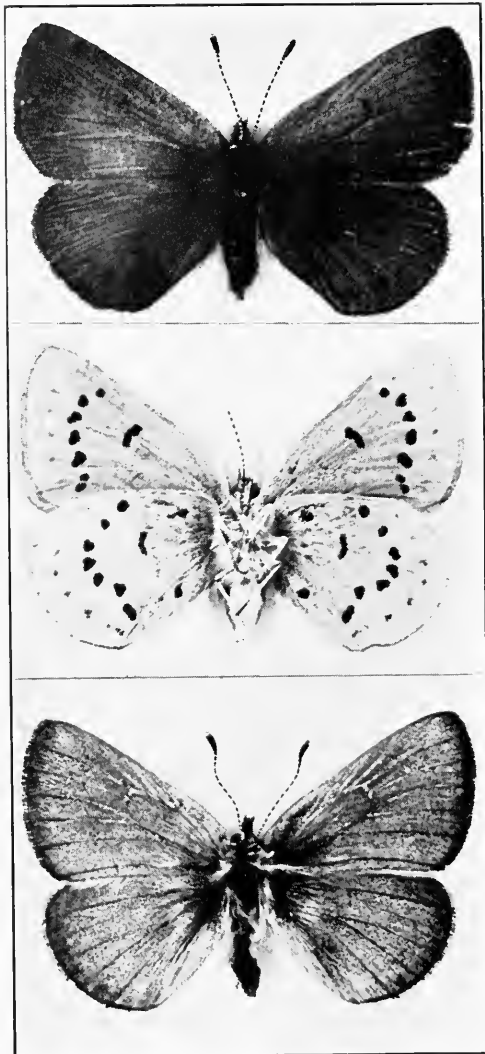
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PLEBEJUS MARICOPA FENDERI.—MACY.

# ENTOMOLOGICAL NEWS

VOL. XLII.

JANUARY, 1931

No. 1

## **A New Oregon Butterfly (Lepid. Lycaenidae).**

RALPH W. MACY, University of Minnesota, Minneapolis.

(Plate I).

For several seasons the writer has noted a small colony of large Blues flying about an isolated patch of *Lupinus* on a hillside six miles south-west of McMinnville, Oregon. These butterflies apparently are of a new race so I shall name it for my good friend, Mr. K. P. Fender, an enthusiastic collector. ***Plebejus maricopa fenderi***, f. n.

♂. *Under surface*: Primaries. Uniform bluish-gray with a very slightly heavier powdering of blue in the basal area. A semi-lunate black spot occurs at the apex of the discal cell. In the limbal area other black spots form two crescent-shaped rows of which the outer is much the less distinct—even nearly absent in one case. One each, of the spots of the inner row, occurs between the veins  $R_{4+5}$  and  $M_1$ ,  $M_1$  and  $M_2$ ,  $M_2$  and  $M_3$ ,  $M_3$  and  $Cu_1$ , and  $Cu_1$  and  $Cu_2$ . Two smaller spots occur between  $Cu_2$  and 2nd A. Of the spots of the outer row, one each occurs between the same veins except that there is only one between  $Cu_2$  and 2nd A, and none between  $R_{1+5}$  and  $M_1$ .

Secondaries. Ground color same as that of the primaries except that the basal area is much more heavily sprinkled with blue. There is a continuation of the two rows of spots of the primaries, with spots located as follows: Inner row: one each between veins  $Sc + R_1$  and  $R_s$ ,  $R_s$  and  $M_1$ ,  $M_1$  and  $M_2$ ,  $M_2$  and  $M_3$ ,  $M_3$  and  $Cu_1$ ,  $Cu_1$  and  $Cu_2$ , and two smaller ones between  $Cu_2$  and 2nd A. Outer row: one each between  $Sc + R_1$  and  $R_s$ ,  $R_s$  and  $M_1$ ,  $M_1$  and  $M_2$ ,  $M_2$  and  $M_3$ ,  $M_3$  and  $Cu_1$ ,  $Cu_1$  and  $Cu_2$ , and  $Cu_2$  and 2nd A. In addition, there is an indistinct spot near the base of cell  $R_1$ . The semi-lunate spot at the apex of the discal cell is much less distinct than it is in the front wing.

*Upper Surface.* Blue, shading into a broad, dark-gray marginal border. The blue scales tend to be scattering.

♀. *Under Surface:* Primaries. The markings are the same as in the male except slightly heavier.

Secondaries. Light creamy-tan. All of the spots are much heavier but are arranged as in the male, with these exceptions: the two spots of the inner row between  $Cu_2$  and 2nd A are fused, and there is a distinct dark spot in the basal area between veins 2nd A and 3rd A.

*Upper Surface:* Bronze, shading into a dark-gray border on the outer margin. A fairly distinct semi-lunate spot occurs at the apex of the discal cell of the fore wing.

Both sexes have a fine black line extending along the edges of the outer margins of the hind wings, and there is a white fringe on both wings.

Expanse: males, 31mm.; females, 31 to 33mm.

*Type:* ♀, Plate I, fig. 2. *Allotype:* ♂, fig. 3. *Paratypes:* 1 ♂, 1 ♀, fig. 1. All taken by the author at a location six miles S.E. of McMinnville, OREGON, May 25, 1929, and are now in his collection.

#### EXPLANATION OF PLATE I.

*Plebejus maricopa fenderi*, f. n.

Fig. 1.—Paratype. Female, upper surface.

Fig. 2.—Type. Female, under surface.

Fig. 3.—Allotype. Male, upper surface.

#### Unusual Numbers of *Diapheromera veliei* Walsh (Orth.: Phasmidae).

The prairie walking stick, *Diapheromera veliei* Walsh, was found in almost incredible numbers on July 25, 1930, in the sandhill region just north of Hardin, Colorado. The vegetation was literally covered with them and they were also numerous on the ground. From one clump of red top grass about twelve inches in diameter the writer picked nine individuals, five of which were females and four males. Over the entire area the males and females seemed to be in approximately equal numbers. Many were copulating. The insects were observed to cover an area of nearly a mile square and probably could have been found in these numbers over a much larger area.

HUGO G. RODECK, University of Colorado, Boulder, Col.



**Notes on the Abstera-Group of the Genus Tephritis,  
and a Description of a New Species from  
California (Diptera: Trypetidae).**

By EZRA T. CRESSON, JR.

In determining some material submitted by Mr. K. L. Wolff of the California Horticultural Commission, collected by him and his associates in their work on the insects of the cocklebur, *Xanthium canadensis*, two interesting species of this genus were encountered. One of these proved to be a species described from California in 1868, but has since been considered a synonym of a well-known eastern species. The other is here described as new.

TEPHRITIS ABSTERSA (Loew)

1862. *Trypeta abstersa* Loew, Berl. Ent. Zeit., vi, p. 221.  
(Cent., II, 77.)

1873. *Trypeta abstersa* Loew, Mon. Dipt. No. Am., iii, p. 322,  
pl. II, fig. 7. (Urellia.)

This species is typical of a group in the genus *Tephritis*, particularly characteristic in having the radiation of the infuscated area of the wings producing two hyaline costal wedges in the marginal cell, two in the apex of submarginal cell, one in apex of first posterior and three in the second posterior cells; a small drop in the apex of the marginal cell is also characteristic and appears to be constant, as I have no records of its absence. The ray to the almost hyaline stigma is narrow and extends from the anterior crossvein to the tip of the first vein; the inferior basal portion of the wings is more or less distinctly maculated.

This species was originally described from "Amer. boreal.", probably from Eastern United States. It is entirely yellow with some infuscation on the thorax and apical portions of the abdominal segments; the third antennal segment in both sexes is yellow, scarcely longer than broad, rounded apically; the face is scarcely longer than broad, and the mesonotum is scarcely darker than the humeri. The wing is well figured by Loew.

In his redescription of this species in 1873, Loew included

material from Cuba which he supposed to be the same species, but it is probable that this was not the case. He states that "they are somewhat smaller, have a more extended blackish coloring, and the incomplete gray reticulation of the proximal half of the wing is considerably darker towards the posterior margin."

Of this species I have seen material from: Swarthmore, Pennsylvania, August 5, 1906 [1 ♂]; Manahawkin, New Jersey, September 5, [1 ♂]; Riverton, New Jersey, July 18, [1 ♂].

TEPHRITIS ACUTANGULA (Thomson)

1868. *Trypeta acutangula* Thomson, Eugenes Reise, Dipt., p. 583.

1890. *Euaesta abstersa* Coquillett, Jour. N. Y. Ent. Soc., vii, p. 265 [not Loew].

1907. *Euaesta abstersa* Cresson, Trans. Am. Ent. Soc., xxxiii, p. 106 [not. Loew].

Coquillett considered this species synonymous with *abstersa*, with which treatment I do not concur although it is not improbable that it may prove to be a subspecies or a variety. It is a darker species with very little yellow on the body, and may be described as follows:

Black; head except occiput and sometimes third antennal segment, humeri, scutellum apically, halteres, squamae, and legs, yellow. Basal portion of the arista also pale. In the darker forms the bristles of the head (except postorbital cilia), of mesonotum, humeri, notopleura, and scutellum, are black; all pile and other bristles are white, although some flexor bristles of the femora may be dark. Thorax and abdomen densely cinereous, almost obscuring the black ground color. Face generally longer than broad, and third antennal segment somewhat longer than broad, generally with an acute superior apical angle.

This form seems to have quite an extensive range west of the Mississippi River, from Dakota to Southern California. It is noticed that the California specimens have the third antennal segment generally dark, which is not the case with those from other localities I mention. Of this species I have seen material from:

Dakota: no data, [1 ♀].

Minnesota: no data, [1 ♂, 1 ♀].

Texas: El Paso, April 4-5, (Viereck & Rehn), [1 ♂, 2 ♀].  
Ysleta, April 2, (Viereck & Rehn), [1 ♂, 1 ♀].

New Mexico: Alamogordo, April 22 to June, (Viereck & Rehn), [3 ♂, 2 ♀]. Beulah, August 17, (Skinner), [1 ♂, 2 ♀].  
Cloudercroft, May 24, (Viereck & Rehn), [1 ♂].

California: Beverly Hills, September 13, (J. C. Menzies), [Cal. Hort. Comm., 1 ♀]. Claremont, (Baker), [1 ♀]. Pasadena, April 6-11, (K. L. Wolff), [Cal. Hort. Comm.; 2 ♂, 2 ♀].

### **Tephritis wolffi** new species.

Identical with *Trypeta tenera* Loew of Europe in wing pattern, but differing mostly in having the third antennal segment of the male black.

♂. Head quadrate in profile, with eyes slightly vertical. Cheeks narrow, scarcely as broad as third antennal segment. Frons slightly turgid, prominent at antennae; parafrons broad with two frontorbital bristles. Face falling vertically, with epistoma not prominent. Mesofrons yellow to orange; orbits, face, cheeks and occiput much paler, whitish. Second antennal segment brown; third black, elongate, tapering apically; arista with basal third white and yellow. Thorax black, densely cinereous, with pale pubescence and hairs. Scutellum pale apically, with four bristles; apical pair short. Abdomen rather cylindrical, with pale hairs and pubescence; bases of the elongate sixth segment and lateral basal angles of the others, dark. Legs pale; fore femora noticeably thickened. Length, 3 mm.

♀. Similar, with third antennal segment tawny; bases of fourth to sixth abdominal segments black; ovipositor segment conical, turgid and polished black.

*Type*.—Male: Pomona, California, (K. L. Wolff; September 12, 1930), [A.N.S.P., no. 6390]. *Paratypes*.—3 ♂, 4 ♀: topotypical. 1 ♂, Visalia, California, (Culbertson); [A. N. S. P.]

Two males in poor condition from Lemon Cone, Tulare County, California, 500 ft. alt., (J. C. Bradley; July 9-11, 1907), [Cornell], are apparently conspecific with the above type series.

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### Change of Address

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## **Typha Insects and their Parasites.**

By A. C. COLE, JR.

Ohio State University, Columbus.

Very little has been written concerning the insect fauna inhabiting *Typha*, or cat-tails. The most complete paper on the subject is that of Claassen (1921), in which he lists the species that he found under their respective orders and relates them, either directly or indirectly, to their environment. Several papers have been published on the taxonomy, morphology, and biology of the species considered individually. In order to conduct an adequate survey of this group of insects many consecutive years of study are required. Several of these species have secondary hosts and alternation of generations is not unlikely.

This paper is merely a list of the insect fauna of *Typha*, together with habitat notes and a small amount of life-history data compiled after a four-year survey of the group. In view of the fact that Claassen discusses the biology of a great many of these insects, no attempt will be made here to consider this phase.

Several areas were selected from each desirable locality in which to conduct the work. Such areas were, for the greater part, typical of that section of the country in which the insects lived. They were as follows:

Monroe, Michigan—The River Raisin, which flows through the town, is bordered on both of its banks by large areas of *Typha latifolia*. This proved to be an ideal collecting spot for the year of 1927. Due to a flood in the spring of 1928, which destroyed a large part of the plants and killed most of the insects, collecting in this region had to be almost entirely abandoned. One mile east of Monroe one finds the shores of Lake Erie with its many acres of swampland. Such a location was especially well suited for this work inasmuch as most of the *Typhac* were concentrated in large beds of pure stands of *Typha latifolia*. In the center of a wood within the town limits is a patch of *Typha angustifolia* which netted several additional insects.

Bolle's Harbor, Michigan, located on the shore of Lake Erie and about five miles southeast of Monroe, made a comparatively good collecting ground, although the proportion of *Typha* to other plants in the association was not large. Only *Typha latifolia* was to be found at this location.

Columbus, Ohio, has a few small patches of cat-tail along one of its rivers, the Olentangy. These areas are small and somewhat isolated from other plants of the typical pond association.

St. Marys, Ohio—Along the St. Marys River may be found several long areas of *Typha latifolia* in which one finds a number of insects. The river is quite narrow throughout the length of its course and the collector may wade from one bank to the other.

Roberts, Idaho—Five miles north of this town the author collected a few cat-tail insects in a large swamp harboring *Typha latifolia* and *Typha angustifolia*, in the summer of 1929.

Bozeman, Montana—At approximately five miles north of the city of Bozeman is a patch of *Typha latifolia* from which a few insects were collected in the summer of 1929.

Everglades, Florida—Along the Tamiami Trail in southern Florida are huge areas of *Typha latifolia* and *angustifolia*, in many cases intermingled. Insects were collected from this locality during the winter of 1930.

Yankeetown, Florida, situated on the Gulf in Northwestern Florida has several cat-tail swamps nearby from which cat-tail insects were collected by the author during the winter of 1930. The greater part of the *Typha* at that point belongs to *latifolia*.

The only plants taken into consideration in this study were the two species of *Typha*, namely, *latifolia* and *angustifolia*. By far the greater portion of the insect fauna was reared from the former, this being the commonest species and the most succulent. In most cases the two species were found independent of one another, but in several instances were intermingled.

*Typha* is widely distributed throughout the United States and is found most abundantly in pond associations. It is often the most common vegetation bordering inland lakes, and its

tall, swaying leaf-blades are not easily confused with other plants.

The author confirms the statement of Claassen that "where cat-tails are not so abundant, a higher percentage of infestation usually occurs, which renders it much easier to obtain material".

Inasmuch as *Typha* insects for the greater part require moist, warm conditions for development, a duplication of these factors is essential for rearing the insects.

From this study of cat-tail insects many interesting points have developed. For instance, in an article published by the author in ENTOMOLOGICAL NEWS (1930) the stable fly has been reported parasitic on a large Lepidopterous borer in the stalks of *Typha latifolia*. This insect has rarely been recorded as a parasite. It has been reported by Breakey in the *Annals of the Entomological Society of America* for 1929 as parasitic on the iris borer, *Macronoctua onusta* Grote.

Many Lepidopterous larvae found inhabiting *Typha* have been confused with the European corn borer. Several of these larvae have been brought to Government laboratories, often by irate farmers who report cat-tail swamps as a source of all the corn borers infesting their nearby fields. The European corn borer has never been officially reported from *Typha* and the author has been unable to rear this species on any type of cat-tail. According to experiments and observations by the author the larvae will not feed on any part of the plant.

With a very few exceptions cat-tail insects seem to be universal in their distribution. According to the author's observations the most common insect inhabiting *Typha* is *Arsilonche albovenosa* Goeze. This species has been recorded from a great many sections of the United States and from both species of *Typha*.\*

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\* The author wishes to express his appreciation to Dr. D. M. DeLong, of the Ohio State University, for his advice and criticisms. Also to the following specialists of the U. S. National Museum, at Washington, D. C.: Dr. R. A. Cushman and Dr. A. B. Gahan, Hymenoptera; Dr. J. M. Aldrich and Dr. C. T. Greene, Diptera; The late Dr. H. G. Dyar, Dr. Carl Heinrich and Dr. A. Busch, Lepidoptera; Dr. E. A. Chapin, Coleoptera; Dr. A. N. Caudell, Orthoptera; Dr. P. W. Mason, Thysanoptera.

## LEPIDOPTERA &amp; PARASITES.

(1) *ARSILONCHE ALBOVENOSA* Goeze. Two larvae were collected at Monroe, Michigan, July 10, 1927. Both of them pupated on July 13 and both emerged on August 1; one male and one female. The larvae were found feeding on the *Typha* leaves leaving only the midrib intact.

From this species were reared, at Monroe, Michigan: (2) *Blacus* sp. and (3) *Microbracon* sp., larval parasites, and (4) *Macrocentrus ancylivora* Roh. and (5) *Pimpla inquisitoricella* D. T., pupal parasites, all determined by R. A. Cushman of the U. S. National Museum.

Twenty parasites emerged from a larva of *albovenosa*, collected from the leaf of *Typha latifolia*, five miles north of Bozeman, Montana, on August 14, 1929. These were identified by R. A. Cushman as (6) *Rogas stigmator* Say. The host larva was found in a large patch of *Typha latifolia* which showed very little leaf damage. The new stalks were headed and the old stalks fire-burned.

(7) *Exorista larvarum* L., determined by Dr. J. M. Aldrich, was collected from a larva of *A. albovenosa*, ten miles north of Roberts, Idaho, on August 15, 1929. The insect was taken in the larval stage and it pupated externally. Its host larva was found on *Typha latifolia*.

Numerous larvae of *A. albovenosa* were collected on *Typha angustifolia* in the Everglades of Florida, February 28, 1930. Most of them were on or near the tips of the leaves of the old stalks only. No larvae were present on the young, immature stalks and they showed no damage. A few pupae of this insect were also collected from the exterior of mature stalks.

A few larvae of *A. albovenosa* were collected from the leaves of *Typha latifolia* at Yankeetown, Florida, on March 6, 1930. Most of them were ready to undergo pupation and none of those collected were parasitized.

(8) *Alciodes intermedius* Cress. is reported by Claassen as parasitic on *albovenosa*.

(9) *APATELA OBLINITA* Abbot & Smith. Two larvae, collected on *Typha* leaves at Monroe, Michigan, July 15, 1927, pupated on August 21, and emerged as males on August 29.

Two parasitized larvae were also collected, from which emerged (10) *Sceliphron caementarium* Drury\* and (11) *Casimaria genuina* Nort., both specimens determined by R. A. Cushman.

\* Although a parasitic habit of this species has heretofore been unknown, the author reared it under isolated laboratory conditions during which there was no opportunity for error.

(12) *ENDOTHAENIA HEBESANA* Wlk. At Monroe, Michigan (1927) larvae were found feeding on the seeds of *Typha latifolia*. From sixteen larvae only twelve pupated and ten emerged. (13) A *Microbracon* sp. determined by R. A. Cushman was collected in the larval stage.

(14) *LYMNAECIA PHRAGMITELLA* Staint. Twenty larvae were collected in heads of *Typha* on July 16, 1927, at Monroe, Michigan, from which nineteen pupated and seventeen emerged.

(15) *Elachterinae* sp. is reported by Claassen as a parasite of *phragmitella*.

*Parasites.* Parasites of the various *Typha* insects are listed under their hosts.

(16) *COLEOPTHARA* sp. A great number of these small larvae were found burrowing in dried stalks of *Typha latifolia* at Monroe, Michigan, in the early spring of 1927. Their life history seems to correspond to that of *Lymnaecia phragmitella* Staint. as related by Claassen (1921).

(17) *NONAGRIA OBLONGA* Grote. Three larvae were collected from overwintering stalks of *Typha latifolia* in a pond near the Olentangy River at Columbus, Ohio, December 31, 1929. They were all above the surface of the ice, varying in distance from one to six inches. They appeared to be quite dormant at the time of collecting. Eighteen stalks were opened, only seven showing damage. Two more larvae were dissected out on January 19, 1930, from the same locality. Fifty stalks were opened, twelve showing damage. It seems that infestation by this insect occurs among the smaller and younger plants and not in those which have headed. In only very few cases have full grown stalks been found attacked. The larvae collected were encased in ice and, inasmuch as the minimum temperature for the preceding night was 8° F. below zero, appear to be quite resistant to low temperatures *providing* they are within the stalks. If a larva be removed from the stalk and placed, exposed, on the surface of the ice, a quick drop from freezing to zero is sufficient to cause death.

(18) *Apanteles cincitiformis* Vier. is reported by Claassen as a parasite of *oblonga*.

(19) *NONAGRIA SUBFLAVA* Grote. Larvae of this insect were found feeding on leaves of *Typha latifolia* in the Florida Everglades on February 28, 1930. The leaves showed about 100% infestation. Several pupae and pupal cases were also found but the majority of the insects were in the larval stage. Holland gives a very good description of this insect in his Moth Book (1913).

(20) *ARCHANARA SUBCARNEA* Kell. At Toledo, Ohio, on July 27, 1928, the author collected two larvae and two pupae



in stalks of *Typha latifolia*. An adult emerging from one of the pupae was determined by the late Dr. H. G. Dyar. From twenty larvae collected near Toledo, two species of parasites (21) *Muscina stabulans* Fall, and (22) *Masicera scullis* Mg., were reared, both being determined by Dr. J. M. Aldrich. At Bolle's Harbor, Michigan, near Monroe, larvae and pupae of this insect were collected on August 16, 1928, from which also emerged specimens of *Masicera scullis* and *Muscina stabulans*.

There seemed to be a heavy infestation of this insect near Toledo, Ohio, but near Monroe, Michigan, twenty miles north and on a mile stretch of Lake Erie only one individual was collected from approximately 1000 stalks. On December 27, 1928, a larva of *A. subcarnea* was taken from a stalk of *Typha latifolia* in a pond along the Olentangy River at Columbus, Ohio.

*Typha latifolia* was examined at Saint Marys, Ohio, on July 29, 1928, and several pupae were found in the base of the stalks, some of them submerged in water. Adults reared from these specimens were determined as *subcarnea* by Dr. Dyar.

*Arzama obliqua* Walk. This name is in all probability a synonym of *Archanara subcarnea* Kell. inasmuch as its description and life-history as described by Claassen agree with the latter.

(23) *Sturmia nigrata* Town. Reported by Claassen (1921). This insect is parasitic on the larvae of *Arzama obliqua*. One adult was reared at Roberts, Idaho, on August 16, 1929.

(24) BACTRA MAIORINA Hein. An adult of this species emerged from the head of *Typha latifolia* at Monroe, Michigan, on June 21, 1928, and was determined by Dr. Carl Heinrich. Nothing is known of its habits.

(25) CACOECIA ROSACEANA Harr. One specimen emerged from a pupa in a stalk of *Typha latifolia* at Monroe, Michigan, and was determined by Dr. A. Busck.

(26) UNIDENTIFIED LEPIDOPTERON. An undeterminable larva was found feeding on the leaves and tender stalks of *Typha latifolia* at Monroe, Michigan on August 12, 1928. A species of Hymenopterous parasite emerged from this larva on August 15 (two males and three females) which were determined by A. B. Gahan as (27) *Eulophus* sp.

(28) ARCHIPS OBSOLETANA Walk. Larvae of this insect were found feeding in the head of *Typha latifolia* at Monroe, Michigan, at Bolle's Harbor, Michigan, and at Toledo, Ohio, in 1927 and 1928.

(29) DICYMOLOMIA JULIANALIS Walk. This species is described by Claassen as feeding in the head of *Typha latifolia*.

(To be continued).

## A New *Melitaea* from Oregon (Lep.: Nymphalidae).

By R. A. LEUSSLER, Omaha, Nebraska.

### *Melitaea hewesi* n. sp.

♂. Expanse 40 mm. (centre of thorax to apex x 2) *Upperside*: Primaries, marginal row of straight, narrow, fulvous spots edged with black; submarginal row of creamy, fulvous-tinged spots, all more or less triangular with the base slightly convex, those between veins 1 & 2 and between 2 & 3 being largest; inside submarginal row there is a row of smaller irregular shaped spots somewhat more fulvous; and inside this row an irregular row of lighter spots; a light colored bar in the cell, a similar colored spot below it near costa, and another in cell near base, a few darker fulvous spots separating the light spots from each other; the space between all of the various spots on the entire wing filled in with black; fringes pale cream, broadly cut by black at the veins, giving the appearance of a checkered fringe.

Secondaries, marginal and submarginal row of spots same as on primaries, row inside submarginal row composed of dark fulvous spots, row in discal area composed of very pale elongated spots; a minute pale spot, flanked outwardly by a curved fulvous spot, in cell near base; basal area, inner margin and all the space between spots black; fringes same as on primaries.

*Underside*: Primaries, rather pale dull fulvous, with all of the spots of the upper side reproduced; the submarginal spots on this side are larger than on upper side and very pale cream, almost white; the marginal fulvous spots continuous, forming a narrow band, uncut by veins; fringes same as on upper side. Secondaries, marginal fulvous band as on primaries; all spots of upper side reproduced, but considerably enlarged and so pale as to be almost white; the median band encloses a series of small, pale fulvous spots or, perhaps more properly, rings (some of them being hollow in the centre); spots in the basal area separated from each other by a narrow irregular fulvous band as is usual in the genus; all the pale spots edged with black. Body, above black, beneath pale yellowish white, palpi fulvous. Antennae, black above, reddish beneath.

♀. Expanse 48 mm. *Upperside*: Strikingly different from the male, the ground color of primaries and secondaries being black, and all the spots creamy white, excepting those forming the marginal band which are reddish fulvous; median row of spots on secondaries are mere dots; fringes same as male. *Underside*: Similar to male; body and palpi same as male.

The above descriptions apply respectively to the male holotype and female allotype taken at Tygh, OREGON, about 25 miles south of the Columbia River near the Dalles in Sherman County,

June 12, 1930, by Dr. L. I. Hewes of San Francisco, for whom I take pleasure in naming the species. Besides the holotype and allotype there are before me 9 other males and 11 other females, all collected by Dr. Hewes, and I deem it advisable to record here the variation within the series. Males Nos. 1, 2, 3 & 4, Tygh, Oregon, June 12, 1930, agree with type and are designated as paratypes. Male No. 5 same date and locality shows less contrast between pale and fulvous spots on upper side of both wings, and the same is true of the under side of primaries. Male No. 6, same date and locality, is a lightly marked specimen still less contrasty. No. 7 same date and locality, although a male this specimen is in appearance the same as the female form *cremita* of *M. palla*. Male No. 8, Goodnow Hills, WASHINGTON, June 26, 1927, same as No. 7. Male No. 9, Tygh, Oregon, June 12, 1930, is an albinic specimen, all the light colored spots being white and the fulvous ones very pale. The variation in the 11 females is less noteworthy. They are all designated as paratypes. 6 were taken at Tygh, Oregon, June 30, 1929, and the remaining 5 in the same locality June 12, 1930. There is some variation in size; in 3 of the specimens the median row of spots or dots is practically obsolete; in 2 others they are slightly tinged with red; in still another all of the spots are conspicuously large and in some of the specimens all of the spots are chalk white rather than creamy white.

What relationship this species bears to other Melitaeae I cannot say. It probably is nearest to *palla* and *whitneyi*, but in my opinion is quite distinct. 2 male and 2 female paratypes in collection of R. A. Leussler at Omaha; the types and remainder of specimens returned to Dr. Hewes.

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### **Food Requirements for the Pupation of Two Coleopterous Larvae, *Synchroa punctata* Newm. and *Dendroides canadensis* Lec. (Melandryidae, Pyrochroidae).**

By NELLIE M. PAYNE.

Fifty grown larvae of each of the species, *Synchroa punctata* and *Dendroides canadensis* were collected in April, 1924, near Saint Paul, Minnesota. These larvae were separated from the

oak bark and frass in which they occurred, washed in 70% alcohol, and fed on filter paper over night. Then the larvae were placed singly in small shell vials containing sterilized oak bark free from *Armillaria nigra*, a fungus which is often present in dead and dying trees. None of these larvae pupated the first year ending April, 1925, although controls collected at the same time and fed unsterilized oak bark or rhizomes of *Armillaria nigra*, pupated and emerged as adults in the summer of 1924. The larvae which were kept on the sterilized medium were transported to Philadelphia in September, 1925, and the experiment continued.

Observations have been made on these larvae for six complete years. The experiment is now in its seventh year. Several larvae have died but the death rate has been very low after the first four years. Larvae have been removed annually or semi-annually and approximately half of them have been fed on rhizomes of *A. nigra* and half on unsterilized oak bark. After the first year larvae thus fed pupated within twenty-four hours after feeding and emerged within two weeks. Larvae removed in April, 1925, required five days in which to pupate. Temperature at which pupae were kept varied between 20-22 degrees centigrade. The following table shows the death rate and the larvae pupating after each special feeding. None of the larvae died during pupation.

Date	SYNCHROA PUNCTATA			DENDROIDES CANADENSIS		
	Fed <i>A. nigra</i> or			Fed <i>A. nigra</i> or		
	Died in larval stage	unsterilized oak bark	Number remaining	Died in larval stage	unsterilized oak bark	Number remaining
April, 1924	0	0	50	0	0	50
April, 1925	4	5	41	5	5	40
April, 1926	1	6	34	3	7	30
April, 1927	2	6	26	2	8	20
Oct., 1927	7	3	16	0	3	17
April, 1928	0	3	13	1	3	13
Oct., 1928	0	2	11	0	3	10
April, 1929	1	2	8	0	2	8
Oct., 1929	0	2	6	0	2	6
April, 1930	0	2	4	1	2	3

Both *Synchroa punctata* and *Dendroides canadensis* normally complete their life cycle within one year. Thus the diet of sterilized food prolonged their lives to over six times the normal length. The larvae reared on the sterilized medium were

healthy and vigorous, but merely unable to differentiate. The actual chemical compound producing pupation in these two species is unknown. The sudden transformation of the old larvae indicates that the pupation-causing substance is of a catalytic nature. This catalyst may or may not be specific, since pupation could occur either by addition of unsterilized oak bark or of *Armillaria nigra* rhizomes to the diet. However the great frequency with which *A. nigra* was present in trees in which *S. punctata* and *D. canadensis* normally fed, lead the writer to suppose that the effect of unsterilized oak bark on pupation may have been due to small bits of *Armillaria* or other fungi.

Recently Uvarov [1928] has summarized the literature relating to insect nutrition. This admirable summary renders a bibliography to a brief note superfluous.

#### LITERATURE CITATION.

UVAROV, B. P. Insect Nutrition and Metabolism. A Summary of the Literature. Trans. Ent. Soc. London. Dec. 31, 1928. pp. 255-343.

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### A Recent Occurrence of *Catopsilia phileia* Joh. in Missouri. (Lepid.: Pieridae).

An unusual capture for this part of the country was the taking of a male specimen of *Catopsilia phileia* Joh. in Webster Groves, Missouri, on July 11, 1930, by Jack Neavles, a young butterfly-hunter of my neighborhood. The range of this tropical butterfly is generally regarded as extending into Texas, but there are on record occurrences of stray individuals at localities considerably farther north. In the present instance, the flight of the butterfly for so great a distance from its normal territory may be definitely correlated with the protracted hot weather that preceded its appearance here.

Cases like this, in which butterflies are observed hundreds of miles away from the localities where they are known to breed, demonstrate that butterflies are capable of flying enormous distances, and indicate a probability that such long flights may take place more frequently than has been noted by observers. They therefore deserve careful study, being important aids to the solution of some of the problems that beset the investigator of insect migrations.

HAROLD O'BYRNE, Webster Groves, Missouri.

### **An Additional Annotated List of the Ants of Mississippi\* (Hym.: Formicoidea).**

M. R. SMITH, A. & M. College, Mississippi.

In a previous article (Ent. News, Vol. 39, pp. 242-246 and 275-279, 1928) 19 additional species of ants were recorded for Mississippi. The present paper lists 20 more species, thus making a grand total of 126 species which have been recorded for the state. Although a great deal of collecting for ants has been done in some parts of the state, there are other areas in which no collecting or only very little collecting has been done. When these areas are adequately scouted, it would not be surprising if the list of the ants of the state is extended to include 150 species or more.

Of the 126 species collected to date, 11 species or 8.7 percent are apparently new species. New species have been found within the following genera:—*Aphaenogaster*, *Stenammas*, *Pheidole*, *Leptothorax*, *Myrmica*, and *Camponotus* sub-genus *Colobopsis*.

The most interesting of the new species is a *Stenammas*, which is apparently distinct from anything that has yet been recorded for North America. This species is of even further interest in that the genus *Stenammas* is very poorly represented in this section of the country.

Another interesting new species is a *Colobopsis*, which is allied to *C. impressus* in the general shape of the head of the soldier (that is, with subparallel sides) yet is very distinct not only from this species but from all other *Colobopsis* that have yet been taken in North America.

#### Subfamily DORYLINÆ

##### 107. *ECITON MEXICANUM* (F. Smith).

Wiggins. Male specimens of what is believed to be this species were taken by Mr. J. P. Kislanko at trap lights at Wiggins on the night of June 27, 1930. Our specimens agree very well with the figure of this species as given by Wheeler in fig. 11, plate 26 of the Bull. Amer. Mus. Nat. Hist. Vol. 24, (\* A contribution from the Mississippi Agricultural Experiment Station)

1908. Wheeler states, "the male of this species is easily distinguished from all the known males of the genus by the peculiar shape of the mandibles which are narrow, straight at the base and curved at the tips, with the middle of the external margin concave and a low but distinct projection on the inner margin." I am inclined to believe that this ant is the male phase of *Eciton pilosus*. *E. mexicanum* is known only from the male. The male of *E. pilosus* on the other hand is not known. My reasons for believing that the males of *E. mexicanum* are very probably the males of *E. pilosus* will be given in a forthcoming article.

108. *APHAENOGASTER TEXANA* var. *CAROLINENSIS* Wheeler.

Columbus, Starkville, Greenwood Springs. The slender, yellowish-brown workers of this ant might easily be confused with the smaller workers of *Aphaenogaster fulva* or some of its forms. The head of the worker of *carolinensis* is much more slender than the head of the worker of *A. fulva*, and the posterior corners are decidedly rounder. The eyes are proportionally larger and the antennae longer.

This species was described from specimens nesting in the soil beneath stones in the open woods at Tryon, N. C. (Bull. Amer. Mus. Nat. Hist. Vol. 34, p. 414, 1915). In Mississippi I have taken the ants from the soil beneath logs and also from beneath the bark of stumps. At Columbus, Mississippi, a colony was found nesting in a pine log near a fine colony of *Euponera gilva*.

109. *STENAMMA FOVEOLOCEPHALA* M. R. Smith.

Ackerman. Two workers of this species were collected from the sandy soil on the south slope of a thinly wooded hillside, 2 miles from Ackerman, Mississippi. Although a careful search was made for further specimens none were found. These are the first workers of *Stenamma* that have been collected in the state. To date this is the fourth species of *Stenamma* to be described for North America. The other three species are as follows: *brevicornis* and its various subspecies and varieties, *nearcticum* (which is known only from the male and female phases), and *manni* which was described by Dr. Wheeler from Mexican specimens.

This species differs from *brevicornis* and its allied forms in

the following particulars: (1) the eyes are larger; (2) the sculpturing of the head is decidedly foveolate-reticulate; (3) the rugulae on the basal surface of the epinotum are transverse; (4) the postpetiole is longer and when viewed from above subcampanulate; (5) the color is darker, almost black.

The description of this species appeared in *Annals Ent. Soc. of Amer.* Vol. 23, No. 3, 1930.

110. *LEPTOTHORAX WHEELERI* M. R. Smith.

A. & M. College, Starkville, Sturgis, Adaton. This species was recently described and illustrated in *Annals Ent. Soc. of America*, Vol. 22, pp. 548, 1929. The worker of this species is very closely related to the worker of *L. schaumii* and *L. fortinodis*. From these species it differs, however, in the following particulars: (1) it has longer and larger epinotal spines; (2) the thorax is not so compressed laterally and dorsally as with the species mentioned; (3) the sculpturing is much coarser.

All of the nests which I have encountered were found in cavities in live, standing trees or in logs and stumps.

111. *LEPTOTHORAX (D.) PERGANDEI* subsp. *FLAVUS* M. R. Smith.

Adaton, Longview, Starkville. This interesting species belonging to the subgenus *Dichothorax* was also recently described in the *Annals Ent. Soc. Amer.* Vol. 22, pp. 549-550, 1929. Although closely allied to *pergandei*, the worker can be distinguished from the worker of *pergandei* by the following differences: (1) its larger size; (2) different color (yellow); (3) less acute meso-epinotal constriction; (4) the longer, blunter, and stouter epinotal spines; (5) the much larger and more convex petiole, and the distinctly broader post petiole; (6) and by the longer, coarser, and more uneven pilosity.

All the colonies which I have seen were nesting in crevices just beneath the bark of pine stumps, usually very near the soil level.

112. *LEPTOTHORAX PERGANDEI* subsp. *FLORIDANUS* Emery.

Louisville, Blue Mountain, Ripley. According to Emery this subspecies differs from *L. (D.) pergandei* in the following particulars, namely: (1) the body is more shining; (2) the epinotum smooth and shining above; (3) the mesoepinotal con-



striction is punctulate, subopaque; (4) the petiolar node is narrower and not impressed above; (5) the postpetiole is hardly  $\frac{1}{3}$  again as broad as the petiole and proportionally narrower than in *pergandei*. Wheeler in addition states that the color, pilosity, and sculpture are the same in both forms.

Mr. S. W. Simmons, who collected the ants at two of the locations mentioned above, informs me that they were found nesting in the soil beneath logs and stones.

113. *LEPTOTHORAX* (D.) *PERGANDEI FLORIDANUS* var. *SPINOSUS* M. R. Smith.

Summit. This species was described in the same journal as the other species of *Leptothorax* just mentioned (p. 551). It is also a member of the subgenus *Dichothorax*. The worker differs from that of *floridanus* as follows: (1) the epinotal spines are longer and are directed more upward and outward; (2) the epinotal spines are not small or tuberculate as with *pergandei* and *floridanus*, but distinctly spinose, and longer than broad at base; (3) the pilosity is longer, coarser, and more uneven; (4) the color, although variable, is somewhat darker than that of *floridanus*.

These ants were collected from a rotting pine stump at Summit, Mississippi, the type-locality.

114. *STRUMIGENYS ORNATA* Mayr.

Louisville. One specimen of this ant was collected by Mr. G. W. Haug from amongst leaves and other debris on the ground in a dense growth of oak trees about 8 miles northwest of Louisville.

The worker of this species can be very easily distinguished by the exceedingly long clavate hairs which are directed upward from the surface of the clypeus. The ants appear to be rather rare in the state.

115. *STRUMIGENYS CLYPEATA* var. *PILINASIS* Forel.

Louisville. Three specimens of this species were taken by me from a small crevice in a well rotted log, lying at the foot of a hill in the same patch of woodlands as the species mentioned above.

This species can be recognized by the peculiar shape of the

head of the worker, which tapers very strongly anteriorly, thus causing the clypeus to be considerably longer than broad. The clypeus is covered with numerous erect hairs, which are not at all clavate or scale-like as in the other species of *Strumigenys*. Also the exposed sections of the mandibles are toothed internally for their entire length.

116. *SOLENOPSIS PERGANDEI* Forel.

Greenwood Springs, Quitman, Biloxi, Ackerman. The worker of *S. pergandei* can be distinguished from the worker of *S. molesta* as follows: (1) it is a larger species; (2) the head is practically quadrate; (3) the node of the post-petiole is about as long as wide and more spherically shaped. The worker of *S. molesta* has a post-petiole node, which when viewed from above appears to be wider than long. For the description of *pergandei* see Ann. Soc. Ent. Belg. Vol. 45, p. 343, 1901. The species was described from North Carolina specimens.

I have seen nests of this ant in the soil and also in crevices in rotting pine stumps. At Quitman, alate females were found in the nest on July 6th. This does not appear to be as common a species in Mississippi as *molesta*.

117. *Solenopsis globularia* subsp. *mobiliensis* Creighton.

Ocean Springs, Perkinston, Pascagoula. This species was first collected at Mobile, Alabama, by Mr. W. S. Creighton of Harvard University. At the time he wrote me in regard to it, he was of the opinion that it was possibly an imported species. This species, the only form of *globularia* that I know to occur in the United States, is very distinct from our other species of *Solenopsis*. The worker can be readily recognized by its abnormally large postpetiole, which when viewed from above and behind is transversely-elliptical. The epinotum when viewed from the side is decidedly angular.

Mr. J. P. Kislanko, who collected the ants at two of the above named localities, found them nesting in wood in both instances, and seeds were observed in their nest on one of these occasions. Mr. R. P. Colmer sent in specimens from Pascagoula, which were stealing canary bird seed from a house.

118. *TETRAMORIUM* (*TRIGLYPHOTHRIX*) *STRIATIDENS* Emery.

West Point. A large number of workers of this imported Indian ant were collected from the brick wall of a store in the business section of West Point, by Mr. E. E. Byrd. Mr. Byrd stated that he believed the ants to be nesting in the wall as he saw numerous workers enter and leave small holes in the wall. The ants are slow moving in gait and given to sulking when touched by an object.

This is the second time that the species has ever been recorded from the United States. It was first taken in 1913 at New Orleans by Mr. E. R. Barber (*Wheeler, Jour. Ec. Ent. Vol. 9, pp. 566-569, 1916*). This ant, as Wheeler aptly remarks, is tending to become world-wide in its distribution. Whether it will prove a pest in the state remains to be seen.

119. *MYRMICA* *SCHENCKI* var. *SPATULATA* M. R. Smith.

Starkville. This, the only species of *Myrmica* that has yet been taken in Mississippi, is apparently a new one. As its name indicates, both workers and females can be distinguished from allied forms of *Myrmica* by the exceedingly large spoon or spatulate-shaped lobes at the base of the antennae. Viewed from above the margins of the lobes are very thin and somewhat reflexed. Viewed laterally the lobes form slightly more than a right angle with the base of the scapes of the antennae.

This species was found nesting in the soil in a low, heavily wooded area 5 miles west of Starkville. The area is frequently subject to overflow.

A description of the worker and female of this species appeared in Vol. 23, No. 3, of the *Annals Ent. Soc. Amer.* 1930.

120. *PHEIDOLE* *LAMIA* Wheeler.

Fayette. Two soldiers and a number of workers of this extremely interesting ant were collected by Mr. G. W. Haug from the soil at the base of a maple tree in the old Argentine ant area at Fayette. The soldier of this ant can be easily recognized at a glance because of its peculiarly shaped head, which is long and subcylindrical with truncated anterior portion. The soldiers are supposed to use their heads in plugging the galleries to the nest. According to Wheeler the ants are decidedly

subterranean in nature. Mr. Haug informed me that although he made a very careful search for soldiers he only succeeded in taking two specimens. Apparently the soldiers are very scarce in the nest. They may function as queens as Wheeler suggests. *Ph. lamia* was described by Wheeler from specimens collected at Austin, Texas. So far as I am aware this is the first time that the ant has been taken outside of that state.

121. *DOLICHODERUS PLAGIATUS PUSTULATUS* var. *BEUTEN-MUELLERI* Wheeler.

Smithville, Biloxi. The types of this species are from the Black Mountains of North Carolina. For description of the species see Bull. Amer. Mus. Nat. Hist. Vol. 20, p. 304, 1904. The worker of this species has a black head and gaster and a reddish-brown thorax. The head and thorax which bear shallow foveolae are glabrous. There are also erect hairs on the upper surface of the body.

At Smithville workers were collected from oak, hickory, and sumac where they were seeking honey dew. At Biloxi on September 5, 1929, the ants were found attending aphids on a species of grass in a marshy area, not over 125 yards from the waters of the Gulf of Mexico. Between the sheaths of the grass were found immature stages of the ants, which were covered over by fine down-like hairs that had been pulled from the grass by the worker ants. Both winged females and female pupae were found.

#### Subfamily FORMICINAE.

122. *FORMICA TRUNCICOLA INTEGR*a Nylander.

Greenwood Springs. These beautiful, robust, red and black ants were found in large numbers amongst sand, leaves, and other debris along the edge of a small stream. In this vicinity there were many elder bushes on which were numerous black aphids that the workers were busily attending. When I attempted to capture the worker ants, they hid beneath leaves and would cautiously peep out as if they were endowed with intelligence. For a description of this species see Bull. Mus. Comp. Zool. Harvard, Vol. LIII, pp. 444-445, 1913.

123. *CAMPONOTUS CARYAE* subsp. *DISCOLOR* (Buckley).

Corinth, A. & M. College. This beautiful red and black ant with emarginate clypeus is described in Proc. Ent. Soc. Phila. Vol. 6, p. 166, 1866.

Judging from our records it does not appear to be as common a species as *rasilis*, which it resembles in both appearance and habits. It can be easily distinguished from *rasilis* by the coarse, piligerous foveolae on the cheeks and clypeus of the worker and female. At Corinth a single worker was taken from the trunk of a tree in a low, heavily wooded area. At A. & M. College, Mr. J. M. Langston found one dealate female and 3 workers in a cavity in a pecan husk on the college farm.

124. *CAMPONOTUS (COLOBOPSIS) OBLIQUUS* M. R. Smith.

Starkville. This species is entirely distinct from any other species of North American *Colobopsis* that has yet been described. With respect to the shape of the head of the soldier (that is, its subparallel sides) it would appear to be closely allied to *C. impressus*. From the latter species it differs in the following characters: (1) its smaller size (3.5-3.75 mm.); (2) the much coarser sculpturing of the head; (3) the less concave, truncate surface of the head; and (4) in the more rectangularly shaped clypeus.

The workers of this ant were found nesting in a cavity in the husk of a hickory nut, *Caryac* sp., which was gathered in a low woodland pasture, 5 miles southwest of Starkville. To Mr. J. M. Langston credit is due for collecting this species.

The description of this species appeared in Vol. 23, No. 3 of the Annals Ent. Soc. of Amer. 1930.

125. *LASIUS BREVICORNIS* Emery.

Ripley. This species is apparently confined to the cooler, more northern sections of the state. Our specimens have been collected by Mr. S. W. Simmons, who informs me that this is not an uncommon ant in the area from which it is listed above. Mr. Simmons found the ants nesting in the soil in a hilly, wooded area. The worker of *L. brevicornis* can easily be distinguished by its short antennal scapes, which do not extend entirely to the posterior corners of the head. The maxillary palpi are 6-segmented.

126. *LASIUS (A.) CLAVIGER* Roger.

Ripley. This species is represented in our collection by a single dealate female, which was captured at the above named locality by Mr. S. W. Simmons. Although *L. interjectus* Mayr is a fairly common ant in this state, its cogener *L. claviger* for some unexplainable reason seems to be rare or absent in the areas where we have collected intensively.

The worker of *L. claviger* can easily be distinguished by the following characters: (1) the 3-segmented maxillary palpi; (2) the antero-posteriorly compressed petiole, the superior border of which is sharp; (3) by the absence of teeth on the superior borders of the mandibles; (4) by the numerous erect hairs which are widely distributed over the dorsal surface of the gaster.

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### **The Night Flight of Diurnal Butterflies (Lepid.).**

By PHIL RAU, Kirkwood, Missouri.

I was glad that Mr. Hayward was led to publish in the October NEWS the fine lot of records of the night flight of diurnal Lepidoptera, even though he thinks the data are of no scientific value. Notes of this type are valuable in the study of psychogenesis. I believe that changes in habits and eventually in morphology of species have in many cases had their inception in just such cases of digression from instinct as Mr. O'Byrne's and Mr. Hayward's data represent. When an animal behaves in a way which differs from the established habit of the species, we know there must be some cause for this digression. Such action is usually more difficult, requires more effort, than following customary routine; hence the cause must be more impelling than is outwardly apparent. I believe that these causes for digression are usually psychic in nature.

I fully agree with Mr. Hayward when he says that each record should be complete with full environmental data, but I do not agree with him when he says that the appearance of Lepidoptera on the wing at unusual times is purely accidental, that they have merely been disturbed by night prowlers. A night in the field with sleeping insects will prove to anyone that insects, especially butterflies, sleep soundly at night, and if disturbed they drop to the ground. They can easily be picked up

in the fingers, or a twig upon which they are asleep can be carried several miles without disturbing them.\*

When a day-flying male *Promethes* moth† comes to the female in the cage on my roof at four a.m., (even though he is only one out of many), my interpretation is that its organ for odor perception is more highly developed than that of its companions, or its sex urge is greater than its impulse to sleep, or both. At least, its inner urge for action must be different from that of its companions. If it beats the other ardent swains in its quest for mating, or if perchance it meets a mate of like tendencies, there is ample probability that the psychic urge to this new departure will recur in the offspring. If the new habit gives the creature an advantage among its fellows, there is a chance that it may become permanent in the species. All this, of course, would be quite unthinkable if the first occurrence of the new act was purely accidental or caused by extraneous forces.

We are in the habit of thinking that night-flying moths are active at any hour of the night, and likewise day-flying moths are active during any and all hours of the day. In the paper cited, we show that each species of moths with which we worked has a very definite period of flight, which recurs once in each cycle of twenty-four hours, and if a change of this "hour" occurs in a species, we would not expect it to occur en masse, but to have its inception in one or a few individuals of the race,—just the erratic type of individuals that Mr. O'Byrne and Mr. Hayward mention.

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### The C. F. Adams Collection of Diptera.

A collection of Diptera, totalling approximately 12,000 specimens, has been presented to Purdue University by Dr. C. F. Adams, Director of the Bacteriological Laboratory of the Indiana State Board of Health and formerly Dean and Entomologist of the College of Agriculture of the University of Arkansas. Dr. Adams has retained the Mycetophilidae and a named set of the Culicidae, in which groups he will continue his studies.

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\* See Rau and Rau, *The Sleep of Insects; An Ecological Study*. Ann. Ent. Soc. Amer. 9: 227-274. 1916.

† Rau and Rau, *The Sex Attraction and Rhythmic Periodicity in the Great Saturniid Moths*. Trans. Acad. Sci. St. Louis 26: 82-221. 1929.

## A New Species of Two-winged Fly belonging to the Genus *Acronarista* (Diptera: Tachinidae)<sup>1</sup>

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

In 1908, Townsend established the genus *Acronarista* with *mirabilis* as the type and sole species.<sup>1</sup> The description was based upon a single specimen collected by the late Dr. H. G. Dyar at Palm Beach, Florida.

I am indebted to Dr. J. M. Aldrich for the opportunity of examining the type specimen now in the U. S. National Museum. The type is a male and not a female as stated in the original description. This correction has already been indicated by W. R. Thompson.<sup>2</sup> The species is rare among our native Tachinidae and for more than twenty years no additional specimens have been discovered.

A second species from Louisiana, described as new in the present paper, seems congeneric. It differs in having the arista situated about midway between the base and apex of the anterior ramus of the third antennal joint; in having one to three setules near the tip of the first vein; and a number of other less essential details.

### *Acronarista cornuta* new species

Male: Front at narrowest (vertex) 0.384 of the head width in the one specimen, widening but slightly to base of antennae; parafrontals faintly pruinose subshining in certain angles, with only a few short inconspicuous hairs outside the frontal rows; median stripe brownish-black, uniform in width to triangle and slightly broader than one parafrontal; frontal bristles descending to apex of second antennal joint, the uppermost one or two pairs smaller than the preceding ones; ocellars proclinate; verticals one pair (inner) rather stout, curving backward; orbitals present (three on one side and two on other), all proclinate; face gray pollinose, very deeply excavated, the sides linear, bare, and strongly divergent downward; vibrissae large, inserted on oral margin, with only a few bristles on the ridges above; antennae reaching oral margin, basal joints short, tinged with yellow; third wholly black, deeply and broadly incised to form an anterior and posterior ramus which in profile are distinctly bowed effecting a U-shaped appearance; arista situated slightly

<sup>1</sup> Tax. Musc. Flies, Smith Misc. Colls., Vol. LI, p. 85.

<sup>2</sup> Canad. Ent., Vol. XLIII, p. 313.



nearer base than apex of anterior ramus, thickened almost to tip, penultimate joint only slightly shorter than the third; cheeks about one-sixth the eye height; proboscis short, fleshy; palpi yellow; eyes bare.

Thorax and scutellum black, dusted lightly with bluish-gray pollen, humeri more densely pollinose; mesonotum showing five indistinct dark stripes in front and none behind suture. Chaetotaxy: humeral 2; posthumeral 2; presutural 1; acrostichal 3, 1; dorsocentral 3, 3; notopleural 2; intraalar 3 (anterior one minute); supraalar 3; postalar 2; pteropleural 1; sternopleural 4 (intermediate ones small); scutellum with two lateral besides a weaker apical pair, no discals; postscutellum normally developed; calypters semitransparent, white.

Abdomen rather short and flat, basal margins of segments two to four with narrow bands of bluish-gray pollen, the remainder of these segments, including the first, shining black; first segment without median marginal bristles; second with one pair, rather small; third with a marginal row situated considerably before the hind margin; fourth with a discal row but without a distinct row of marginals.

Legs blackish, rather stout, pulvilli conspicuous but shorter than last tarsal joint; mid tibia with one bristle on outer front side; hind tibia with a sparse row of short bristles on outer posterior edge with one or two longer near middle.

Wings hyaline; the hind cross vein erect joining the fourth vein slightly before the middle between small cross vein and bend; first vein with one to three setules near the apex; third with one rather large bristle at base; fourth vein with a broadly rounded bend, curving outward near the tip leaving the first posterior cell narrowly open almost in exact wing tip; costal spine minute.

Length, 4 mm.

Female: Unknown.

Described from a single male specimen from Opelousas, LOUISIANA, March, 1897, (collector unknown) received from David G. Hall.

*Type:* Male, Cat. No. 43172 U.S.N.M.

This species, like the genotype, is a minute fly with the third antennal joint cleft into two rami. In profile these are less strongly bowed than in *mirabilis* and the entire joint is black. The presence of a few setules on the first vein; the elongated penultimate joint of the arista; and the insertion of the latter nearer the base of the third antennal joint do not appear to be characters of generic importance in this case.

**Dynastes tityus Linn. in Delaware (Coleop.: Scarabaeidae).**

From the paper by Dr. P. P. Calvert on the occurrence of this species in Pennsylvania, in the NEWS for June and July, 1930, I was especially interested to learn of the occurrence of this beetle in that state, as I have collected one male in the vicinity of Newark, Delaware, in 1927, although I can give no further data concerning it.

In the collection of the Delaware Agricultural Experiment Station, there is one specimen, also a male, dated August 7, 1929, locality Nassau, Delaware, with no collector's name attached. I think the collector was Dr. H. D. Dozier, as I remember pinning the specimen. Nassau is just this side of Rehoboth Beach, toward the southeastern end of Delaware. During collections made in Pennsylvania in 1927 and in the following year, I did not find another specimen. In the fall of 1928, I collected a number of immature and fully grown larvae of this species in the vicinity of Knoxville, Tennessee, and I was again able to obtain some this past summer (1930).

The reported occurrence of this species in Pennsylvania is of special interest: I had thought Delaware to be its northern limit.

L. CHESTER MARSTON, JR., Department of Biology,  
University of Toronto.

**The Composition of the Head of Insects.**

In the embryo of *Carausius* (walking stick) seven pairs of coelom sacs are laid down in the head. Of these only the antennal, mandibular, first and second maxillary are preserved for any length of time. The others (labral, preantennal, intercalary) remain rudimentary. The labral and preantennal belong to the primary head region. The preantennal pair is to be considered as homologous with that so-named in *Scolopendra*. In *Carausius* the reduction of the coelom sacs proceeds from behind forward. The second maxillary coelom sacs are like those of the thorax, the mandibular are reduced to their ventral parts. The phylogenetically oldest secondary head segment is, therefore, the mandibular, the phylogenetically youngest is the second maxillary. R. WIESMANN in Leuzinger, Wiesmann and Lehmann: Zur Kenntniss der Anatomie u. Entwicklungsgeschichte der Stabheuschrecke *Carausius morosus* Br. Jena, Gustav Fischer, 1926, pages 317-318.

**Additions to the Index to Vol. XLI, 1930.**

Under Obituary Notices, insert Rathvon, S. S. 234. Under Personals, insert Auxer, S. 236. Under Coleoptera, insert Auxer Collection 236, *quadristriatus*, *Tropisternus* 238, Rathvon Collection 199, Raub Collection 236.

**List of the Titles of Periodicals and Serials Referred to by  
Numbers in Entomological Literature  
in Entomological News.**

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1. Transactions of The American Entomological Society. Philadelphia.
2. Entomologische Blätter, red. v. H. Eckstein etc. Berlin.
3. Annals of the Carnegie Museum. Pittsburgh, Pa.
4. Canadian Entomologist. London, Canada.
5. Psyche, A Journal of Entomology. Boston, Mass.
6. Journal of the New York Entomological Society. New York.
7. Annals of the Entomological Society of America. Columbus, Ohio.
8. Entomologists' Monthly Magazine. London.
9. The Entomologist. London.
10. Proceedings of the Ent. Soc. of Washington. Washington, D. C.
11. Deutsche entomologische Zeitschrift. Berlin.
12. Journal of Economic Entomology, Geneva, N. Y.
13. Journal of Entomology and Zoology. Claremont, Cal.
14. Entomologische Zeitschrift. Frankfurt a.M., Germany.
15. Natural History, American Museum of Natural History. New York.
16. American Journal of Science. New Haven, Conn.
17. Entomologische Rundschau. Stuttgart, Germany.
18. Internationale entomologische Zeitschrift. Guben, Germany.
19. Bulletin of the Brooklyn Entomological Society. Brooklyn, N. Y.
20. Societas entomologica. Stuttgart, Germany.
21. The Entomologists' Record and Journal of Variation. London.
22. Bulletin of Entomological Research. London.
23. Bollettino del Laboratorio di Zoologia generale e agraria della R. Scuola superiore d'Agricoltura in Portici. Italy.
24. Annales de la société entomologique de France. Paris.
25. Bulletin de la société entomologique de France. Paris.
26. Entomologischer Anzeiger, hrsg. Adolf Hoffmann. Wien, Austria.
27. Bolletino della Società Entomologica. Genova, Italy.
28. Ent. Tidskrift utgäfen af Ent. Förningen i Stockholm. Sweden.
29. Annual Report of the Ent. Society of Ontario. Toronto, Canada.
30. The Maine Naturalist. Thornaston, Maine.
31. Nature. London.
32. Boletim do Museu Nacional do Rio de Janeiro. Brazil.
33. Bull. et Annales de la Société entomologique de Belgique. Bruxelles.
34. Zoologischer Anzeiger, hrsg. v. E. Korschelt. Leipzig.
35. The Annals of Applied Biology. Cambridge, England.
36. Transactions of the Entomological Society of London. England.
37. Proceedings of the Hawaiian Entomological Society. Honolulu.
38. Bull. of the Southern California Academy of Sciences. Los Angeles.
39. The Florida Entomologist. Gainesville, Fla.
40. American Museum Novitates. New York.
41. Mitteilungen der schweiz. ent. Gesellschaft. Schaffhausen. Switzerland.
42. The Journal of Experimental Zoology. Philadelphia.
43. Ohio Journal of Sciences. Columbus, Ohio.
44. Revista chilena de historia natural. Valparaiso, Chile.
45. Zeitschrift für wissenschaftliche Insektenbiologie. Berlin.
46. Zeitschrift für Morphologie und Ökologie der Tiere. Berlin.
47. Journal of Agricultural Research. Washington, D. C.
48. Wiener entomologische Zeitung. Wien, Austria.
49. Entomologische Mitteilungen. Berlin.
50. Proceedings of the U. S. National Museum. Washington, D. C.
51. Notulae entomologicae, ed. Soc. ent. helsingfors. Helsingfors, Finland.
52. Archiv für Naturgeschichte, hrsg. v. E. Strand. Berlin.

53. Quarterly Journal of Microscopical Science. London.
54. Annales de Parasitologie Humaine et Comparée. Paris.
55. Pan-Pacific Entomologist. San Francisco, Cal.
56. "Konowia". Zeit. für systematische Insektenkunde. Wien, Austria.
57. La Feuille des Naturalistes. Paris.
58. Entomologische Berichten. Nederlandsche ent. Ver. Amsterdam.
59. Encyclopédie entomologique, ed. P. Lechevalier. Paris.
60. Stettiner entomologische Zeitung. Stettin, Germany.
61. Proceedings of the California Academy of Sciences. San Francisco.
62. Bulletin of the American Museum of Natural History. New York.
63. Deutsche entomologische Zeitschrift "Iris". Berlin.
64. Zeitschrift des österr. entomologen-Vereines. Wien.
65. Zeitschrift für angewandte Entomologie, hrsg. K. Escherich. Berlin.
66. Report of the Proceedings of the Entomological Meeting. Pusa, India.
67. University of California Publications, Entomology. Berkeley, Cal.
68. Science. New York.
69. Comptes rendus hebdom. des séances de l'Académie des sciences. Paris.
70. Entomologica Americana, Brooklyn Entomological Society. Brooklyn.
71. Novitates Zoologicae. Tring, England.
72. Revue russe d'Entomologie. Leningrad, USSR.
73. Quarterly Review of Biology. Baltimore, Maryland.
74. Šborník entomolog. národního musea v Praze. Prague, Czechoslovakia.
75. Annals and Magazine of Natural History. London.
76. The Scientific Monthly. New York.
77. Comptes rendus heb. des séances et mémo. de la soc. de biologie. Paris.
78. Bulletin Biologique de la France et de la Belgique. Paris.
79. Koleopterologische Rundschau. Wien.
80. Lepidopterologische Rundschau, hrsg. Adolf Hoffmann. Wien.
81. Folia myrmecol. et termitol. hrsg. Anton Krausse. Bernau bei Berlin.
82. Bulletin, Division of the Natural History Survey. Urbana, Illinois.
83. Arkiv för zoologie, K. Svenska Vetenskapsakademien i. Stockholm.
84. Ecology. Brooklyn.
85. Genetics. Princeton, New Jersey.
86. Zoologica, New York Zoological Society. New York.
87. Archiv für Entwicklungsmechanik der Organ., hrsg. v. Roux. Leipzig.
88. Die Naturwissenschaften, hrsg. A. Berliner. Berlin.
89. Zoologische Jahrbücher, hrsg. v. Spengel. Jena, Germany.
90. The American Naturalist. Garrison-on-Hudson, New York.
91. Journal of the Washington Academy of Sciences. Washington, D. C.
92. Biological Bulletin. Wood's Hole, Massachusetts.
93. Proceedings of the Zoological Society of London. England.
94. Zeitschrift für wissenschaftliche Zoologie. Leipzig.
95. Proceedings of the Biological Soc. of Washington, Washington, D. C.
96. La Cellule. Lierre, Belgium.
97. Biologisches Zentralblatt. Leipzig.
98. Le Naturaliste Canadien. Cap Rouge, Chicoutimi, Quebec.
99. Mélanges exotico-entomologiques, Par Maurice Pic. Moulins, France.
100. Bulletin Intern., Académie Polonaise des Sci. et des Lett. Cracovie, Poland.
101. Tijdschrift voor entomologie, Nederlandsche Entomol. Ver., Amsterdam.
102. Entomologiske Meddelelser, Entomologisk Forening, Copenhagen.
103. Journal of the Kansas Entomological Society, Lawrence, Kansas.
104. Revista de la Sociedad entomologica Argentina, Buenos Aires.

## Entomological Literature

COMPILED BY LAURA S. MACKAY UNDER THE SUPERVISION OF  
E. T. CRESSON, JR.

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 **within brackets** [ ] refer to the journals, as numbered in the list of Periodicals and Serials published in the January and June numbers (or which may be secured from the publisher of Entomological News for 10c), in which the paper appeared. The number of, or annual volume, and in some cases the part, left, &c. the latter **within** ( ) follows; then the pagination follows the **colon** :

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

\*Papers containing new forms or names have an \* preceding the author's name.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

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.

 Note the change in the method of citing the bibliographical references, as explained above.

Papers published in the Entomological News are not listed.

**GENERAL.**—**Dimmock, G.**—Obituary. By J. H. Emerton. [5] 37: 299, ill. **Enderlein, G.**—Parallelismus der Erfahrungen in der belebten Natur. [Ent. Jahrb., Krancher] 40: 79-80, ill. **Fulda, O.**—Eine plauderei. [18] 24: 321-326. **Howard, L. O.**—A history of applied entomology. (Somewhat Anecdotal). [Smiths. Misc. Coll.] 84: 564 pp., ill. **Lay, G. W.**—The language of scientists. [68] 72: 567-569. **Nomenclator animalium generum et subgenerum.** Hrsg. Schulze, Kükenthal, Heider & Hesse. Bd. 3. Hyetu-Lauxanacanthis. Berlin. pp. 1619-1778. **Reed, A. C.**—Animal parasites of man and their control. [68] 72: 611-620. **Roy, E.**—L'étude des insectes. [98] 57: 209-220. **Shaw, E. L.**—Insects from Lactuca stems. [6] 38: 463-468. **Snodgrass, R. E.**—How insects fly. [Smiths. Report] 1929: 383-421, ill. **Swett, L. W.**—Obituary. By C. W. Johnson. [5] 37: 301, ill.

**ANATOMY, PHYSIOLOGY, ETC.**—**deLépiney, J.**—Note préliminaire sur le rôle de la vision ocellaire dans le comportement des chenilles de *Lymantria dispar*. [Bull. Soc. Zool., France] 53: 479-490, ill. **Dieuzeide, R.**—Contribution à l'étude des Néoplasmes végétaux le role des pucerons en phytopathologie. [Act. Soc. Linné., Bordeaux] 81: 160 pp., ill. **Eastham, L. E. S.**—The embryology of *Pieris rapae*-organogeny. [Philos. Trans. R. Soc. London] 219, (B): 50 pp., ill. **Hovasse, R.**—*Marchalina hellenica* (Gennadius). Essai de monographie d'une Cochenille. [78] 64: 389-449, ill. **Lespes, Regnier & Rungs.**—Contribution à l'étude des phases chez le criquet pèlerin, *Schistocerca gregaria*. [69]

191: 874-878. **Marcu, O.**—Beitrag zur kenntnis der stridulations-organe von *Prionus coriarius*. [34] 92: 65-66, ill. **Marcus, B. A.**—Untersuchungen ueber die Malpighischen gefässe bei käfern. [46] 19: 609-677, ill. **Napier, L. E.**—The artificial feeding of Sandflies. [Indian Jour. Med. Res.] 18: 699-706, ill. **Rabaud, E.**—L'instinct maternel des araignées. [Bull. Soc. Zool., France] 53: 204-210. **Rabaud, E.**—Le stationnement de l'argiope fasciée (*Argiope bruennichi*). [69] 191: 878-880. **Shull, F.**—Control of gamic and parthenogenetic reproduction in winged aphids by temperature and light. [Zeit. Induk. Abstim. u. Vererbung., Berlin] 55: 108-126. **Staercke, A.**—Ein neues formicarium. [34] 92: 152-155, ill. **Sweetman, H. L.**—The external morphology of the Mexican bean beetle, *Epilachna corrupta* (Coccinellidae). [6] 38: 423-452, ill. **Tanner, M. L.**—Plant lice pumping in unison. [68] 72: 560. **Timon-David, J.**—Recherches sur les matières grasses des insectes. [Ann. Fac. Sci., Marseille] 4: 29-207, ill. **Toumanoff, K.**—Notes sur le gynandromorphisme chez *Carausius (Dixippus) morosus*. [Bull. Soc. Zool. France] 528-544, ill. **Toumanoff & Veretennikoff.**—Résultats préliminaires d'expériences d'irradiation par les rayons x sur *Carausius (Dixippus) morosus*. [78] 64: 495-510, ill. **Trojan, E.**—Die dufoursche drüse bei *Apis mellifica*. [46] 19: 678-685, ill. **Tulloch, G. S.**—Thoracic modifications accompanying the development of subaptery and aptery in the genus *Monomorium*. [5] 37: 202-206, ill. **Weiss, G.**—Sur certaines conditions de mort et de chez les abeilles et chez d'autres insectes en captivité. Sur les échanges gazeux des abeilles. [77] 105: 571-573; 574-576. **Welsh, J. H.**—Reversal of phototrotism in a parasitic water mite. [92] 59: 165-169.

**ARACHNIDA AND MYRIOPODA.**—\***Jacot, A. P.**—Oribatid mites of the subfamily Phthiracarinae of the north-eastern United States. [Pro. Boston Soc. Nat. Hist.] 39: 209-261, ill. \***Marshall, R.**—Hydracarina from Glacier National Park. [Trans. American Micro. Soc.] 49: 342-344, ill.

**THE SMALLER ORDERS OF INSECTS.**—\***Banks, N.**—New neuropteroid insects from the United States. [5] 37: 223-233, ill. \***Ewing, H. E.**—Six new species of Mallophaga. [10] 32: 117-123, ill. **Light, S. F.**—The California species of the genus *Amitermes silvestri*. (Isoptera). [67] 5: 173-214, ill. **Light, S. F.**—The Mexican species of *Amitermes silvestri* (Isoptera). [67] 5: 215-232, ill. **Martynov, A. V.**—The interpretation of the wing venation and tracheation of the Odonata and Agnatha. [5] 37: 245-280.

**ORTHOPTERA.**—Johnson, C. W.—The walking-stick, *Monomera blatchleyi* race *atlantica* in eastern Massachusetts. [5] 37: 285.

**HEMIPTERA.**—Pack & Knowlton.—Notes on Utah Hemiptera. [4] 62: 248-250. \*Pickles, A.—*Leocomia cinchonae*, sp. n., a new Ceropid from Jamaica. [75] 6: 586-589, ill.

**LEPIDOPTERA.**—Allen & Lott.—*Epiblema strenuana*, the host of certain parasites of the oriental fruit moth, *Laspeyresia molesta*. [10] 32: 135-136. \*Bell, E. L.—Descriptions of new South American Hesperiiidae. [6] 38: 455-460, ill. Cook, W. C.—An ecologically annotated list of the Phalaenidae of Montana. [4] 62: 257-264, cont. Eidmann, H.—Ueber den taxonomischen wert des weiblichen genitalapparates lepidopteren. [34] 92: 113-122, ill. Ford, L. T.—Notes on some broods of polymorphic Lepidoptera. [9] 63: 258. Jordan, K.—Description of new Sphingidae and remarks on some others. (S). [71] 36: 149, ill. Lück, R.—Die variabilität von *Heliconius thelxiope* in Franz. Guyana. [18] 24: 337-341. Peter Wynne, A. S. B. F.—Moths destroyed by bats. [9] 63: 256. Schmith, K.—Die Brassoliden des municipis Joinville im staate Sta. Catharina, Südbrasilien. [Ent. Jahrb., Krancher] 40: 150-153.

**DIPTERA.**—Aldrich, J. M.—Notes on the types of American two-winged flies of the genus *Sarcophaga* and a few related forms described by the early authors. [50] 78, Art. 12: 39 pp., ill. (S). Barnes, H. F.—On some factors governing the emergence of gall midges (Cecidomyiidae). [93] 1930: 381-393, ill. \*Bau, A.—Die ausbeute der deutschen Chaco-Expedition 1925-26. Diptera. XX. Pupipara. (S). [56] 9: 209-213, ill. Bequaert, J.—Notes on American Nemestriniidae. [5] 37: 286-297. \*Curran, C. H.—A new tachinid parasitic on a sawfly. [4] 62: 246-247. Dolley, W. L.—An entomological sheep in wolf's clothing. [Enax tenax] [76] 1930: 508-516, ill. Duncan, F. N.—Some observations on the biology of the male *Drosophila melanogaster*. [90] 64: 545-551, ill. Hoffman, C. C.—La distribución geográfica de los mosquitos *Anopheles* en el estado de Veracruz. [Dept. Salubrid Publica, Mexico] 1929: 76 pp., ill. Hoffmann, C. C.—Los mosquitos *Anopheles* transmisores del paludismo en el valle de Mexico. [Bol. Dept. Salubrid Publica, Mexico] 1929: 16 pp. Johnson, C. W.—A bot fly from the white-footed mouse. [5] 37: 283-284. \*Lengersdorf, F.—Neue *Sciara* (*Lycoria*)-arten des Zoologischen Museums in Hamburg aus Borneo und Kostarika. [34] 92: 123-130, ill. Philip, C. B.—Supplemental note regarding mosquito vectors of experimental yellow fever. [68] 72: 578. Tulloch, G. S.—A key to the biting mosquitoes of New England. [5] 37:

234-244, ill. **Wentworth, C. K.**—Mosquitoes versus Culicidae. [68] 72: 579-580.

**COLEOPTERA.**—\***Chapin, E. A.**—New Coccinellidae from the West Indies. [91] 20: 488-495. \***Chittenden, F. H.**—New species of North American weevils of the genus *Lixus*. [50] 7. Art. 18: 26 pp., ill. **Chittenden, F. H.**—New species of North American weevils of the genus *Lixus*. [50] 77. Art. 18: 26 pp., ill. **Collett, H. R. P.**—The burying of carrion by Coleoptera. [8] 66: 257-258. **von Dalla Torre & Hustache.**—Coleopterorum Catalogus. Pars 113. Curculionidae: Ceuthorrhynchinae. 150 pp. **Daviault, L.**—Sur les variations des coccinelles du genre *Adalia*. [98] 57: 221-224. \***Fall, H. C.**—New Coleoptera XIV, with notes on known species. [4] 62: 251-257. \***Fisher, W. S.**—New West Indian Buprestidae. [10] 32: 125-129. \***Fleutiaux, M. E.**—Description d'un Melaside nouveau de la collection du Muséum National d'Histoire Naturelle de Paris. (S). [Bull. Mus. Nat. Hist. Nat., Paris] 2: 410-411. \***Funkhouser, W. D.**—New genera and species of neotropical Membracidae. [6] 38: 405-420, ill. \***Pic, M. M.**—Dascillides et Helodides nouveaux. (S). [Bull. Mus. Nat. Hist. Nat., Paris] 2: 271-273. **St. George, R. A.**—The discovery of what is possibly the larva of an introduced tenebrionid, *Leichenium variegatum*. [10] 32: 122-123, ill. **Williams, B. S.**—A new method of capturing Coleoptera in flight. [8] 66: 253-255.

**HYMENOPTERA.**—\***Benson, R. B.**—Sawflies collected by the Oxford University Expedition to British Guiana, 1929. [75] 6: 620-621. **Claude-Joseph, F.**—Recherches biologiques sur les friedateurs du Chile. [Ann. Sci. Nat., Paris, Zool.] (10) 13: 235-354, ill. **Constantineanu, M. J.**—Quelques anomalies chez les Ichneumonides. [Bull. Mus. Nat. Hist. Nat., Paris] 2: 557-563, ill. **Hoffmann, F.**—Ueber bienenzucht im tieflande Brasiliens, bzw. in Jaraguá. [Ent. Jahrb., Krancher] 40: 183. **Johnson, C. W.**—On the variation and abundance of *Sirex nitidus*. [5] 37: 281-282. \***Malloch & Rohwer.**—New forms of sphecoïd wasps of the genus *Didineis*. [50] 77. Art. 14: 7 pp., ill. **Schmiedeknecht, O.**—Opuscula Ichneumonologica. Suppl. Bd., Fasc. 9. *Platylabus*, *Cryptinae*, pp. 5-28. \***Swenk, M. H.**—A new bee of the genus *Colletes* from Panama. [5] 37: 219-222. **Vandel, A.**—La production d'intercastes chez la fourmi *Pheidole pallidula* sous l'action de parasites du genre *Mermis*. [78] 64: 457-494, ill. \***Whittaker, O.**—Eight new species of Serphoidea from British Columbia. [10] 32: 129-135. **Willem, V.**—L'Architecture des abeilles. [Bull. Cl. Sci. Acad. R. Belg.] (5) 16: 893-906, ill.

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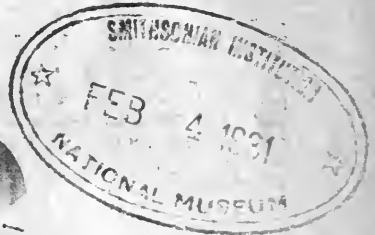
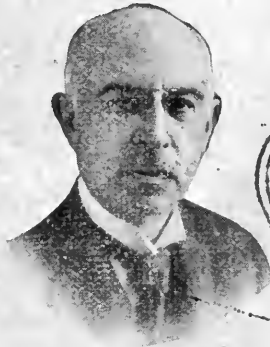
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**FEBRUARY, 1931**

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No. 2



HENRY SKINNER  
1861-1926

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## **On *Melanoplus borealis* in Northern Labrador (Orthop.: Acrididae).**

By JAMES A. G. REHN, Academy of Natural Sciences,  
Philadelphia.

My friend Dr. Samuel C. Palmer, of Swarthmore College, while a member of the Bowdoin-Baffinland Expedition of 1929, made a special effort to secure specimens of any Orthoptera encountered in the course of the botanical work on which he was engaged in northern Labrador and southern Baffinland. On his return he placed a small but interesting series in my hands, and I am able to state it represents adults and immature individuals of the boreal *Melanoplus borealis* (Fieber), which has been recorded from Greenland, Hudson Bay and various localities in Labrador, as well as from Alaska and many other localities more to the southward of these areas. Dr. Palmer, at my request, has kindly supplied the following information on the occurrence of the species in the areas studied:

"The grasshoppers in this lot consist of a few specimens collected by myself on the Bowdoin-Baffinland Expedition of 1929 under Captain D. B. MacMillan, with whom I went as botanist. The expedition occupied three months, much of which time was spent in getting to and back again from this northern region. Several efforts were made to secure grasshopper specimens but these were largely unsuccessful. On the north shore of Frobisher Bay in Baffinland there were many grass-covered, well-watered expanses, where grasshoppers could easily feed. I searched a number of these areas but did not see a single grasshopper. We were here from August 19th to August 24th. Flowers were in bloom in these meadows and the grass was fresh and green, indicating that the weather conditions were probably as good as they would probably be at any time. On

August 22nd we moved to the south shore of Frobisher Bay, and came to anchor at the base of a glacier which we called MacMillan Glacier. On the next day we proceeded out the bay to a point where a stream drained a valley which divided the Grinnell Ice Cap. At the outlet of this stream there was a great overwash plain of glacial material. The top of this plain was very level, several acres in extent and was quite grassy. Several species of arctic butterflies were abundant, but I could not find any grasshoppers.

"On our return to Labrador we anchored in a narrow fiord on Cape Mugford. We came into this haven out of a fog-bound sea on August 27th. On both sides rose high hills to about 1,000 feet. There were extensive talus slopes around the bases of these mountains and they spread out into grassy meadows as they neared the sea. Here I found a very few nymphal specimens of *Melanoplus borealis*. They were very inactive and easily caught by hand. Other insects were quite abundant and I caught several.

"Our next stop where an opportunity was offered to collect was at Nain on August 31st. There are numerous grassy places about this town, and two small streams poured their icy waters into the bay. Along the open slopes between these two streams I found a number of adult and nymph forms which at the time I thought were of two species, but which later proved to be but one. Along the grassy banks of the streams I had hoped to find more but was disappointed. The insects apparently preferred the warmer open gently sloping hillsides.

"On our way north I did not see any grasshoppers. The hillsides still held large patches of snow and the nights were cool. On our return in late August the snow had all disappeared, and the warming sun had been strong enough to make existence possible for these few grasshoppers for a short time in late summer."

The Cape Mugford specimens number five, and consist of one immature male and four immature females representing the two instars preceding maturity. Those from Nain number twenty-four, and comprise six adult males, ten adult females,

two immature males and six immature females. The Nain immature specimens are all in the instar preceding maturity except a single female in the next preceding one.

All the adult individuals have well developed tegmina, and in size are similar to material of the species in hand from Prince Edward Island, the Province of Quebec (Bic), northern Indiana (Fulton and Marshall Counties), northern Michigan (Pequaming), and Field, British Columbia, but appreciably smaller than specimens from a number of the Magdalen Islands and Isle Royale in Lake Superior. The material collected was presented by Dr. Palmer to the Academy of Natural Sciences of Philadelphia.

While the species has been reported from Nain, Rama and some other Labrador localities, it is desirable to place on record all possible habitat information bearing on the life of infrequently studied arctic environments.

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### **Typha Insects and their Parasites.**

By A. C. COLE, JR.

Ohio State University, Columbus.

(Continued from page 11)

#### DIPTERA & PARASITES.

(30) *PLATYCHIRUS QUADRATUS* Say. Four larvae of this species were collected at Monroe, Michigan, on June 19, 1927. All of them pupated on June 27 and three emerged on July 3, 1927. They were reared from overwintering heads of *Typha latifolia*.

(31) *CHAETOPSIS AENEAE* Will. Numerous individuals were collected in the larval stage in all localities previously mentioned. The larvae were found in the moist portion of *Typha latifolia* stalks, usually in the burrows of Lepidopterous feeders. The adults were determined by Dr. J. M. Aldrich.

(32) *MACROSARGUS CLAVIS* Wied. Three larvae were collected from leaves of *Typha latifolia* at Monroe, Michigan, July 31, 1927. From additional larvae two species of parasites were reared: (33) *Diaulinius pulchripes* Cwfd., determined by A. B. Gahan, and (34) *Tumidiscapus* sp., determined by A. B. Cushman.

(35) *DROSOPHILA* sp. One female emerged from a stalk of *Typha latifolia* at Monroe, Michigan, on July 31, 1927. The specimen was determined by Dr. J. M. Aldrich.

(36) *ELACHIPTERA NIGRICEPS* Loew. Two adults emerged from a stalk of *Typha latifolia* at Monroe, Michigan, on August 6, 1927. These specimens were determined by Dr. C. T. Greene.

(37) *CORODONTA DORSALIS* Lw. Seven adults were reared from larvae in *Typha latifolia* stalks at Monroe, Michigan. Three specimens were determined by Dr. C. T. Greene. One parasitized larva was collected on the same date from which emerged three undeterminable Chalcids on August 17, 1927.

(38) *APHIOCHAETA CHAETONEURA* Mall. One specimen was reared from a larva collected from a tunnel of *Archanara subcarnea* Kell., at Monroe, Michigan, on August 16, 1928.

#### COLEOPTERA.

(39) *CALENDRA PERTINAX* Oliv. The larvae of this insect bore in the stalk on or near the surface of the ground. Three specimens were reared from *Typha latifolia* at Monroe, Michigan on July 6, 1927.

(40) *MONONYCHUS VULPECULUS* Fab. Larvae of this species were found feeding on the heads of *Typha latifolia* at Monroe, Michigan, on July 12, 1927. The adults were determined by Dr. E. A. Chapin.

(41) *PARIA CANELLA* var. *ATERIMA* Oliv. The larvae were found in the leaf-sheaths of *Typha latifolia* at Monroe, Michigan, on May 26, 1928. Three individuals, two males and one female, were determined by Dr. E. A. Chapin.

(42) *NOTARIS PUNCTICOLLIS* Lec. This insect is reported by W. A. Hoffman (1915) as burrowing in the stems of *Typha latifolia*. "The burrow appears very much the same as that of *Calendra pertinax* Oliv." (Claassen). One adult was reared at Monroe, Michigan, on September 2, 1928.

#### HYMENOPTERA.

(43) *EURYTOMA BICOLOR* Walsh. The larvae of this insect were found in galls in the stems of dry, overwintered *Typha latifolia*. The larvae were collected at Monroe, Michigan, on April 23, 1927, pupated by April 26, and emerged by August 7.

Fresh stalks of *Typha* at various localities near Monroe were examined in June, July, August, and September of the same year and no trace of the insect was found in the new growth. It seems that they are either periodical or that they have an alternate host.

Specimens of this insect were determined by Dr. A. B. Gahan.

## HEMIPTERA.

(44) *ISCHNORHYNCHUS RESEDAE* Panz. Specimens of this insect were collected at Monroe, Michigan, (1927) in the 3rd, 4th, and 5th nymphal stages, being more abundant however, in the third. They were taken from the moist petioles of *Typha latifolia*.

(45) *SIPHOCORYNE NYMPHACAE* Linn. Reported by Claassen. These insects are found on the surface of the leaves from the sheath to the tip of the leaf.

(46) *APHIS AVENAE* Fab. Reported by Claassen. This species is found "behind the sheaths of the leaves, in the gelatinous material below the surface of the water in which the plants are growing."

(47) *RHOPALOSIPHUM DIANTHII* Schrank. Reported on cat-tail by Sanborn (1906).

(48) *RHOPALOSIPHUM PERSICAE* Sulz. Reported on *T. latifolia* and *angustifolia* by Wilson and Vickery (1918).

(49) *APHIS GOSSYPII* Glov. Reported on *Typha latifolia* by Davidson (1917) (8).

(50) *MACROSIPHUM GRANARIUM* Kirby. Reported by Davidson (1917).

(51) *HYALOPTERUS ARUNDINIS* Fab. Reported by Davidson (1917).

## ORTHOPTERA AND PARASITES.

(52) *CONOCEPHALUS* sp. Several specimens were collected in the egg stage at Monroe, Michigan (1927-1928) in overwintering stalks of *Typha latifolia*. They were found imbedded between the pith and the epidermis of the stalk. Three adults were determined by A. N. Caudell. Two species of parasites emerged from eggs: (53) *Macroteleia* sp., and (54) *Tumidiscapus* sp., both determined by Dr. A. B. Gahan.

(55) *CONOCEPHALUS* sp. Similar to the above but with egg deposition restricted to certain areas of the stalk.

## THYSANOPTERA.

(56) *THRIPSAPHIS BALLI* Gill. Adults were collected from moist petioles of *Typha latifolia* at Monroe, Michigan, on July 24, 1927, and were determined by P. W. Mason.

Insects infesting *Typha* may be classified according to their location in the various areas of the plant itself. Such a classification follows. The number following each name is that under which it appears in the preceding list.

## INSECTS INFESTING THE ROOTS.

*Calendra pertinax* Oliv. (39). *Notaris puncticollis* Lec. (42).

## INSECTS INFESTING THE STEMS.

*Colcophora* sp. (16). *Corodonta dorsalis* Lw. (37).  
*Nonagria oblonga* Grote. (17). *Aphiochacta chaetoneura*  
*Cucoecia rosaceana* Harr. Mall. (38).  
*Archanara subcarnea* Kell. (20) *Calendra pertinax* Oliv. (39).  
 (25). *Notaris puncticollis* Lec. (42).  
*Chaetopsis acnea* Wied. (31). *Eurytoma bicolor* Walsh.  
*Drosophila* sp. (35). (43).  
*Elachiptera nigriceps* Loew. *Conocephalus* sp. (52).  
 (36). *Conocephalus* sp. (55).

## INSECTS INFESTING THE LEAVES.

*Arsilonche albovenosa* Goeze. *Siphocoryne nymphacae* Linn.  
 (1). (45).  
*Apatela oblita* A. & S. (9). *Aphisavenae* Fab. (46).  
*Nonagria subflava* Grote. (19). *Rhopalosiphum dianthi*  
*Unidentified Lepidopteron* Schrank (47).  
 (26). *Rhopalosiphum persicae*  
*Macrosargus clavus* Wied. Sulz. (48).  
 (32). *Aphis gossypii* Glov. (49).  
*Paria canella* var. *aterrima* *Macrosiphum granarium*  
 Oliv. (41). Kirby (50).  
*Ischnorhynchus resedae* Panz. *Hyalopterus arundinis* Fab.  
 (44). (51).  
*Thripsaphis ballii* Gill. (56).

## INSECTS INFESTING THE HEADS.

*Endothaenia hebesana* Wlk. *Dicymolomia julfanalisis* Walk.  
 (12). (29).  
*Lymnaccia phragmitella* *Platychirus quadratus* Say  
 Staint. (14). (30).  
*Bactra maiorina* Hein. (24). *Mononychus vulpcculus* Fab.  
*Archips obsoletana* Walk. (40).  
 (28).

## INSECT PARASITES.

*Blacus* sp. (2) ex *Arsilonche albovenosa* Goeze.  
*Microbracon* sp. (3) ex *Arsilonche albovenosa* Goeze.  
*Macrocentrus ancylivora* Roh. (4) ex *Arsilonche albovenosa*  
 Goeze.  
*Pimpla inquisitoricella* D. T. (5) ex *Arsilonche albovenosa*  
 Goeze.  
*Rogas stigmator* Say (6) ex *Arsilonche albovenosa* Goeze.  
*Exorista larcorum* L. (7) ex *Arsilonche albovenosa* Goeze.  
*Alciodes intermedius* Cress. (8) ex *Arsilonche albovenosa*  
 Goeze.



- ✓ *Sceliphron caementarium* Drury (10) ex *Apatcla oblonga* A. & S.
- ✓ *Casimaria genuina* Nort. (11) ex *Apatcla oblonga* A. & S.
- ✓ *Microbracon* sp. (13) ex *Endothenia hebesana* Wlk.
- ✓ *Apatclea cinctiformis* Vier. (18) ex *Nonagria oblonga* Grote.
- ✓ *Muscina stabulans* Fall. (21) ex *Archanara subcarnea* Kell.
- ✓ *Masicra senilis* Rond. (22) ex *Archanara subcarnea* Kell.
- ✓ *Sturmia nigrita* Town. (23) ex *Arazama obliqua* Walk.
- ✓ *Eulophus* sp. (27) ex an unidentified Lepidopteron.
- ✓ *Dialinus pulchripes* Cwfd. (33) ex *Cryptochactum* sp.
- ✓ *Tumidiscapus* sp. (34) ex *Cryptochactum* sp.
- ✓ *Elachterinae* sp. (45) ex *Lynnaccia phragmitella* Staint.
- ✓ *Macroteleia* sp. (53) ex *Conoccephalus* sp.
- ✓ *Tumidiscapus* sp. (54) ex *Conoccephalus* sp.

## BIBLIOGRAPHY.

- BEUTENMÜLLER, WILLIAM. 1901. *Arsilonche albovencosa* Goeze. In descriptive catalogue of the Noctuidae found within fifty miles of New York City. Amer. Mus. Nat. Hist. 14; article 20:261.
- BIRD, HENRY. 1902. Boring noctuid larvae. New York Ent. Soc. Jour. 10:214-216.
- CLAASSEN, P. W. 1919. A possible new source of food supply. Sci. mo. 9:179:185.
- ID. 1921. Typha insects: Their ecological relationships. Cornell Univ. Agr. Exp. Sta. Memoir 47:459-531.
- COLE, A. C., JR. 1929. *Archanara subcarnea* Kell. (Lepidop.: Noctuidae) a host of *Masicra senilis* Rond. (Dipt.: Tachinidae). Ent. News, Vol. 40, No. 7:225.
- ID. 1930a. The preservation of Lepidopterous larvae by injection. Ent. News, Vol. 41 :106-108.
- ID. 1930b. *Muscina stabulans* Fall. (Diptera: Muscidae) parasitic on *Archanara subcarnea* Kell. (Lepidop.: Noctuidae). Ent. News, Vol. 41:112.
- DAVIDSON, W. M. 1917. The cat-tail rush, *Typha latifolia* as a summer host of injurious insects. Calif. Com. Hort. Mo. Bul. 6:64-65.
- GROTE, AUGUSTUS R. 1882. The North American species of *Nonagria*. New York Ent. Club. Papilio 2:94-99.
- HOLLAND, W. J. 1913. The moth book. Doubleday, Page & Co., pp. 1-479.
- NEEDHAM, J. G., and LLOYD, J. T. 1916. The life of inland waters. Pp. 1-438.
- SATTERTHWAIT, A. F. 1920. Notes on the habits of *Calendra pertinax* Oliv. Jour. Econ. Ent. 13:280-295.
- WALTON, W. R. 1908. Notes on the life history of *Nonagria oblonga* Gr. Ent. News 19:295-299.

## Notes on Utah Heteroptera and Homoptera.<sup>1</sup>

By GEORGE F. KNOWLTON.

Much insect material has reposed in the Utah Agricultural Experiment Station and Utah State Agricultural College collections, but only a small portion of this material has been classified and recorded. An effort is being made to gradually build up this collection and get as much of the material named as is possible, so that it will become of assistance in the recognition of local insects. This paper records some of the material that has been determined in the past few years.

The writer is indebted to Messrs. Herbert Osborn, W. L. McAtee, H. H. Knight, H. B. Hungerford, William T. Davis, and R. H. Beamer, for naming much of the material herein recorded.

Order HETEROPTERA Linn.

Family SCUTELLERIDAE (Leach).

1. *HOMAEMUS AENEIFRONS* (Say). Peterson, September 14, 1925 (Knowlton).

2. *HOMAEMUS BIJUGIS* Uhl. Providence, August 10, 1930 (M. J. Janes).

3. *EURYGASTER ALTERNATUS* (Say). Logan, May 17, 1923 (Knowlton); Providence, June 8, 1930 (M. J. Janes).

Family CYDNIDAE (Billberg).

4. *HOMALOPORUS CONGRUUS* Uhl. Panguitch, July 29, 1928 (Knowlton).

Family PENTATOMIDAE (Leach).

5. *BRACHYMENA 4-PUSTULATA* (Fabr.). Evans, May 13, 1930 (Knowlton); Farmington, July 16, 1930 (M. J. Janes); Hinckley, July 23, 1914 (Pack).

6. *PERIBALUS LIMBOLARIUS* Stal. Draper, June 23, 1926 (Knowlton); Farmington, July 16, 1930 (M. J. Janes); on beets at Hooper, August 24, 1929 (Knowlton); on ragweed at Logan, August 15, 1926 (Knowlton).

7. *TRICHOPEPLA ATRICORNIS* Stal. Cedar, July 25, 1926 (Knowlton).

8. *RHYTIDOLOMIA FACETA* (Say). Richfield, August 7, 1924 (Knowlton).

<sup>1</sup>Contribution from the Department of Entomology, Utah Agricultural Experiment Station.

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9. *CHLOROCHROA UHLERI* Stal. Curlew, August 30, 1929 (Knowlton); Elberta, August 7, 1929 (Knowlton); on clover, Garland, August 12, 1929 (Pack); on *Gutierrezia*, Logan, October 4, 1929 (Knowlton); Schowell, October 14, 1929 (Knowlton).

10. *C. CONGRUA* Uhl. On beets at Benjamin, August 26, 1929 (Knowlton); Cache Junction, June 12, 1929 (Knowlton); Farmington, July 16, 1930 (Knowlton and M. J. Janes); on beets at Far West, August 17, 1930 (Knowlton); Nephi, July 23, 1915 (Ball); on beets at Spanish Fork, July 9, 1930 (Knowlton); Stansbury Island, June 13, 1913 (Pack, Hagan, Titus).

11. *C. LIGATA* (Say). Logan, May 21, 1908 (J. B. Horton).

12. *C. SAYI* Stal. Farmington, July 23, 1930 (M. J. Janes); Layton, July 5, 1930 (Knowlton); on wheat at Promontory, September 10, 1929 (Knowlton); damaging wheat in Round Valley, near Salina, August, 1930 (Knowlton).

13. *CARPOCORIS REMOTUS* Horv. On alfalfa, Lewiston, August 13, 1929 (Pack).

14. *EUSCHISTUS SERVUS* (Say). Logan, September 2, 1903; Logan Canyon, August 15, 1912 (Hagan); on beets at North Ogden, June 7, 1929 (Knowlton).

15. *E. INFLATUS* Van D. On potatoes at Farmington, July 16, 1930 (M. J. Janes) and July 20, 1930 (Knowlton).

16. *E. VARIOLARIUS* (P. B.). Farmington, June 11, 1930 (Knowlton and Janes); Provo, August 10, 1930 (M. J. Janes); numerous on beets at Spanish Fork, August 20, 1929 (Knowlton).

17. *NEOTTIGLOSSA UNDATA* (Say). Logan.

18. *COSMOPEPLA BIMACULATA* (Thom.). Logan, May 26, 1909.

19. *THYANTA PERDITOR* (Fabr.) Nephi, July 23, 1905 (Ball).

20. *T. CUSTATOR* (Fabr.). On sugar-beets at Farmington, October 9, 1929 (Knowlton); Grantsville, August 27, 1929; on *Gutierrezia* in Logan Canyon, October 4, 1929 (Knowlton); on beets at Penrose, September 28, 1929 (Knowlton); on alfalfa at Providence, June 8, 1930 (M. J. Janes); Mantua, July 27, 1925 (Knowlton).

21. *T. RUGULOSA* (Say). On *Atriplex* at Locomotive Springs, June 9, 1930 (Knowlton).

22. *T. PUNCTIVENTRIS* Van D. Logan, August 24, 1909 (Hoff).

23. *BANASA SORDIDA* (Uhl.). Brigham City, September 25, 1916.

24. *PERILLUS BIOCULATUS* var. *CLANDA* (Say). Blue Creek, July 18, 1930 (Knowlton).

25. *PODISUS BRACTEATUS* F. R. Logan, September 26, 1909.

Family COREIDAE (Leach).

26. *ANASA TRISTIS* (De Geer). The squash bug is commonly destructive to squash in Davis and Weber Counties and parts of Utah and Cache Counties. During the winter of 1929-30 adult specimens kept in the Experiment Station insectary at Logan had a 45 per cent mortality. Damage during the summer of 1930 was ordinarily severe, with numerous reports of damage being received at the Experiment Station.

27. *MEGALOTOMUS 5-SPINOSUS* (Say). Logan, May 21, 1908 (Horton) and July 4, 1923 (Knowlton).

28. *HARMOSTES REFLEXULUS* (Say). Iosepa, July 17, 1926 (Knowlton).

29. *CORIZUS HYALINUS* (Fabr.). Richmond, September 1, 1926 (Knowlton).

30. *CORIZUS VIRIDICATUS* Uhl. Corinne, June 22, 1929 (Knowlton and Bowen).

31. *CORIZUS CRASSICORNIS* (Linn.). Logan Meadows, July, 1928 (Knowlton).

32. *LEPTOCORIS TRIVITTATUS* (Say). The boxelder bug is a common house pest in northern Utah and collects in large numbers on the sunny south side of buildings during warm spring afternoons. Frequent inquiries are received at the Experiment Station regarding this pest.

Family NEIDIDAE (Kirkaldy).

33. *NEIDES MUTICUS* (Say). Point of the Mountain, South of Salt Lake City, July 20, 1909 (Titus).

Family LYGAEIDAE (Schilling).

34. *LYGAEUS RECLIVATUS* Say. Low, September 19, 1930 (Knowlton).

35. *L. KALMI* Stal. Dry Lake, July 31, 1926 (Knowlton); Logan, June 10, 1926 (Knowlton); Promontory, April 18, 1929 (Knowlton); Salt Lake City, June 23, 1927 (Knowlton); Snowville, April 16, 1929 (Knowlton); Stansbury Island, June 13, 1913 (Pack, Hagan, Titus).

36. *NYSIUS CALIFORNICUS* Stal. Cisco, August 7, 1906; Joseph, August 6, 1907 (Titus).

37. *N. ERICAE* (Schilling). The false chinch bug is abundant and widespread in Utah and at times causes damage to sugarbeets, grains, and alfalfa. The nymphs and adults appear early in the spring, as soon as the ground warms up.

38. *GEOCORIS BULLATUS* (Say). Logan, September 28, 1922 (Knowlton); Milford, July 21, 1926 (Knowlton).

39. *G. PALLENS* Stal. Magna, May, 1927 (Knowlton).

40. *G. PALLENS* var. *decoratus* Uhl. Timpie, July 17, 1927 (Knowlton). Adults and nymphs of *Geocoris* sp. are commonly found in the stomachs of lizards (*Uta stansburiana stansburiana* B. and G.) collected in northern Utah on deserted dry-farms and Russian thistle patches.

Family TINGIDIDAE (Laporte).

41. *PIESMA CINEREA* (Say). On sugar-beets at Collinston, July 21, 1927 (Knowlton).

42. *CORYTHUCHA HISPIDA* Uhler. Stansbury Island, June 13, 1913 (Pack, Hagan, Titus).

Family PHYMATIDAE (Laporte).

43. *PHYMATA EROSA* (Linn.). Logan, August, 1929 (Knowlton).

44. *P. EROSA* subsp. *FASCIATA* (Gray). Brigham City, September 10, 1925 (Knowlton); Logan, August, 1929 (Knowlton); Spring Canyon, August 28, 1925 (Knowlton).

Family REDUVIDAE (Latreille).

45. *APIOMERUS CRASSIPES* (Fabr.). Cedar Spring, June, 1930 (Knowlton); Logan, July 4, 1907 (Titus).

46. *TRIATOMA PROTRACTA* (Uhler). Logan, September 14, 1928 (Knowlton).

47. *ZELUS SOCIUS* Uhl. Skull Valley, August, 1929 (Knowlton); Snowville, July, 1929 (Knowlton).

48. *SINEA DIADEMA* (Fabr.). Draper, August, 1925 (Knowlton); Ogden, July, 1929 (Knowlton).

49. *S. CONFUSA* Caud. Spring Canyon, August 28, 1925 (Knowlton).

Family NABIDAE (Costa).

50. *NABIS FERUS* (Linn.). Delta, July 15, 1926 (Knowlton); Lewiston, July, 1926 (Knowlton); Promontory, October, 1929 (Knowlton); Snowville, August, 1929 (Knowlton). Fairly common in northern Utah, in the breeding grounds of the beet leafhopper.

Family CIMICIDAE (Latreille).

51. *CIMEX LECTULARIUS* Linn. The bedbug was abundant in a chicken coop at Logan, July 28, 1924 (Hawley and Knowlton). Reports of infestations and requests for advice on control in houses are frequently received. To keep free from this pest many apartment houses fumigate frequently.

(To be continued).

## Recapture of Marked Cutworm Moths in a Trap Lantern (Lep. : Noctuidae).

By A. E. BROWER, Ithaca, New York.

During the summer of 1929 a study of the movement of moths, by marking individuals of species of the genus *Catocala* (Noctuidae) was carried out. The results were reported in Ent. News, Vol. 41:10-15, 44-46, 1930. In the summer of 1930 a trial experiment was made at Cornell University, in connection with the operation of the trap lantern, to determine the feasibility of obtaining data upon the movements of Noctuidae attracted by light. Despite the preliminary nature of the work the unexpected results seem worthy of publication.

The trap lantern is located in a secluded situation near the ground between a large outdoor rearing cage and a strip of timber. The light used was a 50 watt electric lamp. In marking the moths each specimen was grasped firmly near the base of the wings on one side with a pair of curve-pointed forceps and a finger supplied for them to cling to. Lacquers were used for marking as they become very gummy and quick drying if left open to the air for a few hours. A different mark was used for each night's catch. Colors were changed as often as necessary to secure simple marks or combinations of marks. Each moth was placed in a container as soon as marked.

The catch of four nights was taken about three-eighths of a mile southeast of the trap and released in a growth of weeds and grass beside an overgrown fence row. One night's catch, the second, was tossed out in the grass close to the trap lantern, marking being discontinued and the light turned off at 12:15. The catches of the eight subsequent nights were carried about three-eighths of a mile west of the trap; if this was done about midnight the moths were released under an electric light, but if it was in the morning they were released in a strip of natural trees and bushes. In both cases the plan was to have a number of buildings of the College of Agriculture and several electric lights intervening between the point of release and the trap lantern. Marked moths which returned were again carried away with those caught the same night without remarking them.

As may be seen in the list of recaptured moths, "recaptures" were secured as follows; after eight days, four moths; nine days, three; ten days, two; and twelve days, one. Besides,

many other specimens were recaptured after shorter periods. Of these ten moths which were retaken after a period of eight or more days, three had been carried southeast of the trap, two had been released at the trap, and five had been carried west from the trap. It is significant that marked moths were retaken every night after the second night and marked moths from each night's catch except two were recaptured. The failure to recapture any moths from these two nights was probably due to the small numbers marked on these nights with the premature closing of the experiment by cold nights.

One thousand moths were marked in this experiment. Ten moths, or 1%, were recaptured at the trap after a period of eight or more days, the longest period being twelve days. The percentage of recaptures was slightly higher from moths carried southeast of the trap compared with those carried west of the trap. Those released at the trap were recaptured in comparatively large numbers. This experiment so far as it goes indicates that cutworm moths range about freely in an area within a radius of three-eighths mile; only future experiments can show how much farther. The recapture of twenty moths from the catch released at the trap might be expected, but it seems extraordinary that so many of these, carried away to a considerable distance beyond buildings and released where lights could be seen in every direction, should return to a more or less secluded trap lantern.

TABLE SHOWING THE NUMBER OF EACH SPECIES MARKED EACH NIGHT AND IN PARENTHESIS THE NUMBER RECOVERED ON SUBSEQUENT DATES.

Time, p.m. a.m.	AUGUST														Total						
	17	17	19	19	21	22	22	23	23	24	24	25	25	26		26	27	28	28	29	30
<i>Feltia ducens &amp; jaculifera</i>	33 (2)	46 (15)	24	61 (1)	30 (4)	25	48 (2)	Too cold and stormy	71 (2)	54 (3)	44 (1)	38	46	13							533 (30)
<i>Noctua c-nigrum</i>		5	5	2 (1)	13 (1)	7	12		11 (1)	13	8	2	2	1							81 (3)
<i>N. nor-maniana</i>					3	2	5		4	3	3	1	2								23
<i>N. baja smithii</i>		5 (2)	4	5	10	14 (2)	26 (1)		23	17	34 (2)	19 (1)	14 (1)	3							174 (9)
<i>Agroperina dubitans</i>	4	3 (2)	11	11	13	11	25		20	12 (1)	15 (1)	2	9 (1)	1							137 (5)
<i>A. helva</i>	3	3 (1)	8	2	5	5	6 (2)		3	4	9 (1)		4								52 (4)
Total ...	40 (2)	*62 (20)	52 (0)	81 (2)	74 (5)	64 (2)	122 (5)		132 (3)	103 (4)	113 (5)	62 (1)	77 (2)	18 (0)							1000 (51)

Part of the moths were marked at midnight and part of them in the morning. Since a night includes portions of two days, each night's work is indicated by two dates. A dash indicates operation of trap but no moths marked at midnight. A zero shows that the trap was not operated after midnight.

\* This night's catch of moths was liberated near the trap.

## LIST OF RECAPTURED MOTHS.

FELTIA DUCENS AND JACULIFERA				Date of marking	Date	No. of re- capture	No. recap- tured
	Date of marking	of re- capture	recap- tured				
Aug. 17 P.M.	19 A.M.	4		Aug. 17 P.M.	21 A.M.	2	
17 P.M.	19 P.M.	5		22 A.M.	27—28	1	
17 P.M.	21 A.M.	3		22 A.M.	31—		
19 P.M.	21 A.M.	1			Sept. 1	1	
21 A.M.	22 A.M.	1			(10 days)		
17 A.M.	25—26	2		22—23	31—		
	(9 days)				Sept. 1	1	
17 P.M.	25—26	2			(9 days)		
	(8 days)			27—28	1—2		
21 A.M.	26—27	2			Sept. 2		
22—23	26—27	1		28 P.M.	2—3		
21 A.M.	28 P.M.	1			Sept. 1		
	(8 days)			29—30	2—3		
26—27	29—30	2			Sept. 1		
25—26	29—30	1					
17 P.M.	29—30	1					
	(12 days)						
22—23	30—31	1					
	(8 days)						
27—28	30—31	1					
25—26	30—31	1		29—30	2—3		
26—27	31—				Sept. 1		
	Sept. 1	1					
	(10 days)						
NOCTUA C-NIGRUM				A. HELVA			
Aug. 21 A.M.	22—23	1		Aug. 17 P.M.	19 P.M.	1	
25—26	26—27	1		22—23	25—26	1	
19 P.M.	29—30	1		22—23	26—27	1	
	(10 days)			27—28	29—30	1	

**Common Names for Dragonflies (Odonata).**

By E. B. WILLIAMSON, Museum of Zoology, Ann Arbor, Michigan.

The usefulness of common names for insects depends on circumstances which are not the same in all orders or sub-groups. A decision in any specific case, therefore, rests largely with the specialists concerned. So in discussing the value of



common names for dragonflies, I am not trying to define any general rules for the selection or use of common names for other insects but I shall undertake a discussion of some common names for dragonflies, attempting to determine how useful these names are, or may be, and whether or not they are appropriate. Common names are essentially more or less local names which find the barriers of language insurmountable so I shall confine myself still farther to the common names of North American dragonflies. Such a discussion seems particularly needed at this time. Professor Needham in his recent Handbook of North American Dragonflies has proposed some common names and in the same volume has used names of earlier vintage. A second printing of the Handbook is promised and before that is done it seems desirable to frankly discuss this matter of common names for North American dragonflies. In most schools the Handbook will be the only book on dragonflies available to the general student body for an indefinite period, and in many general and private libraries the casual student will find it his only source of detailed information on the subject. It will profoundly influence dragonfly work in North America over a long period, so its methods and probable effects are of interest to every student.

Let us now take up these common names in detail. Quotations are all from the Handbook. The insects of the order Odonata are now pretty generally known as Dragonflies. Mosquito Hawks, Snakefeeders, and Snakedoctors are some of the other more local names which cause no confusion and are, I think, never misused or misunderstood. In the past the matter of common names stood thus for many years without confusion and without any inconvenience to anybody. But into this peaceful scene was injected the name "Damsselfly" for the Zygoptera, one of the suborders of the Odonata. This name was not a folk name anywhere for the Zygoptera. It was a suggested use of the name which was, I think, too readily accepted and for about thirty years has been used without a proper understanding in this connection of the use of the common name "Dragonfly". For example, "the two principal groups of dragonflies that make up the order Odonata are Dragonflies proper and Damsselflies". But nowhere in odonate

literature so far as I can recall is any reference in the text to "dragonflies proper", and later on in the Handbook the "Suborder Anisoptera" equals "Dragonflies" without any qualification. Examples of resulting ambiguity are many. "There are more prosaic ways of getting dragonflies. . . . Small dragonflies and damselflies that sit on the low grasses . . ." In the first line of the paragraph from which this is quoted dragonflies equals Odonata, and in the fourth line equals Anisoptera. "They all eat other smaller dragonflies." "Dusk-flying and shade dwelling dragonflies run to somber browns." The "Skimmers" "are the commonest and best known of dragonflies". And under Nannothemis, "These are the smallest of our dragonflies". "Neoneura . . . are slender damselflies"; "Hesperagrion . . . are small . . . damselflies"; but "Zonagrion are slender dragonflies". For thirty years this is the ambiguity throughout odonate literature for which the word "damselflies" is responsible. It has been thus used only by those who have come directly or indirectly in contact with colleges, it was never a folk name, and it may well stand as a warning sign against the hasty coining or new application of common names. I know of students, in two institutions who, when told to collect dragonflies (Odonata), collected only "dragonflies proper" (Anisoptera) during an entire summer. As they were novices with an insect net the results were not happy.

In the Handbook, four families are discussed. A common name for only one of these is suggested, Libellulidae, "The Skimmers". But the Subfamily Libellulinae are called the "Common Skimmers", and the species of the genus *Libellula* are again, like the Libellulidae, only "The Skimmers", a situation with endless possibilities for confusion. Of the nine subfamilies, common names are proposed for four. Lestinae and Coenagrioninae are not named but the much less frequently observed Macrominae are called "The Belted Skimmers", though no genus or species in the subfamily is named. The larger subfamily in both genera and species, the Cordulinae, in which two genera have common names, is not named. Of the seventy-five genera, sixteen are named. Of these sixteen genera, eleven have no species with a common name, and five genera among them have nine named species. Certainly in the eleven, if not

in all, the inevitable result will be that the generic name will be used specifically in different localities for different species, making chaos certain. The rarely observed Cordulegasters, the single genus in the unnamed Cordulegasterinae, are "The Biddies" from a habit of the nymphs when disturbed. Tetragoneurias with no species named are "Dog-tails" or "Wags". Why there should be two common names for insects so rarely observed and only rarely conspicuous is not clear. And the Enallagmas, also without a named species, are the "Bluets, etc.". But I cannot see just why. And the beautiful insects, beautifully named *Tramca*, become "The Raggedy Skimmers". Why certain genera such as *Celithemis*, *Pantala*, *Lestes*, *Argia*, and others, in the light of those named, remained unnamed is not clear.

Of the three hundred and sixty species in the Handbook, twenty-two are named. Two of these are among the rarest of all North American dragonflies, certainly hardly fifty specimens of the two together having ever been taken. At least ten of them are either rare or local, or both. Two *Aeshnas* are named. Based on the material studied by Walker, there are four unnamed species commoner than one of these, and nine of the other. *Coryphaeschna ingens* is named but the much more widely known, or at least seen, *Epiaschna heros* is not. The rarely seen *Nannothemis bella* is named the "Blue Bell", and the very abundant *Pachydiplax longipennis* is called the "Blue Pirate", though neither is blue as that term is used for Odonata. Since there is the single species in each genus it would seem the generic names would serve as splendid common names. Of the one hundred and four species of Coenagrionidae, including the most abundant species of dragonflies in North America, only two are named, while the very rare two species of Petalurinae are both named. And of the two Coenagrionidae named, one is one of the rarer *Argias*, and the other *Telcbasis salva*, "The Flapper," has the distribution given as California, truly not a menace to the country at large. The commonest and most widely distributed aeshuine in North America, *Anax junius*, is not named, but the rare and local *Anax walsinghami* is. In other words I am neither satisfied with the list of species selected for naming nor pleased with the common names used.

And I am fully persuaded that any list I might select and the names I might propose would meet with as little general approval.

Over a long period of years I have enjoyed the companionship on collecting trips of many good and unselfish friends for whose enthusiastic help I have no words to express my appreciation. Most of these men have had no connection with colleges, yet in the field and visiting together long winter evenings we have a common vocabulary for all the dragonflies we know. And this vocabulary is understandable in every continent. I think we shall make no change. But if there must be common names by edict, would it not be well to go slowly and after some discussion of each proposal so that the feeble-minded and tongue-tied student of the future, reared entirely on a diet of common names, may have bequeathed to him a nomenclator vulgaris as exact, appropriate and euphonious as possible? Of course there will always be students whose work will require some knowledge of a more universal nomenclature but that will just be their hard luck.

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### **The Meloidae of South Dakota (Coleoptera).<sup>1</sup>**

By LAURENCE A. CARRUTH, South Dakota State College,  
Brookings.

This paper is based on a collection of 963 labeled Meloids in the Entomology-Zoology department of the South Dakota State College. These insects include thirty species in ten genera and were taken at eighty-one places in forty-five of the sixty-three counties of the State. Every section of the State is well represented. The insects were taken mainly by persons associated at one time or another with the Entomology-Zoology department of the College.<sup>2</sup> A number of specimens, including practically all those in the following list that are without date or collector's data, were included in the collection of the late P. C. Trimman of Volga, South Dakota, which was purchased by the State College in 1910 or thereabouts. A large number of

<sup>1</sup> Contribution from the Entomology-Zoology Department of the South Dakota State College, Brookings, So. Dak.

The writer gratefully acknowledges the assistance given by Professors H. C. Severin and G. I. Gilbertson of the South Dakota State College, and by Mr. H. S. Barber of the United States National Museum.

Meloids, including several species not before reported in the State, have accumulated during the past few years as a result of extensive collecting trips made by members of the college Entomology-Zoology department. These insects were not classified or tabulated until recently when the work was undertaken by the writer.

The collection at the South Dakota State College is the only one known to contain a representative group of South Dakota Meloidae. Since the data given in this paper greatly extend the ranges of some species over those previously published, and since practically no published reports are available on the Meloidae of adjoining states, it is believed that this report will be of interest.

In the following notes the subfamilies and genera are arranged in the order given by Van Dyke.<sup>3</sup> Each species is prefixed by the serial number given in Leng's "Catalog of the Coleoptera of North America North of Mexico." "Sp." below stands for specimen or specimens.

#### Subfamily MELOINAE.

1. (7973) *PYROTA ENGELMANNI* Lec. Chamberlain, 1 sp. June 15, 1928; Parmelee, 3 sp. June 18, 1927; Rosebud, 1 sp. June 23, 1924; all by (G.I.G.). Wewela, 1 sp. June 19, 1930 (L.A.C.). White River, 1 sp. June 18, 1927, 1 sp. June 15, 1929, (H.C.S.). Chester, 2 sp. June 15, 1930, (G.B.S.).

2. (7980) *P. DAKOTANA* Wick. Nowlin, 1 sp. June 25, 1928, (H.C.S.). Philip, 11 sp. June 23, 1923, (G.I.G.). Pierre, 4 sp., no data. The Pierre specimens, acquired from the Truman collection, are probably cotypes.

3. (7998) *EPICAUTA TRICHRUS* Pall. Chester, 3 sp. June 21, 1930, on sweet william (*Phlox pilosa*), (G.B.S.). Elk Point, 2 sp. June 19, 1924; Florence (Medicine Lake), 1 sp. June 23, 1927; all by (G.I.G.). Brookings, 5 sp.; Hot Springs, 1 sp.; Volga, 2 sp.; all no data.

4. (8004) *E. FERRUGINEA* Say. Brule Agency, 1 sp. Aug. 23, 1929; Buffalo, 1 sp. Sep. 9, 1927; Chamberlain, 2 sp. June 15, 1928; Eureka, 16 sp. Sept. 5, 1930; Forestburg, 1 sp. Aug.

<sup>2</sup> In the following report, the collectors, where known, are indicated by their initials. These persons are thus represented: L. A. C., Laurence A. Carruth; M. F., Morton Fredricksen; G. I. G., George I. Gilbertson; P. H. J., Paul H. Johnson; L. C. L., L. C. Lippert; M. K. R., Merrill K. Riley; J. A. S., J. A. Salisbury; H. C. S., Harry C. Severin; G. B. S., Gerald B. Spawn.

<sup>3</sup> Univ. of Cal. Publications in Entomology, Vol. 4, No. 12, pp. 404-405, 1928.

21, 1929; Grass Rope, 6 sp. Aug. 23, 1929; Howell, 14 sp. Sep. 5, 1930; Kadoka (Bad Lands), 3 sp. Aug. 25, 1929; McNecly, 1 sp. Sep. 17, 1930; Miranda, 9 sp. Sep. 5, 1930; Pierre, 1 sp. Aug. 22, 1927; Smithwick, 3 sp. Sep. 15, 1930; White Lake, 13 sp. Aug. 23, 1929; all by G.I.G. Capa, 6 sp. Aug. 12, 1919, 5 sp. Aug. 24, 1922; Orman Dam, 1 sp. Sep. 10, 1929; all by H.C.S. Aurora Co., 4 sp., no data.

5. (8005) *E. SERICANS* Lec. Buffalo, 4 sp. June 20, 1926; Chamberlain, 9 sp. June 15, 1928; Hot Springs, 4 sp. June 26, 1924, 1 sp. Sep. 6, 1923; Newell, 3 sp. June 29, 1923; Philip, 4 sp. June 23, 1923, Tulare, 1 sp. July 13, 1928; White Lake, 2 sp. Aug. 23, 1923; Whitewood, 1 sp. June 21, 1926; all by G.I.G. Capa, 3 sp. Aug. 24, 1922; Nowlin, 1 sp. June 25, 1928; all by H.C.S. Pierre, 1 sp., no data.

6. (8007) *E. CALLOSA* Lec. Chamberlain, 3 sp. June 15, 1928; Newell, 1 sp. June 29, 1923, 8 sp. July 5, 1923, 11 sp. Aug. 19, 1924; all by G.I.G. Capa, 8 sp. Aug. 24, 1922 (H.C.S.); Ipswich, 1 sp. July 29, 1929; Pierre, 5 sp.; Nowlin Co.,<sup>4</sup> 5 sp.; all no further data.

7. (8017) *E. MACULATA* Say. Brule Agency, 1 sp. Aug. 23, 1927; Cheyenne Agency, 1 sp. July 14, 1928; Grass Rope, 5 sp. June 19, 1929; Herried, 8 sp. June 15, 1929; Orman Dam, 2 sp. July 17, 1928; Philip, 3 sp. June 23, 1923; Wall, 1 sp. June 24, 1921; all by G.I.G. Brookings, 9 sp. June 13, 1911, Capa, 5 sp. Aug. 24, 1922; Cave Hills, 1 sp. July 22, 1928; Lemmon, 1 sp. Aug. 24, 1924; all by H.C.S. Owanka, 11 sp. found on red root (*Ceanothus ovatus*) and on garden vegetables, July 14, 1930; Parmelee, 1 sp. June 20, 1930; White River, 14 sp. found damaging garden vegetables, July 14, 1930; all by L.A.C. Nowlin Co.,<sup>4</sup> 14 sp.; Slim Buttes, 2 sp.; Volga, 10 sp.; all no further data.

8. (8019) *E. LEMNISCATA* Fab. Canton, 6 sp. Aug. 3, 1922, (H.C.S.) Springfield, 1 sp. Aug. 27, 1926; Tyndall, 1 sp. Aug. 27, 1929; all by G.I.G.

9. (8024) *E. CINEREA* Forst. Brown's Valley, 1 sp. June 23, 1927; Elk Point, 1 sp. June 12, 1925; Meckling, 2 sp. June 15, 1925; Springfield, 1 sp. June 16, 1926; White, 1 sp. Aug. 10, 1927; all by G.I.G.

10. (8032) *E. CORVINA* Lec. Grass Rope, 3 sp. Aug. 23, 1929, (G.I.G.); Hot Springs, 2 sp. Aug. 9, 1917.

11. (8033) *E. PENNSYLVANICA* DeG. Altamont, 9 sp. Sep. 5, 1930; Buffalo, 2 sp. Sep. 9, 1927; Canton, 2 sp. Aug. 16, 1927; Elk Point, 1 sp. Aug. 25, 1926; Englewood, 1 sp. Aug.

<sup>4</sup>The specimens labeled "Nowlin County" are from the Truman Collection and were probably taken in the early nineties. Nowlin County no longer exists but has long since been enlarged to form the present Haakon County.

30; 1924; Eureka, 9 sp. Sep. 5, 1930; Houghton, 2 sp. Sep. 5, 1930; Howell, 14 sp. Sep. 14, 1930; Lake City, 7 sp. Sep. 5, 1930; Lake Hendricks, 15 sp. Aug. 10, 1927; Lake Poinsett, 3 sp. Aug. 23, 1927; Letcher, 8 sp. Sep. 7, 1928; Lowry, 17 sp. Sep. 5, 1930; Miranda, 17 sp. Sep. 5, 1930; Mound City, 2 sp. Sep. 5, 1930; Smithwick, 1 sp. Sep. 15, 1930; Wewela, 11 sp. Sep. 16, 1930; White, 1 sp. Aug. 10, 1927; White Lake, 2 sp. Aug. 23, 1929; all by (G.I.G.). Brookings, 22 sp. Aug. 20, 1929; Capa, 2 sp. Aug. 24, 1922; White, 1 sp. July 26, 1922; all by H.C.S. Brookings, 1 sp. Aug. 4, 1929, by P.H.J., 4 sp. Aug. 3, 6, 8 and 27, 1928, all from white sweet clover (*Melilotus alba*) by M.K.R. and M.F., 5 sp. Aug. 3, 6, 8 and 21, 1928, all from yellow sweet clover (*Melilotus officinalis*) by M.K.R. and M.F. Springfield, 7 sp. June 15, 1930, by L.A.C. Forestburg, 1 sp. Aug. 21, 1929; Newell, 1 sp. Aug. 20, 1924; Pierre, 3 sp. Aug. 5, 1919; Sisseton, 1 sp. July 31, 1919, 1 sp. Aug. 29, 1921; Slim Buttes, 6 sp.; Yankton, 1 sp. Aug. 7, 1916; all no further data.

12. (8042) *MACROBASIS UNICOLOR* Kirby. Britton, 4 sp. July 10, 1927; Brown's Valley, 4 sp. June 23, 1927; Buffalo, 3 sp. June 20, 1925; Canton, 1 sp. June 12, 1926; Centerville, 1 sp. June 14, 1928; Chester, 2 sp. June 17, 1930; Meckling, 2 sp. June 13, 1925, 1 sp. June 16, 1926; Newell, 4 sp. July 5, 1925; Rapid City, 1 sp. June 25, 1923; Redfield, 2 sp. June 21, 1927; Tabor, 1 sp. June 20, 1924; Vermillion, 4 sp. June 11, 1921; Wababay, 1 sp. Aug. 29, 1927; all by (G.I.G.). Brookings, 1 sp. Apr. 29, 1919, 9 sp. June 13, 1911, 3 sp. on *Caragana* (Siberian Pea) June 16, 1930, 3 sp. June 21, 1918, 2 sp. July 17, 1924; Clover, 2 sp. June 18, 1929; Huron, 7 sp. June 7, 1928; Ludlow, 1 sp. June 1, 1928; all by H.C.S. Brookings, 13 sp. from yellow sweet clover (*Melilotus officinalis*) June 25 to July 23, 1928, 21 sp. from white sweet clover (*Melilotus alba*) July 7 to Aug. 8, 1928; all by M.K.R. and M.F. Colton, 2 sp. June 17, 1930; Eureka, 1 sp. June 25, 1930; Irene, 1 sp. June 17, 1930; Parmelee, 2 sp. June 20, 1930; all by L.A.C. Chester, 1 sp. June 29, 1930, (G.B.S.). Garden City, 3 sp. June 26, 1919; Meadow, 4 sp. June 21, 1921; Nowlin Co.,<sup>4</sup> 1 sp.; Pierre, 1 sp. June 21, 1928; all no further data.

13. (19616) *M. MURINA* Lec. Brown's Valley, 10 sp. June 23, 1927; Englewood, 1 sp. June 18, 1925; Florence, 1 sp. June 23, 1927; Lead, 2 sp. July 12, 1923; all by G.I.G. Brookings, 1 sp. June 12, 1923; White, 1 sp. July 1, 1925, all by H.C.S. Brookings, 6 sp. from yellow sweet clover (*Melilotus officinalis*) June 25 to Aug. 8, 1928, by M.K.R. and M.F.

14. (8053) *M. IMMACULATA* Say. Chamberlain, 2 sp. July 10, 1930, by H.C.S.; White River, July 14, 1930, 29 sp. found causing injury to garden vegetables (L.A.C.).

15. (8054) *M. SEGMENTATA* Say. Chamberlain, 9 sp. June 15, 1928; Grass Rope, 11 sp. June 19, 1929; Oglala (Bad Lands), 1 sp. June 20, 1928; Pierre, 1 sp. June 25, 1928, 6 sp. July 15, 1927; Wheeler Bridge, 1 sp. Aug. 20, 1927; White-wood, 4 sp. June 21, 1926; all by (G.I.G.). Brookings, 1 sp. June 15, 1924; Chamberlain, 1 sp. July 15, 1930; White River, 2 sp. May 26, 1921; all by H.C.S. White River, 6 sp. found damaging garden vegetables June 14, 1930 (L.A.C.). Interior (Bad Lands), 4 sp. June 19, 1924; Slim Buttes, 6 sp.; no further data.

16. (8066) *LYTTA NUTTALLI* Say. Buffalo, 3 sp. June 20, 1925; Newell, 5 sp. June 29 and July 5, 1923; Sisseton Ind. Res. 1 sp. June 23, 1927; all by G.I.G. Brookings, 4 sp. July 2, 1924; Faulkton, 2 sp. July 10, 1922; all by H.C.S. Selby, 32 sp. July 20 to 30, 1927, by G.I.G., L.C.L. and J.A.S. Brookings, 3 sp. June 19, 1891; Leola, 4 sp. July 17, 1908, no further data.

17. (8075) *L. BIGUTTATA* Say. Nowlin Co.,<sup>4</sup> 3 sp., no data.

18. (8102) *L. SPHAERICOLLIS* Say. Buffalo, 7 sp. June 20, 1925, 2 sp. Aug. 26, 1924; Chamberlain, 2 sp. June 15, 1928; Grass Rope, 9 sp. June 15, 1929; Mobridge, 3 sp. Aug. 20, 1924; Mossman, 3 sp. July 14, 1928; Philip, 3 sp. June 23, 1923; Whitewood, 12 sp. July 18, 1923; all by G.I.G. Camp Crook, 1 sp. July 21, 1928 (H.C.S.). Hot Springs, 2 sp. June 22, 1930 (L.A.C.). Brookings, 2 sp.; Mobridge, 1 sp. July 20, 1930; no further data.

19. (8137) *HENOUS CONFERTUS* Say. Springfield, 1 sp. June 13, 1925, 1 sp. June 15, 1928; Yankton, 2 sp. Aug. 30, 1930; all by G.I.G. Yankton, 1 sp. Aug. 6, 1923 (H.C.S.).

20. (8148) *MELOE AMERICANUS* Leach. Canton, 1 sp. Aug. 27, 1923; 1 sp. Sep. 16, 1925; Custer, 1 sp. Sep. 11, 1927; Englewood, 1 sp. Sep. 14, 1930; Springfield, 1 sp. Aug. 27, 1926; all by G.I.G. Brookings, 2 sp. Oct. 15, 1924.

#### Subfamily NEMOGNATHINAE.

21. (8196) *TRICRANIA STANSBURYI* Haldeman. Two specimens labeled "South Dakota" were found in the former Truman Collection.

22. (8156) *ZONITIS ATRIPENNIS* Say. Hot Springs, 3 sp.; Volga, 3 sp.; no further data.

23. (8158) *ZONITIS BILINEATA* Say. Yankton, 1 sp. Aug. 6, 1923, (H.C.S.). Aurora Co., 3 sp., no further data.

24. (8168) *GNATHIUM MINIMUM* Say. Buffalo, 1 sp. Sep. 9, 1927; Martin, 1 sp. Sep. 3, 1924; all by G.I.G. Hot Springs, 1 sp.; Pierre, 14 sp.; Rapid City, 1 sp.; Volga, 1 sp.; no further data.

25. (8172) *NEMOGNATHA LURIDA* Lec. Newell, 1 sp. July



5, 1923, (G.I.G.). Brookings, 3 sp.; Nowlin Co.,<sup>1</sup> 5 sp.; Rapid City, 3 sp.; Volga, 4 sp.; no further data.

26. (8174) *N. LUTEA* Lec. Hot Springs, 2 sp. June 26, 1924; Newell, 1 sp. June 29, 1923; Rosebud, 2 sp. June 18, 1927; all by G.I.G. Wewela, 1 sp. June 19, 1930 (L.A.C.). Nowlin Co.,<sup>4</sup> 1 sp., no data.

27. (8175) *N. BICOLOR* Lec. Rapid City, 2 sp. no data.

28. (8178) *N. PALLIATA* Lec. Lake Oakwood, 1 sp. July 10, 1921 (H.C.S.). Brookings, 8 sp.; Volga, 3 sp.; no further data.

29. (8181) *N. NIGRIPENNIS* Lec. 5 sp. labeled "Western South Dakota" from the Truman Collection.

30. (8185) *N. IMMACULATA* Say. Aurora Co., 4 sp.; Hot Springs, 1 sp.; Nowlin Co.,<sup>4</sup> 4 sp.; Rapid City, 2 sp.; Volga, 2 sp.; no further data.

### Relationships of the Gyrinidae (Coleoptera).

Part 19 of the *Catalogue of Indian Insects* (Calcutta: Government of India Central Publication Branch 1930, 37 pp.) is on the Gyrinoidea, by George Ochs of Frankfurt am Main. The following is taken from his Preface:

"The Gyrinidae are generally considered as a family of the sub-order Adephaga. They are indeed adephagid in some general characters, in other characters, however, they are abnormal and approach other families, which are far from the adephagous series. From this I concluded,<sup>1</sup> concerning their phylogenetic origin, that the Gyrinidae must be older than the true Adephaga, which opinion was already expressed by Lameere,<sup>2</sup> Fowler<sup>3</sup> and other authors. For this reason, it would perhaps be best, to consider the Gyrinidae as an isolated family, like for example the Palpicornia, with which they have probably some, though very distant, relations. Nevertheless, the nearest allies existing are the Adephaga, but if placed in this series, this requires a subdivision, and I feel inclined to follow the arrangement of Leng<sup>4</sup> and of Tillyard,<sup>5</sup> who unite the true Adephaga in a superfamily (Caraboidea) and consider the Gyrinoidea as a section of equivalent value. I cannot agree with Hatch,<sup>6</sup> who regards the Gyrinoidea [Gyrinidae?] as simply derived from the Dytiscidae, and must therefore reject the arrangement of Handlirsch,<sup>7</sup> who unites the Gyrinidae with the aquatic families of the Adephaga in his Hydrocantharini."

<sup>1</sup> Ochs, Ent. Zeitschr. Frankf., XXXX: 122. 1926.

<sup>2</sup> Lameere, Ann. Soc. Ent. Belg., XLIV: 376. 1900.

<sup>3</sup> Fowler, Fauna Brit. Ind., Col.: 50. 1912.

<sup>4</sup> Leng, Cat. Col. N. Amer.: 26. 1920.

<sup>5</sup> Tillyard, Ins. of Austral. & N. Zcal.: 187. 1926.

<sup>6</sup> Hatch, Papers. Mich. Acad., V: 430. 1925.

<sup>7</sup> Handlirsch in Schroeder's Handb. der Entom., III: 550. 1925.

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., FEBRUARY, 1931.

## Entomology at the Convocation Week Meetings, December 29, 1930, to January 3, 1931.

Our annual summary of the entomological items of the programs of the eighty-seventh meeting of the American Association for the Advancement of Science and associated societies, held at Cleveland, Ohio, follows.

The number of papers listed by the various societies were:	
Entomological Society of America .....	41
American Association of Economic Entomologists .....	88
American Society of Zoologists .....	20
Same, Genetics Section .....	8
Ecological Society of America .....	4
American Phytopathological Society .....	1
American Society of Parasitologists .....	5
American Society of Tropical Medicine .....	1
Phi Sigma Biological Research Society .....	10
Invited Papers on Hydrobiology and Agriculture (pages xliv-xlv of the General Program) .....	2
Total .....	180

These papers were distributed in subject as follows:

i		Apiculture .....	3
General Entomology .....	4	Insects Affecting Cereals, Forage and Field Crops .....	22
History of Entomology ..	1	Do. Truck Crops .....	5
Collecting, Mounting and Rearing Methods .....	5	Do. Greenhouse Plants ..	2
Cytology .....	9	Do. Fruits and Fruit Trees	17
Anatomy .....	3	Do. Household and Stored Products .....	5
Physiology .....	28	Do. Forest & Shade Trees	7
Ecology .....	18	Do. Carrying Plant Disease Germs .....	1
Geographical Distribution.	13		
Ontogeny .....	7		
Genetics .....	13		
Parasites of Insects .....	4	ii	
Insects, etc., Affecting Man and Other Animals ....	8	Acarina .....	4
Taxonomy .....	7	Pseudoscorpionida .....	1
General Economic Ento- mology .....	4	Orthoptera .....	8
Insecticides .....	10	Mallophaga .....	1
		Isoptera .....	3
		Odonata .....	3

Ephemerida .....	1	Lepidoptera (excluding	
Homoptera .....	16	Codling Moth, Oriental	
Heteroptera .....	5	Peach Moth and Corn	
Coleoptera (excluding		Borers) .....	18
Japanese Beetle .....	9	Codling Moth .....	3
Japanese Beetle .....	2	Oriental Peach Moth ..	1
Hymenoptera (excluding		Corn Borers .....	9
Honey Bee) .....	17	Diptera (excluding	
Honey Bee .....	5	<i>Drosophila</i> ) .....	24
Trichoptera .....	1	<i>Drosophila</i> .....	6

Many of these figures are duplications, both between sections i and ii and also within each section.

In addition to the above papers there were exhibits of *Pyrethrum* flowers by Alfred Weed and of Mounting Coleoptera, especially *Micros*, by Henry Dietrich, in connection with the Entomological Society of America, and of the luminosity of butterfly wings by Austin H. Clark.

The Entomological Society of America, Dr. Edith M. Patch, *president*, Prof. J. J. Davis, *secretary*, met December 30 and 31. Thanks to Mr. J. A. G. Rehn, we present the following comment on the sessions. The attendance averaged from 80 to 100. Prof. C. T. Brues showed remarkable motion pictures of hot springs in action and several of masses of living brine fly larvae (Ephydriidae); he touched upon naucorids and small water beetles forming part of the insect life of hot springs. Prof. J. G. Needham did not give his account of his airplane trip to the West Indies for dragonflies. Mr. C. H. Curran suggested more broadly and truly comprehensive monographs, new catalogs and more complete taxonomic descriptions. Dr. E. P. Felt proposed a system of letter symbols for placing insects, based on the Dewey library type. Miss Grace H. Griswold gave the length of adult life in the Webbing Clothes Moth (*Tineola biselliella* Hum.) as 6-40 days in the female, 6-70 days in the male, the bulk of the individuals of the two sexes respectively living 23 and 43-53 days. Prof. H. B. Hungerford described his recent visit to the entomological museums of Upsala, Stockholm, Copenhagen, Kiel, Hamburg, Halle, Berlin, Berlin-Dahlem, Vienna, Budapest, Paris, Brussels, Amsterdam, Oxford and London. Prof. H. Osborn gave notes on the work of Jared Potter Kirtland in Ohio. Prof. B. B. Fulton gave an analysis of the species of the cricket genus *Nemobius*, spoke of the application of previously unused male genital characters, described the anatomy of the genitalia of both sexes, discussed the physiological and ecological forms in several subspecies of *N. fasciatus* and illustrated typical habitats of various forms. Mr. J. W. Wilson described injury

to vegetables in Florida by *Tibicen davisi*. Mr. George S. Tulloch described the ditching done in Nantucket in 1930 to control mosquitoes as the first general major state project; the results were very satisfactory. Mr. F. H. Wilson gave the duration of the incubation period of the egg of *Lipceurus heterographus* as 6-7 days, 1st instar 6-12 days, 2nd instar 10-11 days, 3rd instar 12-14 days, adult (♂) 37, (♀) 38 days. Prof. R. H. Beamer stated that Brood IV of the Seventeen Year Cicada has been known in Kansas since 1825; it appeared in the eastern portion of the State in 1930, largely as the form *cassini*, probably localized to specific environments; he held *septendecim* and *cassini* to be clearly distinct species (c.g., differences in number of eggs laid, in song) having in common only the periodic habit and occurrence in the same brood. Prof. C. L. Metcalf, by aid of very finely presented diagrams and charts, gave a summary of temperate and some tropical insects, ticks, mites and spiders that bite man; he omitted *Dermatobia*. Dr. N. E. McIndoo described the geotropic and phototropic responses of the Mexican Bean Beetle as well as those to various types of sprayed foliage after determination of preference to sour, bitter and sweet substances. Mr. C. E. Abbott spoke of the proboscis reflex of decapitated flies.

The annual public address of the Society was given on the evening of December 30 by Prof. H. J. Quayle, comprising an account of several trips to the Mediterranean area, southern Africa, Japan and Australia, studying the Mediterranean fruit fly problem.

At the business meeting, twenty-five dollars was voted to the *Zoological Record*. The Committee on the United States National Museum reported the acquisition of the Barnes collection of Lepidoptera by the museum. A committee on the Fifth International Congress of Entomology was authorized, the chairman to be appointed by the president. The new officers elected were president, J. W. Folsom; vice presidents, J. M. Swaine and Harold Morrison; J. J. Davis re-elected secretary-treasurer.

The annual address by the president of the American Association of Economic Entomologists, this year Mr. Franklin Sherman, was on Census Taking in Entomology, given on the morning of December 31.

The Entomologists' Dinner was on the evening of the same day. President Sherman presented Dr. W. E. Britton as toastmaster. Dr. W. J. Holland was the guest of honor. Addresses were made by Doctors Holland, Patch, Felt, Needham, Herbert Osborn, O'Kane, Vernon Kellogg, Lutz, Burgess and Arthur Gibson; about 300 attended.

## Entomological Literature

COMPILED BY LAURA S. MACKEY UNDER THE SUPERVISION OF  
E. T. CRESSON, JR.

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 **within brackets** [ ] refer to the journals, as numbered in the list of Periodicals and Serials published in the January and June numbers (or which may be secured from the publisher of Entomological News for 10c), in which the paper appeared. The number of, or annual **volume**, and in some cases the part, left, &c. the latter **within** ( ) follows; then the pagination follows the **colon** :

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

\*Papers containing new forms or names have an \* preceding the author's name.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

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.

 Note the change in the method of citing the bibliographical references, as explained above.

Papers published in the Entomological News are not listed.

**GENERAL.**—**Aurivillius, C.**—Obituary. By L. R. N. [Norsk Ent. Tidsskrift] 2: 307-308. **Bibliographia Zoologica.** Volume 40. 472 pp. **Cockerell, T. D. A.**—The description and figuring of imperfect fossils. [68] 72: 654. **Gunn, N. R.**—The Norman R. Gunn collection of butterflies. By E. P. Van Duzee. [55] 7: 72. **de Joannis, J.**—Quelques éclaircissements à propos de la loi de priorité. [Lambillionea] 1930: 180-181. **Internationale Kongres for Entomologi.**—IV. [Norsk Ent. Tidsskrift] 2: 310-315. **McDonald, F. W.**—Memories of some Old London Entomologists. [Pro. So. Lond. Ent. & Nat. Hist. Soc.] 1929-30: 1-6. **Tillyard, R. J.**—A new theory of the evolution of the insects. [31] 126: 996-998.

**ANATOMY, PHYSIOLOGY, ETC.**—**Brindley, T. A.**—The growth and development of *Ephestia kuehniella* and *Tribolium confusum* under controlled conditions of temperature and relative humidity. [7] 23: 741-757, ill. **Bugnion, E.**—Les pièces buccales, le sac infrabuccal et le pharynx des fourmis. [Bull. Soc. R. Ent. Egypte] 1930: 85-204, ill. **Chudoba, S.**—Appareil centriolaire dans les cellules sexuelles males chez *Dytiscus marginalis*. [77] 105: 617-619, ill. **Dunham, W. E.**—Temperature gradient in the egg-laying activities of the queen bee. [43] 30: 403-410, ill. **Flanders, S. E.**—Wax secretion in the Rhizobium. (Col.) [7] 23: 808-809, ill. **Howland, L. J.**—The nutrition of mosquito larvae, with special reference to their algal food. [22] 21: 431-440, ill. **Marcovitch & Stanley.**—The climatic limitations of the

Mexican bean beetle. [7] 23: 666-686, ill. **Mehta, D. R.**—Observations on the influence of temperature and humidity on the bionomics of *Dysdercus cingulatus*. [22] 21: 547-562, ill. **Misra, A. B.**—On the post-embryonic development of the female lac insect, *Laccifer lacca* (Coccidae). [22] 21: 455-467, ill. **Oekland, F.**—Studien ueber die arbeitsteilung und die teilung des arbeitsgebietes bei der roten waldameise (*Formica rufa*). [46] 20: 63-131, ill. **Paterson, N. F.**—The bionomics and morphology of the early stages of *Paraphoedon tumidulus*. (Phytophaga, Chrysomelidae). [93] 1930: 627-676, ill. **Pfeiffer & Stammer.**—Pathogenes leuchten bei insekten. [46] 20: 136-171, ill. **Portier, P.**—Respiration pendant le vol chez les lépidoptères. [69] 105: 760-764. **Poutiers, R.**—Influence de certains facteurs sur la nymphose des larves de *Ceratitis capitata*. [77] 105: 709-710. **Régnier & Lespes**—Sur l'existence d'une génération estivale chez le Criquet pèlerin (*Schistocera gregaria*). [69] 191: 1082-1083. **Reinig, W. F.**—Phaenoanalytische studien ueber rassenbildung. *Psithyrus rupestris*. [89] Syst. 60: 257-280, ill. **Zacher, F.**—Untersuchungen zur morphologie und biologie der samenkaefer (Bruchidae-Lariidae). [Arb. Biol. Reichs. f. Land- u. Forstw.] 18: 233-384, ill.

**ARACHNIDA AND MYRIOPODA.**—**Brumpt, M. E.**—Parasitisme latent de l'*Ixodiphagus caucurtei* chez les larves gorgées et les nymphes à jeun de divers ixodines (*Ixodes ricinus* et *Rhipicephalus sanguineus*). [69] 191: 1085-1087. **\*Ewing, H. E.**—A fossil arachnid from the lower carboniferous shales (Pocono formation) of Virginia. [7] 23: 641-643, ill. **\*Jackson, A. R.**—Results of the Oxford University Expedition to Greenland, 1928. Aranee and Opiliones collected by Major R. W. G. Hingston; with some notes on Icelandic spiders. [75] 6: 639-656, ill.

**THE SMALLER ORDERS OF INSECTS.**—**Borror, D. J.**—Notes on the Odonata occurring in the vicinity of Silver Lake, Logan County, Ohio, from June 25 to September 1, 1930. [43] 30: 411-415. **\*Hilton, W. A.**—Pauropoda from North America. [7] 23: 765-783, ill. **Jaffuel, P. F.**—Contribución al estudio de los Mecópteros. [44] 33: 537-549, ill. (S). **\*Navas, R. P. L.**—Insectos Neotropicos. Algunos insectos de Chile. [44] 33: 17-24, 326-334, ill.

**ORTHOPTERA.**—**Allard, H. A.**—The occurrence of the crickets *Anaxipha pulicaria* and *Cycloptilum trigonipalpus* (Rehn and Hebard) in the vicinity of the District of Columbia, hitherto unreported here. [10] 32: 144-146. **\*Chopard, L.**—Descriptions de Gryllides américains nouveaux. [44] 33: 522-531, ill. (S). **\*Fulton, B. B.**—Notes on Oregon

orthoptera with descriptions of new species and races. [7] 23: 611-641. \***Sjöstedt, Y.**—Orthopterentypen im Naturhistorischen Reichmuseum zu Stockholm. I Mantidae. (S). [83] 21A, No. 32: 1-43, ill.

**HEMIPTERA.**—**deLong, D. M.**—Venational characters in Typhlocybinae wings. [43] 30: 398-402, ill. \***Knight, H. H.**—A new key to Paracalocoris with descriptions of eight new species (Miridae). [7] 23: 810-827. \***Osborn, H.**—North American leafhoppers of the Athysanella group (Cicadellidae). [7] 23: 687-720, ill. **Rivnay, E.**—Host selection and cannibalism in the bed bug *Cimex lectularius*. [7] 23: 758-764. \***Walley, G. S.**—Notes and descriptions of species of *Arctocorixa* from Ontario and Quebec (Corixidae). [4] 62: 280-286, ill.

**LEPIDOPTERA.**—\***d'Almeida, R. F.**—Etude sur le genre *Terias*. [44] 33: 421-427, ill. **Felt, E. P.**—The Norway maple *Nepticula*. [10] 32: 146-149. \***Gehlen, B.**—Neue SpHINGIDEN. (S). [14] 44: 258-259, ill. **Hoffman, F.**—Beiträge zur Naturgeschichte brasilianischer schmetterlinge. I. [45] 25: 93-112. **Keifer, H. H.**—*Argyresthias* found in Golden Gate Park, San Francisco. [55] 7: 76. \***Michael, O.**—Neue *Agrias*-Ab. vom mittleren Amazonas. [14] 44: 273-277, cont., ill. \***Sternitsky, R. F.**—A new subspecies of *Plebejus icariodes*. [55] 7: 93-94.

**DIPTERA.**—\***Alexander, C. P.**—New species of crane flies from South America. Part. IV. (*Tipulidae*). [7] 23: 721-740. \***Alexander, C. P.**—New or little-known species of the genus *Gnophomyia* Osten Saken from Ecuador and Perú (*Tipulidae*). [44] 33: 164-168, ill. **de Andrade, E. N.**—Subsídios para a entomologia agrícola Brasileira. VIII. Pesquisas sobre a biologia da mosca da Madeira. *Pantophthalmus pictus*. [Arch. Ins. Biol., São Paulo] 3: 249-286, ill. **Andrews, H. W.**—The earlier stages of Diptera. [Pro. So. Lond. Ent. & Nat. Hist. Soc.] 1929-30: 17-29. \***da Costa Lima, A.**—Sobre especies do genero *Miamyia* subgenero *Miamyia* (*Culicidae*). [Mem. Inst. Oswaldo Cruz] 24: 187-194, ill. (S). **Curran, C. H.**—A new *Gymnopternus* from Oregon (*Dolichopidae*). [4] 62: 287. **Gibbins, E. G.**—A simple method of making permanent microscope mounts of mosquito larvae. [22] 21: 429-430, ill. **Leeson, H. S.**—Variations in the wing ornamentation of *Anopheles funestus*. [22] 21: 421-428, ill. \***Painter, R. H.**—Notes on some *Bombyliidae* from the Republic of Honduras. [7] 23: 793-807, ill. **Roberts, R. A.**—The wintering habits of muscoid flies in Iowa. [7] 23: 784-792. \***Seguy, E.**—Note sur quatre *Toxophorines* de l'Amérique centrale et meridionale. [44] 33:

532-536, ill. **Stuardo, C.**—Notas entomológicas un genero de Nemestrinidae no mencionado para la fauna chilena. [44] 33: 161-163, ill. \***Van Duzee, M. C.**—New Dolichopodidae from Connecticut. [40] 439: 5 pp. \***Webber, R. T.**—A revision of the N. A. Tachinid flies of the genus *Achaetoneura*. [50] 78 (10): 37 pp., ill.

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**Archilestes grandis (Ramb.) in Ohio (Odonata:  
Agrionidae).**

The following is extracted, at the Editor's request, from a letter from the undersigned to Dr. F. M. Gaige, dated October 17, 1927.

"I was down at Oxford, Ohio, September 25, 1927, and had a most remarkable experience. There is a little brook which runs through the west side of the campus at the Western College, and which at its head is merely a draw. One branch of this draw goes back of some houses on the campus, and is apparently little more than a sewer; septic tanks are located on it. Another branch of the draw goes back into the Miami campus, and receives refuse liquids from the chemical laboratory and the power house. In fact, the crawfish farther down in the creek and still within the campus above the rustic bridge, were all dead so far as I could discover, though there were a few mayfly and stonefly larvae in the creek. Through the campus this little creek meanders among well-sodded knolls or rounded hills which are kept mowed with lawn mowers. At one place it is dammed to form a small pool, possibly an acre in extent. A driveway is built on the dam, forming this pool. Just above the pool is a little rustic foot-bridge over the creek. Here the creek is a foot or two wide and when I saw it two weeks ago and last Monday, there was a very small flow of water. The creek bed itself, just above the foot-bridge, is composed of broken up thin pieces of very fossiliferous limestone. There are a few small willows, mint, asters, and such vegetation on the creek, but it is practically entirely open and virtually landscaped—just a little artificial-looking dab of scenery. But when I walked down to it two weeks ago last Sunday, you can imagine my surprise when, just above the foot-bridge, I found *Archilestes grandis* flying. Can you imagine such a

thing? It is altogether the most surprising find I have ever made in collecting dragonflies. I collected four of them (3 ♂, 1 ♀) that day when I first found them and saw possibly a dozen more. Last Tuesday (October 11) I collected five more (4 ♂, 1 ♀) and saw several I did not disturb. Some were ovipositing, as far as I observed (and I made only three observations) in living twigs of willow and elm, and in dead twigs of sycamore. The twigs selected were from one foot to ten feet elevation, and in every case, over the water. In ovipositing they flew in couple, often alighting on twigs a little distance from above the water or even in trees or shrubs back from the creek bank, but in no case was oviposition observed in a situation from which the larvae would not fall directly into the water.

"The creek flows through the dam, forming the pool, in an arched cement culvert, and passes at once into an uncared for brush woodlot, much more shaded than above the rustic bridge. Here, just below the culvert, several *Archilestes* were seen on September 25, but, though I looked for them there on October 11, none were seen though they were in undiminished numbers just above the bridge."

At the time I visited Oxford I talked with a caretaker on the Western College campus who told me that in the sixteen years he had been there, he thought the creek had never been dry, and that in the winter it never froze but "steamed" all winter. He said the chemicals it carried killed all the gold fish, planted in the pool several times. On October 11th I visited several other small streams emptying into the same stream into which the campus creek flowed but found no *Archilestes* on any of them. On the campus stream the *Archilestes* flew along the creek, and occasionally breezed out over the adjacent lawn to a distance of maybe 50-100 feet from the stream, flying 2-3 feet high, and returning to the stream without alighting at any distance from it. Strange as it may seem, during such flights in the sun, out from the stream and back again, they somehow suggested a gomphine—that is at a distance, of course.

*Archilestes grandis* was associated on the creek with *Aeshna umbrosa*. At the pond on the same date (October 11) were *Sympetrum vicinum*, *Anax junius*, *Ichnura verticalis* and *Enallagma civile*. E. B. WILLIAMSON, Bluffton, Indiana.

#### **Archilestes in Ohio (Odonata, Agrionidae).**

Nymphs of the damselfly, *Archilestes*, (*A. grandis*?) have been found in pools about Dayton, Ohio. Heretofore the known range of this genus has been from Washington to California, except in one instance from Arkansas.

The record was verified by Dr. J. G. Needham.

CHARLES W. COTTERMAN, Dayton, Ohio.

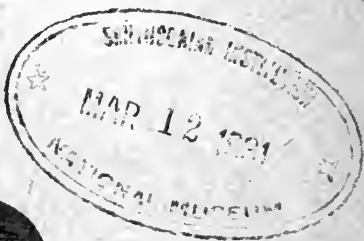
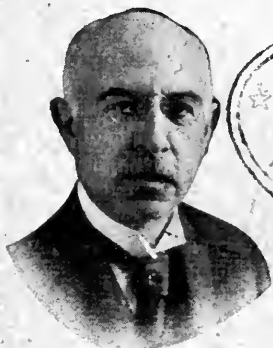
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MARCH, 1931

# ENTOMOLOGICAL NEWS

Vol. XLII

No. 3



HENRY SKINNER  
1861-1926

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# ENTOMOLOGICAL NEWS

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## The Races of *Diapheromera veliei* (Orthoptera, Phasmidae, Heteronemiinae).

By MORGAN HEBARD, Philadelphia, Pennsylvania.

Recently in our studies of the Orthoptera of Kansas we found that *Diapheromera veliei* Walsh, occurred in its typical form over that entire State, its maximum abundance being reached in the central Great Plains. It is apparently less hardy than *Diapheromera femorata* (Say) as its known northern limits are Lake Hendricks, South Dakota, and Julesburg, Colorado, while toward the foot of the Rocky Mountains in Colorado (except probably in its southern portion) it disappears, this probably due there to the greater elevation and consequently more boreal environment of the plains.

To the south we have it typical as far as Stillwater, Oklahoma, Dalhart, Texas, and Vaughn, New Mexico, and it reaches westward over the lower divides of the Rockies as far as Albuquerque, in the latter State. Further south in Texas and New Mexico, however, we find it supplanted by a geographic race and study of the literature convinces us that that race must bear the name *Diapheromera veliei mesillana* Scudder. The following data lead to this conclusion.

DIAPHEROMERA VELIEI MESILLANA Scudder.

1901. *Diapheromera mesillana* Scudder, Psyche, IX, p. 189. [[Juv.] ♂; between Mesilla and Las Cruces, New Mexico.]

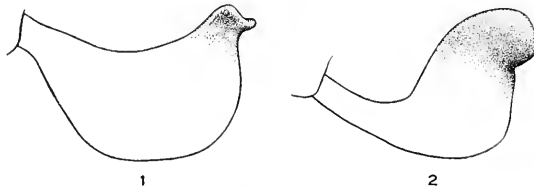
1907. *B[acunculus] texanus* Brunner, Insektenfam. der Phasmiden, p. 333. [♂, ♀; Texas.<sup>1</sup>]

Scudder described *mesillana* from immature males and, though difficult to associate specifically, we have sufficient such material to be satisfied that the species represented is the same as that

<sup>1</sup>The specimen recorded from New York was either mislabeled or represents a distinct species.

here discussed from large series of adults. In the Rio Grande valley of New Mexico this is the only species of this type present.

Brunner's description of *Bacunculus texanus* is very unsatisfactory. Probably immature material (at least in part), in which femoral spines are often lacking, led to the generic assignment, as there is no Heteronemiid found in the United States in which the adults have both median and caudal femora unarmed. Selecting Texas as type locality of *texanus*, we find that the description fits best the present insect of the forms which occur in that State and we therefore place that name as a synonym. With the wealth of material which was available in preparing "Die Insektenfamilie der Phasmiden" it is very regrettable that the work throughout is so very superficial and inaccurate.



- Fig. 1. *Diapheromera velici velici* Walsh. Lateral view of male poculum. Syracuse, Kansas. (Much enlarged.)  
 Fig. 2. *Diapheromera velici mesillana* Scudder. Lateral view of male poculum. Foothills of Ord Mountains, Brewster County, Texas. (Much enlarged.)

This race differs from typical *velici* in having the male poculum very broadly lipped, while in the female sex the femoral apices are usually strikingly suffused with black. The head averages broader, but this is apparently not constant, and the female cerci average considerably shorter. Though in all central Texan material the female femoral apices are conspicuously black, this marking is wholly absent in a female before us from Vaughn, New Mexico and in one from El Paso, Texas. It is, however, very decided in a female from Pecos, Texas and in one from Lake Valley, Sierra County, New Mexico. Absence of such marking, never found in typical *velici*, may indicate that such an individual has developed in different plants or bushes than are usually selected by the present insect.

Intergradation with *velici velici* is shown by the following material. A large series from Midland, Texas, has the male procutum as in typical *velici*; the females have the femoral apices narrowly suffused with black and the cerci very elongate, even more elongate than the average for *velici velici*, in which more individual variation in this feature is shown than in *velici mesillana*. A large series from Melena, Chaves County, New Mexico, is similar except that the female cerci are slightly shorter, though much longer than in *velici mesillana*.

The range of the present race extends from Lake Valley and Deming, New Mexico, east to Robstown and Cisco, Texas. It was reported from San Diego, Alice and Victoria, Texas, as *velici* by Caudell in 1918.<sup>2</sup> It is one of the most abundant and generally distributed Phasmids in central Texas, where it is particularly encountered on the low mesquite trees which there are thickly scattered over the plains. Its area of intergradation with *velici velici* apparently extends from central-northern east New Mexico eastward.

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#### Notes on *Tremex columba* Linn. (Hymen.: Siricidae).

In the latter part of May, near my home in the suburbs of Philadelphia, I noticed a maple tree that was dead or nearly so; on examining the trunk of the tree I found numerous larvae of *Tremex columba*. I cut out a section of the trunk about 20 inches long and 10 inches in diameter, taking it home and placing it in one of my breeding cages. The first *Tremex* emerged on June 16. From June 16 to 26, 96 males and 10 females emerged; 7 males and 22 females were obtained from June 27 to July 6, from July 7 to 16, 5 males and 1 female, 6 males and 5 females from July 17 to 31, and 6 males and 4 females during the month of August. In all 162 *Tremex* emerged from this small section cut from the trunk of the tree,—120 males and 42 females. I kept the log for some time but did not obtain any specimens after the month of August. Have wondered how many hundred *Tremex columba* there were in that tree, which was about 25 feet high and 12 inches in diameter.

PHILIP LAURENT.

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<sup>2</sup> Ent. News, XXIX, p. 25.

## Notes on Utah Heteroptera and Homoptera.

By GEORGE F. KNOWLTON.

(Continued from page 43).

Family ANTHOCORIDAE (Am. and Serv.).

52. *ANTHOCORIS ANTEVOLENS* White. In leaves curled by *Prociphilus fraxiniifolii* (Riley), Hyrum, June, 1929 (Knowlton).

Family MIRIDAE (Hahn).

53. *TRIGONOTYLUS RUFICORNIS* (Geoff.). On barley in Cache Valley, 1929 (Pack); on beets at Logan, April 20, 1929 (Knowlton); on wheat and oats, Salt Lake City, 1929 (Pack); on *Chcirinia repanda*, Snowville, June, 1930 (Knowlton).

54. *ADELPHOCORIS SUPERBUS* (Uhl.). Brigham City, September 12, 1925 (Knowlton); on beets at Fielding, August 28, 1925 (Knowlton); on sugar-beets, Hooper, June 29, 1929 (Knowlton); Logan, August 19, 1925 (Knowlton); Manti, July 26, 1927 (Knowlton); Provo, September 8, 1923 (Hawley); Trenton, September 7, 1923 (Knowlton).

55. *IRBISIA BRACHYCERUS* var. *SOLANI* Heid. Amalga, June, 1928 (Knowlton); Logan, July 5, 1929 (Knowlton).

56. *THYRILLUS PACIFICUS* (Uhl.). Howell, July 3, 1928 (Knowlton).

57. *LYGUS PRATENSIS* (Linn.). The tarnished plant bug is present throughout Utah, commonly attacking sugar-beets, alfalfa, potatoes, and many other crops. It often becomes extremely abundant and more or less damaging.

58. *L. PRATENSIS* var. *HESPERUS* Kngt. Frequently taken on beets and alfalfa.

59. *L. PRATENSIS* var. *ELISUS* Van D. This species is common in Utah and has been collected at Arthur, Bear River City, Cornish, Cove, Delta, Farmington, Fairfield, Garland, Hyde Park, Logan, Lymndyl, Millville, Ogden, Riverside, Tremonton, Wanship, Willard, and many other places.

60. *MELANOTRICHUS BREVIROSTRIS* Knight. Bear River City, September 9, 1925 (Knowlton).

61. *PLAGIOGNATHUS POLITUS* Uhl. On beets at Willard, July 26, 1927 (Knowlton).

62. *ATOMOSCELIS MODESTUS* (Van D.). On sugar-beets at Lewiston, June 5, 1929 (Knowlton); on mustard at Snowville, May 18, 1929 (Knowlton).

63. *CLAMYDATUS ASSOCIATUS* (Uhl.). Bear River City, September 9, 1925 (Knowlton); Brigham City, September 10, 1925 (Knowlton); Garland, September 6, 1925 (Knowlton); Lewis-



ton, August 8, 1929 (Knowlton); Trenton, September 1, 1925 (Knowlton).

64. *CAMPYLOMMA VERBASCI* (Meyer). On sugar-beets at Ogden, June 23, 1927 (Knowlton).

Family GERRIDAE (Am. and Serv.).

65. *GERRIS REMIGIS* Say. Benson, April 8, 1930 (Knowlton); Grantsville, April 3, 1930 (Knowlton); Lehi, April 4, 1930 (Knowlton); Logan Meadows, April 8, 1930 (Knowlton); Providence, June, 1930 (M. J. Janes).

66. *LIMNOPORUS RUFOSCUTELLATUS* Latr. Benson, April 8, 1930 (Knowlton); Logan, and Logan Meadows, April 8, 1930 (Knowlton).

Family NOTONECTIDAE (Leach).

67. *NOTONECTA IRRORATA* Uhl. Logan, October 1, 1922 (Knowlton).

68. *N. UNDULATA* Say. Logan, October 7, 1922 (Knowlton).

69. *N. UNIFASCIATA* Guer. Grantsville, April 12, 1930 (Knowlton); Lehi, April 4, 1930 (Knowlton); Locomotive Springs, April 10, 1930 (Knowlton); Pleasant Grove, April 4, 1930 (Knowlton).

70. *N. KIRBYI* Hung. Grantsville, April 12, and May 26, 1930 (Knowlton); Logan, October 1, 1922 (Knowlton); Skull Valley, April 12, 1930 (Knowlton and C. H. Smith).

Family BELOSTOMIDAE (Leach).

71. *LETHOCERUS AMERICANUS* (Leidy). Lehi, May 27, 1930 (Knowlton, M. J. Janes); Logan, November, 1923 (Knowlton); Ogden, August, 1929 (Knowlton); Salt Lake City, July 18, 1921 (Knowlton).

Family CORIXIDAE (Leach).

72. *ARCTOCORIXA LAEVIGATA* (Uhl.). American Fork, April 4, 1930 (Knowlton); Lehi, April 4, 1930 (Knowlton); Locomotive Springs, April 12, 1930 (Knowlton), Logan, April 12, 1930 (Knowlton); Pleasant Grove, April 4, 1930 (Knowlton); Salt Lake City, May 27, 1930 (Knowlton); Skull Valley, April 3, 1930 (Knowlton).

Order HOMOPTERA Latreille.

Family CICADIDAE (Latreille).

73. *DICEROPROCTA APACHE* Davis. St. George, 1919 (R. A. Morris).

74. *CACAMA VALVATA* (Uhl.). St. George, June 18, 1921 (D. McFarland).

75. *OKANAGANA UTAHENSIS* Davis. Bountiful, July 12, 1929 (Pack and M. J. Janes); Cooperton, July 3, 1929 (Knowlton); Corinne, June 22, 1929 (Knowlton); Fort Duchesne, June 25, 1926 (W. Sorenson); Logan, July 31, 1923 (Knowlton); Mill Creek Canyon, June 22, 1926 (Knowlton); Rattle Snake Pass, July 11, 1929 (Knowlton); Salt Lake City, July 3, 1929 (Knowlton); Skull Valley, June 26, 1929 (Knowlton and W. Keller); Snowville, July 11, 1929 (Knowlton); Stansbury Island, June 13, 1913 (Pack, Hagan, Titus).

76. *O. SCHAEFFERI* Davis. Beaver, July 6, 1927 (Knowlton) and June 25, 1927 (Pack).

77. *O. VANDUZEEI* Distant. Bountiful, June 22, 1929 (Pack and M. J. Janes).

78. *O. GIBBERA* Davis. Corinne, June 22, 1929 (Knowlton and M. F. Bowen); Delle, July 24, 1929 (Knowlton); "The Delle", July 24, 1929 (Knowlton); Hardup, June 9, 1930 (Knowlton); Iosepa, June 14, 1929 (Knowlton); Timpie, June 15, 1929 (Knowlton and Keller); Skull Valley, June 12, 1929 (Knowlton).

79. *O. BELLA* Davis. Blue Creek, June 17, 1930 (Knowlton and M. J. Janes); Brigham Canyon, June 17, 1930 (Knowlton and Janes); Cache Junction, June 20, 1909 (C. P. Smith) and June 23, 1912 (Hagan); Garland, June 18, 1904; Logan, July 14, 1906, July 2, 1909 (Stewart); Logan Canyon, June 26, 1920 (G. E. King); Sardine Canyon, June 20, 1930 (Knowlton and M. J. Janes); Stansbury Island, June 13, 1913 (Pack, Hagan, Titus).

80. *O. STRIATIPES* (Hald.). Bonneville, July 16, 1909 (Titus); Bountiful, July 12, 1929 (Pack); Fairview, July 10, 1929 (Knowlton); Garland, July 13, 1929 (Knowlton and Bowen); Lehi, July 19, 1909 (Titus); Logan; Point of Mountain, south of Salt Lake City, July 2, 1909 (Titus); Woods Cross, July 17, 1909 (Titus).

81. *O. FRATERCULA* Davis. Snowville, June 20, 1929 (Knowlton and Bowen).

82. *PLATYPEDIA PUTNAMI* (Uhl.). Cache Junction, June 3, 1912 (Hagan); Logan Dry Canyon, June 29, 1912.

83. *P. LUTEA* Davis. Logan Dry Canyon, June 6, 1924 (Knowlton); Provo, June 1, 1930 (Knowlton); Salt Lake City, July 2, 1912.

84. *P. MOHAVENSIS* Davis. Beaver, June 25, 1927 (Knowlton), June, 1928 (Pack).

#### Family MEMBRACIDAE (Germar).

85. *CERESA BUBALUS* (Fabr.). Garland, June, 1929 (Knowlton).

86. *C. BASALIS* Walk. Fort Duchesne, August 11, 1927 (C. J. Sorenson).

87. *STICTOCEPHALA PACIFICA* Van D. On sugar-beets at Grantsville, August 13, 1927 (Knowlton).

88. *S. FESTINA* (Say.). Hawbush, September 14, 1929 (C. J. Sorenson); Lake Point, September 11, 1929 (Knowlton); McCormick, September 11, 1929 (Sorenson); Richmond, September 9, 1926 (Knowlton).

89. *HELIRIA RUBIDELLA* Ball. On apple, Logan, July, 1924 (Knowlton).

90. *TELAMONA PYRAMIDATA* Uhler. Newton, July 8, 1929 (Pack); Provo, August 7, 1929 (Pack).

91. *PUBLILIA MODESTA* Uhl. Brigham City, August 10, 1927 (Knowlton); La Point, September 25, 1929 (C. J. Sorenson); on sage at Logan, August 21, 1929 (Knowlton); on beets at Provo, July 5, 1927 (Knowlton); Tremonton, April 29, 1927 (Knowlton).

92. *LEIOSCYTA FERRUGINIPENNIS* var. *TESTACEA* Van Duzee. On Russian thistle, Center, August 17, 1929 (Knowlton); on *Atriplex*, Clover, April 17, 1929 (Knowlton); Elberta, August 7, 1929 (Knowlton); Goshen, July 27, 1929 (Knowlton); Lucin, August 12, 1929 (Knowlton and Bowen); Ophir, August 17, 1929 (Knowlton).

#### Family CICADELLIDAE (Latreille).

93. *ONCOPSIS COGNATUS* (Van D.). Salt Lake City, June 22, 1926 (Knowlton).

94. *BYTHOSCOPIUS FRANCISCANUS* (Baker). Brigham City, September 2, 1927 (Knowlton).

95. *HELOCHARA COMMUNIS* Fitch. Common on grass, Grantsville, April 27, 1930 (Knowlton); Hyde Park, April 27, 1929 (Knowlton); Logan, June 3, 1922 (Knowlton); Magna, June 27, 1930 (Knowlton); Ogden, April 22, 1929 (Knowlton); Sandy, September 20, 1930 (Knowlton).

96. *XEROPHLOEA VIRIDIS* (Fabr.). Amalga, August 31, 1927 (Knowlton); mouth of Logan Canyon, October 4, 1929 (Knowlton); on beets at Trenton, September 20, 1929 (Knowlton).

97. *EUTETTIX TENELLUS* (Baker). Abundant in Utah during 1930, causing serious damage to sugar-beets and tomatoes in many parts of the state.

98. *PHLEPSIUS OVATUS* Van D. Corinne, July 21, 1929 (Knowlton); Garland, July 13, 1929 (Knowlton and Bowen); Willard, April 17, 1929 (Knowlton).

99. *P. IRRORATUS* (Say.). Mouth of Logan Canyon, October 4, 1929 (Knowlton).

100. *CICADULA* *SEXNOTATA* (Fall.). Mouth of Logan Canyon, October 4, 1929 (Knowlton); Morgan, September 14, 1925 (Knowlton).

101. *DIKRANEURA* *CARNEOLA* (Stal.). Lewiston, July 2, 1927 (Knowlton); numerous on *Gutierrezia*, mouth of Logan Canyon, October 4, 1929 (Knowlton).

102. *EMPOASCA* *ASPERSA* G. and B. Austin, June 25, 1926 (Knowlton).

103. *E. FLAVESCENS* (Fabr.). Hyrum, April 17, 1930 (Knowlton); Logan, April 20, 1929 (Knowlton).

104. *TYPHLOCYBA* *POMARIA* McAtee. On apple at Tremonton, September 7, 1923 (Hawley).

105. *ERYTHRONEURA* *COMES* (Say). On Virginia creeper at Bountiful, 1929 (Pack); Brigham, 1929 (Pack); on currant and grape, Clearfield, 1929 (Pack); damaging Virginia creeper at Salt Lake City, July, 1930 (Knowlton).

Family *FULGORIDAE* (Latreille).

106. *ORMENIS* *SAUCIA* Van D. Angus, July 9, 1927 (Knowlton).

107. *LIBURNIA* *GILLETTEI* Van D. Ogden, April 17, 1929 (Knowlton).

Family *CIERMIDAE* (Fallen).

108. *APHALARIA* *CALTHAE* (Linn.). Fairfield, June 19, 1913 (Titus); Mills, September 19, 1930 (Knowlton).

109. *PARATRIOZA* *COCKERELLI* (Sulc.). Damaging early potatoes in several parts of northern Utah, spring of 1930.

110. *EUPHARERUS* *VERMICULOSUS* Crawford. Logan Canyon, August 21, 1925 (Knowlton); on *Artemisia*, Spring Canyon, August 28, 1925 (Knowlton).

111. *ARYTAINA* *RIBESIAE* (Crawf.). Lehi, 1929 (Pack); Salt Lake City, 1929 (Pack).

### New Species of West Indian *Agromyzidae* (Diptera).

S. W. FROST, The Pennsylvania State College.

Two new species of *Agromyza* are described and notes given on other species of *Agromyza* recently taken in the West Indies.

#### *Agromyza cornmelinae* n. sp.

A medium sized species, 1 to 1.5 mm. Male: front, face, cheeks, antennae, proboscis and palpi entirely yellow; scutellum, pleurae and legs largely yellow; mesonotum with yellow before the scutellum. Front including orbits slightly wider than either eye, sides nearly parallel; frontal stripe and orbits concolorous,

not separable; four pairs of fronto-orbitals equally spaced in rows, upper three pairs of equal size the lower pair smaller; orbital hair sparse but conspicuous, upturned; front slightly produced above antennae; cheeks nearly one-half eye height; one weak pair of oral vibrissae, distinctly stronger than accompanying setae along lower margin of cheeks; yellow of cheeks continuing back of eye and joining yellow of orbits; ocellar triangle reddish brown separated from brown of occiput by a broad yellow line, with several minute setae between the ocellar bristles; antennae entirely yellow, bristle on second segment short, black, a fringe of minute black bristles along the distal outer edge of second antennal segment, third segment (male) greatly enlarged, rounded on outer edge, sparsely covered with short white pile; arista scarcely one-and-one-fourth times the length of the third antennal segment, slender, brown in color and microscopically pubescent, basal fourth only moderately swollen and bare.

Mesonotum marked in center with subshining brown, sides of mesonotum yellow, yellow continuing broadly across anterior margin leaving a brown area in the center about one-third the width of the mesonotum; anterior callosities entirely yellow without dark spots; yellow continuing entirely across posterior margin of mesonotum, the posterior edge of the discal brown color divided by short yellow points into five short lobes, the center the broadest and reaching nearly to the scutellum; sides of pleurae almost entirely yellow, a subshining brown triangle on lower part of sterno-pleurae and a similar spot on hypo-pleurae; scutellum pale yellow in the middle, darkened only on sides at the base; four pairs of dorso-central bristles, the anterior two pairs smaller, less than one-half the length of the posterior pairs; about six rows of small acrostichals scarcely reaching to the third pair of dorso-centrals; three rows of small setae outside the dorso-centrals; one presutural arising from yellow color of mesonotum, two weak pairs of intraalar, one mesopleural and one sternopleural.

Legs entirely yellow, setae black, tibiae and tarsi only slightly darker.

Abdomen largely yellow, first segment yellow on basal three-fourths, second and third segments subshining brown with yellow incisures, fourth and fifth with central brown spots and yellow on the sides, male genitalia centrally yellow, laterally shining brown.

Wings rather short, auxiliary vein indistinct but ending separately in costa close to vein one, costa reaching to vein four, anterior cross-vein distinctly before middle of discal cell and about one-third from base of discal cell, posterior cross vein

one-and-one-half times its length from the anterior cross-vein, veins two and three distinctly diverging, veins three and four subparallel, second, third and fourth sections of costa as  $2\frac{1}{2}$ -1-1, last section of fifth vein one-and-three-quarters times the length of the penultimate section, vein five nearly straight or bending gently at the tip into the wing margin, sixth vein reaching three-quarters' way to the wing margin. Squamae gray, fringe dusky. Halteres yellow.

Female similar in structure and color to male but third antennal segment in female normal in size and ovipositor shining black.

*Holotype*: ♂ February 10, 1915, St. Vincent, BRITISH WEST INDIES (F. Watts) reared as a leaf-miner on *Commelina virginica*. Five *paratypes* all reared as leaf-miners on *Commelina virginica* by F. Watts as follows: 2 ♂ and 3 ♀ Feb. 10, 1915, St. Vincent, B. W. I. There are also two other *paratypes* 1 ♂ from CUBA reared from *Commelina nudiflora* and 1 ♀ St. Vincent, B. W. I. (S. C. Harland).

This species runs close to *angulicornis* Mall. but has more than two rows of acrostichals. It also runs close to *melampyga* Loew, but the markings on the mesonotum are different, the anterior cross-vein is distinctly before the middle of the discal cell and the third antennal segment in the male is greatly enlarged.

#### **Agromyza ipomaeae** n. sp.

A medium sized species, 2 mm.

♂: Front, face, cheeks and proboscis yellow; antennae and palpi black; cheeks one-quarter eye-height; yellow of cheeks extending only slightly behind the eye; a single pair of oral vibrissae, distinctly stronger than accompanying setae along the lower margin of the cheeks; ocellar triangle shining black only between ocelli, sides yellow, black of ocellar triangle continuous with black of occiput, several minute hairs on ocellar triangle between ocelli; orbits darkened only very narrowly on upper outer angles; four fronto-orbital bristles; orbital hairs small and sparse; basal segments of antennae dark brown, bristle on second segment weak, smaller than lower fronto-orbital bristle, third segment black, medium sized, rounded at tip, sparsely covered with short white pile, arista three times the length of the third antennal segment, pubescence microscopic but distinct.

Mesonotum and scutellum shining black, pleurae largely

shining black, sutures narrowly yellow, base of wing yellow, yellow extending on anterior humeral callosities but not above wing base; humeral bristle arising from edge of yellow color, post-humeral bristle arising from a narrow black spot on pleurae, presutural bristles not strong, arising from edge of black on mesonotum, one propleural and one sternopleural bristle; two strong pairs of dorso-central bristles of about equal length, a weaker pair preceding these; seven or eight rows of acrostichals reaching to posterior pair of dorso-centrals; three rows of small setae outside dorso-centrals.

Legs subshining black, anterior knees yellow, mid tibiae with two distinct posterior mid-tibial bristles.

Wings hyaline, auxiliary vein distinct from vein one, ending independently in the costa, costa reaching to the fourth vein, anterior cross-vein near the middle of the discal cell, posterior cross-vein its length from the anterior cross-vein, last section of fifth vein about two times the length of the penultimate section, sixth vein reaching almost to the wing margin, squamae gray, edge and fringe dark brown. Halteres yellow.

*Holotype*: ♂ June 20, 1930, Rio Piedras, PORTO RICO (M. D. Leonard) reared as a leaf-miner on *Ipomaea batatas*. 8 *paratypes*; 1 ♂ June 20, 1930, 3 ♂ and 4 ♀ June 22, 1930, also reared from *Ipomaea batatis* Rio Piedras, P. R. (M. D. Leonard).

This species runs close to the European *artemisiac* Kaltb., but *artemisiac* Kaltb. has abundant oral hairs in addition to the orbital bristles. It also runs close to *jucunda* V.d.W. It differs chiefly in having the orbits entirely yellow and the squamae gray in color. In *jucunda* V.d.W. the anterior cross-vein is distinctly beyond the center of the discal cell. This is a variable character and cannot always be relied upon. The writer has *jucunda* V.d.W. reared as a miner from *Verbena*, *Ambrosia* and *Helianthus*. Most of the specimens show the anterior cross-vein beyond the center of the discal cell but one shows it near the center of the cell and one specimen shows no posterior cross-vein on one side.

The following species have been identified from material in the United States National Museum.

AGROMYZA INAEQUALIS Mall., 9 ♂ and 4 ♀ Oct. 15 St. Vincent, BRITISH WEST INDIES (F. Watts) miner on Lima beans.

AGROMYZA PLUMISETA Mall., 1 ♂ Aug. 7 St. Domingo, WEST INDIES (A. Busck), 1 ♂ May 31, 1917, St. Thomas, W. I. (H. Morrison).

AGROMYZA PARVICORNIS Loew, 1 ♂ and 1 injured specimen Oct. 21, 1912, Rio Piedras, PORTO RICO (T. H. Jones).

AGROMYZA MACULOSA Mall. 2 ♂ and 1 ♀ July 16, 1922, Rio Piedras, PORTO RICO, bred from Asters (F. Stein).

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### The Status of Leng's Classification of the Coleoptera.

Dr. Clarence E. Mickel, in the September, 1930, issue of the *Annals of the Entomological Society of America* (XXIII, p. 511), states that "the classification of this order [Coleoptera] used by the latter [Leng] in his catalogue of North American Coleoptera is the one now met with in current literature." This is cited as partial evidence for the assertion: "The systems of classification in use at the present time for at least three large orders of insects have originated in this country [North America]." As applied to the Coleoptera I do not believe that the literature substantiates such a conclusion.

In the first place, Mr. Leng's system is largely based on that of Ganglbauer (1903) and Kolbe (1908). So far as it departs from these systems, it is characterized by the following among other peculiarities: recognition of Omophronidae, Corynetidae, and Trogidae as distinct families; division of the Adephaga into Caraboidea and Gyrinoidea; removal of the Cupesidae, Rhysodidae, and Paussidae from the Adephaga; division of the Staphyliniformia into Silphoidea and Staphyliinoidea; the abolition of the Heteromera (following Sharp and Muir) and its distribution among the Serricornia and Clavicornia as Mordelloidea and Tenebrionoidea.

Outside of North America I am unable to cite a single entomological work that has adopted the peculiarities of Mr. Leng's system. Works that have appeared since 1920 that do not follow him include: *Zoological Record*, Imm's *General Textbook of Entomology*, Tillyard's *Insects of Australia and New Zealand*, Handlirsch in Schröder's *Handbuch der Entomologie*, Scheerpeltz and Winkler in Brohmer's *Tierwelt Mitteleuropas*, Porta's *Fauna Coleopterorum Italica*, and Winkler's *Catalogus Coleopterorum regionis palaearticae*. So far as the classification of the Coleoptera now in use throughout the world is to be ascribed to any one man, that man would seem to be Ganglbauer.

MELVILLE H. HATCH, University of Washington, Seattle,  
Washington.



## A New *Belomicrus* from the West (Hymen.: Sphecidae).

By V. S. L. PATE, Cornell University, Ithaca, N. Y.

In a collection of Oxybeline wasps that Dr. Francis X. Williams of the Hawaiian Sugar Planters' Association sent recently for determination there is a new species of *Belomicrus*, a description of which is appended below inasmuch as Dr. Williams desires to publish some notes on its life history. Hitherto nothing has been known concerning the biology of any *Belomicrus* save a few scattered flower records. It gives me great pleasure to dedicate this interesting little species to its prospective Boswell as well as its habitat.

### *Belomicrus franciscus* sp. nov.

♂. 5 mm. long. Black. Mandibles light yellow, apices piceous. Margin of clypeal bevel above, scape except a brown spot behind, pedicel and flagellum beneath, pronotum to and including the tubercles, axillary sclerite, a macula on each side of the scutellum, postscutellum, fore femora apically and beneath, middle and hind femora apically, all tibiae externally and metatarsi, light yellow; remainder of tarsi fulvous. Tegulae fuliginous subhyaline; squamae and mucro apically whitish subhyaline. Abdomen ferruginous, each tergite with a yellow fascia preapically, that of the first tergite widest; first two sternites deeply infuscated, brownish black discally. Wings clear hyaline, veins light brown. Face with appressed short silky pubescence, remainder of body silvery puberulent.

*Head* shining, finely but distinctly punctured; mandibles medially within with a distinct inwardly directed tooth; clypeus discally tuberculate, widely emarginate and with a nitidous bevel apically, the apical margin parallel with a flat ridge which is obtusely angulate at the tubercle and which appears superficially to be the apical margin of the clypeus; front with two elongate, glabrous, nitidous impressions to accommodate the scapes when laid back and an impressed line from the anterior ocellus to the clypeal tubercle; postocellar line about three times the ocellular; vertex behind the compound eyes rounded; temporal carinae absent.

*Thorax* shining, with puncturation similar to head; pronotum not carinate, rounded anteriorly and laterally, declivitous anteriorly; prepectus rounded anteriorly; squamae enclosing the postscutellum and almost contiguous behind, with the posterior emargination a shallow V-shaped notch, posterior apices

rounded; micro short, straight, apex obtuse; propodeum finely granulate throughout and obscurely and indistinctly striate dorsally and laterally, median fovea above and lateral carinae below erased.

*Abdomen* shining, finely punctate, constricted somewhat between the segments, second sternite with a suggestion of a raised arcuate ridge preapically on each side.

♀. 4.75 mm. long. Similar to the male except that the clypeus is retuse apically and horizontally striate on the bevel below the tubercle. Psammophore with the mandibular, temporal, humeral and femoral ammochaetae present and well developed.

*Holotype*.—♂, Lone Mountain, San Francisco, CALIFORNIA, 1930 (F. X. Williams) [Cornell University, Type No. 924.1].

*Allotype*.—♀, same data as holotype. *Paratypes*.—5♂♂, same data as holotype.

This species belongs to the *forbesi*-group. Full details concerning its relationship to allied species, ultimate location of the types, as well as figures of the species will be published at a later date in a forthcoming monograph of the Oxybeline wasps of the New World.

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### **A New Milliped of the Genus *Fontaria* from Mississippi (Chilognatha: Xystodesmidae).**

By RALPH V. CHAMBERLIN, University of Utah.

Among material recently sent to me for identification from the U. S. Bureau of Entomology was a single adult male of the new species of *Fontaria* described below. It was collected by Mr. K. L. Cockerham at Biloxi, Miss. The type is in the author's collection.

***Fontaria lamellidens*, sp. nov.**

The dorsum and head light horn brown, with the carinae paler. Antennae light brown. Venter and legs dilute yellowish.

Body of the typical general shape, being parallel-sided over the middle portion and moderately narrowed at the ends. The lateral carinae are well developed; posterior margins of first few running slightly forwards, while the succeeding few are transverse and the others directed in increasing degree caudad of transverse; the caudo-ectal angle is in all but the first three

carinae produced caudad in subdentiform manner, with apex rounded; the last four pairs of carinae produced more strongly caudad as usual, their apices all rounded. Carinae all moderately depressed; lateral borders elevated, moderately indented opposite pores on porigerous segments; anterior margin more narrowly elevated.


Head shining, smooth or nearly so. Vertigial sulcus distinctly impressed, ending abruptly above the level of insertion of antennae, but followed by a short median longitudinal impressed line at level of antennae. Vertigial foveolae 2 2, each bearing a long seta. Labral border set off by a fine, broken, impressed line, paler in color than rest of head, conspicuously setose, the setae at lateral ends of the area arranged in denser patches. In the male the coxae of the second legs bear the usual special processes which are short and cylindrical. The anterior sternites in the male are without obvious processes.

The gonopods of the male have the basal portion of the telopodite strongly pilose over the meso-ventral surface, the long hairs directed mesad, while the principal blade is more sparsely provided with much shorter hairs along mesal side, these present from base distad beyond the middle of blade. The principal blade is moderately curved, each crossing the other distally; at the distal end the blade is divided parallel to the flat surface into two lamellar processes; the ventral one of these lamellae moderately curved mesad, the dorsal one with inner edge straight, the other curved, its distal end more acute than that of the ventral lamella; the lamellae of equal length, parallel with each other, and nearly contiguous. Inner prong of the telopodite glabrous, nearly straight, narrowing to a slenderly acute tip which is slightly curved outward, reaching to near the level of furcation of the principal blade.

Length of holotype (a male), about 33 mm.; maximum width across carinae, 8 mm.

Locality.—MISSISSIPPI: Biloxi. K. L. Cockerham, collector.

Distinguished from all other species of the genus in the lamellate form of the distal process of the gonopods as above described.



#### Change of Address.

I am now with the U. S. Bureau of Entomology and located at the U. S. National Museum. My home address is 2222 Que Street, N. W., Washington, D. C.—H. G. BARBER.

### **The Naming of Individual Variants in Lepidoptera.**

By G. TALBOT, The Hill Museum, Witley, Surrey, England.

The article on this subject by Mr. A. B. Klots (*Ent. News* xli, pp. 298, 324) places before American Lepidopterists an opinion held by many European workers. The present writer has twice referred to this subject. Firstly re the question of naming teratological specimens (*Ent. Zeit.* 42, p. 201, 1929); secondly re the naming of variations in the markings of certain Coleoptera (*Ent. Record* 42, p. 70, 1930).

The article by Klots appears to be prompted not only by the custom of giving names to insignificant variants, but also by the attempt made by Gunder to place this method on a scientific basis. We agree with Klots that Gunder has failed in his attempt to classify variants.

Perhaps the reply of those who think to continue this custom of naming all variants, would be that it does not matter what kind of variation it is, but as a difference of a kind can be discerned, it should be duly christened to distinguish it from a form which closely resembles it. Such a view could be held only by those who have either not seen a large collection of a variable species, or who have not seriously considered the question. Let us take, for example, a series of specimens showing the development of a band on the wing, from a wing without any trace of a band to one in which a well-defined band occurs. If we call the specimen with a half-developed band a "Transition Form", this term must be used for all the other specimens in the series because we cannot define any line of demarcation. The use of the term "Transition Form" is superfluous; it must necessarily include many pure aberrations which may never be repeated in the history of the species.

Before giving a name to some variant, let us pause and ask whether it deserves a name.

A definitely distinguishable variant can receive a name, but one may often be at a loss to know whether to call it a "Form" or an "Aberration". In the absence of breeding one has to judge by experience or by the kind of material. If more than one specimen of the variant is known from the same locality, it may be called a "Form" as presumably it is recurrent. Many

such Forms (excluding dimorphs and seasonal) are called Races by some European authors, as distinguished from sub-species. They are not, however, true Races, because the typical form occurs with them, and predominates.

Methods of classification adopted for one group of animals must hold good for all other groups. There cannot be one system for Lepidoptera and another for Mammals.

Let us examine the Human Species from the Lepidopterist's point of view. Each individual is different inasmuch as the difference is apparent to every other individual, and each has a name. This is so far in accordance with the method of naming all differences, but in Man it is done for his own convenience, and represents personality. The homologue in Lepidoptera would be those slight variations which may be detected only by means of a powerful microscope.

A certain population of men differs from another population in several ways, especially in its language. Such is a tribe or nation, represented in Lepidoptera by "Forms".

Several populations of Man agree in certain structural characters, and we have the Chinese and Polynesian Races for example. These are surely represented in Lepidoptera by sub-species or geographical races.

Lastly we have human aberrations, some pathological, others characterised by definite personalities and proved genius. It has not been thought useful to give a varietal name to a congenital idiot, nor to a mathematical genius.

The growing lists of names for individual variants in Lepidoptera is embarrassing and inconvenient. It is largely the work of amateur zoologists whose knowledge is frequently restricted to a section of Lepidoptera.

If one has a good series of variants in a race of a variable species to which many names have been given, one cannot be certain, without comparison with the type specimen, if any one of these variants is to be called by a certain name already published. In many cases no specimen identical with a Type would be found, and every individual would require a name. As no-one could remember what the majority of such names represented, and it would be found necessary to read carefully a key-

list of all the described variants in the species, the name loses its presumed value and becomes superfluous to any study.

The question now arises as to whether we can accept the view expressed by Klots that "Scientific names should not be applied to any concept lower than subspecies".

In the category below subspecies, we have, perhaps, four Forms (including specimens comprised under Gunder's "Transition Form"). Sometimes a recognizable Form will be found to occur elsewhere as a subspecies. It should obviously bear a name. Other Forms are mimetic examples, and should bear a name to record their existence, and to enable the phenomena with which they are associated, to be dealt with easily. One never knows when any particular Form will bear a new significance in connection with the species-study, or with some problem arising out of the study of other species. Furthermore, the rate of evolutionary change going on amongst insects and other of the lower groups of organisms, may be sufficiently great for some alteration in status to occur during the time which may be available to Man for his studies.

For these reasons we believe that concepts below the rank of subspecies may bear scientific names.

A name should be given to any specimen or specimens which show definite differentiating characters, providing these characters are not of a teratological or pathological type.

If the requisite data be not available, the classification of the new Form must remain *sub judice*. It may prove to be a race, a local form, a seasonal or sexual form, and it may be one among others remaining to be discovered, belonging to any one of the forms mentioned.

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#### Ceratopogonine Midges on Wings of Odonata. (Dipt.: Chironomidae).

Dr. J. Bequaert (The African Republic of Liberia and the Belgian Congo, Vol. II, p. 846, 1930) records the finding of female midges at Gbanga, Liberia, September, 1926, fixed by means of the proboscis to the underside of the wings of dragonflies, *Trithemis arteriosa* (Burm.) and *Orthetrum microstigma* Ris. According to Mr. F. W. Edwards, of the British Museum, the midge is an undescribed species, probably of a new genus. The only similar record is by Jacobson and de Meijere (Tijdschr. v. Ent., lxvi: 135, 137, 1923).

**Bites by Aphis Lion (Neur.: Chrysopidae).**

Dr. L. O. Howard has called our attention to the following letter on this subject in the *Journal of the American Medical Association* for December 13, 1930, page 1855, which we reprint here, as the original may not come to the attention of all entomologists.

*To the Editor.*—A prolonged drought, as a disturbance, digs deep into the daily web of life. The aphid lion (Chrysopidae) usually finds aphides enough and to spare; but not this dry year. As a result, he turned to anything bearing blood and I have known of six or more bites this summer. About the first week in August, sitting under a large white oak tree in my yard, I felt a sharp bite on the wrist and looked to find, to me, a new form of insect sinking his "beak" into the flexor aspect of my wrist so vigorously and with such manifest enjoyment that I became more interested than angry. He was a yellowish, spotted, canoe-shaped larva of some kind about 5 or 6 mm. long, with a pair of long curved, almost parallel mandibles, now covered with blood, with which he was tearing the flesh. Some movement of mine made him move about an inch away, where he started again, nothing daunted. The pain was more like a bite than a sting, but the after results indicated some new and novel toxin. Interested, I let him suck his fill at the second bite, and then I bottled him for identification—with the result mentioned. An hour later there was an intense burning pain, worse than any mosquito bite, with an areola an inch or more in diameter around the first bite and almost none around the second, showing seemingly a mosquito-like initial injection of some anti-clotting globulin. The next day the two were equally inflamed and almost purpuric in tint. It was not until the fourth day that the inflammation began to decline. Two friends who saw the "bug" had experiences almost as bad, and one or two others who visited me had "strange bites" of untoward severity. Has this experience been found elsewhere? I am anxious to know.

P. B. BARRINGER, M.D., University, Va.

[Dr. Howard in the first edition of his *Insect Book*, page 223, and Dr. Werner Marchand (*ENT NEWS*, XXXIII, p. 120, April, 1922) have described similar cases, but in neither instance do the effects of the bites appear to have been as prolonged as in those narrated by Dr. Barringer.—EDITOR, *ENT. NEWS*.]

## Entomological Literature

COMPILED BY LAURA S. MACKEY UNDER THE SUPERVISION OF  
E. T. CRESSON, JR.

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 **within brackets** [ ] refer to the journals, as numbered in the list of Periodicals and Serials published in the January and June numbers (or which may be secured from the publisher of Entomological News for 10c), in which the paper appeared. The number of, or annual **volume**, and in some cases the part, heft, &c. the latter **within** ( ) follows; then the pagination follows the **colon** :

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

\*Papers containing new forms or names have an \* preceding the author's name.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

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.

~~■~~ *Note the change in the method of citing the bibliographical references, as explained above.*

Papers published in the Entomological News are not listed.

**GENERAL.—Anon.**—Entomology and the British Empire. [31] 127: 61-62. **Bryson, H. R.**—The interchange of soil and subsoil by burrowing insects. [103] 4: 17-24. **Clark, A. H.**—Nature narratives. Vol. 1. 135 pp. Baltimore, 1929. **Cockayne, E. A.**—Insect teratology. [36] 78: 209-226, ill. **David, K.**—Zum apterismus bei insekten. [45] 25: 168. **Eltringham & Britten.**—Histological and illustrative methods for entomologists. 139 pp., ill. **Hayward, K. J.**—In far Argentina. [21] 43: 8-11. **Lameéré, A.**—[Sur la philosophie des sociétés d'Insectes]. [Mem. Soc. Ent. Belgique] 23: xvii-xxxiii. **Pilsbry, H. A.**—The status of Bulla. [The Nautilus] 44: 98. **Poche, F.**—Dr. Stiles' "American referendum" on three propositions in nomenclature. [Verh. Zool. Bot. Gesel. Wien] 79: 273-283. **Poulton, E. B.**—An appeal for uniformity of usage in nomenclature. [Pro. Ent. Soc. London] 5: 25-26. **Ruediger, E.**—Insekten als symbole. [Ent. Nachricht.] 4-94-97.

**ANATOMY, PHYSIOLOGY, ETC.—André, M.**—L'appareil respiratoire du Thrombicula autumnalis (Acarien: Fam. Thrombidiidae). [Assoc. Franc. Avanc. Sci.] 1929: 433-434, ill. **Bodenheimer, F. S.**—Ueber thermotaktisches verhalten, körpertemperatur und aktivitätsminimum bei insekten. [34] 93: 59-61. **Brindley, M. D. H.**—On the metasternal scent-glands of certain heteroptera. [36] 78:



199-207, ill. **Crampton, G. C.**—A comparison of the more important structural details of the larva of the archaic tanyderid dipteran *Protoplasia fitchii* with other holometabola from the standpoint of phylogeny. [19] 25: 239-258, ill. **Gunn, D. L.**—The function of the air sacs of insects. [31] 127: 58-59. **Jancke, O.**—Zur kenntnis der männlichen kaudalregion der Anopluren. [Zeit. Parasit., Berlin] 3: 1-7, ill. **Lever, R. J. A. W.**—A new endoskeletal organ in the hind legs of the Halticinae. [34] 92: 287-288, ill. **Marcu, O.**—Beitrag zur kenntnis der stridulationsorgane bei Ipiden. [34] 92: 238-242, ill. **Marcu, O.**—Beitrag zur kenntnis der tracheen der insekten. [34] 93: 61-63, ill.

**ARACHNIDA AND MYRIOPODA.**—\***Beier, M.**—Zur kenntnis der Chthoniiden (Pseudoskorpione). [34] 93: 49-56. (S). **Cook, H. J.**—The finding of large centipedes in Wyoming and western Nebraska. [68] 73: 126. \***McGregor, E. A.**—A new spinning mite attacking *Asparagus plumosus* in Florida. [10] 32: 161-163, ill. **Petrunkevitch, A.**—The spiders of Porto Rico. Part III. [Trans. Connecticut Acad. Arts & Sci.] 31: 188 pp., ill. \***Viets, K.**—Ueber nordamerikanische Koenikea-arten (Hydracarina). [34] 92: 266-272, ill. \***Viets, K.**—Ueber einige Gattungen und arten der Axonopsae, Mideopsae und Arrhenurae (Hydracarina). [34] 93: 33-48, ill.

**THE SMALLER ORDERS OF INSECTS.**—\***Carpenter, F. M.**—The lower permian insects of Kansas. Part 2. The orders Paleodictyoptera, Protodonata, and Odonata. [16] 21: 97-139, ill.

**ORTHOPTERA.**—\***Hebard, M.**—The orthoptera of Alberta. [Pro. Acad. Nat. Sci. Phila.] 82: 377-403.

**HEMIPTERA.**—\***Bueker, E. D.**—Two new mealy-bugs (Coccidae) in nests of ants (*Lasius*). [40] 453: 3 pp., ill. **Drake, C. J.**—Notes on American Tingitidae. [19] 25: 268-272. \***Green, E. E.**—Notes on some Coccidae collected by Dr. Julius Melzer, at Sao Paulo, Brazil (Rhynch.). [60] 91: 214-219, ill. \***Johnston, H. G.**—Four new species of Miridae from Texas. [19] 25: 295-300. **Klyver, F. D.**—*Euphyllura arctostaphyli* and *Euphyllura neveipennis* (Chermidae). A difference in interpretation. [10] 32: 153-159, ill. \***Laing, F.**—Description of a new species of Aleyrodidae. (Rhynch.). (S). [60] 91: 219-221, ill.

**LEPIDOPTERA.**—**Bryk, F.**—Lepidopterorum Catalogus. Pars 39. Papilionidae III (*Papilio*). 513-676. **Bryk,**

F.—Lepidopterorum Catalogus. Pars 42. Dioptidae. 3-65.  
**Clark, A. H.**—Some observations on butterfly migrations. [76] 1931: 150-155. **Cockerell, T. D. A.**—Notes on *Eurymus eurytheme autumnalis*. [19] 25: 300. \***Hering, M.**—Neue und alte Lepidopteren. (S). [Mitt. Zool. Mus., Berlin] 16: 513-522, ill. **Macrolepidoptera** of the World. Fauna Americana Part 213. [This part completes the American Saturniidae by Draudt and begins the Uraniidae by Gaede.]  
**Martin & Ingham.**—Diurnal lepidoptera of Huntington Lake region, Fresno County, California. [Bull. So. Calif. Acad. Sci.] 29: 115-134. \***Meyrick, E.**—Exotic Microlepidoptera. (S). 4: 32 pp. **Poulton, E. B.**—Insects collected by Dr. J. A. Douglas, in a hitherto unexplored area of E. Peru. Intense pain caused by the bite and sting of a winged female Ponerine ant. The snake-like appearance of the S. American sphingid larva of *Pholus labrusca*, enhanced by the modified caudal horn. [Pro. Ent. Soc. London] 5: 19-20, 22-24. \***Róber, J.**—Neue exotische falter. [18] 24: 389-393, ill. **Stichel, H.**—Lepidopterorum Catalogus. Pars 41. Riodinidae III: Riodiniinae II. 545-720. \***Wurster, C. W.**—A melanic form of *Telea polyphemus*. [19] 25: 273-274, ill.

**DIPTERA.**—\***Alexander, C. P.**—New or insufficiently-known crane-flies from the nearctic region (Tipulidae). Part III. [19] 25: 276-282. \***Bau, A.**—*Lipoptena surinamensis* und *Melophagus ovinus bolivianus*, zwei neue Hippobosciden. [60] 91: 175-177. \***Collin, J. E.**—A revision of the Greenland species of the Authomyid genus *Limnophora* sens. lat., with figures of the male genitalia of these and many other palaeartic species. [36] 78: 255-281, ill. \***Collin, J. E.**—The Oxford University Expedition to Greenland, 1928. Diptera (Orthorrhapha Brachycera and Cyclorrhapha) from Greenland. [75] 7: 67-91, ill. **Czerny, L.**—Die *Musca annulata* (Micropez.). (S). [Mitt. Deutschen Ent. Gesell.] 1: 117-121. \***Hoffmann, C. C.**—Los simúlidos de la region Onchocercosa de Chiapas (Con descripcion de nuevas especies). (S). [An. Inst. Biol., Mexico] 1: 293-306, ill. **Jeffrey, E. C.**—Cytological evidence as to the status of *Drosophila melanogaster*. [90] 65: 19-30, ill. \***Kröber, O.**—Die südamerikanischen arten der gattung *Sciöne* (Rhinotriclista). [60] 91: 141-174, ill. \***Lindner, E.**—Revision der amerikanischen dipterenfamilie der Rhopalomeridae. (S). [11] 1930: 122-137, ill. \***Malloch, J. R.**—Notes on some Acalyprate flies in the United States Na-

tional Museum. [50] 78, Art. 15: 32 pp., ill. (S). **Matheson, R.**—Distribution notes on Culicidae. [19] 25: 291-294. **Roubaud, M. E.**—Sur l'existence de races biologiques génétiquement distinctes chez le moustique commun *Culex pipiens*. [69] 191: 1386-1388. **Schwardt, H. H.**—Notes on the immature stages of Arkansas Tabanidae. [103] 4: 1-4. **Thorpe, W. H.**—The biology of the petroleum fly. [68] 73: 101-102. **Thorpe, W. H.**—The biology of the petroleum fly (*Psilopa petrolii*). [36] 78: 331-343, ill.

**COLEOPTERA.**—**Arangua, E. V.**—Contribuciones al estudio de los Cicindelidae. V. La Cicindela oregona en los estados del sur oeste. [44] 33: 394-402. **\*Blaisdell, F. E.**—Revision of the Endomychid tribe Liesthini with a description of a new genus and a new species. [1] 56: 375-390, ill. **\*Borchmann, F.**—Die gattung *Lystronychus* (Allecul.). (S). [11] 1930: 81-121, ill. **Bradley, J. C.**—The names of certain Rhynchophora. [19] 25: 259-262. **Eggers, H.**—Borkenkäfer (Ipidae) aus Südamerika. III [2] 26: 163-171, Cont. **\*Fall, H. C.**—An interesting new genus and species of Cistelidae. [103] 4: 15-16. **\*Fisher, W. S.**—A new long-horn beetle from Costa Rica (Cerambycidae). [91] 21: 23-24. **Grossmann, H.**—Beiträge zur kenntnis der lebensgemeinschaft zwischen borkenkäfern und pilzen. [Zeit. Parasit., Berlin] 3: 56-102, ill. **\*Hustache, A.**—Curculionides de la Guadeloupe. [Faune Col. Franc.] 4: 148 pp., ill. **Jeannel, R.**—Monographie des Trechinae. Morphologie comparée et distribution géographique d'un groupe de coleopteres. (Liv. 4). [L'Abeille] 34: 59-122, ill. **Kleine, R.**—Bibliographie der brenthidenliteratur. [60] 91: 195-213. **\*Ohaus, F.**—Eine neue Plusiotis aus Guatemala. [60] 91: 265-266, ill. **\*Ohaus, F.**—Neue brasilianische Dynastinen. [60] 91: 261-265, ill. **\*Ohaus, F.**—XXVI. Beiträge zur kenntnis der Rutelinen. (S). [11] 1930: 138-158, ill. **Park, O.**—Studies in the ecology of forest Coleoptera—II. The relation of certain Coleoptera to plants for food and shelter, especially those species associated with fungi in the Chicago area. [84] 12: 188-206, ill. **\*Pic, M.**—Contribution a l'étude des coléoptères Malacodermes. II. Quelques données générales sur la systématique et cas particuliers. (S). [24] 99: 311-324. **\*Pic, M.**—Malacodermes exotiques. (S). [Issued with L'Exchange Rev. Linné paged separately.] **\*Pic, M.**—Coléoptères exotiques en partie nouveaux. (S). [L'Exchange Rev. Linné] 45: 7-8, 11-12, 16. **Schedl, K. E.**—Morphology of the bark-beetles of the genus *Gnathotrichus*. [Smiths. Misc. Coll.] 82: 88 pp., ill.

**HYMENOPTERA.**—**Bruch, C.**—Nidificación de "Sceliphron figulus" y observaciones biológicas sobre esta especie. [An. Soc. Cien. Argentina] 110: 367-386, ill.  
\***Creighton, W. S.**—The new world species of the genus *Solenopsis* (Formicidae). [Pro. American Acad. Arts & Sci.] 66: 39-151, ill. [New species from South America.]  
\***DeGant, F.**—Two new species of parasitic hymenoptera (Braconidae) from Ohio. [10] 32: 163-165. \***Gahan, A. B.**—Two new hymenopterous parasites of *Tachypterellus* consors. [91] 21: 37-39. \***Hoffmeyer, E. B.**—Notes on some North American Callimomidae (Chalc.). [102] 17: 213-218, ill. **Parks, H. B.**—Notes on Texas bees. [19] 25: 263-267.

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**SPECIAL NOTICES.**—**Opinions** 115-123 rendered by the International Commission on Zoological Nomenclature. [Smiths. Misc. Coll.] 73: 1-36. [Nothing directly entomological.]

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#### BRADLEY'S MANUAL OF THE GENERA OF BEETLES.

Dr. J. Chester Bradley, Professor of Entomology in Cornell University, has compiled for the use of his students a Manual of the Genera of Beetles of America, north of Mexico. It makes a volume of 360 pages which is offered to students of Coleoptera, other than those in the University, through the publishers, Daw, Illston & Co., of Ithaca, N. Y.

The work includes dichotomous keys for determining the families of Coleoptera known to occur in America, north of Mexico, pages 1 to 15, keys to the tribes and genera included in each family, pages 16 to 305, a taxonomic conspectus of the genera, pages 306 to 334, and an index. The keys are stated in the preface to have been selected, rearranged, abbreviated, combined and translated from "all the most recent sources, scattered through the world's literature on insects." In some cases alternative keys are given, as on pages 16 to 22, where the tribes of the Carabidae are defined according to Sloane and again according to Horn; and in a few instances the keys are original. Apparently no effort has been spared to make the work a complete compilation of our present knowledge of the classification of Coleoptera; it includes even Dr. Blatchley's discovery of the family Gnostidae (published in April, 1930), and presents a view of recently proposed changes in classification and nomenclature that will be useful to all.

In dealing with the changes proposed in the classification, Dr. Bradley has followed essentially that of the writer's catalogue; to provide ready reference thereto, the number of the catalogue page for each genus is entered in the List of Genera. Modifications in the sequence or rank adopted in the catalogue have been made only in cases where more recent work has made such a course necessary; in a few instances, proposed changes, characterized as premature or revolutionary, have been disregarded.

The matter thus prepared has been reproduced in pages resembling typewritten sheets, clearly and legibly printed, and reflecting credit upon the publisher as well as the author. In the difficulty now existing of procuring copies of the Leconte and Horn "Classification," or of Blatchley's "Beetles of Indiana," the need of such a manual is apparent; and it is gratifying to record that it has been prepared in a competent and conservative manner.

In the preparation of the keys, in which Dr. Bradley acknowledges the helpful criticism of Dr. W. T. M. Forbes, and in the correction of the manuscript, in which he was assisted by Mr. Kenneth Caster, errors, though not entirely absent, seem to have been practically eliminated. It should be noted, however, that on page 21, line 8, (35) is an error for (30). It is probable that in defining nearly 4000 categories, other errors may have escaped detection.

It may be of interest to add a few words as to the changes in families which Dr. Bradley has adopted. Nine families are added, usually on excellent authority; these are Pseudomorphidae, Leiodidae, Laridae, Ptilodactylidae, Psoidae, Silvanidae, Languriidae, Trogidae, and Calendridae. The argument in favor of such changes is the striking differences between the genera included and those with which they have formerly been included. On the other hand seven families are reduced in rank; these are Platypsyllidae, Leptinidae, Brathinidae, Corynetidae, Pedilidae, Plastoceridae and Elmidae. In consistency of treatment some of these reductions may not be ultimately adopted. The position assigned to Brathinus, as a genus of Omaliinae, seems to the writer especially inconsistent; but in this, as in the other changes mentioned, Dr. Bradley has followed the most recent author on the subject.

A few changes have been made in nomenclature, e.g., Elacidae for Othniidae, Ciidae for Cisidae, Choragidae for Platystomidae; the last-named, according to Pierce '30, seems to be unnecessary.

The student of the Coleoptera will find in this Manual a

complete and comprehensive guide to the classification into families, tribes and genera, wisely planned and excellently executed. Dr. Bradley is to be congratulated on the highly successful completion of a monumental task, a volume in which, for the first time since 1883, every coleopterous genus of America, north of Mexico, is adequately defined.

C. W. LENG.

THOMAS SAY, EARLY AMERICAN NATURALIST. BY HARRY B. WEISS and GRACE M. ZIEGLER. A Foreword by L. O. HOWARD. MCMXXXI Charles C. Thomas, Publisher, Springfield, Illinois; Baltimore, Maryland. Pp. xiv, 260, 27 illustrations. \$5.00 postpaid.—For the past few years Mr. Weiss has been giving us vivacious sketches of entomological celebrities of many lands. It is quite appropriate, therefore, that he should undertake this more pretentious life of one of the earliest and best known American workers in this field. He and Miss Ziegler have brought together all that was previously known of Say's life and added thereto much unpublished material from many sources. The publisher's jacket rightly describes the book as primarily concerned with Say's life rather than his scientific attainments, and Dr. Howard adds that, after reading the authors' account of a number of Say's contemporaries, "one feels almost as though he himself had lived at that time and knew these things as one knows contemporary things."

Three generations of Says preceded Thomas Say, the entomologist, in Philadelphia. There was William Say, his great-grandfather, who is supposed to have come over with William Penn, who in 1699 married Mary Paschall, daughter of two others supposedly of Penn's company. William Say died in 1714. His son Thomas (1709-1796), saddler and harness-maker, later apothecary and "physician", city commissioner and coroner, was famous for "the Uncommon Visions" which he had when a young man. Benjamin Say (1756-1813) is "supposed to have graduated as a physician from the University of Pennsylvania in 1780, although present available alumni records do not substantiate this". Nevertheless he practised medicine, charged fees therefor, and signed the original Constitution of the College of Physicians of Philadelphia as a Junior Fellow, January 2, 1787 (the year of its foundation), and subsequently served as its treasurer for eighteen years.

Benjamin Say married Ann Bonsall, granddaughter of John Bartram, the botanist, on October 1, 1776. Their oldest child, Mary (Polly), appeared November 17, 1778; the second,

Thomas, the subject of this book, was not born until June 27, 1787. One naturally looks to his mother's ancestry as accountable for his interest in natural history and we are told that, as a boy, when he collected beetles and butterflies, "he was encouraged by William Bartram, of Kingsessing, his great-uncle, who induced him and several of his young companions to contribute their findings to his collection of natural history specimens."

Thomas Say's brief partnership with John Speakman in the drug business, their financial failure, doubtless soon forgotten in his absorption in the newly founded (1812) Academy of Natural Sciences of Philadelphia are matters well-known. Less familiar, perhaps, is his service as a member of the Philadelphia First City Troop from September 5 to December 20, 1814, in the war with England, although his duties were, apparently, not outside the state of Pennsylvania.

Say's knowledge of the world was chiefly obtained in the four expeditions to Florida (1817-1818), the Rocky Mountains (1819-1820), St. Peter's River and Lake Winnipeg (1823) and Mexico (1828), to accounts of which some forty-seven pages are devoted. The first and fourth were private journeys with William Maclure, President of the Philadelphia Academy 1817-1840, man of means and friend of Say. The second and third were performed under the orders of the Secretary of War, John C. Calhoun, and the command of Major Stephen H. Long, of the United States Topographical Engineers. Say was Zoologist on both expeditions, but gathered data not only on animals but also on the vocabularies of Indian tribes.

It was between the third and fourth of these journeys, or in 1825, that Say left Philadelphia with Maclure for New Harmony, Indiana, to participate in Robert Owen's communistic experiment. At New Harmony, on January 4, 1827, he married Lucy Way Sistare, of New York City, who had come out with the same party; there he became agent for Maclure after Owen's withdrawal and there he died October 10, 1834.

Entomologists will be interested in Say's fourteen letters to John F. Melsheimer, from April 12, 1816, to December 1, 1824, many of them first published in the NEWS for 1901 and 1902. Say, indeed, has sometimes been called "The Father of American Entomology", but he himself applied the term "parent of Entomology in this country" in his *American Entomology*, to Frederick Valentine Melsheimer, author of the *Catalogue of Insects of Pennsylvania* of 1806,\* and father of John F. Melsheimer. In a letter of November 6, 1817, he tells the latter:

\* Compare ENTOMOLOGICAL NEWS, xli, p. 196, June, 1930.

"I assure you that Shells and Crustacea are but secondary things with me, INSECTS are the great objects of my attention. I hope to be able to renounce everything else & attend to them only." Either by choice or by necessity this hope itself was renounced, for it was in his closing years at New Harmony that his *American Conchology* was written and published, although never completed. Say had his troubles with Dermestids in his collection as appears from three different references in this book (pages 54, 145, 154), with non-receipt of separata of his papers (page 59), with the non-publication of another (page 148).

Say was nominally "Professor of Natural History including Geology" at the University of Pennsylvania, in Philadelphia, from 1822 to 1828. Our authors have not shed any further light on this part of his career than is already contained in Francis Newton Thorpe's *Benjamin Franklin and the University of Pennsylvania*,† for example. It is not known whether Say ever gave any instruction under this appointment or not, although he placed his professorial title under his name on the title pages of his *American Entomology*. The last three years of his tenure were certainly spent away from Philadelphia.

The biography of Say and of his ancestors occupies the first nine chapters, or 158 pages of the book. Then follow brief accounts of some of his friends: his brother Benjamin (1790-1836), William Maclure (1763-1840), Titian Ramsey Peale (1800-1885), J. F. Melsheimer, Thaddeus William Harris (1795-1856), Nicholas Marcellus Hentz (1797-1856) and others whose interests lay along non-entomological lines. Some of his European correspondents are enumerated in chapter XII. A summary of his published writings forms chapter XIII. Chapter XIV describes the period in which Say worked, Chapter XV the fate of his collections. Mrs. Say survived until November 15, 1886, dying in Lexington, Massachusetts, at the age of 86; chapter XVI bears her name. Chapter XVII describes the Say Burial Grounds in Philadelphia and at New Harmony; it is in the latter that the remains of Thomas Say repose. The eighteenth chapter gives the location of Say's manuscripts and letters, which the authors have so diligently explored. Chapter XIX discusses the portraits of Thomas Say, three of which are reproduced here. The Postface mentions "the numerous persons whose combined help made this life of Thomas Say possible and whose unflinching courtesy was a constant source of pleasure." There are also nine pages of genea-

† Bureau of Education Circular of Information No. 2, 1892. Washington: Government Printing Office, 1893. See pages 330-331 in the article on "The Biological School," by Joseph T. Rothrock.



logical records of the Say family and a bibliography, occupying ten pages, of general works, articles on the Say family, on Thomas Say and on his contemporaries, but no list of Say's writings is included, probably for reasons which are hinted at in chapter XIII. The volume concludes with an index. The illustrations, in addition to the three portraits mentioned above, comprise portraits of Robert Owen, Maclure, Charles Alexander Lesueur, John Speakman, Jr., and Mrs. Say, views in old Philadelphia and in New Harmony, and fac-similes of title-pages of books and of letters of Thomas Say.

Weiss and Ziegler's *Thomas Say* thus gives us a fuller account of this early American naturalist than we have ever before possessed, told in a pleasing way, and enabling us to understand more clearly the beginnings of natural science in the United States. Like all of Mr. Thomas' publications, the book is finely manufactured.

P. P. CALVERT.

THE AFRICAN REPUBLIC OF LIBERIA AND THE BELGIAN CONGO. Based on the Observations made and the Material collected during the Harvard African Expedition 1926-1927. Edited by RICHARD P. STRONG. Cambridge, Harvard University Press 1930. 4 to., 2 vols., paged consecutively: Vol I, pp. xxvi, 1-568, 7 maps, 443 + 2 figs.; Vol. II, pp. ix, 569-1064, 2 maps, 33 + 28 figs. \$15.00.—The contents of these finely printed and illustrated volumes are divided into three parts: 1. A detailed and interesting account of the geography, climate, inhabitants and their peculiarities, sanitary and medical conditions, geology, flora, mammals, birds, reptiles, amphibians and insects of Liberia, by Dr. Strong (209 pages). 2. Medical and pathological investigations in Liberia and the Belgian Congo by Drs. Strong and George B. Shattuck (252 pages). 3. Medical and Biological Investigations. Eighteen articles, by various authors, on helminths, protozoa, plants, mammals, birds, reptiles, amphibians, certain groups of insects and photography (591 pages). The attention now being directed to slavery and prevalence of human diseases in Liberia, instigated in part by this expedition, renders the presentation of these conditions very timely.

Among the entomological contents of this report is the summary on entomology (pp. 189-197) in Part I and an extensive article (205 pages) on Medical and Economic Entomology by Dr. Joseph Bequaert, entomologist of the expedition, treating of Arachnids, Isoptera, Heteroptera, Dermoptera, Orthoptera, Diptera, Anoplura, Mallophaga, Siphonaptera and Coleoptera, which is supplemented by another on Hemiptera, Mallophaga

and Anoplura, by G. F. Ferris. Of all the groups dealt with by Dr. Bequaert, the Tabanidae receive the greatest attention (113 pages), at least one new subgeneric name and a number of new species being proposed, while keys to the Ethiopian genera and to the species inhabiting the Belgian Congo of several genera are given as well as a tentative grouping of the family embodying his views of the natural relationships between the several genera. Three main divisions, or subfamilies, are recognized under the names of Coenomyiinae, Pangoniinae and Tabaninae, the distinctions between them being chiefly in the presence or absence of ocelli and of spurs on the hind tibiae, and the straight or wavy course of the sixth longitudinal vein (*An*). Under the Mosquitoes it is remarked that: "In Liberia the mosquitoes most troublesome and dangerous to man are a few domestic or urban species, whose breeding places are almost entirely the result of human activities. In the primary rain forest, second-growth, swampy forest, or mangrove, away from the towns, one is but little annoyed by these insects. In the towns, however, one is bitten mostly by *Aedes aegypti*, *Culex quinquefasciatus*, *Anopheles gambiae* and *A. funestus*, all of which are important carriers of human diseases. At Monrovia, I found that even these mosquitoes were not particularly numerous nor annoying during July and November; at any rate they were much less abundant than in many other tropical places I have visited. Dr. A. W. Sellards had a similar experience in March, so that apparently much the same conditions prevail throughout the year. An investigation of the town and its immediate surroundings disclosed relatively few breeding places, although no attempt had ever been made at controlling or eliminating them. Some of these breeding places, such as open ditches of stagnant water or empty cans nears houses, could easily be dealt with. The most difficult to control, however, will be the large open wells, surrounded by vertical stone walls, that are found in almost every yard throughout the town. At Monrovia both anophelines and *Aedes aegypti* were breeding in them. . . . Perhaps the proper solution of the problem might be to stock the wells with certain small fishes that feed upon mosquito larvae."

Prof. Ferris describes and figures both new and previously known species of *Trichodectes*. Briefer articles are those by C. T. Brues on *Aneurobracon*, a remarkable new genus of Braconidae from Liberia, by C. P. Alexander on Tipulidae collected by the Expedition (some new species), and by P. P. Calvert on the Odonata, and N. Banks on Neuroptera, Mecoptera and Trichoptera, from the same source.

P. P. CALVERT.

## OBITUARY.

JAMES H. EMERTON died in Boston, Massachusetts, on December 5, 1930. He was widely known as a student of spiders, an illustrator of scientific books and a constructor of zoological and anatomical models. He was born in Salem, Massachusetts, in 1847. He published a series of papers on New England and Canadian spiders in the *Transactions of the Connecticut Academy of Arts and Sciences* (New Haven), from 1882 to 1894. These led to frequent calls upon him "for a smaller and simpler book to meet the wants of readers who, without making a special study of the subject" wanted "to know a little about spiders in general and especially those species that they often met with." The result was his book of 243 pages and 501 figures entitled *The Common Spiders of the United States* (Boston & London, Ginn & Co., 1902). He also wrote *The Structure and Habits of Spiders* (1878) and *The New England Spiders*. He made many illustrations for Packard's *Guide to the Study of Insects*, Scudder's *Butterflies of New England*, and non-entomological works of A. E. Verrill and C. S. Minot. We are informed that an extensive obituary notice with a list of his papers will appear in *Psyche*.

P. P. CALVERT.

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The death of Professor JURIOUS PHILIPTSCHENKO on May 19, 1930, at Leningrad, of meningitis, is announced in a note, signed by M. Rimsky-Korsakow, V. Dogiel, M. Rozanova, T. Lus and T. Liepin, published in *Science* for January 23, 1931. We quote from it as follows: "He was born on February 1, 1882, in the family of an agriculturist-scientist residing in the province of Orel. After graduating in the University of Petersburg, in 1906, he continued studying for his professorship at the Zoological Cabinet at the University. In 1912 he presented his dissertation on the embryology of Apterygota, and the degree of Master of Zoology was conferred on him for it. In 1917 [he] obtained his doctorate on presenting another dissertation on the variability and heredity of the skull in mammals. In the meanwhile, he was elected first assistant professor, then reader

in Zoology, and in 1919 professor of the University of Petersburg, where he established the first chair of genetics in Russia and founded a new school of young geneticists. . . . Some months before his demise [he] was placed at the head of the department of genetics of the Institute of Animal Industry of the Lenin Academy of Agricultural Sciences in U. S. S. R. His works, nine of which represent large manuals of genetics and experimental zoology, amount to 114 in number . . . As to his personality, it should be mentioned that he was not only an eminent scientific investigator and a brilliant lecturer, but also an exceptional man, well known for his inexhaustible energy, kindness and responsiveness to the needs of all those who surrounded him. His death was a heavy blow to every one who knew him closely and a great loss for science."

Philipstchenko's papers on the Apterygota, insofar as they were not published in Russian, appeared chiefly in the *Zeitschrift für wissenschaftliche Zoologie* and comprise his *Anatomische Studien über Collembola* (vol. 85, 1906), *Über die excretorischen und phagocytären Organe von Ctenolepisma lineata* (vol. 88, 1907), *Über die Kopfdrüsen der Thysanuren* (vol. 91, 1908) and *Die Embryonalentwicklung von Isotoma cinerea Nic.* (vol. 103, 1912). A summary of the last named is given by its author in the *Zoologischer Anzeiger* (vol. 39) for the same year.

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Professor JAMES S. HINE, of the Ohio State University, known for his work on Tabanidae, Asilidae and on Odonata, died suddenly on December 22, 1930.

The sudden and unexpected death, on January 30, 1931, of Dr. FRITZ RIS, at Rheinau, Switzerland, after a brief indisposition, is announced. His publications on neuropteroid insects, especially in later years the Odonata, and including a great monograph of the Libellulinae of the world, have given him high rank as an entomologist.

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We hope to present longer notices of both these naturalists in later numbers of the NEWS.

Subscriptions for 1931 are now payable.

APRIL, 1931

# ENTOMOLOGICAL NEWS

Vol. XLII

No. 4



HENRY SKINNER  
1861-1926

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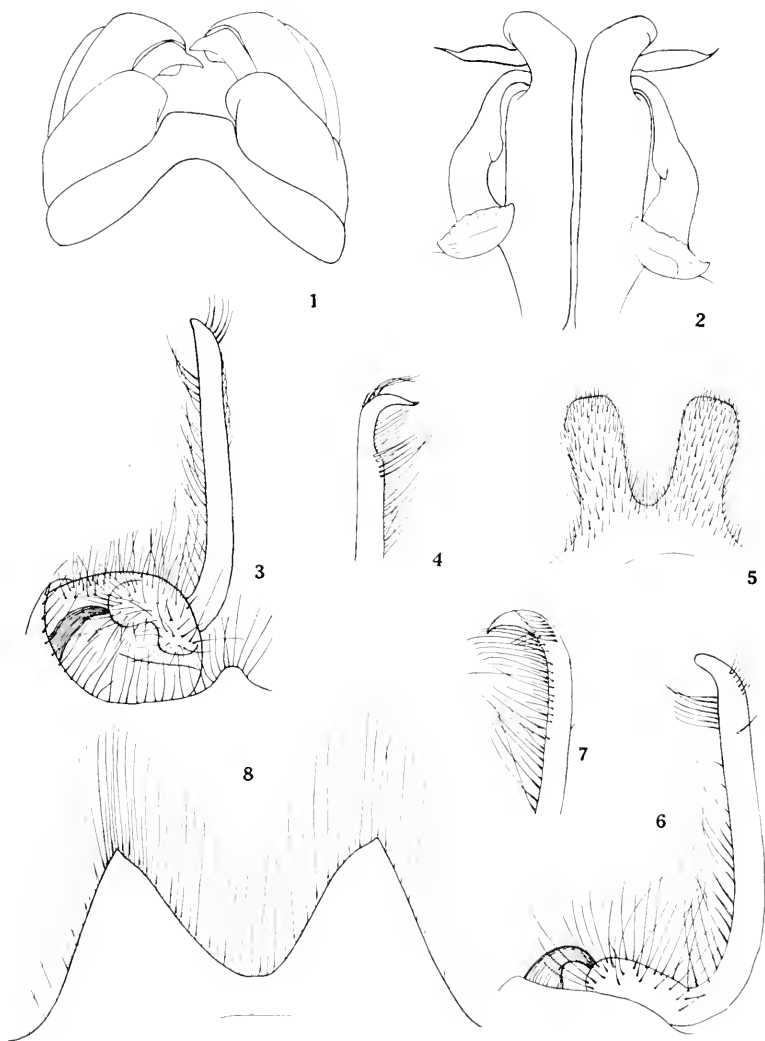
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Communications on observations made in the course of your studies are solicited; also exhibits of any specimens you consider of interest.

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1. *SPIROBOLUS OKLAHOMAE*.  
2. *ORTHOPORUS WICHITANUS*.  
3-5. *EURYMERODESMUS MUNDUS*.  
6-8. *E. BIRDI*. — CHAMBERLIN.



# ENTOMOLOGICAL NEWS

VOL. XLII.

APRIL, 1931

No. 4

## On a Collection of Chilopods and Diplopods from Oklahoma.

By RALPH V. CHAMBERLIN, University of Utah.

(Plate II)

There have been few records of Chilopods and Diplopods from Oklahoma. It is a matter of considerable interest, therefore, to be able to report upon an interesting collection of these arthropods made by Professor R. D. Bird of the University of Oklahoma and by him transmitted to me for identification. The types of the four new diplopods represented in the material are deposited in the author's collection.

### CHILOPODA.

#### OTOCRYPTOPS SEXSPINOSUS (Say).

Murray County, Oct. 26, 1929. One specimen. R. D. Bird, coll.

#### SCOLOPENDRA HEROS Girard.

Carter County, Ardmore, one specimen; Mount Scott, Wichita National Forest, one specimen; Taliga, South Canadian River, one specimen taken in a seine; south of Buffalo Lodge, Wichita National Forest, July 7, 1928; near Camp Boulder, Wichita National Forest, 28 June, 1928, one very young specimen.

#### SCOLOPENDRA POLYMORPHA Wood.

Norman, June 9, 1929; Woods County, April 29, 1930; one specimen from each locality.

#### NEOLITHOBIUS SUPRENANS Chamberlin.

Norman, February 23, 1929, one male and one female collected by R. D. Bird; Cleveland County, Mar. 10, 1929, two males collected by R. D. Bird; Woods County, July 25, 1930, one specimen.

#### ARENOPHILUS BIPUNCTICEPS (Wood).

Norman, Nov. 19, 1930, one specimen collected by N. Wheat; Woods County, July 23, 1930, one specimen collected by R. D. Bird.

#### SCUTIGERA COLEOPTRATA Linnaeus.

Norman, Nov. 21, 1930; Oct. 20, 1929, and Jan., 1931, one specimen on each date.

## DIPLOPODA.

*LYSIOPETALUM LACTARIUM* (Say).

Wichita National Forest, near Buffalo Lodge, two specimens taken under cow dung.

*BLANIULUS GUTTULATUS* (Bosc).

Sussex County, June 15, 1930. Three specimens.

*ETHIOLUS DIVERSIFRONS* (Wood).

Cleveland County, April 5, 1929, several males and one female. R. D. Bird coll.

*PARAIULUS* sp.

Murray County, Apr. 5, 1929. Several immature males and females. R. D. Bird coll.

***Spirobolus oklahomae* sp. nov.** (Plate II, fig. 1.)

General color dark brown or fuscous with a reddish or reddish-brown band caudad of the sulcus on each segment, this band lighter in color down the sides; collum bordered both anteriorly and posteriorly with reddish; head fuscous excepting clypeal border, which is paler. Antennae and legs reddish.

Vertex of head crossed by a fine striaform sulcus which ends anteriorly at level of upper border of eyes; a similarly fine medium longitudinal sulcus from lowest level of antennal sockets to median labral emargination. Occipital region of head densely coarsely punctate, the frontal and clypeal regions more sparsely and more finely punctate, shining, in region between antennal sockets a few, fine transverse striae; below antennal sockets some fine vertical striae. Antenna of usual proportions, and lying in the usual excavation in head and stipes. Clypeal foveolae 5+5 or 6+6.

Collum ending on each side above lower process of second segment in the typical manner, the lower end rounded; margined below and up anterior side to level of eye; surface densely punctate and with fine coriarius markings.

Second tergite produced forward below end of collum on each side, the anterior border of process conspicuously elevated.

All segments densely punctate, the punctae coarser and deeper along depression of sulcus; transverse sulcus caudad of middle, acutely angled at level of pore which lies cephalad of it. Metazonites below crossed by longitudinal striae; striae at same level on prononite curving forward and upward.

Anal tergite depressed transversely across posterior portion but without sulcus; caudal angle rounded, surpassed by the anal valves.

Anal valves at mesal border moderately compressed and elevated.

Anterior legs of male with proximal joints compressed in the antero-caudal direction as usual, the third going especially conspicuously flattened, broad in the dorso-ventral plane. Coxal processes of third legs short, columnar, being about as thick distally as proximally, the distal end bearing at middle only an obsolete conical point which is easily overlooked. Processes of fourth and fifth legs short, with conspicuous conical apices.

In the gonopods of the male the anterior or median lamina extended forward at middle in a broad, subquadrate plate, the anterior corners of which are rounded, and the anterior margin scarcely convex. Posterior plate of telopodite of anterior gonopod with outer border convex, the narrowed apical portion reflected caudad and a little ectad at tip. See further the accompanying figures.

Number of segments in male holotype, 52.

Length, about 73 mm.; diameter, 6 mm.

*Holotype*, male, Murray County, Oct. 4, 1930. R. D. Bird coll.

Also one male at Buffalo Lodge, Wichita National Forest taken June 15, 1928. Two females Pushmataha County, June 25, 1929. R. D. Bird coll.

This species resembles *S. marginatus*; but it is a smaller form differing in having the median plate of the male gonopods distally truncate as well as in the form of posterior and of anterior gonopods as shown in the accompanying figure.

#### ***Orthoporus wichitanus* sp. nov.** (Plate II, fig. 2.)

General color of the body fuscous with a narrow annulus bordering caudal margin of each segment lighter, more reddish though the lighter annuli are not conspicuous; covered portion of progonites paler. Head fuscous above, lighter in clypeal region excepting a dark band above the labral border, this band curving upward on each side.

Head with a transverse sulcus across posterior portion of occiput running between posterior angles of eyes and angulate at middle; a finer median longitudinal sulcus running from angle of the transverse sulcus across vertex to join a fine transverse impressed line between inner angles of eyes. No median sulcus below. On each side just in front of the occipital transverse sulcus a series of shorter, and overlapping, curved transverse lines; the vertical region otherwise smooth and shining. Lower frontal region somewhat roughened with impressed, mostly irregular furrows or sulci, the adjacent clypeal region

similarly marked but also subdensely punctate. Labral border about 18 setigerous foveolae in depressions separated by short longitudinal ridges.

Collum not inflexed below; the anterior lateral corner in the male extended forward in a well rounded lobe which is margined with a sulcus. A second sulcus subparallel to the margining one extends farther dorsad; a third sulcus is subparallel to the second one below but does not extend up dorsad beyond middle of the anterior lobe; a fourth sulcus rims from the posterior-lateral or lower corner, curving forward and upward to the level of lower edge of eye; a fifth sulcus caudad of the fourth is short, like the third; and a sixth sulcus, which curves still less than the fourth, extends dorsad a little beyond upper end of the latter. On each side caudad of these striae a number of irregular, short, more weakly impressed, longitudinal striae. Smooth and shining above.

Tergites in general densely but very finely punctate. Segmental sulcus strongly impressed, cross-ribbed; preceded over prozonite above by finer transverse striae. Longitudinal striae strongly impressed below, across metazonite. Segmental pore well removed from the sulcus which is not at all or but vaguely excurved opposite it.

Anal tergite not covering the valves completely; angle of caudal portion rounded, the caudal triangular portion set off by a strongly impressed transverse sulcus, the tergite in front of this sulcus densely punctate, and caudad of it strongly puncturugose. Anal valves with margins strongly elevated; surface punctate but not rugose.

Anterior gonopods each with ventral end produced into a lobe which bends outward below base of cone and is rounded at the end; the lateral cone extending directly laterad, acuminate, terminating in a slenderly acute, sigmoidal tip. Coxa of posterior gonopod curving upward and ending about half-way to base of anterior gonopod, where it presents on the mesal side a short angular prominence or spur; telopodite broadly laminate as usual, expanding and curving toward free end.

Segments in male holotype, 64-66.

Diameter of holotype 7 mm.; length, about 115 mm.

A female allotype is about 120 mm. long; diameter 10 mm.

*Holotype*, male, Elk Mountain, Wichita Forest Reserve, June 22, 1928. Female *allotype* taken July 9th west of Elk Mountain, N. M. Newport coll.

This species, the sole representative of the genus known from this part of the United States, may be recognized at once by

the form of the conspicuous, acuminate lateral cones of the anterior gonopods and the form of the telopodite of the posterior gonopods as shown in the accompanying figure.

*POLYDESMUS PINETORUM* Bollman.

Norman Black Jack Forest, Feb. 26, 1930, one male and one female, D. Zeigler coll.

***Eurymerodesmus\* birdi*** sp. nov. (Plate II, figs. 6-8).

Dorsum in general brown, with a wide median longitudinal strip lighter, sometimes yellowish, in some bisected by a darker arterial line; the keels also yellowish; sides and venter yellow, collum bordered with yellow all the way around. Head with a network of dark lines over vertex; a dark spot under base of each antenna. Legs fine yellow to brown, antennae brown, typically darker than the legs, the sixth joint darker than the others.

Head smooth. Vertigial sulcus sharply impressed, ending at level of antennal sockets. Antennae filiform, the ultimate article alone narrowed, having the usual four sensory cones.

Collum narrower than second tergite in about same degree as latter is narrower than the third; lateral ends narrowed and distally rounded as usual; anterior margin straight over median region, the lateral portion slanting to ends and a little incurved at middle; posterior margin straight or slightly incurved over middle region, the lateral portion convex, bending forward to ends; keel narrowly margined on posterior side, the margination broader about ends and the sulcus paralleling outer margin and gradually fading out on dorsal region.

In the succeeding tergites the margins of the keels are thickened, the labial margin being swollen and set off by a distinct depression the other margins more narrowly elevated; lateral margin in dorsal view evenly convex, smooth. Posterior angles of 16-19 keels produced caudad in incurving degree from first of these to the 19th.

Anal tergite with the caudal processes narrowly truncate at the end. And valves with margins elevated and closely oppressed. Each elevated border having a long seta towards its upper end. Anal scale with sides strongly convex, narrowed caudad, producing an angle on median caudal line, each side of which is a long seta.

In the male there is a pair of short, rounded prominences between each pair of legs of the sixth segment, these processes

\*For characteristics of the genus see Chamberlin, Proc. Biol. Soc. Wash., 1920, vol. 33, p. 97.

strongly setose at distal ends. On the seventh segment there is on each side of the gonopods a triangular process or lamina which is setose. Each gonopod has a telopodite which runs transversely against the basal lobe to its mesal end, then runs sub-ventrally on a nearly straight blade to a transverse, sub-unciform terminal portion; the terminal transverse portion short with an acute and somewhat recurved point; blade strongly setose on mesal margin to apical portion which has setae on caudal side of base but is distally glabrous. See figures.

Length, about 32 mm.; width, 4.5 mm.

*Holotype*, male, Murray County, Oct. 17, 1929, R. D. Bird coll. Also from the same locality one adult male and one female and two immature specimens.

This species is readily distinguished from the genotype by the details of the gonopods and by the triangular form of the connected sternal processes of the seventh segment. These processes are conspicuously different in size and shape from those of the following species, *E. mundus*. The form of the gonopods is shown in the accompanying figures.

***Eurymerodesmus mundus* sp. nov.** (Plate II, figs. 3-5.)

General color of the dorsum brown with the carinae and caudal borders of the tergites brick-red; the brown color extending down the sides on the prozonites farther than on metazonites beneath the keels, the sides otherwise and the venter light yellow. Collum bordered anteriorly as well as posteriorly with red. Head brownish above, darker over area between antennae and over upper clypeal region, the labral and lateral borders yellow; antennae yellowish tinged with brown. The brown denser on fifth and especially on the sixth segment, and on proximal portion of the seventh. Legs yellow.

Head smooth. Vertical sulcus sharply impressed, ending near upper level of antennal sockets, the terminal portion widened. Antennae filiform, the seventh article above narrowed.

Lateral ends of collum narrowly rounded, the line connecting them running well caudad of middle; median portion of anterior margin nearly straight, slightly convex, the lateral portion curving widely and evenly to lateral end; caudal margin bending forward over lateral portion to the end. Margined about lateral ends, where the border is more thickened, and along anterior and posterior borders part way to the median line.

In the succeeding tergites the anterior corners of the keels are all well rounded. Anterior tergites in general with lateral portion of caudal margins running obliquely forward and becoming more and more nearly transverse in middle and posterior regions; posterior angles of 18th and 19th tergites distinctly produced, but distally well rounded; the corners of a few preceding tergites slightly extended caudad. Lateral margins of keels as seen from above smooth and convex; the lateral margins of keels strongly thickened, the anterior and posterior borders more narrowly thickened or margined.

Last tergite with narrower caudal portion the sides of which converge to a narrowly truncate apex; the caudal portion yellow except for reddish stripe at its base. Valves with mesal borders narrowly elevated or thickened. Anal scale semicircular, the caudal margin convex and with a setigerous tubercle each side of middle region.

Sternal process between legs of sixth segment obsolete; and none present between posterior legs of seventh segment; those on eighth segment very small.

In the male the seventh segment presents behind the gonopods a pair of stout, columnar or somewhat clavate processes which are united at base by a low transverse lamina; a low lamina ectad of each column extends laterad and a little cephalad, its free margin slanting from near middle of length of the column rapidly to surface of somite. Telopodites of gonopods rising from mesal side of basal segments, each telopodite a nearly straight blade which narrows gradually to level of free end of the column where it bends abruptly caudad and is apically acute; the caudal surface of telopodite densely setose up to level of the apical portion as shown in the figures.

Length of male holotype, about 27 mm., the width, 5 mm.

*Holotype*, male, Norman, Black Jack Forest at University, 26 Feb., 1930, D. Zeigler coll.

Also from the same locality two males, 1 male 10 mm., 1929, R. D. Bird. Cleveland County, 1 male, April 5, 1929. A number of immature specimens, apparently this species, taken near Camp Boulder, Wichita National Forest, 8th June, 1928.

The species is conspicuously different from other known species of the genus in the form of the sternal processes of the seventh segment of the male. These are columnar in form, parallel in position and are connected at bases in the usual way. They are fully as long as the gonopods which they completely conceal in posterior view. See figures.

## EXPLANATION OF PLATE II.

- Fig. 1. *Spiroboldus oklahomae* n. sp., anterior view of gonopods of male.  
 Fig. 2. *Orthoporus wichitanus* n. sp., gonopods of male.  
 Fig. 3. *Eurymerodesmus mundus*, right gonopod of male, anterior view.  
 Fig. 4. *Eurymerodesmus mundus* n. sp., distal end of right gonopod of male, lateral view.  
 Fig. 5. *Eurymerodesmus mundus* n. sp., sternal processes of seventh segment of male, caudal view, less highly magnified than figs. 6 and 7.  
 Fig. 6. *Eurymerodesmus birdi* n. sp., right gonopod of male, anterior view.  
 Fig. 7. *Eurymerodesmus birdi* n. sp., apical portion of left gonopod of male, sublateral view.  
 Fig. 8. *Eurymerodesmus birdi* n. sp., sternal processes of seventh segment of male, anterior view.



### Descriptions of New Genera and Species of the Dipterous Family Ephydriidae. Paper IX.\*

By EZRA T. CRESSON, JR.

#### *Hydrellia serena* new species.

Black, including tibiae and tarsi; palpi fulvous, halteres lemon yellow. Nearly shining, sparingly dark brown pollinose, with frontalia broadly velvety-black from dorsal aspect. Lunule, face, cheeks, tormae, and undersurface of thorax, grayish; humeri and mesopleura dark, concolorous with mesonotum. Face not prominent in profile, weakly convex, the bristles not much stronger than the arisal hairs. Antesutural dorsocentral very weak, scarcely differentiated from surrounding setulae. Fifth abdominal segment of male acutely triangular, slightly longer than fourth.

Length, 2 mm.

*Type*.—Male; Ilwaco, WASHINGTON, July, 1917, (A. L. Melander), [A.N.S.P. no. 6482]. *Paratypes*.—3 ♂, 6 ♀; topotypical.

This species is similar to my conception of *nigricans* of Europe, with the dorsocentrals developed as in *scalaris*, but

\* Paper VII. See ENT. NEWS, XXXVI, p. 165, (1925).

Paper VIII. See ENT. NEWS, XLI, p. 76, (1930).



the fifth abdominal segment of male similar to that of *cruralis*. In our lineal arrangement we will place the species between *tibialis* and *formosa*.

**Hydrellia platygastra** new species.

Black including palpi and antennae; halteres lemon yellow, extreme apices of femora, bases and apices of tibiae and most of tarsi, brown to tawny. Somewhat shining especially the abdomen, obscured by grayish brown pollen. Frons subopaque with velvety-black frontalia. Face entirely opaque, velvety-brown or black. Pleura below and posteriorly somewhat grayish; humeri and mesopleura dark, concolorous with mesonotum. Frons broad, with reclinate frontal bristle very strong; face almost flat in profile. Antesutural dorsocentral strong and near sutural region. Abdomen of male with third and following segments strongly compressed laterally, dilated dorso-ventrally; genital segment very large. Length, 2.5 to 3 mm.

*Type*.—Male: Beaver Creek, Newport, OREGON, (J. M. Aldrich), [A.N.S.P., no. 6483]. *Paratypes*.—1 ♂, 5 ♀; topotypical.

A species very easily distinguished by the dark, velvety-black face, black antennae and palpi. The laterally compressed abdomen of the male is very characteristic and is shared by but very few other species in this genus. This and the next species we will place following *nobilis*, but they seem to constitute a small group of themselves.

**Hydrellia morrisoni** new species.

Very similar to *platygastra* but face is whitish, the antesutural dorsocentral is reduced, and the hind tarsi very noticeably dilated medianly.

Black including palpi, antennae and tibiae; halteres lemon-yellow, tarsi brownish. Opaque cinereous; abdomen more shining. Frons and mesonotum dark gray; frontalia not well marked; lunule gray; face white becoming gray along orbits. Reclinate frontal bristle present; face in profile weakly convex. Antesutural dorsocentral weak. Middle tibiae in male as thick as femora; hind tibiae dilated medianly with convex extensor margin and flattened anterior surface. Length, 2.5 mm.

*Type*.—Male: White Mountains, NEW HAMPSHIRE (Morrison), [U.S.N.M., no. 43453]. *Paratype*.—1 ♂; topotypical.

**Hydrellia americana** new species.

Very similar to *albilabris* Meigen of Europe, but the pleura are slightly grayish, not so intensely black as in that species. From *tibialis* it differs in having the frons more velvety-black, at most only the upper part of the medifrons not included; the procellar bristles are also weaker in this species.

Black including antennae and palpi; halteres lemon-yellow. Subopaque, sparingly brownish pollinose. Frons velvety-black except sometimes at vertical margin; procellar bristles very weak, much weaker than the frontorbitals. Face and lunule silvery-white. Pleura slightly grayish not opaque. Length, 1.5 to 1.8 mm.

*Type*.—Female; Chesapeake Beach, MARYLAND, August 2, (J. M. Aldrich), [U.S.N.M., no. 43454] *Paratypes*.—2 ♀; Machias, MAINE, July 17, and 19, (C. W. Johnson), [Boston Soc. Nat. Hist.]. 1 ♀; Wilmington Notch, Adirondacks, NEW YORK, July 3, (Aldrich), [U.S.N.M.].

The male is unknown.

**Hydrellia subnitens** new species.

A western species suggesting our eastern *cruralis* Coquillett, but more shining, with dark tibiae, and very narrow cheeks.

Black; third antennal segment except disk, mouthparts, face, extremities of tibiae, and all tarsi except apices, yellow. Halteres lemon-yellow. Frons rather opaque, brownish, with frontalia scarcely differentiated from the trapezoidal medifrons; lunule white as is also the face, but not sericeous. The latter twice as long as broad, weakly and evenly convex in profile, with long slender bristles and very narrow, linear parafacials. Cheeks very narrow. Arista with seven to eight well spaced hairs.

Mesonotum including humeri, notopleura and scutellum, dark, subopaque, brown pollinose; mesopleura except extreme upper margin, gray. Antesutural dorsocentral strong, well removed from sutural region. Abdomen broad, almost shining, brownish pollinose; fifth segment of male much longer than fourth, rather broadly truncate. Wings long; second costal section twice as long as third. Length, 2.4 mm.

*Type*.—Male; Tacoma, WASHINGTON, August 27, 1911, (A. L. Melander), [A.N.S.P., no. 6484]. *Paratypes*.—2 ♂, 1 ♀; topotypical.

**Hydrellia crassipes** new species.

Apparently very similar to *atroglauca* Coquillett, but with dark tibiae. I have not seen a male of *atroglauca*.

Black; palpi and tarsi tawny. Halteres whitish. Opaque; mesonotum including humeri, scutellum and dorsum of abdomen, dark, subopaque, dark ochereous pollinose; lower occiput, pleura, venter of abdomen, femora and tibiae, gray to whitish. Frons opaque black, with frontalia scarcely differentiated; lunule white. Face and cheeks plumbaceous to yellowish gray, not sericeous; former nearly three times as long as broad, in profile convex, somewhat prominent below middle, with four to six rather stout bristles each side. Cheeks not as broad as third antennal segment. Arista with seven to nine hairs.

Antesutural dorsocentral strong and well separated from postsutural pair, with intermediate setula. Abdomen ovate with third to fifth segments subequal in length; the fifth triangular, acute apically. Hind femora of male stout and slightly arcuate; their tibiae with a conspicuous foliaceous flexor dilation. Length, 2.2 to 2.5 mm.

*Type*.—Male: Sandusky, Cedar Point, OHIO, August 4, 1902, [Ohio State University]. *Paratypes*.—19 ♂, 28 ♀; topotypical.

**Hydrellia decens** new species.

In lacking the reclinate frontal bristles, this species suggests *proclinata*, Cresson, but here we have a very shining, metallic colored form.

Black including antennae and palpi; halteres yellowish white. Shining to polished, metallic colored; mesonotum including humeri, and notopleura, dark; upper part of pleura and metanotum brownish. Frons and upper occiput subopaque, frontalia opaque black; reclinate frontal bristles not developed; lunule gray. Face rather narrow with parallel facialia, opaque brownish to black, grayish laterally; in profile, weakly convex; bristles hairlike. Arista with about ten hairs. Antesutural dorsocentrals strong and well removed from the postsutural pair. Length, 2.3 mm.

*Type*.—Female; MARYLAND near Plummers Island, August 12, 1914, (R. C. Shannon), [U.S.N.M., no. 43455]. *Paratypes*.—1 ♀; topotypical. 1 ♀; Plummers Island, Maryland, July 13, (W. L. McAtee), [Biol. Surv.].

The male sex is unknown.

**Hydrellia pulla** new species.

A robust, strongly bristled species, with prominent subconical face. Its systematic position is rather doubtful, but can be placed in the group with *atroglauca*.

Black; palpi tawny, halteres lemon-yellow. Upper surfaces brown, nearly opaque; face, occiput, pleura below, bluish gray; humeri notopleura and upper part of mesopleura dark. Frons opaque black with scarcely differentiated black frontalia; reclinate frontals strong; lunule small, concolorous with face. Face in profile conically prominent medianly, with four to five stout bristles. Arista with seven hairs. Antesutural dorsocentrals strong and well removed from sutural region. Length, 3 mm.

*Type*.—Female; Spencer lake, NEW YORK, June 30, 1907, [Cornell]. *Paratype*.—1 ♀; Goshen, CONNECTICUT, July 6, 1919, (M. P. Zappa), [Boston].

The male sex is unknown.

**Hydrellia notiphiloides** new species.

A species allied to *cruralis* Coq. but having the tibiae dark.

Black; palpi and halteres pale yellow. Opaque; mesonotum, scutellum and abdomen somewhat shining, brown to grayish pruinose; lunule, face, cheeks, white, sometimes yellowish; occiput, pleura, lateral margins of abdomen venter, and femora, cinereous; humeri gray concolorous with pleura, contrasting with the dark notopleura and mesonotum. Frons brownish, with frontalia somewhat differentiated, blackish; reclinate frontal bristle strong. Face broad, in profile, convex, with three to five stout bristles. Cheeks broad, about one-third eye-height in width. Antennal arista with six hairs. Mesonotal bristles and setulae strong; antesutural dorsocentrals strong and well removed from postsutural pair. Abdomen with segments broad, subequal in length; fifth of male convex, acute. Length, 2 to 2.5 mm.

*Type*.—Male; Cedar Point, Sandusky, OHIO, August 5, 1902, [Ohio State University]. *Paratypes*.—1 ♂, 5 ♀; topotypical 1 ♂; topotypical, June 30, 1 ♂; Nantucket, MASSACHUSETTS, July 20, 1910, [Boston Soc. Nat. Hist.].

## Notes on Some Butterflies of Northeastern Georgia.

By ROBERT W. MONTGOMERY, Poseyville, Indiana.

During the summer of 1930 collecting was done in Habersham and Banks counties, Georgia. These two counties are in the edge of Blue Ridge Mountains; collecting was done at elevations varying from 1400 to 1800 feet.

Many types of localities, including peach and apple orchards, shrub covered pastures, marshes, woodlands, roadsides and flower gardens were visited. But one species was found in woods and that near the edge. The absence of flowering vegetation in the woods was no doubt the reason for this.

The writer was accompanied on collecting trips by H. T. Vanderford and Erskine M. Livingstone.

### PAPILIONIDAE.

1. *PAPILIO PHILENOR* L. Taken from all localities except woodlands, June 26-September 7. The emergence of a brood began about August 8.

2. *PAPILIO POLYXENES* Fab. A very few specimens from orchards and flower gardens, August 12-30.

3. *PAPILIO TURNUS* L. A few specimens taken at intervals from June 30-September 1. Flower gardens and orchards. Form *glaucus* L. from flower gardens and marsh, June 25, September 1.

4. *PAPILIO TROILUS* L. Marsh, orchards and flower gardens, July 13-September 7.

### PIERIDAE.

5. *PIERIS PROTODICE* Bdv.-Lec. A few specimens from flowers, August 24-30.

6. *PIERIS RAPAE* L. Flower and vegetable gardens, May 26-August 30.

7. *CATOPSISILIA EUBULE* L. One specimen from flower garden, August 25; one specimen from marsh, September 1.

8. *COLIAS EURYTHEME* Bdv. Two specimens from pasture, June 21, September 7.

9. *TERIAS NICIPPE* Cram. A single specimen from pasture, August 24.

10. *TERIAS LISA* Bdv. Captured in all localities visited, July 21-September 7.

### DANAIDAE.

11. *DANAIS PLENIPPUS* Fab. Pastures, marshes and orchards, August 24-September 7.

## SATYRIDAE.

12. *NEONYMPHA GEMMA* Hbn. Five specimens from an orchard, June 16. This was an old orchard and afforded a dense shade. One specimen from marsh at border of dense woods, August 28.

13. *CERCYONIS ALOPE* Fab. A single specimen from an orchard, August 25. When first observed it was resting on the top of an Oriental Fruit Moth bait trap.

## NYMPHALIDAE.

14. *DIONE VANILLAE* L. Taken from all localities except woodlands, August 12-September 18. A newly emerged male taken September 16.

15. *EUPTOIETA CLAUDIA* Cram. Pastures, orchards, flower gardens, and roadsides, July 12-September 7.

16. *ARGYNNIS DIANA* Cram. A single specimen captured on street in Cornelia, July 10.

17. *ARGYNNIS CYBELE* Fab. Two specimens from orchards, July 23, Aug. 10.

18. *PHYCIODES THAROS* Drury. Pastures, orchards, flower gardens and roadsides, May 26-September 1.

19. *CYNTHIA HUNTERA* Fab. One specimen from an orchard, August 12; one from a marsh, September 1.

20. *CYNTHIA CARDUI* L. One specimen from roadside, July 27.

21. *JUNONIA COENIA* Hbn. Taken from all localities except woodlands, July 27-September 1.

22. *BASILARCHIA ASTYANAX* Fab. Three specimens, all from orchards, July 27, August 24.

## LYCAENIDAE.

23. *STRYMON CECROPS* Fab. One specimen from marsh at edge of woods, August 24.

24. *STRYMON MELINUS* Hbn. One specimen from an orchard, July 27.

25. *LYCAENA HYPOPHILEAS* Bdv. A single specimen taken from a marsh, August 24.

26. *EVERES COMYNTAS* Godt. Pastures, marshes and roadsides, June 17-September 17.

27. *GLAUCOPSYCHE PSEUDARGIOLUS* Bdv.-Lec. Marsh, roadside, August 24.

## HESPERIDAE.

28. *EPARGYREUS TITYRUS* Fab. May 10-September 1.

29. *ACHLARUS LYCIADES* Gey. July 10, September 7.

30. THORYBES PYLADES Scud. July 21-August 29.
31. THORYBES BATHYLLUS S. & A. July 27-September 7.
32. HESPERIA CENTAUREAE Ramb. September 1.
33. HESPERIA TESSELATA Scud. August 24.
34. PHOLISORA CATULLUS Fab. August 26.
35. ANCYLOXIPHA MUMITOR Fab. September 7.
36. HYLEPHILA CAMPESTRIS Bdv. August 24, September 7.
37. AMBLYSIRTES VIALIS Edw. July 27.

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**Papilio daunus** Boisd. in Scott County, Kansas (Lepid.:  
Papilionidae).

The occurrence of this magnificent species of the genus *Papilio* here on the western Kansas prairie is very interesting, geographically. From available data concerning the species *daunus*, it appears to be a typical mountain species, or at most, confined to the valleys and slopes of the Rocky Mountain ranges, extending from Idaho southward into Mexico.

For the past few years, I have usually encountered *daunus* on my collecting rounds, and have taken a few each year. It does not occur in sufficient numbers, however, to call it a common insect in this locality. When on the wing, it is apt to be confused with specimens of *glaucus*; as a rule, however, *glaucus* specimens are much smaller than *daunus* and the larger size of *daunus* may serve to distinguish between the two when flying, as they often fly in company with each other. The insect, as encountered in this region, has a very wide wing expanse for summer examples, the females measuring four and a half to five inches, the males being a trifle smaller.

A fact concerning *Papilio daunus* not usually known, and not mentioned in any reference books, is that it is double-brooded in its more southern limits, the first brood emerging from over-wintering chrysalids and appearing during the latter part of the month of April and the first of May; the second, or summer brood, produced from the eggs laid by the females of the first generation, and appearing in June and July, and even August. The specimens of the first brood are quite small and ordinary looking, measuring from three to three and a half inches as compared with the giants of June, and later, that measure four inches and more.

It would seem that *daunus* in its more northern ranges is single-brooded, and that it has been almost entirely the summer examples, according to their size, that have found their way into collections and illustrations.

VIRGIL F. CALKINS, Scott City, Kansas.

### Abnormal Antenna in *Eleodes* (Coleop.: Tenebrionidae).

By ORLANDO PARK, Department of Zoölogy, University of Illinois.

Among a number of tenebrionids received some months ago from New Mexico, a female of *Elcodes carbonaria* (Say) was observed to have an abnormal right antenna. The distal border of the fifth segment was distorted. From this area of the segment arose an accessory structure one millimeter long, which bore several bristle-bearing punctures. This palp-like piece projected distally and ended in a thickened knob which was distinctly notched on its apex. Near the point where the piece turned distally, a small projection was given off which extended proximally, as can be noted in the accompanying figure. This accessory piece of the fifth segment did not show articulating surfaces under a magnification of forty diameters.



An articulating surface could not be discerned between the malformed fifth and the sixth segments of the right antenna, the latter being firmly set into the fifth in such a way that antennal movement must have been peculiar in life.

The left antenna of this individual was normal, normality being determined by comparison with antennae of other individuals of the species (12 ♀ ♀, 9 ♂ ♂) taken from the same area over a period of five years.

Finally, the left mesothoracic femur of the specimen being described had been diagonally fractured at some time, and the fracture had subsequently healed over to form a femur conspicuously bent and irregular.

Bateson ('94) listed six cases of paired supernumerary antennae (pp. 522-523), and seven cases of supposedly double antennae (p. 551) in heteromerous beetles, these abnormalities being reported by a number of workers. The malformed *Elcodes* described above, however, is not easily treated. In a previous note (Park, '28) literature was cited on the possible effect of injury and this abnormality might be the result of one



of many feasible accidents. If so, the right antenna may or may not have been injured at the same time as the left middle leg. Again, the fifth segment might not have been injured, and the accessory structure noted may represent a duplicating right antenna in an undeveloped condition. Finally, the knob-like proximal projection may be significant, in that the fifth segment may have shown an abortive tendency to form a pair of supernumerary antennae. However, this latter is hardly tenable in view of the unjointed and rudimentary condition of the malformation.

I am indebted to Mr. William J. Gerhard and to Mr. Emil Liljeblad of the Field Museum of Natural History for the determination of this interesting specimen. The latter was taken beneath a loose board on the ground, at Las Cruces, New Mexico, by Mr. R. S. Campbell on July 21, 1929, and is now in the collection of the writer.

#### LITERATURE CITED.

- BATESON, WILLIAM, 1894. Materials for the study of variation. London: Macmillan and Co., xvi + 598 pp.  
PARK, ORLANDO, 1928. Bifurcation of antenna in *Balaninus*. Ent. News, 39: 219-220.

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### **Dixie Dragonflies Collected during the Summer of 1930 (Odonata).**

By C. FRANCIS BYERS, Dept. of Biology, University of Florida.

During the summer of 1930 the Museum of Zoology of the University of Michigan financed a collecting trip for insects into the southeastern portion of the United States. The author, from the University of Florida, and Mr. Herman Spieth, from the University of Indiana, plus a model-T Ford, plus the field man's usual outlay of paraphernalia, constituted the expedition.

The start was made from Gainesville, Florida, at noon on June 19th. Camp was established that night at McClenny, Florida, near the banks of the St. Marys River. As the primary aim of the collectors was to secure specimens of the insect orders *Odonata* (dragon-flies) and *Ephemera* (may-flies), the selection of camp and collecting sights was restricted to regions near bodies of water, mostly on this trip, to rivers. The following table will give the reader an idea of the region covered with dates, localities visited, etc.

TABLE.

Date	State	County	Locality	River System or Lakes
June 19-20	Florida	Baker	McClenny	St. Marys
" 22	Georgia	Glynn	Everett City	Altamaha
" 22-23	"	Wayne	Jesup	"
" 24-25	"	Laurens	Dublin	Oconee
" 25	"	Wilkinson	Irwinton	"
" 25	"	"	Milledgeville	Black Lake
" 26	"	Jefferson	Louisville	Ogechee
" 26-27	"	Burke	Keysville	Savannah
" 28	"	Johnson	"	"
" 29	S. Carolina	Greenwood	Ware Shoals	Saluda
" 30	"	Newberry	Chappells	"
July 1	N. Carolina	Mecklenburg	Pineville	Catawba
" 2-3	"	Wilkes	N. Wilkesboro	Yadkin
" 4	"	Ashe	W. Jefferson	New River
" 4	"	Caldwell	Lenoir	_____
" 5-6	"	McDowell	Marion	Catawba R. L. Tahoma
" 8-9	"	Swain	Bryson City	Tuskasegee
" 10-11	"	Macon	Highlands	_____
" 13	Georgia	Floyd	Rome	Coosa
" 19-23	Florida	Alachua	Gainesville	_____
" 19	"	Liberty	Rock Bluff	Apalachicola
" 23-24	Georgia	Dooly	Vienna	Flint
" 24	"	Spalding	Griffin	"
" 25	"	Gwinnett	Lawrenceville	Yellow
" 27-28	N. Carolina	Cherokee	Murphy	L. Tennessee
" 30-31	"	Swain	Bryson City	Tuskasegee
Aug. 1-9	"	"	" region	Great Smoky drainage
" 9	Tennessee	Sevier	Sevierville	"
" 10	"	"	Gatlingburg	"
" 11	"	"	Elkmont	"

The following is the list of species of dragon-flies collected in the states of Florida, Georgia, South Carolina, North Carolina and Tennessee during the summer of 1930 (June 19-August 11). The number in parenthesis indicates the number of specimens taken of that species which it follows. Only the names of the counties and states are given. For additional information see the table of localities. The total list numbers about 500 specimens, 33 genera and 72 species.

*List of Species.*

SUBORDER ANISOPTERA.

SUBFAMILY GOMPHINAE.

1. *PROGOMPHUS* *OBSCURUS* (Rambur)—(9) Johnson, Wayne—Georgia.
2. *HAGENIUS* *BREVISTYLUS* Selys—(1) McDowell—North Carolina.
3. *GOMPHUS* *SCUDDERI* Selys—(1) Swain—North Carolina.
4. *G.* *SPINICEPS* (Walsh)—(3) Swain—North Carolina.

5. *G. PLAGIATUS* Selys—(1) Floyd—Georgia.
6. *G. sp?*—(2) Floyd—Georgia.
7. *DROMOGOMPHUS ARMATUS* Selys—(2) Burke—Georgia.
8. *D. SPINOSUS* Selys—(11) Floyd, Laurens, Wilkinson—Georgia; McDowell—North Carolina.
9. *ERPETOGOMPHUS DESIGNATUS* Hagen—(3) Sevier—Tennessee.

## SUBFAMILY AESCHNINAE.

10. *BOYERIA VINOSA* (Say)—(5) Burke—Georgia; Cherokee, Swain—North Carolina.
11. *CORYPIAESCHNA INGENS* (Rambur)—(2) Baker, Glynn—Georgia.
12. *ANAX JUNIUS* (Drury)—(6) Macon, McDowell—North Carolina.
13. *A. LONGIPES* Hagen—(1) Macon—North Carolina.
14. *AESHNA UMBROSA* Walker—(1) Swain—North Carolina.
15. *NASIAESCHNA PENTHACANTHA* (Rambur)—(2) Glynn, Wayne—Georgia.
16. *EPIAESCHNA HEROS* (Fabricius)—(5) Burke, Glynn—Georgia.

## SUBFAMILY CORDULINAE.

17. *MACROMIA ALLEGHANIENSIS* Williamson—(2) Cherokee, Swain—North Carolina.
18. *M. GEORGINA* (Selys)—(16) Alachua—Florida; Greenwood—South Carolina; Laurens—Georgia.
19. *M. ILLINOIENSIS* Walsh—(4) Cherokee, Swain—N. Carolina; Sevier—Tennessee.
20. *M. TAENIOLATA* Rambur—(8) Burke, Laurens, Wayne—Georgia.
21. *EPICORDULIA REGINA* Selys—(2) Laurens—Georgia.
22. *TETRAGONEURIA STELLA* Williamson—(1) Wayne—Georgia.
23. *SOMATOCHLORA ELONGATA* Scudder—(1) Macon—North Carolina.
24. *S. LINEARIS* (Hagen)—(8) Burke, Floyd—Georgia.

## SUBFAMILY LIBELLULINAE.

25. *CELITHEMIS AMANDA* (Hagen)—(2) Baker—Florida.
26. *C. ELISA* (Hagen)—(1) McDowell—North Carolina.
27. *PERITHEMIS SEMINOLE* Calvert—(2) Alachua—Florida; Wayne—Georgia.
28. *P. TENERA* (Say)—(10) Burke, Gwinnett—Georgia; Greenwood—S. Carolina.
29. *LIBELLULA AURIPENNIS* Burmeister—(5) Baker—Florida; Glynn, Jefferson—Georgia.
30. *L. AXILLENA* Westwood—(7) Baker—Florida; Glynn, Wayne—Georgia.

31. *L. CYANEA* Fabricius—(2) Mecklenburg, McDowell—North Carolina.
32. *L. FLAVIDA* Rambur—(7) Burke—Georgia; Swain, Wilkes—North Carolina.
33. *L. INCESTA* Hagen—(10) Baker—Florida; Burke, Dooly, Glynn, Laurens, Wayne—Georgia.
34. *L. LUCTUOSA* Burmeister—(3) Mecklenburg, McDowell—North Carolina.
35. *L. LYDIA* Drury—(6) Floyd, Gwinnett, Laurens—Georgia; Macon, McDowell—North Carolina.
36. *L. PULCHELLA* Drury—(2) Mecklenburg—North Carolina.
37. *L. SEMIFASCIATA* Burmeister—(1) Glynn—Georgia.
38. *L. VIBRANS* Fabricius—(9) Burke, Glynn, Laurens—Georgia; Liberty—Florida.
39. *SYMPETRUM VICINUM* (Hagen)—(3) McDowell—North Carolina.
40. *ERYTHRODIPLAX MINUSCULA* (Rambur)—(8) Baker—Florida; Jefferson, Wayne—Georgia; Wilkinson, McDowell—North Carolina.
41. *PACHYDIPLAX LONGIPENNIS* (Burmeister)—(33) Baker—Florida; Burke, Dooly, Glynn, Gwinnett—Georgia; Mecklenburg, McDowell, Wilkes, Wilkinson—North Carolina.
42. *ERYTHEMIS SIMPLICICOLLIS* (Say)—(8) Baker—Florida; Gwinnett, Laurens—Georgia; McDowell, Wilkinson—North Carolina.
43. *TRAMEA CAROLINA* (Linne)—(3) Baker—Florida; Glynn, Wayne—Georgia.
44. *T. LACERATA* Hagen—(2) McDowell—North Carolina.
45. *PANTALA FLAVESCENS* (Fabricius)—(1) Greenwood—South Carolina.
46. *P. HYMENAEA* (Say)—(1) Greenwood—South Carolina.

## SUBORDER ZYGOPTERA.

## SUBFAMILY AGRIONINAE.

47. *AGRION APICALE* (Burmeister)—(8) Burke, Gwinnett—Georgia; McDowell—North Carolina.
48. *A. DIMIDIATUM* (Burmeister)—(9) Dooly, Wayne—Georgia; Liberty—Florida.
49. *A. MACULATUM* Beauvais—(33) Liberty—Florida; Dooly, Jefferson, Wayne—Georgia; Greenwood—South Carolina; Ashe, Cherokee, Macon, Mecklenburg, McDowell, Swain, Wilkes, Wilkinson—North Carolina.
50. *HETAERINA AMERICANA* (Fabricius)—(7) Sevier—Tennessee; Swain—North Carolina.
51. *H. TITIA* (Drury)—(2) Floyd—Georgia.

## SUBFAMILY LESTINAE.

52. *LESTES FORCIPATUS* Rambur—(1) Macon—North Carolina.
53. *L. RECTANGULARIS* Say—(3) Macon, McDowell—North Carolina.

## SUBFAMILY COENAGRIONINAE.

54. *ARGIA APICALIS* (Say)—(38) Burke, Dooly, Floyd, Laurens—Georgia; Greenwood, Newberry—South Carolina; Caldwell, Cherokee, McDowell, Swain, Wilkes—North Carolina; Sevier—Tennessee.
55. *A. BIPUNCTULATA* (Hagen)—(16) Baker—Florida; Greenwood—South Carolina; Jefferson—Georgia.
56. *A. MOESTA PUTRIDA* (Hagen)—(10) Baker—Florida; Dooly, Gwinnett—Georgia; Greenwood—South Carolina; Swain—North Carolina.
57. *A. FUMIPENNIS* (Burmeister)—(12) Baker—Florida; Dooly, Gwinnett—Georgia; Wilkesboro—North Carolina.
58. *A. SEDULA* (Hagen)—(4) Greenwood—S. Carolina; Mecklenburg, McDowell—North Carolina.
59. *A. TIBIALIS* (Rambur)—(40) Baker, Liberty—Florida; Burke, Dooly, Floyd, Jefferson, Laurens—Georgia; Greenwood—South Carolina; Cherokee, Mecklenburg, Wayne, Wilkinson—North Carolina.
60. *A. TRANSLATA* (Hagen)—(10) Cherokee—North Carolina; Sevier—Tennessee.
61. *A. VIOLACEA* (Hagen)—(19) McDowell, Swain—North Carolina.
62. *AMPHIAGRION SAUCIUM* (Burmeister)—(1) Ashe—North Carolina.
63. *CHROMAGRION CONDITUM* (Hagen)—(2) Macon—North Carolina.
64. *ISCHNURA POSITA* (Hagen)—(12) Dooly—Georgia; Mecklenburg, McDowell, Swain, Wilkes, Wilkinson—North Carolina.
65. *I. VERTICALIS* (Say)—(7) Burke—Georgia; Macon, McDowell—North Carolina.
66. *ANOMALAGRION HASTATUM* (Say)—(5) Gwinnett—Georgia; Macon, McDowell, Wilkinson—North Carolina.
67. *ENALLAGMA ASPERSUM* (Hagen)—(2) Macon—North Carolina.
68. *E. DAECKII* (Calvert)—(9) Wilkinson—North Carolina.
69. *E. DOUBLEDAYI* Selys—(3) Dooly—Georgia; McDowell—North Carolina.
70. *E. DURUM* (Hagen)—(1) Baker—Florida.
71. *E. HAGENI* (Walsh)—(15) Macon, Wilkinson—North Carolina.
72. *E. SIGNATUM* (Hagen)—(2) Laurens—Georgia; McDowell—North Carolina.

Because of the great amount of territory covered and the comparatively short time devoted to collecting, the results of the trip are mainly of survey value. The collection is qualitative rather than quantitative. The ratio of the number of species taken to the number of specimens is large.

While the primary objective of the expedition was the securing of specimens as indicated, much valuable information regarding geographic distribution and habits of the insects under observation was amassed.

The region collected over seems to have three more or less distinct geographic areas based upon the distribution of the dragonfly fauna. These are: (1) North Florida and southern Georgia, (Alachua, Baker, Glynn, Liberty and Wayne Counties). Central Georgia and southern South Carolina, (Burke, Dooly, Greenwood, Gwinnett, Jefferson, Johnson, Laurens, Newberry, Spalding and Wilkinson Counties). (3) North Georgia, North Carolina, eastern Tennessee, (Ashe, Caldwell, Cherokee, Floyd, Macon, Mecklenburg, McDowell, Sevier, Swain, Wilkes Counties).

The fauna of the North Carolina area was markedly different in many respects from that of the two regions further south. Also within this area there seems to be a secondary one which could be included in a circle drawn around Floyd Co., Ga., Sevier Co., Tenn., and Cherokee, Macon, and Swain Counties, N. C.

Some interesting observations on the species collected may be noted. *Macromia georgina* and *M. tacniolata* were flying together at Dublin (Laurens Co.) Ga. At Everett City (Glynn Co.) Ga., we found *Coryphaeschna*, *Nasiaeschna* and *Epi-aeschna* together, and in addition five species of *Libellula*. As the habitat here was a broad road-side drainage ditch, skirting a hammoek, the prolific dragon-fly fauna was the more remarkable. Along the Saluda river below Ware Shoals (Greenwood Co.) S. C. both North American species of *Pantala* were found.

The specimen of *Somatochlora elongata*, a typically northern species, was collected at Highlands (Macon Co.), N. C., at an

altitude of 4300 ft. Its presence here was probably due to the elevation effect on temperature.

The capture of two specimens of *Dromogomphus armatus* came as a surprise, as little has been heard from this species since it was described by Selys in 1854.

The Gomphines of the North Carolina secondary area are of peculiar interest, several of them being undescribed species in all probability.

As mentioned before the collection is essentially fluviatile. Consequently the best represented of the genera is the genus *Argia*. There were 149 specimens (roughly 30% of the collection) and all of the eastern North American species (8) taken in this group. Contrariwise the genera *Enallagma* and *Ischnura* suffered from confining our attention to rivers.

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## Entomological Literature

COMPILED BY LAURA S. MACKAY UNDER THE SUPERVISION OF  
E. T. CRESSON, JR.

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 within brackets [ ] refer to the journals, as numbered in the list of Periodicals and Serials published in the January and June numbers (or which may be secured from the publisher of Entomological News for 10c), in which the paper appeared. The number of, or annual volume, and in some cases the part, heft, &c. the latter within ( ) follows; then the pagination follows the colon :

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

\*Papers containing new forms or names have an \* preceding the author's name.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

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.

☞ Note the change in the method of citing the bibliographical references, as explained above.

Papers published in the Entomological News are not listed.

**GENERAL.**—Cockerell, T. D. A.—[Review of Howard's History of Applied Entomology]. [68] 73: 186-188. Emerton, J. H.—Obituary. By N. Banks. [4] 63: 23-24. Hartzell, F. Z.—Ecotopographic maps: their use in entomology and notes on making. [12] 24: 151-157, ill. Hayward, K. J.—Some further notes on insect migration in Argentina. [9] 64: 40-41. Hoffman, A.—Entomologen-Adressbuch. Annuaire des entomologistes Entomologist's directory. Auf. III. Wien 1930, 357 pp. Omer-Cooper, J.—Species-pairs

among insects. [31] 127: 237. **Osborn, H.**—Bibliography of Ohio zoology. [Ohio Biol. Surv., Bull.] 23: 353-410. **Zwölfer, W.**—Zur theorie der insektenepidemien. [97] 50: 724-759.

**ANATOMY, PHYSIOLOGY, ETC.**—**Bonnet, P.**—La mue, l'autotomie et la régénération chez les Araignées, avec une étude des Dolomèdes d'Europe. [Bull. Soc. Hist. Nat., Toulouse] 59: 237-700, ill. **Clark, L. B.**—Some factors involved in the reaction of insects to changes in luminous intensity. [Jour. Exp. Zool.] 58: 31-42, ill. **de Boissezon, P.**—Contribution à l'étude de la biologie et de l'histophysiologie de *Culex pipiens*. [Arch. Zool. Exp. et Gen., Paris] 70: 281-431, ill. **Gorter, F. J.**—Köcherbauversuche an trichopterenlarven. [46] 20: 443-532. **Mukerji, D.**—On the respiratory system of the *Cybister* larva. [Arch. Zool. Exp. et Gen., Paris] 70: 433-467, ill. **Nowikoff, M.**—Untersuchungen über die komplexaugen von lepidopteren nebst einigen bemerkungen über die rhabdome der Arthropoden im allgemeinen. [94] 138: 1-67, ill. **Prell, H.**—Anopheles und die Malaria. [Flugs. Deut. Ges. angew. Ent.] 9: 61 pp., ill. **Valentine, J. M.**—The olfactory sense of the adult meal worm beetle *Tenebrio molitor*. [Jour. Exp. Zool.] 58: 165-228, ill. **Zernoff, V.**—L'immunité et les anticorps non spécifiques chez les insectes (*Chenilles de Galleria mellionella*). [77] 96: 151-153.

**ARACHNIDA AND MYRIOPODA.**—\***Bryant, E. B.**—A revision of the American species of the genus *Ozyptila*. [5] 37: 375-391, ill. \***Mello-Leitão.**—*Aphantochilidas e Thomisidas do Brasil*. [Arch. Mus. Nac., Rio de Janeiro] 31: 9-13.

**THE SMALLER ORDERS OF INSECTS.**—**Brues, C. T.**—Jewelled caddis-worm cases. [5] 37: 392-394. \***Longinos Navás, R. P.**—*Insectos de la Argentina*. [Rev. Soc. Ent. Argentina] 3: 125-132, ill. \***Moulton & Steinweden.**—A new *Taeniothrips* on *gladiolus*. [4] 63: 20-21, ill.

**ORTHOPTERA.**—**Rosas Costa, J. A.**—Notas sobre tres ortopteros anomalos. [Rev. Soc. Ent. Argentina] 3: 67-70, ill.

**HEMIPTERA.**—\***Baker, A. D.**—A study of the male genitalia of Canadian species of Pentatomidae. [Canadian Jour. Res.] 4: 148-179, ill., cont. \***deLong, D. M.**—A revision of the American species of *Empoasca* known to occur north of Mexico. [U. S. Dept. Agric.] Tech. Bull. 231: 60 pp., ill. **Eklblom, T.**—Morphological and biological studies of the Swedish families of Hemiptera-Heteroptera. [Zool.



Bidr. Upsal.] 12: 113-150, ill. \***Hungerford, H. B.**—A new *Velia* from Trinidad (Veliidae). [75] 7: 172-175, ill. \***Melin, D.**—Hemiptera from South and Central America. [Zool. Bidr. Upsal.] 12: 151-198, ill. \***Metcalf & Bruner.**—Cuban *Fulgorina*. The families Tropicuchidae and Acanaloniidae. [5] 37: 395-424, ill. **Zweigelt, F.**—Blattlausgallen. Histogenetische und biologische studien an *Tetraneura*-und *Schizoneuragallen*. [Monograph. angew. Ent.] 11: 684 pp., ill.

**LEPIDOPTERA.**—**Bourquin, F.**—Algunas observaciones sobre Castniidae. [Rev. Soc. Ent. Argentina] 3: 173-174, ill. (S). \***Breyer, A.**—Lepidopteros nuevos para la Rep. Argentina. Lepidopteros de Yacanto especies nuevas, raras y comunes. (S). [Rev. Soc. Ent. Argentina] 3: 151-152, ill; 169-172, ill. \***Brown, F. M.**—A revision of the genus *Aphrissa*. (S). [40] 454: 14 pp., ill. **Cook, W. C.**—An ecologically annotated list of the Phalaenidae of Montana. [4] 63: 1-9, cont. \***Draudt, M.**—Neue Amatiden des amerikanischen faunengebietes. [17] 48: 33-36, cont. (S). \***Jorgensen, P.**—Las especies de Castniidae de la Argentina y Paraguay. [Rev. Soc. Ent. Argentina] 3: 175-180, ill. \***Köhler, P.**—Un nuevo Saturnido argentino, *Mesoleuca bruchi* sp. n. [Rev. Soc. Ent. Argentina] 3: 149-150, ill. **Köhler, P.**—Los Diopitidae argentinos. Notas biológicas acerca de *Ctenucha vittigera lativitta*. [Rev. Soc. Ent. Argentina] 3: 153-162, ill; 167-168, ill. **Martin & Ingham.**—An annotated list of the diurnal lepidoptera of Huntington Lake Region, Fresno County, California. [38] 29: 115-134, ill. **Nosswitz, F.**—Nota sobre *Epistor lugubris*. Un *Morpho* ginandromorfo. [Rev. Soc. Ent. Argentina] 3: 163; 165-166, ill. \***Riley, N. D.**—A new *Ithomiine*. [9] 64: 35 (S). **Schwanwitsch, B. N.**—Studies upon the wing-pattern of *Prepona* and *Agrias* two genera of South-American nymphalid butterflies. [Acta Zool., Stockholm] 11: 289-424, ill.

**DIPTERA.**—\***Bequaert, J.**—The genus *Lasia* (Cyrtidae) in North America, with descriptions of two new species. [40] 455: 11 pp., ill. **Bequaert, J.**—Notes on Hippoboscidae. 2. The sub-family Hippoboscinae. [5] 37: 303-326. **Curran, C. H.**—First supplement to the "Diptera of Porto Rico and the Virgin Islands." [40] 456: 23 pp., ill. **Dunn, L. H.**—Rearing the larvae of *Dermatobia hominis* in man. [5] 37: 327-342, ill. \***Gemignani, E. V.**—Las especies argentinas del genero *Mallophora* y descripción de cuatro nuevas especies. [Rev. Soc. Ent. Argentina] 3: 133-144. **Hegh, E.**—Les Tsé-Tsés. Tome I. Bruxelles 1929. 742 pp., ill. \***Lindner, E.**—Die ausbeute der deutschen Chaco-Expedition 1925-26. *Rhopalomeridae* und *Ortalididae*. (S). [56] 9: 282-284. \***Malloch, J. R.**—Exotic Muscaridae. [75]

7: 185-200. **Shannon, R. C.**—The environment and behavior of some Brazilian mosquitoes. [10] 33: 1-27.

**COLEOPTERA.**—\***Borchmann, F.**—Alleculidae y Meloidae. (S). [Rev. Soc. Ent. Argentina] 3: 85-100, ill. **Brown, W. J.**—Revision of the North American Aegialinae. [4] 63: 9-19, ill., cont. \***Bruch, C.**—Histéridos huéspedes de Pheidole. Coleópteros nuevos y poco conocidos. (S). [Rev. Soc. Ent. Argentina] 3: 1-12, ill., 31-42, ill. \***Chapin, E. A.**—A new Serica from New Jersey. [95] 44: 5-6. \***de Carlo, J. A.**—Familia Belostomidae. Géneros y especies para la Argentina. [Rev. Soc. Ent. Argentina] 3: 101-124, ill. \***Ogloblin, A. A.**—Notes on Bethyidae with the description of two new species from Misiones. [Rev. Soc. Ent., Argentina] 3: 15-27, ill. Beitrag zur kenntnis der neotropischen Halticinen I. [Rev. Soc. Ent. Argentina] 3: 47-53, ill. \***Pic, M.**—Deux nouveaux Hétéromeres de la République Argentine. Nouveaux Coléoptères de diverses familles. (Coléoptères nouveaux de la République Argentine. [Rev. Soc. Ent. Argentina] 3: 29-30, 43-46, 55-56. \***Pic, M.**—Nouveautés diverses. (S). [Mél. Ex. Ent.] Fasc. 55-56: 36 pp., 36 pp. \***Théry, A.**—Observations sur quelques Buprestidae du genre Halcia. (S). [33] 70: 289-304. \***Tillyard, R. J.**—Kansas permian insects, part 13. The new order Protelytroptera, with a discussion of its relationships. [16] 21: 232-266, ill. **Tremoleras, J.**—La fecha de publicación de los Carabidos descritos por Brullé en el "Voyage" de D'Orbugny. [Rev. Soc. Ent. Argentina] 3: 147-148. **Ware, R. E.**—Some notes on collecting Cerambycidae. [Proc. Iowa Ac. Sci.] 36: 367-369. **Zotta, A.**—Un ejemplar topotipo de la especie argentina del genero Campidotus. [Rev. Soc. Ent. Argentina] 3: 145-146.

**HYMENOPTERA.**—**Bruch, C.**—Notas preliminares acerca de Labauchena daguerrei. [Rev. Soc. Ent. Argentina] 3: 73-80, ill. (S). \***Carpenter, F. M.**—The lower permian insects of Kansas. Part 3. The protohymenoptera. [5] 37: 343-374, ill. \***Cockerell, T. D. A.**—Some notes on bees of the genus Andrena. [4] 63: 22-23. \***Dettmer, H.**—Beschreibung von fünf neuen Cynipidenarten, worunter eine neue gattung. (S). [Brotéria] 26: 54-68, ill. **Dozier, H. L.**—A new scelionid egg parasite of the black widow spider. [10] 33: 27-28. **Haupt, H.**—Die einordnung der mir bekannten Psammocharidae mit 2 cubitalzellen in mein system. [Mitt. Zool. Mus., Berlin] 16: 673-797, ill. \***Santschi, F.**—Un nouveau genre de fourmi parasite sans ouvrières de l'Argentine. [Rev. Soc. Ent. Argentina] 3: 81-82, ill. **Vandel, A.**—Étude d'un gynandromorphe (dinergatandromorphe) de Pheidole pallidula (Formicidés). [78] 65: 114-129, ill.

DEMONS OF THE DUST. By WILLIAM MORTON WHEELER Professor of Entomology in Harvard University. A study in Insect Behavior. W. W. Norton & Company, Inc., Publishers. New York, 1930. Pp. xi, 378, frontispiece and 47 illustrations. \$5.00.—“The ‘demons’ of this volume are the inhabitants of extreme desertic environments, sand and dust. It is scarcely necessary to state that the word ‘demon’ is here used metaphorically and in the modern sense of ‘a malevolent being.’ The term has suffered many changes of meaning. To Homer and Hesiod it meant a benevolent supernatural being, or god, and when Socrates spoke of his *daimon* he obviously meant a benevolent spirit like the guardian angel of the devout Catholic. . . . This volume deals mainly with two unrelated groups of insect demons which have acquired a very similar type of behavior as the result of living in dry dust or sand, which as Buxton (1923) says ‘is in many ways the most hostile of all environments,’ for as he remarks later in his fine treatise [Animal Life in Deserts] ‘sand probably presents more difficulties to the flora and fauna which attempt to colonize it than does any other type of desert’ . . . And more intimate acquaintance with the organisms most exquisitely adapted to live under such difficult conditions is sure to arouse a peculiar feeling of the sinister, malignant, weird or supernatural, or what Goethe called the ‘demoniac.’ These terms are all fine examples of the besetting sin of verbalism, of the tacit assumption that there must be an actual objective existent corresponding to a mental process or state because we can coin a name for it. If this be borne in mind, there is no reason why we may not designate as demons animal organisms that exhibit disconcerting or even monstrous forms and behavior as a result of their structural and functional adaptation to extreme environmental conditions.” (Pp. 40, 41.)

After a chapter devoted to the eighteenth century naturalists, Pluche, Réaumur, Bonnet, Roesel, Queen Ulrica Louisa of Sweden and Degeer, to whom the foundations of our knowledge of these demons is due, and another on the fauna of the sands in general, the third chapter (62 pages) is a summary of post-eighteenth century observations on the Ant-lions, their taxonomy, larval structure and behavior. The fourth to eighth chapters present similar accounts of those curious Diptera, of the family Rhagionidae, or Leptidae, to whose larvae Réaumur applied the name of worm-lions in 1753. They are treated as of five specific groups: Mediterranean, *Vermileo vermileo* Linnaeus; Sierra, *V. comstocki* Wheeler and *V. opaquus* Coquillett; the genus *Lampromyia*, of Africa, Spain and the Canary Islands; the little known *Vermilitigris fairchildi* Wheeler, of Sumatra and perhaps Borneo; and two almost equally little known

species from Cuba, Jamaica and Guerrero, Mexico. To knowledge of all of these worm-lions, Prof. Wheeler adds much from his own investigations in field and laboratory.

"It would be easy to make a long list of the detailed resemblances between the ant-lion and worm-lion, including the various taxes and sensory reactions of the larva, its normally biennial life-span, the excavation of the pitfall; lying in wait, the poisoning, burial and extraintestinal digestion of the prey, the occlusion of the posterior end of the stomach, death-feigning, the ability to remain for long months in asitotic stupor, pupation in the sand, the wriggling of the pupa up to the surface to permit eclosion of the imago, etc. On the other hand certain striking differences are to be noticed between the two insects." (P. 280.)

All these resemblances and differences are discussed in appropriate places throughout the text, with true Wheelerian breadth of view and humor, nor is a new term lacking to designate these demons and many others "which ambush instead of actively seeking their prey. . . . I shall . . . call them *lochetic* (from *lochetikos*, lying in wait, entrapping). In this category we may even include such insectivorous plants as the sundews (*Drosera*), pitcher-plants (*Sarracenia*, *Nepenthes*) and the Venus' fly-trap (*Dionaea*). Among animals we have an extraordinary diversity of forms, ranging from the sea-anemones, Hydroids, corals, tube-dwelling Annelids, Crinoids and Polyzoa to many reptiles, such as the *Anniella* described on p. 70 and at least one group of mammals, the cats" (p. 284). Many of these *lochets* are considered and the reviewer, unable to conceal his own peculiar behavior pattern, hastens to add the unmentioned Odonate larvae to the list. "The ambushing or lochetetic, animals are also important as excellent examples of convergent evolution, a principle which, to my knowledge, has not been treated monographically since the publication of Willey's work in 1911" (p. 295).

In connection with the worm-lions the question is again raised as to "the relative value to be attached to larval and imaginal characters in the classification of insects" (p. 193). It is not directly answered, but the last complete sentence on page 190 seems to indicate Prof. Wheeler's belief that the imaginal characters are to be assigned greater weight.

Two appendices give translations of Degeer's (1752) and Réaumur's (1753) original memoirs on the worm-lion and its fly. There is the ever praiseworthy bibliography (pp. 337-362) and finally the index. Although heavier than is comfortable for the hand, the book is attractively made and printed in good legible type.

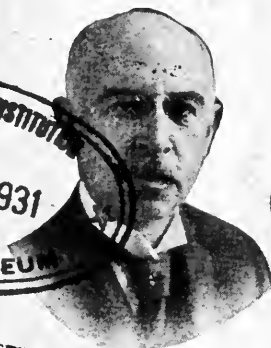
P. P. CALVERT.

MAY, 1931

# ENTOMOLOGICAL NEWS

Vol. XLII

No. 5



HENRY SKINNER  
1861-1926



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**TO CONTRIBUTORS.** All contributions will be considered and passed upon at our earliest convenience and, as far as may be, will be published according to date of reception. The receipt of all papers will be acknowledged. Owing to the limited size of each number of the NEWS, articles longer than six printed pages will be published in two or more installments, unless the author be willing to pay for the cost of a sufficient number of additional pages in any one issue to enable such an article to appear without division.

Proof will be sent to authors. Twenty-five "extras" of an author's contribution, without change in form and without covers, will be given free when they are wanted; if more than twenty-five copies are desired *this should be stated on the MS.*

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 American Entomological Society will be held at 7.30 o'clock P. M., on the fourth Thursday of each month, excepting June, July, August, November and December, and on the third Thursday of November and December.

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.





METATHETELOUS LARVA OF TELEA POLYPHEMUS.—Dawson.



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No. 5

## **Report of Two Cases of Metathetely in Polyphemus Larvae (*Telea polyphemus* Cramer) (Lepid. : Saturniidae).**

By R. W. DAWSON, Department of Zoology, University of Minnesota.

(Plate III.)

The following observations were made incidentally during the progress of an experimental study of the ecological responses of the polyphemus moth to the climatic phase of its environment.<sup>1</sup> Fifty-five eggs from a mating of Nebraska stock were incubated at 25° C. and the emerging larvae reared on a progressively declining temperature scale, following the series of mean normal temperatures characteristic of the climate at Lincoln, Nebraska from late July to middle September. This temperature progression follows:

25.0° C. for 11 days	(incubation of eggs)	19.4° C. for 3 days
23.3° C. for 4 days		18.8° C. for 3 days
22.7° C. for 5 days		18.3° C. for 3 days
22.2° C. for 4 days		17.7° C. for 3 days
21.6° C. for 3 days		17.2° C. for 3 days
21.1° C. for 3 days		16.6° C. for 3 days
20.5° C. for 3 days		16.2° C. for 3 days
20.0° C. for 3 days		

The object of the experiment was to induce dormancy in the first cycle, comparable to that occurring in the second at the close of the growing season. The treatment did not induce dormancy, but was possibly the cause for two cases of "metathetely", or partially arrested metamorphosis appearing among the larvae. At least one would suspect a causal connection with the descending temperature, since such cases are not common among lepidopterous larvae, and were not otherwise noted among the hundreds of polyphemus larvae reared in the general experiments, nor among the 148 other larvae reared to maturity from the same mating.

<sup>1</sup> Journal of Experimental Zoology, Feb., 1931.

The two larvae under consideration attained full size, and instead of evacuating the digestive tract and then spinning, as is the normal procedure, "sat up" to molt, but without first spinning the necessary and characteristic silken carpet employed in detaching the skin. In both cases molting occurred on the fourth day, and was accomplished with difficulty, and only then through supplementary aid. The chief obstruction to casting the skin was the adhesion of the tracheal lining which in some tubes could not be dislodged. The head capsule and mouth parts assumed large dimensions appropriate for a sixth and monstrous instar. The antennae were greatly distended with fluid, and the thoracic legs somewhat so, which rendered them useless. The prolegs lost their microscopic, prehensile hooks, and also became useless. The larvae became very weak and flaccid, and lost all impulses either to feed or crawl, lying quietly on their sides like prepupae. Small amounts of fluid faeces were passed, and after four or five days of progressive decline death occurred. The accompanying life-sized photograph conveys a good impression of the strange condition of these unfortunate larvae.

Comparable phenomena occurring in the confused flour beetle, *Tribolium confusum* Duval, and a review of the literature relating to the subject of metathetely are given by Royal N. Chapman in the *Journal of Experimental Zoology*, 45, pp. 293-299, 1926.

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### **A List of the Existing Entomological Societies in the United States and Canada.**

In the NEWS for July, 1930, page 218, appeared a note from Dr. L. O. Howard suggesting our publishing a list of these societies with an indication of their membership. Endorsing this suggestion, we requested data from the secretaries of all such associations. Following is the result. Some responses have been so much delayed that the information here presented is not all of the same date. Errors may, however lead to corrections from the organizations listed and such will be published as promptly as possible after receipt. Use has also been

made of the "Bulletin of the National Research Council, May 1930, Number 76. Handbook of Scientific and Technical Societies and Institutions of the United States and Canada. Second edition." The societies are listed in chronological order according to date of foundation.

Entomological Society of Philadelphia, founded February 22, 1859, name changed to THE AMERICAN ENTOMOLOGICAL SOCIETY, February 23, 1867. Address 1900 Race Street, Philadelphia, Pennsylvania. President, Roswell C. Williams, Jr.; Recording Secretary, Dr. R. G. Schmieder; Corresponding Secretary, J. A. G. Rehn. Resident members 61, Corresponding members 56, Honorary member 1. Current publications: *Transactions* since 1868, *Entomological News* since 1890. A history of the Society, by E. T. Cresson, was published separately by the Society in 1909.

ENTOMOLOGICAL SOCIETY OF ONTARIO, founded April 16, 1863. Address Ontario Agricultural College, Guelph, Ontario, Canada. President, Dr. J. D. Detwiler; Secretary, R. H. Ozburn. Active members 145, Honorary members 5. Current publications: *Annual Report* since 1870, *Canadian Entomologist* since 1868.

BROOKLYN ENTOMOLOGICAL SOCIETY, founded 1872. Address c/o Brooklyn Museum, Eastern Parkway, Brooklyn, New York. President, W. T. Davis; Secretary, Ernest L. Bell. Active members 58, Life members 3, Honorary members 5. Current publications: *Bulletin* (new series) since 1912, *Entomologica Americana* (new series) since 1926. Mr. George P. Engelhardt published a paper "Brooklyn and New York Entomological Societies, Past and Present" in *Annals of The Entomological Society of America*, volume xxii, number 3, pages 392-400, September 1929.

MONTREAL BRANCH, ENTOMOLOGICAL SOCIETY OF ONTARIO, founded October 16, 1873. Address Lyman Room, Redpath Museum, McGill University, Montreal, Canada. President, George A. Moore; Secretary, John W. Buckle. Active members 18, Honorary members 0.

CAMBRIDGE ENTOMOLOGICAL CLUB, founded January 7, 1874. Address Museum of Comparative Zoology, Cambridge, Massachusetts. President, C. A. Frost; Secretary, P. J. Darlington, Jr. Active or resident members 90, Corresponding members 0, Honorary life members 2. Current publications: *Psyche* since 1874.

ENTOMOLOGICAL SOCIETY OF WASHINGTON, founded February 29, 1884. Address 1729 New York Avenue, Washington,

D. C. President, A. C. Baker; Recording Secretary, J. S. Wade; Corresponding Secretary, S. A. Rohwer. Active members 186, Honorary members 0. Current publication: *Proceedings* since 1884.

AMERICAN ASSOCIATION OF ECONOMIC ENTOMOLOGISTS, organized 1889 as the Association of Official Economic Entomologists. Address Melrose Highlands, Massachusetts. President, J. S. Houser; Secretary, A. F. Burgess. Active members 602, Associate members 550, Foreign members 52, Life members 6. Current publication: *Journal of Economic Entomology* since 1908.

THE NEW YORK ENTOMOLOGICAL SOCIETY, founded June 29, 1892. Address c/o American Museum of Natural History, 77th Street and Central Park West, New York, N. Y. President, Andrew J. Mutchler; Secretary Miss Elizabeth Sherman. Active members 130, Corresponding members 0, Honorary members 1. Current publication: *Journal* since 1893. A history of the Society from 1893 to 1918 by Charles W. Leng was published in the *Journal*, xxvi, pages 129-133. See also under Brooklyn Entomological Society above.

JUGATAE, Graduate Students' Seminar in Entomology, founded February 26, 1897. Address Cornell University, Ithaca, New York. Chairman, Alexander B. Klots. Active members 65, Corresponding members 0, Honorary members 0.

PACIFIC COAST ENTOMOLOGICAL SOCIETY, founded August 7, 1901, as the California Entomological Club. President, E. C. Van Dyke; Secretary, J. O. Martin, 2617 Derby St., Berkeley, California. Active members 80, Honorary members 5. Current publications: *Proceedings* since 1901, *Pan-Pacific Entomologist* since 1924.

ENTOMOLOGICAL SOCIETY OF BRITISH COLUMBIA, founded 1901, reorganized 1903. Address Agassiz, British Columbia. President, J. W. Winson; Secretary, R. Glendenning. Active members 35, Corresponding members 0, Honorary members 0. Current publication: *Proceedings* since 1911, *Quarterly Bulletin* since 1908.

HAWAIIAN ENTOMOLOGICAL SOCIETY, founded December 15, 1904. Address Experiment Station, Hawaiian Sugar Planters Association, Honolulu, Hawaii. Active members 20, Corresponding members 5, Honorary members 2. Current publication: *Proceedings* since 1905.

ST. LOUIS ENTOMOLOGICAL CLUB, founded April 16, 1904. Secretary, Hermann Schwarz, 720 Clark Ave., Webster Groves, Missouri. Active members 8, Corresponding members 0, Honorary members 0.

THE ENTOMOLOGICAL SOCIETY OF AMERICA, founded 1906. Address c/o Secretary, Purdue University, Lafayette, Indiana. President, Dr. Edith M. Patch; Secretary, J. J. Davis. Active members 814, Fellows 100, Honorary fellows 4. Current publication: *Annals* since 1908.

LORQUIN ENTOMOLOGICAL SOCIETY, founded 1913, as the Lorquin Natural History Club. Address Los Angeles Museum, Exposition Park, Los Angeles, California. President, Dr. John A. Comstock; Secretary, John Garth. Active members 60, Corresponding members 0, Honorary members 12.

FLORIDA ENTOMOLOGICAL SOCIETY, founded January 5, 1916. Address Florida Agricultural Experiment Station, University of Florida Campus, Gainesville, Florida. President, C. F. Byers; Secretary, W. L. Ziegler. Resident members 30, Non-resident members 75, Honorary members 5. Current publication: *The Florida Entomologist* since 1917.

POPENOE ENTOMOLOGICAL CLUB, founded 1923. Address Kansas State Agricultural College, Manhattan, Kansas. President, P. G. Lamerson; Secretary, H. L. Caler. Active members 25, Corresponding members 0, Honorary members 0.

KANSAS ENTOMOLOGICAL SOCIETY, founded April 9, 1925. Address Kansas State Agricultural College, Manhattan, Kansas. President, George A. Dean; Secretary, Dr. R. L. Parker. Active members 51, Corresponding members 67, Honorary members 0. Current publication: *Journal* since 1928.

ENTOMOLOGICAL CLUB OF SOUTHERN CALIFORNIA, founded September 17, 1926. President, R. S. Woglum; Secretary, H. M. Armitage, 330 North Broadway, Los Angeles, California. Active members 250, Corresponding members 0, Honorary members 0.

CLEVELAND ENTOMOLOGICAL SOCIETY, founded 1927. Address Cleveland Museum of Natural History, Cleveland, Ohio. President, Henry Wormsbacher; Secretary John C. Pallister. Active members 22, Corresponding members 0, Honorary members 0.

TEXAS ENTOMOLOGICAL SOCIETY, founded 1928. President, S. W. Bilsing; Secretary, Dr. M. A. Stewart, The Rice Institute, Houston, Texas. Members 75 (from *Science* for March 20, 1931, page 310).

ENTOMOLOGICAL CLUB AT THE UNIVERSITY OF KANSAS. Address Lawrence, Kansas. President, Lauren D. Anderson; Secretary, Bonnie LaMaster. Active members 26, Corresponding members 0, Honorary members 0.

The totals of this List are Societies, etc., 22, and of members :

active (resident) 2851, non-resident 75, corresponding 128, honorary 42, life 9, associate 550, foreign 52, fellows 100. The names applied to the classes of members have different meanings in different societies. There are many duplications in the totals of membership; thus a large number of those persons enrolled in the two national societies (American Association of Economic Entomologists, Entomological Society of America) are members of both of these societies and are also members of one or more of the local societies.

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### **A Claim for Priority in Dividing Pterygotan Insects into Two Sections on the Basis of the Position of the Wings in Repose, with Remarks on the Relationships of the Insect Orders.**

By G. C. CRAMPTON, Ph.D., Massachusetts State College, Amherst, Mass.

Recently, entomologists such as Bradley, 1931 (*Laboratory Guide to the Study of the Wings of Insects\**), Tillyard, and others, have begun to stress the importance of separating winged insects into two divisions on the basis of the method of holding their wings outstretched or folding them along the top of the abdomen in repose (*i.e.*, the division into Archipterygota and Neopterygota). Most surprisingly, however, these entomologists, who are trained taxonomists meticulously careful to give exact chronological preference to the first description of a species or similar taxonomic group (even going to

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[\*Dr. Bradley has written to the Editor of the NEWS as follows: "In the wing venation guide which I have recently published, I inadvertently credited Martynov with division of the Pterygota into two groups on the basis of whether the wings were folded or not. Crampton subsequently called my attention in a letter to the fact that he had made that division before Martynov, and had used the terms Archipterygota and Neopterygota. I have therefore made this change in a correction sheet for my wing guide . . . and have also called attention to the fact that Crampton was the first to so divide the Pterygota. I would be very pleased if you would insert an editorial footnote to [that] effect . . . as I should not like to have people feel that I had intentionally refused to recognize Crampton's work." The Editor is glad to add this to Dr. Crampton's paper.]

such extremes as to give page preference, etc., where two descriptions occur in the same publication), nevertheless, insist upon accrediting the first division of insects on the basis of the position of the wings to Martynov, 1924, whose divisions "Palaeoptera" and "Neoptera" were not published until several months after the actual first publication of such a division, on exactly the same basis, made by me, and despite the fact that Martynov's terms, such as the designation "Palaeoptera", had already been used by me five years before (in 1915) to designate a group of ordinal rank, including the Blattids, which do not hold the wings outstretched in repose, and therefore could not be placed in Martynov's group "Palaeoptera".

In the *June*, 1924, issue of the Journal of Entomology and Zoology, Vol. 16, No. 2, p. 33, the first published proposal to divide the Pterygota into two divisions (the Archipterygota and Neopterygota) on the basis of the position of the wings in repose, was made by me, and it was not until months later, in the *fall* of 1924 that Martynov's paper appeared in the *Revue Russe d'Entomologie*, Vol. 18, p. 145, in which he proposed to group winged insects into the "Palaeoptera" and "Neoptera" on exactly the same basis—namely, the method of holding the wings in repose. The Journal of Entomology and Zoology is a publication of recognized standing and has a wide circulation, and since its June issue preceded the fall issue of the *Revue Russe d'Entomologie* by several months, there can be no question as to which article has priority of publication. Furthermore, Martynov's term "Palaeoptera" is preoccupied, having been applied by me to the order to which the Blattids belong, in a paper published in Vol. 26 of the ENTOMOLOGICAL NEWS for October, 1915, p. 249, so that this name was used for a group of insects which could not possibly be included in Martynov's division "Palaeoptera", and was published nine years before the paper by Martynov, 1924. It may also be remarked in passing, that it is undesirable to apply designations ending in "ptera" to groups other than those of ordinal and superordinal rank, so that the designations "Palaeoptera" and "Neoptera" for the two divisions of the Pterygota are not

so appropriate as the designations Archipterygota and Neopterygota which Martynov has attempted to supplant with his own designations, but on the basis of priority, availability, and appropriateness the terms Archipterygota and Neopterygota clearly have precedence, and even if this were not so, Martynov's term "Palaeoptera" would have to fall as a synonym, having been preoccupied by me in 1915.

While the first actual division of the Pterygota into two divisions (the Archipterygota and Neopterygota) on the basis of the position of the wings in repose was published in the June, 1924, issue of the Journal of Entomology and Zoology, this was by no means the first mention of the fact that insects which hold the wings outstretched in repose form a group of closely related insects, as the following quotation from page 116, Vol. 27, No. 5, of *Psyche*, for 1920, will show . . . "As was pointed out in the August, 1919, issue of the Transactions of the Entomological Society of London (p. 93), the Ephemera, Odonata, and certain Palaeodictyoptera form a group characterized by their inability to fold their wings flat along the top of the abdomen, and in an article in the May, 1920, issue of the Proceedings of the Entomological Society of Washington (Vol. 22, p. 98) these insects, together with their immediate relatives (*i.e.*, the Protephemerida, Ephemera, Protodonata, Odonata, certain of the Palaeodictyoptera, etc.), were grouped in an ancestral superorder of insects . . ." The foregoing verbatim quotation from a publication appearing four years before Martynov's paper, will clearly prove that I had long considered that the insects which hold the wings outstretched in repose form a natural group (and likewise cited the chief representatives of this group), but it was not until the June, 1924, issue of the Journal of Entomology and Zoology, that an actual division of the Pterygota into two clear cut divisions was made by me or by anyone else.

Martynov, 1924, has inserted so many different dates at various points in his article (a translation of which is given by F. M. Carpenter, in the September, 1920, issue of *Psyche*, Vol. 37, p. 245) that the reader may get the false impression that



some of these various dates refer to installments of the 1924 paper published at various times; but, by referring to the original article, one may readily see that the first report (dated 1922, although it was not published until the 1924 article) and the date of handing the manuscript to the press in 1923, together with the postscript added before the whole was published in the fall of 1924, were all published at the same time, under a single title, in the fall of 1924 (*l.c.*) months after the publication of the article by me in the June, 1924, issue of the *Journal of Entomology and Zoology*.

Discrepancies between the dates inserted and the statements made in the text itself, make it impossible to determine what was in the original manuscript, and what was later inserted before the publication of the whole paper in 1924. Thus, Professor Martynov states on page 168 of his paper in the *Revue Russe d'Entomologie* for 1924 (or on page 275 of the 1930 translation by Carpenter), that he was still collecting material in October, 1923, to be used in the preparation of his paper, while in a footnote on page 145 of the original article in Russian (or on page 245 of the 1930 translation by Carpenter) appears the statement that the completed manuscript was in press six months before this, in May, 1923, and to clinch the matter the date May, 1923, was again inserted at the end of the discussion as a "finis" on page 170 of the Russian paper (or on page 278 of the 1930 translation), although it is difficult to understand how one could still be collecting material to work in October and include his findings in a manuscript already in the hands of the publisher six months before in May. Discrepancies of this kind make the inserted dates absolutely meaningless for determining what was in the original manuscript and what was later added before the whole article, together with the postscript added in the fall of 1924, was published later in the fall of 1924. At any rate, the actual date of publication, not the dates inserted by the writer, is what determines priority in such matters, and the fact remains that the statements published in this article, including its various inserted dates, were not made till later in the fall of 1924, while in the

previous June of that year, the same division of the Pterygota into two divisions based upon the method of holding the wings in repose, had already been published by me, thus clearly establishing published priority, which is all that counts in such matters, and Martynov's terms "Palaeoptera" and "Neoptera" cannot possibly have precedence over the earlier terms Archipterygota and Neopterygota, for exactly the same insects divided upon exactly the same basis.

On page 224 of the Canadian Entomologist for October, 1922, I had already pointed out that ". . . it would be impossible to derive such a type as the Homopterous wing shown (in the figures) from that of *Eugereon* which is supposed to represent the type ancestral to the Homoptera and Hemiptera, so that it is much more probable that the ancestors of the Homoptera and Hemiptera were very like the common Protorthopteron-Protoblattid stem. . . . *Eugereon*, however, is more like the Palaeodictyoptera and it possibly may be regarded as a specialized Palaeodictyopteron", and on page 222 of the same paper published in 1922, the Hemipterous insects were correctly placed in the group containing the Psocids, Mallophaga, Pediculids, Thysanoptera, Heteroptera and Homoptera. Furthermore, in the June, 1924, issue of the Journal of Entomology and Zoology, published five months before the paper by Martynov, 1924, I definitely separated *Eugereon* from the Hemiptera because *Eugereon* held its wings outstretched in repose, and placed the Hemiptera in the division Neopterygota, because they lay their wings along the abdomen in repose. Martynov, 1924, is therefore mistaken in supposing that he was the first to call attention to the distinct grouping of *Eugereon* and the Hemiptera, and he did not even indicate the correct position of the Hemiptera within the group of insects including the Psocids, Mallophaga, Pediculids, Thysanoptera, etc. The conclusive reasons for separating the Hemiptera from such forms as *Eugereon*, however, were not given in detail by anyone so far as I am aware, before the detailed comparison given in the February, 1927, issue of the Bulletin of the Brooklyn Entomological Society, Vol. 22, p. 1.

In a footnote on page 169, Martynov, 1924 (*l.c.*) accredits Lameere, 1917, with being the first to indicate that the Plecoptera are Orthopteroids. Martynov does not include Lameere in his list of references, but he evidently refers to a casual statement by Lameere, 1917, on page 103 of the Bulletin de la Societe entomologique de France, Seance du 28 fevrier 1917, which may be translated as follows: "The Perlids are Orthoptera with aquatic larvae very distinct from those of the Subulicornes; (while) on the contrary, the larvae of the Ephemerids and Libellulids are not fundamentally different." Two years before this, however, on page 346 of the October issue of the ENTOMOLOGICAL NEWS for 1915, I had already pointed out that "The insects which group themselves about the Plecopteron center constitute a second supersection . . . and all are the descendants of very similar ancestors. Here belong the following orders: Plecoptera, Embiid-like insects, Dermaptera, Grylloblattid-like forms, Zoraptera, Isoptera, Phasmid-like forms, Phyllium-like forms, grasshopper-like forms, Orthoptera and others." The only evidence cited in this paper for assigning the Plecoptera to this Orthopteroid group, however, is the statement that immature Dermaptera such as *Dyscritina*, *Karschiella*, *Bormansia*, etc., have cerci like those of the Plecoptera, so that this reference to the position of the Plecoptera among the Orthopteroids is fully as casual as Lameere's brief statement published two years later. On page 408 of the November issue of the ENTOMOLOGICAL NEWS for 1917, however, very definite reasons for grouping the Embiids, Forficulids and Plecoptera in a single superorder, the Panplecoptera, were given, including the nature of the lateral cervical sclerites which are figured in detail, the ring-like mesothoracic coxae, typically trimerous tarsi, absence of ovipositor and styli, etc.; and this is probably the first citation of definite features of value for determining that the Plecoptera are the closest to the Orthopteroid Embiids of all insects, although a further detailed comparison of the dorsal region of the meso- and meta-thorax (and the wing bases) of the Embiids and Plecoptera is given in the February, 1918, issue of Psyche, Vol. 25, p. 5,

and the wings of the Embiids and Plecoptera are compared on page 214 of the September, 1922, issue of the Canadian Entomologist (Vol. 54), with a view to demonstrating that the closest relatives of the Plecoptera are the Orthopteroid Embiids, and all of these long precede the casual statement by Martynov, 1924, that the Plecoptera should be included in an Orthopteroid superorder for which he proposes the designation "Orthopteroidea".

In closing, it may be mentioned that the comparison between the Hymenoptera and the rest of the Holometabola, on the one hand, and the Hemipteroid Psocids on the other, as given on page 226 of the October, 1922, issue of the Canadian Entomologist, brings out many reasons for concluding that the Holometabola and the Psocids, etc., were descended from a common Protorthopteroid ancestry; and the adumbrations of the Hymenopterous venation suggested by comparing Figs. 65 and 66 (which was the first suggestion for a revision of the then prevalent interpretation of the homologies of the wing veins of the Hymenoptera) may possibly indicate a more correct interpretation of the Hymenopterous venation than some of those later proposed. In fact, Dr. F. M. Carpenter has recently pointed out that the so-called "Protohymenoptera," supposedly ancestral to the Hymenoptera, are, in reality, merely Megasecopterous insects having nothing to do with the ancestral Hymenoptera, and interpretations of the Hymenopterous venations based upon a comparison with the unrelated Megasecoptera are founded upon too insecure a basis. What makes the matter still more complicated, is that Dr. Tillyard mistook the lower for the upper surface of these wings, and overlooked the subcostal vein which is the key vein for tracing the convex and concave veins in insects, so that his comparison of the venation of the Hymenoptera with that of the Megasecopterous "Protohymenoptera" is thrown completely off by this fact, and the true interpretation of the Hymenopterous venation may eventually turn out to be more nearly like that suggested by the comparison of Figs. 65 and 66 in the above-mentioned article, in the Canadian Entomologist for October, 1922!

## The Predatory Enemies of Elateridae (Coleoptera).<sup>1</sup>

By C. A. THOMAS, Pennsylvania State College.

In a recent paper<sup>2</sup> the writer discussed the few recorded examples of the parasites of wireworms. The present paper records the predators known to feed upon the various stages of these insects. It is evident that predators are more important in the natural control of the *Elateridae* than either parasites or diseases.

### ACARINA.

Mites have been included among the predatory enemies of Elateridae, although in most instances it is probable that those found upon wireworms are not there primarily to feed upon them. Mite hypopi (Tyroglyphidae) are frequently found closely grouped upon the abdominal segments of wireworms, especially the ninth segment, often so tightly attached as to be unaffected by the larva's movements through the soil. In such instances the larva usually seemed to be entirely unaffected by the hypopi, and fed and molted as usual. In a few instances, however, when the mites become common upon the thorax and head, and cover the spiracles, the wireworm may be weakened by its load. Mites upon wireworms are not at all uncommon under artificial rearing conditions, but are less frequently found in the field. The records of mites found on wireworms are as follows:

Family TROMBIDIDAE: *Leptus phalangii* (*Acarus phalangii* of DeGeer) fed on juices of adult *Elater ruficaudis*, according to Curtis (1845).

Family PARASITIDAE: Fisher (1889) noted a gamasid mite (*Parasitus*) attached to the body of an *Alaus oculatus* adult.

Family UROPODIDAE: Curtis (1845) stated that *Uropoda umbilica* attached itself to the elytra of *Elater obscurus*.

Family TYROGLYPHIDAE: Tyroglyphid hypopi are sometimes found upon wireworms, and if these wireworms die from disease or other causes, the hypopi may develop into the nymphal

<sup>1</sup> Publication authorized by the Director of the Pennsylvania Agricultural Experiment Station as Technical Paper No. 519.

<sup>2</sup> "Parasites of Wireworms," ENT. NEWS, XL, 287-293, Nov., 1929

and adult mites and may then feed upon the dead larvae. Those who have noted the occurrence of Tyroglyphids upon wireworms are: Hyslop (1915), on wireworms in his rearing cages; Conradi and Eagerton (1914), who found that *Horistonotus uhleri* Horn larvae became infested with *Rhizoglyphus phylloxerae* Riley, but none of these wireworms matured; Pergande (1882), who found Tyroglyphid hypopi on *Melanotus communis* Gyll. larvae; Masaitas (1929), frequently found *Sclatosomus* larvae parasitized by Tyroglyphids in Russia, as high as 33% in the field in 1926; he thought that these mites punctured the skin of the wireworm.

#### PSEUDOSCORPIONIDA.

Leidy (1877) recorded *Chclifer alaus* as parasitizing adults of *Alaus oculus*.

#### ARANEAE.

Many spiders depend largely on what comes to their webs, so that the occurrence of an occasional entangled click beetle is not important. However, Eagerton (1914) reported a small field spider, *Pencetia viridans* Htz. as quite an important enemy of the adults of *Monocrepidius vespertinus* (Fab.) and occasionally of *Horistonotus uhleri*. This spider frequents the upper portion of tasseling corn. Hawkins<sup>3</sup>, of the Maine Experiment Station, found an unidentified small grayish spider consuming adults of *Agriotes mancus* Say.

#### INSECTA: HEMIPTERA.

Conradi and Eagerton (1914), and Eagerton (1914), found *Apiomerus crassipes* Fab. (Family Reduviidae) catching adults of *Monocrepidius vespertinus*, and suspected this and several other hemipterous insects of preying on adults of *Horistonotus uhleri*.

#### COLEOPTERA.

The members of this order rank second only to birds as predatory enemies of wireworms. Nearly all of the coleoptera feeding on Elateridae belong to the family Carabidae, as shown by the following records. Carabid larvae are subterranean and adapted for feeding on soil insects.

Family CICINDELIDAE: *Cicindela rufiventris* Fab.—ate *Horistonotus uhleri* adults—Conradi and Eagerton (1914).

<sup>3</sup> Correspondence.

Family CARABIDÆ: *Steropus* (*Carabus*) *madidus* Fab.—ate wireworms—Curtis (1845).

*Calosoma cancellatum* Esch. adults—ate *Limonius californicus* Mannh. adults—Graf (1914). *C. semilacæe* Lec.—adults ate *Limonius californicus* Mannh. adults—Graf (1914).

*Nebria brevicollis*—ate wireworms—Ford (1917).

*Scarites* sp.—introduced into Hawaii from Brazil—Swezey (1924). *S. subterraneus* Fab.—ate *Pheletes agonus* Say larvae—Writer.

*Pterostichus madidus*—ate wireworms—Ford (1917). *P.* sp.—ate wireworms—Masaitas (1929).

*Pocillus lucublandis* Say—ate wireworms—Hawkins, Maine (1929 correspondence).

*Ophonus* (*Pardilcus*) *calceatus* Duft.—ate wireworms—Masaitas (1929).

*Broscus cephalotes* L.—ate *Limonius pilosus* Lev. and *Agriotes lineatus* L.—Vassiliev (1913, 1914).

In recent correspondence, Headlee stated that a heavy infestation of wireworms occurring in the fall in New Jersey was apparently much reduced by Carabid larvae, so that by the next spring the wireworms had practically disappeared and a tremendous number of undetermined Carabid larvae was found in their place. Whether these Carabids actually killed off the wireworms is not definitely known, but Headlee believed that they had much to do with the disappearance of the latter. Strickland of Alberta, Canada, also said that adult Carabids were the most important insect enemies of wireworms. He believed, however, that the larvae of these Carabids are only of secondary importance, and that they frequently are devoured by wireworms with which they are confined.

Family STAPHYLINIDÆ. Hawkins, Maine, in 1929 correspondence, stated that he found *Staphylinus badipes* Lec. eating adults of *Agriotes mancus*.

Family ELATERIDÆ. A number of elaterid larvae are predacious and cannibalistic. Conradi and Egerton (1914) noted that pupae and soft molting larvae of *Horistonotus uhleri* were destroyed by larvae of *Monocrepidius vespertinus*. They also destroy each other when crowded together. Umnov (1913) observed cannibalism among *Agriotes* larvae, while the writer has frequently found larvae of *Monocrepidius lividus* DeG. and *Alaus oculatus* feeding on other wireworms, especially in ex-

perimental cages. Other elaterid genera which contain precocious larva are *Agryphus*, *Adlocera*, *Chalcolepidius*, *Hemirhipus*, *Melanotus*, *Pyrophorus* and probably some others. It is not known, however, how much good these wireworms actually do in the field.

#### DIPTERA.

Only four records of diptera feeding on Elaterids have been found. The flies concerned are members of the families Asilidae and Therevidae. Kirby and Spence (1846) noted an *Asilus* adult caught with an elaterid beetle in its clutches, while Eagerton (1914) found a robber fly, *Proctacanthus brevipennis* Wied. catching adults of *Monocrepidius vespertinus*. Conradi and Eagerton (1914) stated that the same species killed males of *Horistonotus uhleri* in South Carolina.

Of the THEREVIDAE, Hyslop (1910) found *Thereva cgressa* Coq. larvae feeding on wireworms at Pullman, Washington. Larvae of *Psilocephala aldrichi* Coq. and *P. munda* Coq. were also associated with these wireworms, although not actually seen feeding on them. Conradi and Eagerton (1914) noted a larva, probably *P. pictipennis* Wied. (= *Epomyia pictipennis* Wied.) eating a *Horistonotus uhleri* larva in the field.

#### HYMENOPTERA.

Ants occasionally devour weak or dead click beetles found on the ground. Kirby and Spence (1846) told of several ants dragging an Elaterid. Horton (1918) stated that the adult of *Limonius subauratus* Lec., which feeds on citrus scale excretions, is fearless of the Argentine ant, which attacks other insects.

(To be continued).

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#### A Correction (Hemip.: Aphididae).

An error in my article on Typha Insects in the February NEWS has been called to my attention. *Thripsaphis ballii* Gill. recorded on page 37 of that issue is an Hemipteron and does not belong under Thysanoptera as listed. This species was arranged in the wrong group at Washington and came to me, as listed, in a letter.—ARTHUR C. COLE, Jr., Department of Zoology and Entomology, the Ohio State University, Columbus.



### A New Experience (Coleop.: Cicindelidae).

On February 22, 1931, I took a stroll along the tracks of the Chicago, Milwaukee, St. Paul and Pacific Railway, leading northwest out of this city. Turning over stones, bits of wood and other débris lying on the railway embankment, I was indeed surprised to find a specimen of *Cicindela purpurca* under a brick that lay on the surface of a sandy spot on otherwise bare soil. I have collected insects here about Beaver Dam more or less regularly since 1888, my favorite collecting being under débris and bark in early spring, but never before have I found a hibernating tiger beetle. On being taken into a warm room the tiger immediately showed life. As a lad living in Fayette County, Illinois, I often found Cicindelas hibernating in or under rotten logs and stumps, but this is my first experience in finding one in Wisconsin.

W. E. SNYDER, Beaver Dam, Wisconsin.

## Entomological Literature

COMPILED BY LAURA S. MACKEY UNDER THE SUPERVISION OF  
E. T. CRESSON, JR.

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 within brackets [ ] refer to the journals, as numbered in the list of Periodicals and Serials published in the January and June numbers (or which may be secured from the publisher of Entomological News for 10c), in which the paper appeared. The number of, or annual volume, and in some cases the part, heft, &c. the latter within ( ) follows; then the pagination follows the colon :

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

\*Papers containing new forms or names have an \* preceding the author's name.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

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.

☞ Note the change in the method of citing the bibliographical references, as explained above.

Papers published in the Entomological News are not listed.

**GENERAL.**—Bijok, J.—Winterarbeit einer entomologischen schülergemeinschaft. [14] 44: 326-329, ill. **Breaky, E. P.**—Additional notes on the natural enemies of the iris borer, *Macronoctua onusta*. [7] 24: 40-44. **Emerton, J. H.**—Obituary. By N. Criddle. [Canadian Field Nat.] 45: 90. **Hopping, R.**—Two very common mistakes of entomological writers. [4] 63: 72-73. **Lutz, F. E.**—In defense of

insects. [76] 1931: 367-369. **Rowell, L. S.**—Preparation of bee slides. [68] 73: 320. **Stiles, C. W.**—Is an international zoological nomenclature practicable? [68] 73: 349-354. **Wheeler, W. M.**—Award of the Leidy medal of the Academy of Natural Sciences of Philadelphia to Dr. W. M. Wheeler. [68] 73: 308. **Wucherpfennig, F.**—Amazonas-sammelreise 1930-31. [17] 48: 59-61, ill., cont. \***Zerny, H.**—Ergebnisse einer zoologischen sammelreise nach Brasilien, insbesondere in das Amazonasgebiet. [An. Nat. Mus. Wien] 44. III. Diptera: Dolichopodidae. Par O. Parent. 5-26. IV. Mantodea. Von M. Beier. 27-32, ill. V. Micro-Lepidoptera. By E. Meyrick. 223-268, ill. VI. Lepidoptera: Megalopygidae. Von W. Hopp. 269-277, ill.

**ANATOMY, PHYSIOLOGY, ETC.**—**Allard, H. A.**—The photoperiodism of the firefly *Photinus pyralis*; its relation to the evening twilight and other conditions. [10] 33: 49-58, ill. **Andrews, E. A.**—Honeydew reflexes. [Physiol. Zool.] 3: 467-484. **Gerould, J. H.**—Premature reversal of heart beat in *Bombyx*. [68] 73: 323-325. **Gray, J.**—The post-embryological development of the digestive system in *Homaledra sabalella*. [7] 24: 45-107, ill. **Gresson, R. A. R.**—Yolk-formation in *Periplaneta orientalis*. [53] 74: 257-274, ill. **Henson, H.**—The structure and post-embryonic development of *Vanessa urticae* (Lepidoptera). [53] 74: 321-360, ill. **Hickman, J. R.**—Respiration of the Haliplidae. [Pap. Michigan Acad. Sci. Arts & Letters] 13: 277-289, ill. **Ripper, W.**—Versuch einer kritik der homologiefrage der arthropodentracheen. [94] 138: 303-369, ill. **Robertson, W. R. B.**—Hybrid vigor—a factor in tettigid parthenogenesis? [90] 65: 165-172. **Sikes & Wigglesworth.**—The hatching of insects from the egg, and the appearance of air in the tracheal system. [53] 74: 165-192, ill. **Smith, F. F.**—A further comment on the "Pumping" habit of plant lice. [68] 73: 364. **Stanley, J.**—Studies on the musculatory system and mouth parts of *Laelaps echidninus*. [7] 24: 12pp., ill. **Swingle, M. C.**—Notes on digestion in seven species of insects. [7] 24: 177-180. **Wigglesworth, V. B.**—Effect of desiccation on the bed bug (*Cimex lectularius*). [31] 127: 307-308, ill. **Wigglesworth, V. P.**—Digestion in *Chrysops silacea* (Tabanidae). [Parasitology] 23: 73-76.

**ARACHNIDA AND MYRIOPODA.**—\***Beier, M.**—Die Pseudoskorpione des Wiener Naturhistorischen Museums. [An. Nat. Mus. Wien] 44: 199-222, ill. (S).

**THE SMALLER ORDERS OF INSECTS.**—\***Calvert, P. P.**—The generic characters and the species of *Palaeonema* (Agrionidae). [1] 57: 110pp., ill. (S). **Lestage, J. A.**—Contribution à l'étude des Ephéméroptères. VIII. Les Ephéméroptères du Chili. [33] 71: 41-60, ill. \***McDunnough, J.**—The bicolor group of the genus *Ephemerella* with particular reference to the nymphal stages (Ephemeroptera). [4] 63: 30-42; 61-68, ill. **Mills, H. B.**—New Nearctic *Collembola*. [40] 464: 11pp., ill. **Nichols, E. R.**—"An attempt to classify species of termites from mandibles of workers and nymphs". [13] 23: 18pp., ill.

**ORTHOPTERA.**—\***Beier, M.**—(See **Zerny**, under General). \***Chopard, L.**—Sur une espèce nouvelle du genre *Eneoptera* confondue avec l'*E. surinamensis* [Gryllidae]. (S). [25] 1931: 14-16, ill. **Hebard, M.**—The Orthoptera of Alberta. [Proc. Acad. Nat. Sci. Phila.] 82: 377-403, ill. **Hebard, M.**—Studies in Lower Californian Orthoptera. (S). [1] 57: 113-127, ill. \***Karny, H. H.**—Revision der Gryllacriden des Naturhistorischen Museums in Wien einschliesslich der collection Brunnner v. Wattenwyl. [An. Nat. Mus. Wien] 44: 45-198, ill. (S).

**HEMIPTERA.**—**Jaczewski, T.**—The male of *Mesoveleia williamsi*. Further notes on the American species of *Mesoveleia*. (Heteroptera). [10] 33: 64-65; 65-66, ill. \***Lallemand, V.**—Quelques espèces et variétés nouvelles de *Cercopides* exotiques des collections du Musée Zoologique de Hamburg. (S). [Folia Zool. et Hydrobiol., Riga] 2: 164-169. \***Melin, D.**—Hemiptera from South and Central America. II. (Contributions to a revision of the genus *Phymata*.) [83] 22, No. 2: 40pp., ill. **Miller, N. C. E.**—Larval Heteroptera secreting an obnoxious fluid from the thorax. [8] 67: 54-55. **Muir, F.**—A criticism of Dr. Hansen's theory of the maxillula in Hemiptera. [8] 67: 51-53. **Radio, P. A.**—Dormancy in *Reduvius personatus*. [7] 24: 19-39, ill. **Schmidt, E.**—*Gynopygoplax schultzei*, eine neue Cercopide von den Philippinen. [17] 48: 64. **Silvey, J. K. G.**—Observations on the life-history of *Rheumatobates rileyi* (Gerriidae). [Pap. Michigan Acad. Sci. Arts & Letters] 13: 433-446, ill.

**LEPIDOPTERA.**—\***Busck, A.**—Two new Peruvian Microlepidoptera of economic importance [Gelechiidae and Oecophoridae]. [10] 33: 59-63, ill. **Cook, W. C.**—An

ecologically annotated list of the Phalaenidae of Montana. [4] 63: 25-30. \***Gehlen, B.**—Neue Sphingiden. [14] 44: 362-364, ill. (S). **Harris, L.**—A list of the butterflies of Georgia. [Trans. Georgia Nat. Club] 1: 27pp., ill. **Hoffman, F.**—Beiträge zur naturgeschichte brasilianischer schmetterlinge. II. [45] 26: 1-8. **Hoffman, F.**—Euselasia eucerus. (S). [17] 48: 55-56. \***Hopp, W.**—(See **Zerny** under General). (S). **McDunnough, J.**—Note on the larvae of *Metrea ostreonalis* (Pyraustinae). [4] 63: 50. \***McDunnough, J.**—A new race of *Sphinx gordius*. [4] 63: 73. \***Meyrick, E.**—(See **Zerny** under General). (S). \***Niepelt, W.**—Neue formen exotischer Lepidopteren. (S). [18] 24: 485-486. **Shepard, H. H.**—Additions and corrections to Lindsey's "Types of Hesperoid genera". [7] 24: 173-176. **Walker, J. J.**—Notes on a satyrine butterfly (*Satyrus azorinus*) from the Azores. [Pro. Ent. Soc. London] 5: 77-81.

**DIPTERA.**—**Aldrich, J. M.**—Collecting flies in the west. [Smiths. Inst.] Publ. 3111: 107-112, ill. **Bromley, S. W.**—New neotropical *Andrenosoma* (Asilidae) [1] 57: 129-134. \***Curran, C. H.**—The nearctic species of the Nemestrinid genus *Rhynchocephalus*. [4] 63: 68-72. **Curran, C. H.**—New species of *Chrysopilus* from the Neotropical region (Rhagionidae). [40] 462: 9pp. \***Edwards, F. W.**—New neotropical nematocerous Diptera. (S). [75] 7: 255-261. \***Hall, D. G.**—New North American Sarcophagidae. [7] 24: 181-182, ill. **Mukerji, S.**—Morphology of the pharynx of female *Culicoides* and its taxonomic importance. [31] 127: 339-340, ill. \***Parent, O.**—(See **Zerny** under General). **Twinn, C. R.**—Observations on some aquatic animal and plant enemies of mosquitoes. [4] 63: 51-61. **Van Duzee, M. C.**—New species of Dolichopodidae taken by Mr. and Mrs. F. W. Edwards in South America. [75] 7: 243-255, ill. **Wu, Y. F.**—A contribution to the biology of *Simulium*. [Pap. Michigan Acad. Sci. Arts & Letters] 13: 543-599.

**COLEOPTERA.**—**Bradley, J. C.**—A manual of the genera of beetles of America north of Mexico. Ithaca 1930. 360pp. \***Bridwell, J. C.**—Bruchidae infesting seeds of Compositae, with descriptions of new genera and species. (S). [10] 33: 37-42. \***Fisher, W. S.**—A new leaf mining Buprestid from the Canal Zone. [10] 33: 42-43. **Hickman, J. R.**—Contribution to the biology of the Haliplidae. [7] 24: 129-142. \***Pic, M.**—Neue exotische Coleopteren (Malaco-

dermata). (S). [26] 11: 77-78. **Satterthwait, A. F.**—Key to known pupae of the genus *Calendra*, with host-plant and distribution notes. [7] 24: 143-172, ill.

**HYMENOPTERA.**—**Clausen, C. P.**—Biological observations on *Agriotypus*. [10] 33: 29-37, ill. **Cockerell, T. D. A.**—Rocky Mountain bees. II [40] 458: 20pp. **Compere, H.**—A revision of the species of *Coccophagus* a genus of hymenopterous coccid-inhabiting parasites. [50] 78, Art. 7: 132pp., ill. **Parker, H. L.**—*Macrocentrus gifuensis*, a polyembryonic braconid parasite in the European corn borer. [U. S. Dept. Agric.] Tech. Bull. 230: 62pp., ill. **Ross, H. H.**—Sawflies of the sub-family *Dolerinae* of America north of Mexico. [Ill. Biol. Monogr.] 12: 7-116, ill. \***Ross, H. H.**—Notes on the sawfly subfamily *Tenthredininae*, with descriptions of new forms. [7] 24: 108-128.

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A CONTRIBUTION TO THE KNOWLEDGE OF FLORIDA ODONATA  
by C. FRANCIS BYERS, Ph.D., Assistant Professor of Biology,  
University of Florida, University of Florida Publications, Bio-  
logical Science Series, Vol. I, No. 1, pages 1-327, frontispiece,  
eleven plates with 115 figures, and 19 text figures. May, 1930.

The above publication is Dr. Byers' thesis for his doctorate at the University of Michigan, and as the title states, is a contribution to a knowledge of Florida Odonata, and it must be judged on that basis rather than as a handbook, though its subject matter includes all the essentials of a handbook except an index and glossary.

"This, then, is the problem the author has set for himself—an investigation of the Odonata of the State of Florida: (1) to determine the species of dragonflies found therein, and to write keys and descriptions of them; (2) to determine the life histories and habits of as many of these species as it is possible or feasible; (3) to analyze the state as an environmental area—geologic, geographic, climatologic and biotic—and to speculate upon the effect of these factors on the occurrence, distribution, and migration of Florida species of Odonata." Against this problem Dr. Byers marshalls his data with initiative, skill, and logic in an altogether creditable and often original manner. No other state in the Union offers more definitely "an environmental area" favorably situated to give clean cut answers to his questions than the state he selected for his study.

Part I is an annotated list of the Odonata of Florida; first,

those collected or identified by the author; second, reliable records by others; and third, questionable records. For general reasons and particularly since the book has no index, it might have been better to have included the subject matter of Part I, Part II, and 3 (Ecological observations on species of Florida Odonata) under Part III, in one part under each species. For example, to obtain the information Dr. Byers has brought together on *Tachopteryx thoreyi* in Florida one must refer to pages 11, 43, and 242-244.

In the light of our present knowledge, the sequence of families and subfamilies proposed by de Selys in 1895 and generally used since then, sometimes with minor changes, seems preferable to that used by Dr. Byers in the present paper.

The first two lists of the Annotated List gives a total for the state of 105 species but the three Trameas on page 17 probably need verification. In a letter of October 21, 1930, Dr. Byers writes me that *Erythrodiplax umbrata* taken by himself in both Dade and Alachua Counties, should be transferred from List II to List I, and to the latter list he now adds *Macromia georgina*, *Somatochlora linearis*, *Lestes rectangularis*, and *Telebasis salva*. The last species was also taken in Florida by Jesse H. Williamson in 1921, who in the same year took *Orthemis ferruginea* at Miami, and *Macrodiplax balteata* at Fort Myers and Enterprise. If *Ischnura credula* is not a synonym of *I. ramburii*, the Florida specimens listed under these two names almost certainly belong to one species.

Dr. Byers lists a total of 1592 specimens studied, but the total of males, females, and nymphs is only 1527. This is probably to be explained by duplication in counting a reared nymph as two specimens. The ratio of males (697) to females (618) is remarkable and indicates that many specimens were taken at a distance from water. But still more remarkable is the ratio of species (91) to the number of adults collected (1315). At first I thought Dr. Byers might have identified in the field and collected or saved only those he found of interest but such is evidently not the case as the following facts will show. *Agrion dimidiatum* from four counties is represented by only 13 specimens, while *A. maculatum* from two counties is represented by 77 specimens. Both species are easily recognized in the field. Of fourteen species of *Enallagma*, two species account for fifty per cent of all the *Enallagmas* collected, and nine species are represented by 8 or fewer specimens each. Of the Gomphines, with ten species represented by a total of 65 specimens, two species account for 44 of these,

seven species have each 4 or fewer specimens, and four are represented each by a single specimen. The story is about the same in the Aeshnines with nine species and 70 specimens; two species account for 42 of these and five species are represented each by 3 or fewer specimens. In the Libellulines with twenty-seven species and 461 specimens, four species account for over fifty-five percent of the specimens and for nearly twelve percent of all the material studied and representing ninety-one species. There are 35 more specimens of *Pachydiplax longipennis* and *Erythemis simplicicollis* together than all the Gomphines and Aeshnines. And of these two common Libellulines, generally easily recognized in the field, there are more specimens than there are specimens of the fourteen species of *Enallagma*, which are not always determinable until collected and studied, especially when the fauna is new to the collector. All this suggests that there are in the state a few species of wide geographic and seasonal range, and many other species much more local and on the wing for briefer seasons. Because of this, Dr. Byers sampling here and there all over the state at different seasons, was able to record ninety-one species, represented by so relatively few specimens. I do not think his general results or conclusions are in any way invalidated by this limited material, but his "Florida Biotic Areas" and his "Ecological observations on species of Florida Odonata" must be read with this point in mind.

During its ontogeny the imago dragonfly may undergo many color changes and at every point these colors may be varied or even changed by environmental factors. In a long series of dried specimens of one species everyone knows the different and unpredictable changes which take place. So I think Dr. Byers' attempt to describe the colors of dragonflies in terms of Ridgway (see page 20, second paragraph above the key) is likely to be confusing, if not misleading, in most cases. It certainly would be done, but in each species it would involve an amount of work and of material far beyond the scope of Dr. Byers' thesis. With this slight criticism the taxonomy of the Florida Odonata is very well done, with a commendable approach to uniformity of treatment and with a key which looks as if it would function. Why the total length, as a cardinal measurement, should be generally, but not always, substituted for the old length of abdomen is not clear, as it involves more parts which may be lost, crushed or jammed out of position; and I see no advantage in dropping the seventy-five year old custom of measuring the hind wing to begin

measuring the front wing. In the same way the terminology for thoracic stripes, especially of Gomphines, introduced in Needham's Handbook, is, I think, not as good as the old terminology, and in using it Dr. Byers has introduced some confusion. For example, on page 22, the Roman numerals I and II designate dark stripes, while on pages 45 and 55 Roman numerals are used for pale stripes of the same species, though at least once, as, for example, in describing *Gomphus australis* on page 56, Roman numerals in either sense are abandoned, and the older and preferable terminology is employed.

In the second line from the bottom on page 20, following *Wings insert usually*. Rubric 2 on page 21 is not true throughout the family as some Aeshnines and Gomphines have no brace vein. On page 22, the first sentence of the second section of rubric 18 does not agree with the second section of rubric 24. In the second sentence of both sections of rubric 18, Dr. Byers uses upper and lower sectors of the arculus correctly, but beginning on page 67 and continuing through the discussion of the Aeshnines the terms are not correctly used. The position of *Nannothemis* among the Cordulines in the key might have been advantageously avoided. On page 24, line fifteen from bottom, for 69 read 67. In the first section of rubric 49, change *Libellula* to bold face to correspond with other genera in the key. The second section of the same rubric is incorrect or ambiguous. In rubric 52 "brown" is not in Ridgway and in any case is hardly applicable to *auripennis*, and the "purple" of Ridgway is too vivid to apply to *jesscana*. The first section of rubric 60 is not diagnostic for the species placed under it; there is obviously some confusion in the key in the second section of rubric 61 and rubrics 63 and 64; *Erythrodiplax minuscula* and *berenice* have each less than 11-17 antenodals; and the key does not run out to *Erythrodiplax* as it should. The handling of the sexes of *Hetaerina* in rubrics 76 and 77 is not in conformity with and not as good as the handling of *Lestes* and other genera. Apparently the first section of rubric 96 should be combined with the second section of 95 or omitted, and the second section of 96 should be omitted. In the second section of rubric 106, "color predominantly light yellow" applies only to males and the same qualification should be made on pages 189 and 190 where the description of the adult female applies only to teneral. In the second section of rubric 108, "the stigma uniform in color" does not apply to the stigma of the front wing of *ramburii* and *credula*. On page 38 there is some sort of evidence for



taking *deplanata* and *lydia* out of *Libellula*, and had this been done the key might have been arranged to run out to *Libellula* which could then have been treated as are *Erythrodiplax*, *Tramca*, and *Pantala*. On page 39, second section of rubric 66, *Ischnura* should be in bold face.

On page 41, third line, for *psi* read *upsilon*. On the same page it is hardly correct to say that the author has a list of 119 species for Florida. Counting the four additions since the book was published, the list is about 106-109. And the statement in the last sentence on the same page is too broad. Dr. Calvert has called my attention to an assertion by Hagen, Stet. Ent. Zeit., XIV, page 100, 1853, that the first author to describe and figure nymphs was Rondelet in 1555 (see first paragraph, page 41).

The arduous task of describing the Florida dragonflies in detail has been well, and, in general, uniformly done by Dr. Byers. If a general criticism may be permitted it seems to me that repetition in the text of characters well stated in the preceding key is hardly worth the effort. For example, page 21, rubric 2, "Stigma with a brace vein at its proximal end" is repeated in substance on page 42 (*Aeshnidae*); on page 45 (*Gomphinae*); and again on the same page (*Negomphoides*). And, as another example, on page 54, every character but one in the first paragraph is repeated in the last paragraph on the same page. In this connection the general question might be raised whether or not a description, based on a few specimens, of a well-known and widely distributed species, is worth the arduous labor involved.

On page 42 the second paragraph might be questioned. In the first paragraph under Petalurinae, "Selys" should be enclosed in parentheses, if one is going to use them at all in this connection. On page 45, last line in the second paragraph, for *arc two* read *is an undescrbed*. On page 51, second line, for *short* read *long*. On page 53, last line, Dr. Calvert has called my attention to the fact that Hagen (Trans. Am. Ent. Soc. XII, p. 255, 1885) described a reared nymph. On page 56, under *australis*, for *H. wing* read *F. wing*. On page 70, lines 5 and 4 from bottom, the wings in females, in addition to color described by Dr. Byers, may be entirely clear or may have the basal area pale and the more distal part suffused. Dr. Byers' discussion on pages 82 and 83 has probably not taken the Oriental fauna enough into account, and his use of Cordulegasteridae differs materially from that of Fraser, 1929. On page 83, tenth line from bottom, for *Cordulegaster* read

*Thecaphora*, and omit the parentheses around Selys; eighth line from bottom, for *C.* read *Acshua*; and in seventh line from top, on page 84, make same change for *Cordulegaster*. On page 87, thirteenth line from bottom, for 1830 read 1839. Dr. Byers' undetermined *Neurocordulia*, pages 98 and 99, may as well prove to be *clara* as any of the species he mentions. On pages 100 and 101, the lengths given for *T. petechialis* and *T. stella* are surely those of abdomens and not of entire insects.

On page 104, eleventh line from bottom, for *seven* read *eight*; on the same page, third line from bottom, for *two* read *eleven*; and in second line from bottom for *New World* read *North America*, since five genera of this tribe occur in the New World. Referring to the last line in the first paragraph, page 137, Dr. Calvert has called my attention to a description by himself in Univ. Iowa Stud. Nat. Hist. XII, No. 2, page 25, 1928; and in the same paper, pages 30-35, nymphs of several species of *Erythemis* are discussed (see 3rd paragraph, page 141). The description of *Dythemis rufinervis*, pages 143 and 144, may prove misleading and this is especially true of that of the female, which does not agree with any specimens I have seen.

On page 152, the second sentence in the first paragraph, some Zygoptera rest with horizontal wings. In the second paragraph on page 154, the second sentence would probably be clearer as follows: Wings usually paler brown in color; stigma white. On page 163 in the first line of the third paragraph "about six" would be nearer right than "two". In the sixth line of the same paragraph for *Coenagrionidae* read *Coenagrioninae*. On page 164, first paragraph, first line, for *family* read *subfamily*; and the largest species of the Lestinae do not belong to the genus *Lestes*. On page 175, last sentence in third paragraph is incorrect. On page 179 seventh line, for *Phylogenetically* read *Morphologically*.

Dr. Byers gives an excellent account of the geology, physical geography, and climate of Florida, but I am unable to see that he shows any relation of the first of these to the present dragonfly fauna, which it seems, as far as definite conclusions are possible, is entirely dependent on the present geography and climate, the vital points of which are the proximity of the northern continental land mass, the narrowness and incompleteness of barriers separating it from tropical areas, the present climate, and the diverse aquatic habitats within the state. To be specific, what has geology to do with the dis-

tribution in North America of *Tachopteryx thoreyi* and *Nannothemis bella*?

Any attempt to associate certain dragonflies with "natural ecological areas based principally on the dominant type of vegetation" is, I believe, futile in the case of Florida hammocks and coniferous forests (page 226). Prolonged collecting there would show, as casual visitors, all the Florida dragonflies which do not confine themselves as adults to the immediate vicinity of their nymphal homes, and this means many of the Anisoptera and some of the Zygoptera. A discussion of major or typical habitats if it is to be exact in detail must be based probably entirely on nymphal life, and when adults are considered their general life will probably be of the most significance. Take an extreme case in adult life to make this point clear: What can be said of the habitat of a dragonfly which circles a pool of waste oil at an oil pumping station, congregates in great numbers over rain-flooded cornfields, frequents dredged ditches and abandoned gravel pits, hovers over a farm yard watering trough and a fountain in the city park,—and lays eggs in all of them; and then leaves a village in the center of a continent, where it has been joyously patrolling an oiled street, to take its station on a ship five hundred miles from land? In any case a town can hardly be considered a "highly artificial habitat" (page 241, in last line of which for *bifida* read *neriosa*).

On page 242 Dr. Byers takes up a discussion of the ecology of Florida dragonflies and here he is at his best, telling his story clearly and vividly, and describing the previously unknown nymphs of seven species. In some cases observations are not numerous enough to warrant the drawing of general conclusions. My own experience has been that in many cases I find the greatest difficulty in arriving at such conclusions in dealing with species which I observe oftenest, and this is especially true of the Anisoptera. After over a quarter of a century I cannot tell a "good" *Macromia* day. So comments on and discussions of Dr. Byers' observations could be prolonged to great lengths. To mention one case, his first sentence under *Epiacschma heros*, page 256, contains statements of habits which are entirely different from those which have come under my own limited observations of this species.

Under the discussion of fossil Odonata, page 270, Dr. Byers has apparently overlooked the latest work of Kennedy and Tillyard in which the conclusion reached as to the phylogeny of the Zygoptera is exactly the opposite of that stated on page

271. On page 272, in the phylogenetic diagram, I do not know why Neotropic is placed in parentheses under Epallaginae as the subfamily occurs in every region but the Nearctic, and is best represented in the Oriental.

The fossil record unfortunately is insufficient for any chronological discussion, as defined by Dr. Byers, of the present dragonfly fauna of Florida. On the other hand, when discussing the present Florida fauna and its relations to dragonfly faunas adjacent to it, Dr. Byers is again on solid ground, and he has accumulated and presented his extensive data in a masterly way. Certainly his classification of certain species as nearctic, neotropic, and endemic invites discussion which may result in some changes. His use of the word "endemic" is not in the generally accepted sense, and may be translated apparently as "originating in", as for example in Groups C and D at the bottom of page 276. The five species listed under C, page 275, should be checked by the reader against the Annotated List, pages 11-17. On page 274, at the right of the diagram, transpose *neotropica* and *nearctica*.

The final pages (282-302) of the text discuss very completely and suggestively the "Factors of Distribution", with enough general and controversial matter included to arouse the interest of the general reader. There are two or three minor mistakes to which attention might be called: on page 285, second paragraph, male Zygoptera do not hold the female by the head; on page 285 and 290, copulation in mid-air is rare or accidental and I am not sure it is universal for even a single species; and on page 290, endophytic oviposition occurs in other locations than living aquatic vegetation.

The basis for the arrangement of titles in the bibliography and for the separation of titles into Parts I and II, is not clear. And the arrangement is not good, unless there is some reason for it which I have overlooked. The fourteen Florida habitat photographs, figures 102-115, illustrate beautifully many of the extremely diverse habitats in which it was Dr. Byers' good fortune and pleasure to collect, observe, and philosophize.—E. B. WILLIAMSON.

## OBITUARY.

Prof. JOHN HENRY COMSTOCK, emeritus professor of entomology at Cornell University, died at Ithaca on March 20, after a prolonged illness. He was born February 24, 1849.

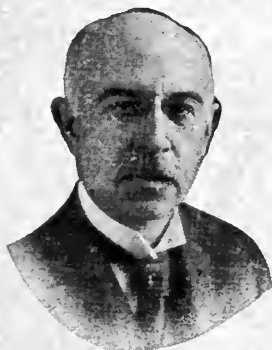


JUNE, 1931

# ENTOMOLOGICAL NEWS

Vol. XLII

No. 6



HENRY SKINNER  
1861-1926

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# ENTOMOLOGICAL NEWS

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JUNE, 1931

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## **Professor John Henry Comstock.**

JOHN HENRY COMSTOCK, 82, professor emeritus of entomology, Cornell University, died at 3:30 o'clock of the morning of March 20, 1931, at his home, 123 Roberts Place, Ithaca, New York, where he had been confined since 1927 by illness following a cerebral hemorrhage.

John Henry Comstock was the son of Ebenezer and Susan Allen Comstock. Born in Janesville, Wis., one of the outposts of the march westward, on February 24, 1849, a year after Wisconsin had been admitted to the Union, John Henry Comstock was an infant when his father was lured to California by the story of the discovery of gold and died of cholera en route. The boy's mother, who belonged to the family of Ethan Allen, returned with him to her native state, New York, and made an heroic struggle to support him, but she was finally forced to place her son in a public home. He was later taken by a family which, though not affluent, could at least give him enough to eat, and, as the people about him were for the most part sailors, he, too, became at 16 a sailor on the Great Lakes.

Although he received a certain amount of formal schooling, he was largely self-educated, and when he found in a bookstore a copy of Harris' "Insects Injurious to Vegetation," he added to his love of botany an interest in entomology, for he bought the book with money borrowed from his shipmates, and so inaugurated his library.

At 20 he was ready to enter college, and decided on the new institution, Cornell University, on the shores of Cayuga Lake, where he could work his way. He also found inspiring teachers and kindred spirits among the students.

John Henry Comstock was one of the creators of Cornell University, for in a very real sense his life has been built into that of the institution. At Cornell he was among the early

students, entering in 1869, the year after the University opened, becoming an instructor while still an undergraduate, and graduating with the degree of B.S. in 1874. At Cornell he taught for more than 40 years, and at Cornell he literally created the Department of Entomology which has grown to be one of the best in the country.

A colleague, Prof. S. H. Gage, has stated in an historical sketch of Professor Comstock that he gave personal instruction to more than 5,000 students from the year 1872, when he began as an undergraduate to give lectures in entomology, to the time of his retirement in 1914. It is safe to add that practically every one of these found his or her way at some time to the Comstock home and enjoyed its hospitality. The total includes at least 50 of his advanced students who have become state or national entomologists or professors of entomology or zoology in various colleges and experiment stations. Among these is Dr. Leland O. Howard, chief of the Bureau of Entomology of the United States Department of Agriculture.

When Professor Comstock began his work at Cornell he constituted the Department of Entomology. He was lecturer, instructor in the field, and assistant in the laboratory. Room and facilities were also meager. When he retired 41 years later the department had a magnificent material equipment and a staff of 31, including five professors.

The Comstock Memorial Library was given to Cornell at the time of his retirement, by his former students, who presented to him a fund of \$2,500 which was in turn passed on by him to the University. On that occasion the chimes were played in his honor, for he was chime master in 1872-73 and had arranged several of the scores played, at the request of the donor of the bells, Jennie McGraw. This is only one indication of the multitude of small as well as great services which John Henry Comstock has performed for Cornell. It is also said that he helped to build with his own hands one of the original University buildings, that in which he later gave his first lectures.

Professor Gage tells the story of how the Department of



Entomology came into being. In the Spring of 1872, 13 of Professor Comstock's college mates petitioned the faculty to permit him to give them a course in entomology that term. The request was granted, and from that day on the work in entomology at Cornell has followed the plan which he instituted. Graduated in 1874 from Cornell University with the degree of Bachelor of Science, he studied as a graduate student in 1874-5 at Harvard and at the University of Leipzig in 1888-9.

In 1878 he married Anna Botsford, then his fellow-student at Cornell, whom he outlived by but six months after more than 50 years of work in common.

Professor Comstock taught at Cornell till 1879 when he became entomologist for the federal government at Washington. Returning in 1881 to Cornell, he served here as professor of entomology and invertebrate zoology until 1914 when he became professor emeritus.

In 1877 he was lecturer on zoology at Vassar College and from 1891 to 1900 non-resident professor of entomology at Leland Stanford University.

In 1891 President David Starr Jordan of Leland Stanford University asked Professor Comstock to organize a Department of Entomology at Stanford, similar to that at Cornell and he undertook the work in his vacations from 1891 to 1900. President Jordan had been one of the students who petitioned the Cornell faculty in 1872 for that beginning course in entomology.

Professor Comstock's books are all widely known and much used. Many of them are illustrated with beautiful wood cuts made by his wife, Anna Botsford Comstock, herself for many years a professor of nature study at Cornell. Their home in Ithaca and the enthusiastic devotion with which they worked and taught have proved an inspiration to many generations of Cornell students.—CATHERINE FINCH in *Ithaca Journal-News* of March 20, 1931.

Prof. Comstock, at the time of his death, was one of two Americans holding honorary fellowships in the Entomological

Society of London, was a member of the entomological societies of France and of Belgium, honorary fellow of the Entomological Societies of America and of Ontario, and of the Fourth International Entomological Congress, corresponding member of the Academy of Natural Sciences of Philadelphia and of the American Entomological Society, member of the American Societies of Naturalists and of Zoologists, of the American Philosophical Society, of the California Academy of Sciences.

Readers of the NEWS will find in its volumes notices of some of his more important writings as they appeared; thus vol. iv, no. 10, Dec., 1893, pp. 334-5, contains a notice of his *Evolution and Taxonomy*; the first edition of his and Mrs. Comstock's *Manual for the Study of Insects* is reviewed in vol. vi, p. 163, May, 1895, the nineteenth edition in xli, p. 273, Oct., 1930; *The Elements of Insect Anatomy*, with V. L. Kellogg (vi, p. 268, Oct., 1895), 3rd edition (xiii, p. 21, Jan., '02); *Insect Life* (viii, p. 226, Nov., 1897); *The Wings of Insects*, with J. G. Needham (ix, p. 75, etc., Mar. *et al.*, 1898); *The Skeleton of the Head of Insects*, with C. Kochi (xiii, p. 55, Feb., '02); *Spider Book* (xxiv, p. 35, Jan., 1913); *The Wings of Insects* (xxx, p. 148, May, 1919); *An Introduction to Entomology*, Part I (xxxii, p. 208, July, 1920); the same, first complete edition, Parts I & II (xxxvi, p. 94, Mar., 1925). Another of his books, written jointly with Mrs. Comstock, was *How to Know the Butterflies* (1904).

Mr. Phil Rau writes to the Editor: "I am enclosing an editorial on Dr. Comstock, clipped from the St. Louis *Post Dispatch* of March 28. Since it is very seldom that a great daily gives editorial space to an entomologist, I thought perhaps you would like to reproduce the article in the NEWS." This editorial follows:

#### THE AMERICAN FABRE.

Not every American boy knew of John Henry Comstock, but he led thousands of them in one of the most fascinating branches of nature study. For where is there a boy who has not sat entranced watching a yellow-bodied spider build a web,

or darted in the sun from hollyhock to peony after spangled-winged butterflies, or chased lightning bugs across the lawn on summer evenings, or spread out under a tree to watch life at an ant hill, the goings out and the comings in and the polite to-do of social amenities in that absorbing world? Thus John Henry Comstock was related to all boydom. He spent most of his 82 years finding out about insects. Entomologists today look back on his pioneering work at Cornell University as the beginning of insect study, both scientific and popular, in this country. His wife was the late Anna Botsford Comstock, natural history artist and wood engraver, with whom he did much of his work. Together they led many an American of a machine age under the open sky and into a fuller appreciation of the world outside the door.

(A biographical notice of Mrs. Comstock was published in the NEWS for October, 1930, pp. 277-279, and portraits of her and her husband in the issue for April, 1930, Plate X.).

### On Some Northern Lepidoptera Rhopalocera.

Dr. Samuel C. Palmer, of Swarthmore College, has given us a small series of Lepidopterous insects for identification, which he captured in Baffinland and Labrador while he was botanist on the Bowdoin-Baffinland Expedition of 1929. A short account of the localities and conditions under which they were collected was published by Mr. James A. G. Rehn in the February NEWS for 1931, page 33.

The following were caught on the south shore of Frobisher Bay, Baffinland, from August 19th to August 24, 1930:

<i>Brenthis improba</i> Butler.. 1♂	<i>Brenthis tarquinius</i> Curtis. 2♂♂
<i>Brenthis butleri</i> Edwards.. 2♂♂ 1♀	<i>Plebeius aquilo</i> Boisduval.. 2♂♂
<i>Brenthis polaris</i> Boisduval. 1♀	

The following were caught August 27th at Cape Mugford, Labrador:

<i>Colias pelidne</i> Boisduval..... 2♂♂	<i>Oeneis semideca</i> var. <i>arctica</i>
<i>Colias nastes</i> Boisduval ..... 1♀	Gibson ..... 1♂
<i>Eresia rossi</i> Curtis ..... 1♀	<i>Oeneis norna</i> Thunberg ..... 1♂
<i>Oeneis taygete</i> Hubner 3♂♂, 1♀,	aberrant
1♂ aberrant	<i>Anarta richardsoni</i> Curtis ... 1♀

I believe the records from these unusual localities will be of interest to Lepidopterists. I wish to acknowledge the assistance of my good friend, Dr. W. J. Holland, in identifying the species.—ROSWELL C. WILLIAMS, JR., Philadelphia, Penna.

## The Predatory Enemies of Elateridae (Coleoptera).

By C. A. THOMAS, Pennsylvania State College.

(Continued from page 140.)

DIPTERA (Addition).

Bromley (1914) listed adults of *Erax acstuanus* L. feeding on a *Melanotus* sp. adult, *Promachus bastardi* Macq., eating a *Limonius* sp. adult, and *P. fitchii* O. S. eating *Elater* and *Melanotus* adults.

### VERTEBRATE PREDATORS.

An examination of the food of various vertebrates indicates that they are more effective wireworm enemies than the invertebrates.

#### BATRACHIA.

Toads and frogs are practically omnivorous with regard to their animal food, but they are of some value in the natural control of elaterids, as is shown by the following data; according to Kirkland (1904), five percent of the food in one hundred and forty-nine toad stomachs examined between April and October, consisted of wireworm beetles and their allies; the U. S. Biological Survey<sup>4</sup> furnished the following data with regard to the elaterid food of six species of North American toads:

Species	No. of Stomachs Examined	Elaterids Adults	Found Larvae	Species of Elaterids Represented
<i>Bufo americanus</i> LeC.	533	185	12	40 (Approx.) <sup>5</sup>
<i>B. boreas</i> B. & G.	370	115	16	31 "
<i>B. woodhousei</i> Gir.	299	99	3	26 "
<i>B. forcleri</i> Putnam	278	83	3	21 "
<i>B. marinus</i> L.	218	46	2	11 "

This table shows that toads do considerable feeding upon the adult Elaterids, but that the larvae are uncommon in their diet. This is to be expected, since the larvae seldom come above ground voluntarily, and those which were eaten were probably picked up in plow furrows by the toads. Of the species of adults eaten, those of the genera *Melanotus* and

<sup>4</sup> The writer is indebted to the U. S. Biological Survey for use of data on the elaterid food of toads and birds.

<sup>5</sup> Approximate, because some fragments could not be identified to species.

Monocrepidius were most frequently represented. Local abundance of species doubtless influences the frequency of occurrence in the stomachs.

Frogs also feed upon click beetles to some extent. Hyslop (1916) examined the stomachs of a large series of field or leopard frogs, *Rana pipiens* Schr., collected on the shores of Lake Oneida in New York State. He concluded that they were of enormous value in destroying the adults of the wheat wireworm, *Agriotes mancus* Say, when these beetles were ovipositing in the grasslands adjacent to the lake. Frost (1924) listed five elaterid species taken from stomachs of various frog species in New York and Pennsylvania. Of these, *A. mancus* was frequently eaten. Neither Hyslop nor Frost mention finding elaterid larvae in any of these stomachs. Haber (1926) did not note Elaterids or their larvae in the stomach contents of a series of the tree frog, *Hyla cinera* Schn.

Surface (1913) noted Elaterids in the food of the following: Toads: *Bufo americana* LeC. Frogs: *Hyla versicolor* LeC.; *Rana pipiens* Schr.; *R. palustris* LeC.; *R. sylvatica* Lec.; and *R. clamitans* Latr. Salamanders: *Plethodon cinereus* (Green); *P. glutinosus* (Green); *Spelerpes ruber* (Daudin); *Diemictylus viridescens* (Raf.).

#### REPTILIA.

Hyslop (1915) stated that a small lizard, *Phrynosoma d. douglasii* (Bell), eats large numbers of adult Elaterids in the desert regions of the Northwest. In Washington State, as high as ninety percent of the food has been found to be click beetles, so that they are probably a large part of the natural food of these lizards at certain seasons. Surface (1907) noted Elaterids as part of the food of the common swift, *Sceloporus undulatus* Latr. He does not mention them among the food items of snakes and turtles, although they doubtless would be eaten by snakes if available.

#### BIRDS.

Birds are, no doubt, of first importance among the natural enemies of wireworms. A large number of species feed upon the various elaterid stages, the amount of feeding depending

upon the season, the abundance of the wireworms and other factors.

Birds feed on wireworms mostly in the spring and early summer, when the click beetles and wireworms are most active, when plowing is in progress, and when the young birds consume large quantities of insects. By late summer, when the young birds are able to forage for themselves, the wireworms are so deep in the soil that they are not available unless deep cultivation happens to turn them up to the soil surface.

Among the many writers who have noted the value of birds as destroyers of wireworms and click beetles are Curtis (1845), Wilcox (1892), Forbes (1882, 1892, 1903), Judd (1901), Beal (1907, 1912a, b, 1917), McAtee (1908), Newstead (1908), Collinge, Gabrielson (1912), French (1913), Hyslop (1915), Kalmbach (1914, 1928), Gibson (1916), Ford (1917), Orton and Chittenden (1917), Gray and Wheldon, Rymer-Roberts (1919), Bandys (1922), Hawkins, Vietinghoff-Riesch (1928). Hawkins stated that while birds do much good in controlling insects in general, and may be valuable in wireworm control, it is not likely that they would become numerous enough to clean up severe infestations of these pests.

Hyslop (1915) listed ninety bird species, found to have fed upon wireworms and click beetles by the U. S. Biological Survey. The 1927 records of the Survey show that the remains of these insects, chiefly of the beetles, have been found in the stomachs of approximately 224 species of birds in North America. Analysis of the data shows that these insects have been recovered most frequently from the stomachs of the following birds: crow, *Corvus brachyrhynchos* Brehm, which ate 25 different species of Elaterids, representing a large number of individuals; starling, *Sturnus vulgaris* L., 23 species; night-hawk, *Chordeiles virginianus* Gmel., 20 species; robin, *Planesticus migratorius* L., 20 species; red-eyed vireo *Vireosylva olivacea* L., 18 species; meadowlark, *Sturnella magna* L., 15 species; magpie, *Pica pica* L., blue jay, *Cyanocitta cristata* L., and upland plover, *Bartramia longicauda* Bechst., each 8 species, and the kingbird, *Tyrannus tyrannus* L., 7 species. The

catbird, bluebird, great-crested flycatcher, house wren, phoebe, killdeer, bobwhite, gulls, English pheasant and a number of other species have been found to contain numerous remains of these insects, while the great majority of the bird species had eaten only occasional specimens and are probably not of much value in the control of these insects. The occurrence of such remains in the stomachs of any species depends to a large extent upon the abundance of the Elaterids as compared with other available bird food, and upon the occurrence or abundance of that bird species in that certain locality.

A study of reports on the value of such birds as crows, rooks, gulls, pheasants, starlings, etc., as destroyers of all stages of Elaterids, provides much interesting information which should be of some value to those who attempt to balance the good with the supposedly bad food habits of these birds. The food of crows in the United States, and of the rook, *Corvus frugilegus*, in Europe, has been quite thoroughly investigated, and wireworms and click beetles have been found as common articles of the diet of these much maligned birds.

According to Curtis (1845), rooks fearlessly follow the plow and consume immense quantities of these insects, and their crops have been found full of them. Leigh (1914) stated that wireworms form about nine percent of the food of the rook. Newstead (1908), Vostrikov (1916), Walton (1917), Ford (1917), Gray and Wheldon (1919), and Masaitas (1927) also noted the value of this bird. Ford said that the jackdaw also feeds on these insects.

Concerning the American crow, Fitch (1866) said that their favorite food and principal sustenance consisted of wireworms and click beetles. While this is rather a strong statement, there is little doubt that these birds do eat a large number of such insects. Kalmbach (1920) recorded 72 wireworms in the stomach of a crow collected in April. Others who noted the value of crows against wireworms were Webster (1893), Wilcox (1892), Graf (1914), Hawkins (1928).

The European starling, which is now so firmly established in the United States, also devours many wireworms and other

soil larvae in addition to the adult beetles. It has often been observed following in the plow furrow, picking up wireworms, white grubs and other pests. Data from the Biological Survey indicate that its greatest consumption of wireworms occurs during May, with much less feeding on them during the rest of the year. (See Forbush, 1916, and Kalmbach, 1928.)

Although gulls are usually regarded as more or less marine birds, many of them also feed inland on cultivated areas. They frequently follow plows in the same manner as poultry and thus pick up many soil insects. Graf (1914) found many individuals of a species of *Larus* feeding in new plow furrows in fields infested with *Limoni* *californicus* Mannh. Florence (1915) referred to the quantities of wireworms consumed by various species of gulls at Aberdeen, Scotland. Newstead (1908) stated that in one instance forty-five *Agriotes* larvae were found in the crop of a black-headed gull, *Larus ridibundus*, in England, while Berry (1917) counted thirty-one wireworms in the crops of twenty-two nestlings of the same species. Ford (1917) also commented on the beneficial effect of gulls against wireworms.

English or ring-necked pheasants, *Phasianus torquatus*, have been accused of causing much damage to sprouting corn and some other crops, but there is little doubt that they also eat a large number of insects,<sup>6</sup> Curtis (1845) said that pheasants and partridges destroy many wireworms in turnip and other fields. Berry (1917) noted that the crop of one pheasant killed in marshy ground contained nearly two hundred wireworms, while according to Gunther (1917) there are excellent reasons for believing that pheasants are a valuable remedial measure on land infested with wireworms. Estates on which they are preserved are practically free from those insects because the young birds are entirely insectivorous. Evershed and Warburton (1918), however, appear to have

<sup>6</sup> Recent data received through the courtesy of Mr. L. A. Luttringer Jr., of the Pennsylvania State Game Commission show the presence of claterid remains in the stomachs of English pheasants collected in Pennsylvania.



found few wireworms in the crops of pheasants in England. Local conditions probably account for this difference.

Domestic fowls can do considerable good in fields by eating insects. Allowed to follow the plow they pick up many wireworms which are turned up in the furrows, and also eat elaterid adults in fields not too far removed from the poultry house. The use of poultry for this purpose was advocated by Curtis (1845), O'Kane (1913), Theobald, Watson (1917), Schaffnit (1919), Rymer-Roberts (1919), Allwood (1920), Roebuck (1925), and others. Roebuck stated, however, that fowls are of value against wireworms only on arable land while plowing, disking, or cultivating is in actual progress, as the wireworms are too deep in the soil at other times. He advised keeping fowls during May and June on grassland adjoining arable land, and to let them range over other fields, especially clover, during early May.

#### MAMMALS.

Mammals in general are not important enemies of Elateridae, but moles and domestic swine may, under certain conditions, have some value in this respect. Moles have long been known to feed on wireworms, white grubs and other soil insects, and many writers are of the opinion that they are very valuable in the natural control of wireworms. According to Curtis (1845), Le Keux believed that moles would probably prove the best protection against wireworms and that since moles have become scarce through killing off, wireworms have greatly increased. Kirby and Spence (1846) were also impressed by the large quantities of wireworms devoured by moles, while White (1914) stated that wireworms were found in forty-one of one hundred mole stomachs collected at Anglesey, England, in December and January. One hundred and thirty-four wireworms were eaten by these forty-one moles, and one stomach contained forty larvae. Ford (1917) asserted that moles prey on *Agriotes obscurus* L. larvae in England, and that wireworms form a fairly constant constituent of the food of the common mole, *Talpa europaea*. According to Sachtleben (1925), wireworms and cockchafer larvae comprised the

greater part of the insect food of one hundred and forty moles that he examined in Russia. Sokanovskii (1926) listed the Elaterids found in mole stomachs in West Russian forests. However, Scheffer (1910) found wireworms in only two mole stomachs of one hundred collected in Kansas, and Adams (1920) gave no reference to these larvae as part of the food of *T. curopaca* in England. As with the pheasants, this scarcity of wireworms in these stomachs is probably due to local conditions of wireworm scarcity in the field.

Domestic swine eat wireworms along with white grubs and other soil insects when they root out grass roots in sod fields. Williamson (1916) stated that hogs in a field before plowing destroy many of these pests and will soon clear them from the soil. Their exact value against wireworms has apparently never been determined, although much has been written on the use of hogs against white grubs.

#### SUMMARY.

A review of the literature on the natural control of the Elateridae, or click beetles, and their larvae, the wireworms, indicates that the predatory enemies exert considerably more control than is caused by their parasitic enemies.

Of the predators, birds, both wild and domesticated, are of the most value in this respect, with the predacious Carabidae, or ground beetles, probably second in importance. Toads and frogs, moles, and certain dipterous larvae also have considerable value.

In spite of the apparent efficiency of these predators, however, they are never more than partly effective in controlling an outbreak of these pests, and the aid they render should always be supplemented by such artificial control measures as are known to have the most value under the conditions at hand. The ultimate effect of such artificial controls upon the parasites and predators as well as upon the wireworms should always be considered.

#### REFERENCES.

- ADAMS, L. E. 1920—Jl. Ministry Agric., England, Vol. 27, p. 659, Oct., 1920.

- ALLWOOD, M. C. 1920—Jl. Roy. Hort. Soc., London, XLV, Nos. 2 and 3, p. 233, July, 1920.
- BAUDYS, E. 1922—Flugbl. tschech. Sektion mahr. Landeskulturrates in Brunn.
- BEAL, F. E. L. 1907—Bul. 30, Biol. Survey, U. S. Dept. Agric. 1912a—Bul. 37, of the same. 1912b—Bul. 44, of the same. Id. 1915—Farmer's Bul. 630, Biol. Survey, U. S. D. A.
- BERRY, W. 1917—Scottish Naturalist, Edinburgh, No. 66, p. 121, June, 1917.
- BROMLEY, S. W. 1914—Psyche, XXI, Dec., 1914, p. 192-198.
- CLELAND, J. B. 1918—Science Bull. 15, p. 17, Dept. Agric., New South Wales.
- COLLINGE, W. E. 1912—Jl. Bd. Agric., England, Sept., 1912.
- CONRADI, A. F., and EAGERTON, H. C. 1914—Bul. 180, S. Carolina Expt. Sta., Clemson.
- CURTIS, J. 1845—Jl. Roy. Agric. Soc., England, Vol. 5, 1845 Art. XI, p. 180
- EAGERTON, H. C. 1914—Bul. 179, S. Carolina Expt. Sta., Clemson.
- EVERSHED, A. F. and WARBURTON, C. 1918—Jl. Agric. Sci., IX, p. 63.
- FISHER, E. R. 1889—Note 165R, July 21, 1889, Div. Ent., U. S. Dept. Agric.
- FITCH, A. 1866—11th Rpt. on Insects of N. Y. In Trans. N. Y. State Agr. Soc., p. 542.
- FLORENCE, L. 1915—Trans. Highl. and Agric. Soc., XXIV, 1912: XXVI, 1914, XXVII, 1915.
- FORBES, S. A. 1882—Bul. 6, Ill. State Lab. Nat. History, Normal, Ill. Id. 1892—18th Rpt. State Ent. of Ill.; 7th Rpt. S. A. Forbes, Reprint 1920, p. 41. Id. 1896—Bul. 44, U. of Ill. Expt. Sta. Id. 1903—Article 4, Bul. Ill. State Lab. Nat. Hist., Vol. I, No. 3, 2nd Edition, p. 86.
- FORBUSH, E. H. 1916—Circ. 45, Mass. State Board Agric., p. 20, Feb., 1916.
- FORD, G. H. 1917—Annals Appl. Biology, III, Nos. 2 and 3, p. 97.
- FROST, S. W. 1924—Jl. N. Y. Ent. Soc., XXXII, p. 173, Dec., 1924.
- FRENCH, C., JR. 1913—Jl. Dept. Agric. of Victoria, XI, pt. 12, p. 729, Melbourne.
- GABRIELSON, I. N. 1912—Wilson Bulletin No. 79, Vol. XXIV, No. 2, pp. 85, 88.

- GIBSON, E. H. 1916—Farmer's Bul. 733, p. 5, U. S. Dept. Agric.
- GRAF, J. E. 1914—Bul. 123, Bur. Ent., U. S. Dept. Agric., p. 46, 48.
- GRAY, R. A. H. and WHELDON, R. W. 1919—Jl. Newcastle (England) Farmers' Club.
- GUNTHER, R. T. 1917—Rpt. on Damage by Birds in Norfolk, etc., in 1916. Oxford Univ. Press.
- HABER, V. R. 1926—Journ. Comp. Psychology, VI, No. 2, p. 189, Apr., 1926.
- HAWKINS, J. H. 1928—Bul. 343, p. 15, Maine Expt. Sta., Orono.
- HORTON, J. R. 1918—Bul. 647, p. 51, U. S. Dept. Agric.
- HYSLOP, J. A. 1910—Proc. Ent. Soc. Washington, Vol. 12, No. 2, p. 98.
- Id. 1915—Bul. 156, p. 25, U. S. Dept. Agric.
- Id. 1916—Farmers' Bul. 725, p. 10, U. S. D. A.
- JUDD, S. D. 1901—Bul. 15, Biol. Survey, U. S. D. A.
- KALMBACH, E. R. 1914—Bul. 107, U. S. D. A. 1920—Farmers' Bul. 1102, U. S. D. A. 1928—Farmers' Bul. 1571, U. S. D. A.
- KIRBY, W. and SPENCE, W. 1846—Introd. to Ent., 6th London Edit., pp. 191, 195, 258.
- KIRKLAND, A. H. 1904—Farmers' Bul. 196, pp. 8, 10, U. S. Dept. Agric.
- LEIDY, J. 1877—Proc. Phila. Acad. Nat. Sci., Vol. 29, p. 260.
- LEIGH, H. S. 1914—Rpt. on Rook Feeding Habits, Econ. Ornith. Comm., England.
- MASAITAS, A. I. 1929—Izv. sibirsk. Kraev. Stantz. Zashch. Rast. No. 3 (6), pp. 1-41, Tomsk. (Rev. Appl. Ent. XVIII, 48.)
- MCATEE, W. L. 1908—Bul. 32, Biol. Survey, U. S. Dept. Agric.
- NEWSTEAD, R. 1908—Food of British Birds, Suppl. Jl. Bd. Agric., Dec., 1908.
- O'KANE, W. C. 1913—Extens. Circ. 8, N. Hampshire Expt. Sta.
- ORTON, W. A. and CHITTENDEN, F. H. 1917—Farmers' Bul. 856, U. S. Dept. Agric.
- PERGANDE, T. 1882—Notes, Vol. 4, No. 2884, Oct. 9, 1882, Div. Ent., U. S. D. A.
- ROEBUCK, A. 1925—"Eggs", XI, Nos. 12, 13, 25, pp. 206, 210, 418; XII, Nos. 1 and 3, pp. 4, 37. Rudgwick, Sussex, Mar.-July, 1925 (RAE, XIII, 590.)
- RYMER-ROBERTS, A. W. 1919—Ann. Applied Biology, Vol. VI, Nos. 2 and 3, p. 132.

- SACHTLEBEN, H. 1925—Arb. Biol. Reichsanst. Land. u. Forstw., XIV, No. 1, p. 77.
- SCHAFFNIT, E. 1919—Bericht Auftreten v. Feind u. Krankh. d. Kulturpfl. in d. Rheinprov. 1918 u. 1919, p. 47.
- SCHEFFER, T. H. 1910—Farm. Bul. 168, Kansas Expt. Sta., Manhattan, Kans.
- SOKANOVSKII, B. V. 1926—Defense des Plantes, III, No. 4-5, p. 390. Leningrad.
- SURFACE, H. A. 1907—Zool. Bul., Div., Zool., Pa. Dept. Agric., Vol. V, No. 3, No. 8; Dec. 1, 1907, pp. 93, 246.  
Id. 1913—Bi-Monthly Bul., Div. Zool., Pa. Dept. Agric., Vol. III, Nos. 3 and 4, May-July, 1913.
- SWEZEY, O. H. 1924—Rpt. Comm. Expt. Sta., Hawaiian Sugar Planters' Assoc., 1923-24, p. 13.
- THEOBALD, F. V. 1917—Fruit Flower and Vegetable Trades' Journal, London, Oct. 13, 1917.
- UMNOV, A. 1913—Rept. on work of Ent. Bureau of Zemstvo of Kaluga for 1913. Kaluga, Russia. (RAE. II, 263.)
- VASSILIEV, E. M. 1913, 1914—Rpts. of the Ent. Expt. Sta. of All Russian Soc. of Sugar Refiners, in Smiela, Kiev.
- VIETINGHOFF-RIESCH, A. VON 1928—Z. angew. Ent., XIII, No. 3, p. 483.
- VOSTRIKOV, P. 1916—Orchards, Market Garden and Bachza., Suppl., Astrachan (Russia), Nos. 2-3, Feb.-Mar., 1916.
- WALTON, C. L. 1917—Ann. Appl. Biol., Vol. IV, Nos. 1 and 2, Sept., 1917, p. 7.
- WATSON, J. R. 1917-1919—Florida Expt. Sta. Buls. 134 and 151.
- WEBSTER, F. M. 1893—Bul. 46, Ohio Agr. Expt. Sta., p. 228.
- WHITE, P. B. 1914—Jl. Bd. Agric., England, Vol. 21, No. 5, p. 401.
- WILCOX, E. V. 1892—Bul. 43, Ohio Expt. Sta., 1892, p. 127.
- WILLIAMSON, W. 1916—Spec. Bul. 8, p. 2, Univ. Minnesota Agric. Extension Div.

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### Prof. T. D. A. Cockerell to go to Africa.

In June my wife and I sail for England, and thence early in July, accompanied by Miss Alice Mackie, for Lobito Bay, West Coast of Africa; thence by rail to the Katanga country, then to Lake Tanganyika, then south via Rhodesia to the Cape; back to England by sea, and reach Colorado about Christmas.

—T. D. A. COCKERELL.

## Descriptions of New Genera and Species of the Dipterous Family Ephydriidae. Paper X.\*

By EZRA T. CRESSON, JR.

### *Ochthera canescens* new species

Black; palpi, halteres, bases of fore and middle tibiae, and tarsi, yellow. Wings immaculate, hyaline, with pale veins. Similar to *mantis* but the frontal orbits opaque, ocherous. Mesonotum faintly bronzed, overcast with gray which becomes white laterally, on the pleura and metanotum. Abdomen overcast with gray becoming more dense laterally.

Structurally similar to *mantis*. Ocellar bristles distinct, much appressed. Mesonotum and scutellum subgranulose. Fore tibial spur as long as the basitarsus, the latter in the male with a well developed apical flexor, spine-like, conical spur, more or less obscured by long bristly hairs; middle femora of male with two flexor series of short bristles, the hind basitarsus with curved flexor hairs. Length, 5 mm.

*Type*.—Male; Polisha, FORMOSA, March, 1908, (Sauter), [A.N.S.P., No. 6485]. *Paratypes*.—1 ♂, 1 ♀; Anping, Formosa, April, 1912, (Sauter), [Hungary Nat. Mus.].

### *Ochthera loreta* new species

Black; palpi, base of fore and middle tarsi, second to fourth segments of hind tarsi, tawny. Halteres pale yellow. Wings hyaline with pale veins. Of general aeneous to metallic silvery color; mesonotum with three cuperous stripes; face granulose, brassy, densely silvery pubescent, leaving the usual sculptured quadrate spots or bars, bare. Abdomen cinereous with broad poorly defined median brown stripes, narrowly extending laterally along the posterior margins of the segments.

Structurally similar to *exculpta*, but the anterior ocellus not noticeably large; face roundly convex, not conical; tormae broader than long; lateral margins of abdomen of male rounded, not angularly turned.

*Type*.—Male; Loreta, BAJA CALIFORNIA, May 19, 1921, (E. P. VanDuzee), [California Acad. Sci.]. *Paratype*.—1 ♂; topotypical. 1 ♂; Tampico, MEXICO, December 22, 1908, [Illinois Natural History Survey].

\* Paper VIII. See ENT. NEWS, XLI, p. 76, (1930).

Paper IX. See ENT. NEWS, XLII, p. 104, (1931).

**Ochthera baia** new species

Black; fore tarsi except apically, and base of middle tarsi, tawny; halteres pale yellow. Wings brownish with brown veins. Frontal plate shining, the broad orbits velvety-black; face uniformly golden pubescent; cheeks and lower occiput cinereous; mesonotum granitose, brassy, with three cupreous stripes; scutellum similar, with brassy tinge. Abdomen rather shining, sparingly brown pruinose; the laterally turned down lateral lobes densely cinereous; pleura and femora, cinereous.

Structurally and in size similar to *lorcta*.

*Type*.—Male; Mulege, BAJA CALIFORNIA, May 14, 1921. (E. P. VanDuzee), [California Acad. Sci. Collection.]. *Paratypes*.—1 ♂, 2 ♀; topotypical.

**Ochthera wrighti** new species

Black; antennae especially third segment, palpi and halteres, fore and middle tibiae and their tarsi except apex of latter, extremities of hind tibiae, more or less of intermediate segment of their tarsi, pale yellow to tawny. Wings clear.

Structurally similar to *regalis*. Width of frons about eight times the distance between anterior ocellus and anterior margin. Face at narrowest portion transversely subcarinate, lower portion not longer than the upper; the lower transverse carina distinctly above epistoma, below this the face is retreating. Fore basitarsus of male as well as the following segments are more dilated than in *regalis*; the former with a similar strong flexor tooth, partially obscured by the surrounding pile and pubescence. Length, 3.5 mm.

Very similar to *regalis* especially in color, but averages larger; frons shorter and broader as is also the lower portion of the face; the latter with the transverse carina more prominent; arisal hairs somewhat flattened on basal three-fourths, especially in the male.

*Type*.—Male; CUBA, (Ch. Wright), [Museum of Comp. Zool., Coll.]. *Paratypes*.—2 ♂, 7 ♀; topotypical.

**Ochthera painteri** new species

Very similar to *wrighti*, differing as follows: Frons longer, but not so noticeably as in *regalis*; more shining, with the lateral opaque orbital areas velvety-black above and sharply defined. Second antennal segment black; third, pale tawny with

the arista hairs normal, long and curving. Face longer, more pruinose in the male, less concaved, with scarcely any transverse carina below, its position being very near the epistomal margin. Palpi black.

*Type*.—Male; Puerto Castilla, HONDURAS. (R. H. Painter; April 18, 1924), [A.N.S.P., No. 6486]. *Paratypes*.—2 ♂, 2 ♀; topotypical, April 4, 20, 23, 1924.

STENOCHTHERA ANGUSTIFACIES Hendel

1930. *Stenochthera angustifacies* Hendel, Konowia, ix, p. 132.

This is the genotype of *Stenochthera* Hendel and was originally described from Bolivia. I have seen specimens from San Bernardino, PARAGUAY, (Fiebrig), [Nat. Hist. Mus., Vienna; 13]; Trinidad Rio, PANAMA, (Busck; March 29), [U.S.N.M.; 1]; Higuito, San Mateo, COSTA RICA, (Schild), [U.S.N.M.; 1].

STENOCHTHERA REGALIS (Williston) n. comb.

1897. *Ochthera regalis* Williston, Kans. Univ. Quart., vi, p. 6.  
1930. *Stenochthera caeruleovittata* Hendel, Konowia, ix, p. 133, n. syn.

Although Hendel, in his reference above cited, states that *Ochthera regalis* Williston belongs to his new genus *Stenochthera*, he does not complete the new combination.

My series of *regalis*, including a female from Dr. Williston's collection and agreeing with his description, are certainly conspecific with Hendel's *caeruleovittata*, at least they agree with Hendel's description. I do not know what Hendel considers *regalis*.

STENOCHTHERA TRIORNATA (Cresson) n. comb.

1926. *Ochthera triornata* Cresson, Trans. Am. Ent. Soc., lii, p. 255.

Hendel states that this is also a member of his new genus, but does not complete the new combination.

This species was originally described from PARAGUAY. I have also seen it from San Sebastiao, Sao Paulo, BRAZIL, (Barbiellini), [1]; and there is a specimen in the Natural History Museum of Vienna without data, bearing label "Coll. Winth".



### More About Bites by Aphis Lions (Neur.: Chrysopidae).

In the March, 1931, issue of the ENTOMOLOGICAL NEWS, P. B. Barringer calls attention to the fact that larvae of Chrysopidae sometimes bite human beings. Dr. Barringer wishes to know whether or not this has been experienced elsewhere.

The writer finds that in South Dakota it is a common experience for individuals working out-of-doors to be bitten several times per year by *Chrysopa* larvae. While conducting his experimental field work and while on collecting trips, the writer has frequently been bitten several times per day by aphid lions. This has taken place regardless of the amount of rainfall that occurred during the season or year. The writer is certain that in South Dakota there is no direct correlation between lack of precipitation and the frequency of attacks upon human beings by *Chrysopa* larvae. Undoubtedly, these attacks occur more frequently when the larvae are abundant, but this, in the opinion of the writer, is because more *Chrysopa* larvae are dislodged from the aphid infested plants when the aphid lions are more abundant than when they are scarce.

The matter of reaching a human body is entirely a matter of chance. In the spring and early summer of 1930, South Dakota experienced one of the worst aphid outbreaks that it ever had. The natural enemies of the aphids, including aphid lions, gradually increased in abundance, and by the middle of summer had reduced the plant lice to a negligible quantity. But even at the time when the aphids were most abundant, aphid lions attacked man when they happened to find themselves upon his body.

The after-effects upon man of the bites of an aphid lion have always been negligible in the experience of the writer, and have never been so severe as those described by Dr. Barringer.

H. C. SEVERIN, South Dakota State College.

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### To Authors of Papers Published in the News.

Authors who desire the galley-proofs of their papers, which have been published in the NEWS in recent years, may obtain the same on application, within the next two months, to the Editor, Zoological Lab., University of Penna., Philadelphia, Penna., and remitting postage for the same. Specify the number, or numbers, in which the article(s) appeared.

**List of the Titles of Periodicals and Serials Referred to by  
Numbers in Entomological Literature  
in Entomological News.**

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1. Transactions of The American Entomological Society. Philadelphia.
2. Entomologische Blätter, red. v. H. Eckstein etc. Berlin.
3. Annals of the Carnegie Museum. Pittsburgh, Pa.
4. Canadian Entomologist. London, Canada.
5. Psyche, A Journal of Entomology. Boston, Mass.
6. Journal of the New York Entomological Society. New York.
7. Annals of the Entomological Society of America. Columbus, Ohio.
8. Entomologists' Monthly Magazine. London.
9. The Entomologist. London.
10. Proceedings of the Ent. Soc. of Washington. Washington, D. C.
11. Deutsche entomologische Zeitschrift. Berlin.
12. Journal of Economic Entomology, Geneva, N. Y.
13. Journal of Entomology and Zoology. Claremont, Cal.
14. Entomologische Zeitschrift. Frankfurt a. M., Germany.
15. Natural History, American Museum of Natural History. New York.
16. American Journal of Science. New Haven, Conn.
17. Entomologische Rundschau. Stuttgart, Germany.
18. Internationale entomologische Zeitschrift. Guben, Germany.
19. Bulletin of the Brooklyn Entomological Society. Brooklyn, N. Y.
20. Societas entomologica. Stuttgart, Germany.
21. The Entomologists' Record and Journal of Variation. London.
22. Bulletin of Entomological Research. London.
23. Bollettino del Laboratorio di Zoologia generale e agraria della  
R. Scuola superiore d'Agricoltura in Portici. Italy.
24. Annales de la société entomologique de France. Paris.
25. Bulletin de la société entomologique de France. Paris.
26. Entomologischer Anzeiger, hrsg. Adolf Hoffmann. Wien, Austria.
27. Bolletino della Società Entomologica. Genova, Italy.
28. Ent. Tidskrift utgifen af Ent. Föreningen i Stockholm. Sweden.
29. Annual Report of the Ent. Society of Ontario. Toronto, Canada.
30. The Maine Naturalist. Thornaston, Maine.
31. Nature. London.
32. Boletim do Museu Nacional do Rio de Janeiro. Brazil.
33. Bull. et Annales de la Société entomologique de Belgique. Bruxelles.
34. Zoologischer Anzeiger, hrsg. v. E. Korschelt. Leipzig.
35. The Annals of Applied Biology. Cambridge, England.
36. Transactions of the Entomological Society of London. England.
37. Proceedings of the Hawaiian Entomological Society. Honolulu.
38. Bull. of the Southern California Academy of Sciences. Los Angeles.
39. The Florida Entomologist. Gainesville, Fla.
40. American Museum Novitates. New York.
41. Mitteilungen der schweiz. ent. Gesellschaft. Schaffhausen, Switzerland.
42. The Journal of Experimental Zoology. Philadelphia.
43. Ohio Journal of Sciences. Columbus, Ohio.
44. Revista chilena de historia natural. Valparaiso, Chile.
45. Zeitschrift für wissenschaftliche Insektenbiologie. Berlin.
46. Zeitschrift für Morphologie und Ökologie der Tiere. Berlin.
47. Journal of Agricultural Research. Washington, D. C.
48. Wiener entomologische Zeitung. Wien, Austria.
49. Entomologische Mitteilungen. Berlin.
50. Proceedings of the U. S. National Museum. Washington, D. C.
51. Notulae entomologicae, ed. Soc. ent. helsingfors. Helsingfors, Finland.
52. Archiv für Naturgeschichte, hrsg. v. E. Strand. Berlin.

53. Quarterly Journal of Microscopical Science. London.
54. Annales de Parasitologie Humaine et Comparée. Paris.
55. Pan-Pacific Entomologist. San Francisco, Cal.
56. "Konowia". Zeit. für systematische Insektenkunde. Wien, Austria.
57. La Feuille des Naturalistes. Paris.
58. Entomologische Berichten. Nederlandsche ent. Ver. Amsterdam.
59. Encyclopédie entomologique, ed. P. Lechevalier. Paris.
60. Stettiner entomologische Zeitung. Stettin, Germany.
61. Proceedings of the California Academy of Sciences. San Francisco.
62. Bulletin of the American Museum of Natural History. New York.
63. Deutsche entomologische Zeitschrift "Iris". Berlin.
64. Zeitschrift des österr. entomologen-Vereines. Wien.
65. Zeitschrift für angewandte Entomologie, hrsg. K. Escherich. Berlin.
66. Report of the Proceedings of the Entomological Meeting. Pusa, India.
67. University of California Publications, Entomology. Berkeley, Cal.
68. Science. New York.
69. Comptes rendus hebdom. des séances de l'Académie des sciences. Paris.
70. Entomologica Americana, Brooklyn Entomological Society. Brooklyn.
71. Novitates Zoologicae. Tring, England.
72. Revue russe d'Entomologie. Leningrad, USSR.
73. Quarterly Review of Biology. Baltimore, Maryland.
74. Sbornik entomolog. národního musea v Praze. Prague, Czechoslovakia.
75. Annals and Magazine of Natural History. London.
76. The Scientific Monthly. New York.
77. Comptes rendus heb. des séances et mémo. de la soc. de biologie. Paris.
78. Bulletin Biologique de la France et de la Belgique. Paris.
79. Koleopterologische Rundschau. Wien.
80. Lepidopterologische Rundschau, hrsg. Adolf Hoffmann. Wien.
81. Folia myrmecol. et termitol. hrsg. Anton Krausse. Bernau bei Berlin.
82. Bulletin, Division of the Natural History Survey. Urbana, Illinois.
83. Arkiv för zoologie, K. Svenska Vetenskapsakademien i. Stockholm.
84. Ecology. Brooklyn.
85. Genetics. Princeton, New Jersey.
86. Zoologica, New York Zoological Society. New York.
87. Archiv für Entwicklungsmechanik der Organ., hrsg. v. Roux. Leipzig.
88. Die Naturwissenschaften, hrsg. A. Berliner. Berlin.
89. Zoologische Jahrbücher, hrsg. v. Spengel. Jena, Germany.
90. The American Naturalist. Garrison-on-Hudson, New York.
91. Journal of the Washington Academy of Sciences. Washington, D. C.
92. Biological Bulletin. Wood's Hole, Massachusetts.
93. Proceedings of the Zoological Society of London. England.
94. Zeitschrift für wissenschaftliche Zoologie. Leipzig.
95. Proceedings of the Biological Soc. of Washington, Washington, D. C.
96. La Cellule. Lierre, Belgium.
97. Biologisches Zentralblatt. Leipzig.
98. Le Naturaliste Canadien. Cap Rouge, Chicoutimi, Quebec.
99. Mélanges exotico-entomologiques, Par Maurice Pic. Moulins, France.
100. Bulletin Intern., Académie Polonaise des Sci. et des Lett. Cracovie, Poland.
101. Tijdschrift voor entomologie, Nederlandsche Entomol. Ver., Amsterdam.
102. Entomologiske Meddelelser, Entomologisk Forening, Copenhagen.
103. Journal of the Kansas Entomological Society, Lawrence, Kansas.
104. Revista de la Sociedad entomologica Argentina, Buenos Aires.

## Entomological Literature

COMPILED BY LAURA S. MACKAY UNDER THE SUPERVISION OF  
E. T. CRESSON, JR.

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 within brackets | | refer to the journals, as numbered in the list of Periodicals and Serials published in the January and June numbers (or which may be secured from the publisher of Entomological News for 10c), in which the paper appeared. The number of, or annual volume, and in some cases the part, heft, &c. the latter within ( ) follows; then the pagination follows the colon :

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

\*Papers containing new forms or names have an \* preceding the author's name.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

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.

 Note the change in the method of citing the bibliographical references, as explained above.

Papers published in the Entomological News are not listed.

**GENERAL.**—Ainslie, G. G.—Obituary. By Larrimer & Wade. [12] 24: 567-569, ill. Comstock, J. H.—Obituary. By J. G. Needham. [68] 73: 409-410. Comstock, J. H.—Obituary. By G. W. H. [12] 24: 564-566, ill. Cook, W. C.—Notes on predicting the probable future distribution of introduced insects. [84] 12: 245-247. de Joannis, J.—Les règles internationales de nomenclature zoologique. [L'Amateur Papillons] 5: 152-160, 193-201. Leech, H. B.—Coleoptera by "smoking" stumps. [19] 26: 12. Mathews, F. S.—Field book of American wild flowers. Being a short description of their character and habits, a concise definition of their colors, and incidental references to the insects which assist in their fertilization. New York. 558 pp., ill. Metcalf, C. L.—Insects that bite man. [Trans. Illinois State Acad. Sci.] 23: 261-272. Patton, W. S.—Insects, ticks, mites and venomous animals of medical and veterinary importance. II. Public Health. 740 pp., ill. Petersen, W.—Nahrung und genitypus. [46] 20: 679-690. Stiles & Nolan.—Key catalogue of parasites reported for Chiroptera (Bats) with their possible public health importance. [U. S. Nat. Health Bull.] 155: 603-742. Tillyard, R. J.—The evolution of the class insecta. [Rep. 20th Meeting Australian & New Zealand Assoc. Adv. Sci.] 20: 193-241, ill. Wardle, R. A.—The problems of applied entomology. [Publ. Univ. Manchester] Biol. Ser. 5: 587 pp., ill.

**ANATOMY, PHYSIOLOGY, ETC.**—Bataillon & Su.—Etudes analytiques et expérimentales sur les rythmes cinétiques dans l'oeuf (Hyla arborea, Paracentrotus lividus, Bombyx mori). [Trav. Inst. Zool. Univ. Montpellier] 54:

439-540, ill. **de Boissezon, P.**—Influence de la température sur la biologie des Culicidés. [Bull. Soc. Zool. France] 55: 255-261. **Dautert-Willimzik, E.**—Einige beobachtungen über das geschlechtsleben der männchen der schlupfwespe *Nasonia brevicornis*. [34] 93: 306-316, ill. **Dawson, R. W.**—The problem of voltinism and dormancy in the Polyphemus moth (*Telea polyphemus*). [42] 59: 87-131. **Ehrhardt, S.**—Ueber arbeitsteilung bei *Myrmica*-und *Messor*-arten. [46] 20: 755-812, ill. **Fischer, E.**—Ein elektrokardiogramm von schmetterlingsspuppen. [41] 15: 46-49, ill. **Flanders, S. E.**—The life cycles of *Trichogramma minutum* in relation to temperature. [68] 73: 458. **Friederichs, H. F.**—Beiträge zur morphologie und physiologie der sehorgane der Cicindelinen. [46] 21: 1-172, ill. **Frisch, K.**—Versuche über den geschmacksinn der bienen. [Sitzungsb. Ges. Morph. u. Phys. München] 39: 49-60. **Heymons & Lengerken.**—Studien über die lebenserscheinungen der Silphini. [46] 20: 691-706, ill. **Hobson, R. P.**—Studies on the nutrition of blow-fly larvae. [42] 8: 109-123, ill. **Lutz, F. E.**—Light as a factor in controlling the start of daily activity of a wren and stingless bees. [40] 468: 9 pp. **Marcu, O.**—Ein neuer beitrage zur kenntnis der stridulationsorgane bei lpiden. [34] 94: 32-37, ill. **McIndoo, N. E.**—Tropisms and sense organs of Coleoptera. [Smiths. Misc. Coll.] 82: 70 pp., ill. **Millot, J.**—Glandes venimeuses et glandes séricigènes chez les Sicariïdes. [Bull. Soc. Zool. France] 55: 150-175, ill. **Pauliuk, I.**—Topographie und funktion des kopulationssapparates von *Lestes sponsa*. [Verh. Mitt. Siebenbürg. Ver. Naturwiss. Hermannstadt] 78: 41-62, ill. **Salt, G.**—A further study of the effects of stylopization on wasps. [42] 59: 133-166, ill. **Stammer, H. J.**—Eine bakteriensymbiose bei den Donaciinen. (Coleoptera.) [88] 19: 270-271. **Vandendries, R.**—La conduite sexuelle des Hyménoptères interprétée par les théories de Hartmann concernant la bisexualité et la relativité sexuelle. [Bull. Classe Sci., Belgique] 16: 1213-1234, ill. **Wigglesworth, V. B.**—The respiration of insects. [Biol. Rev. & Biol. Pro. Cambridge Philos. Soc.] 6: 181-220.

**ARACHNIDA AND MYRIOPODA.**—Gudger, E. W.—More spider hunters. Accounts of arachnids which attack and devour vertebrates other than fishes. [76] 1931: 422-433, ill.

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\***Curran, C. H.**—New species of Empididae from Panama. [40] 467: 12 pp. **Edwards, F. W.**—Mosquitoes breeding in plant pitchers. [Nat. Hist. Mag., Brit. Mus.] 3: 25-28, ill.

**Gjullin, C. M.**—Probable distribution of the Mediterranean fruit fly (*Ceratitis capitata*) in the United States. [84] 12: 248-258, ill. **Johnson, C. W.**—Nestling birds destroyed by the larvae of *Protocalliphora*. [Bull. Bost. Soc. Nat. Hist.] 1931: 21-24. **Mercier & Tolmer.**—Les *Coelopa* (Acalyp-terae; famille des Phycodromidae) d'Europe et de l'Amerique du Nord. [Bull. Soc. Zool. France] 55: 238-242.

**Thomas, I.**—The structure and life-history of *Sciara nitidicollis*. [93] 1930: 1009-1026, ill. **Thorpe, W. H.**—The biology, post-embryonic development and economic importance of *Cryptochaetum iceryae* (Agromyzidae) parasitic on *Icerya purchasi* (Monophlebini). [93] 1930: 929-971, ill.

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**Robertson, C.**—Position of Strepsiptera on hosts. III [19] 26: 45-46. **Schenkling & Marshall.**—Coleopterorum Catalogus. Pars 114. Curculionidae: Eremninae, Leptopinae, Tanyrrhynchinae, Cyliindrorrhinae, Thecesterninae (Suppl.), Rhytirrhinae (Suppl.), Rhyparosominae (Suppl.). 39 pp., 83 pp., 10 pp., 23 pp., 4 pp. **Schenkling & Marshall.**—Coleopterorum Catalogus. Pars 116. Curculionidae: Dinomorphinae, Somatodinae, Amycterinae, Gonipterinae. 39 pp., 11 pp. **Schenkling, S.**—Coleopterorum Catalogus. Pars 117. Niponiidae, Monommidae, Sphindidae, Aspidiphoridae, Sphaeritidae. 7 pp., 4 pp., 2 pp., 2 pp. **Siepmann, C. G.**—On the validity of *Glischrochilus quadrisignatus* (Nitidulidae). [19] 26: 24-35, ill.

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VIGNON, P. INTRODUCTION À LA BIOLOGIE EXPÉRIMENTALE. Les êtres organisés, activités, instincts, structures. 1930. 731 p., 890 fig., 21 pls. en noir, 3 pls. en couleurs. Préface du Professeur E.-L. Bouvier, membre de l'Institut. Paris, P. Lechevalier.—Theories aside, the author brings us face to face with organisms as they are and as they behave. Beginning with animals nearest man, descending the scale, he finds the germ of mind in the Infusoria, Heliozoa and the Amebas. Chap. II treats of some of the least well known instincts. Starting with the idea that instinct is hardly distinguishable from personal initiative, one soon arrives at instincts too wise to be compassed by the inventive power of the creature itself, to say nothing of many instincts inseparably connected with appropriate organs: thus one reaches a domain virginal and rich. Chap. III relates curious facts bearing upon the problem of organic construction. Chap. IV treats extensively of mimicry, seen from many points of view. The author describes in some detail the extraordinary leaf-grasshoppers of tropical America, which he alone has had opportunity to study in detail.

The second part is concerned with Evolution: certain, but inexplicable, manifestly so in the case of the origin of the Tentaculifera, the multiplication of types of the Radiolaria and, above all, when one considers certain mutations which involve an enormous, sudden change, such as the origin of *Sacculina* and development of the beak in various reptiles and birds of the Secondary Era. A study of development of the feather and a visit to the world of flowers bring to an end the second part.

863 works are cited in the Bibliographic Index. 1004 species or varieties are mentioned in the Systematic Index. An important Biological Index is presented. A Philosophical Index is concerned with that philosophy of nature, the foundations of which it is the mission of science to establish.

—PAUL VIGNON.



## OBITUARY.

Professor JAMES STEWART HINE, Director of the Division of Natural History of the Ohio State Archaeological and Historical Museum, died December 22, 1930. His death was due to an acute heart attack and occurred in his home while he, his children and the neighbor children were making preparations for Christmas. Professor Hine had always enjoyed robust health. His taking away was without warning.

Professor Hine was born at Wauseon, Ohio, June 13, 1866, was raised on a farm and worked his way through Ohio State University, where he received the B. S. degree in 1893. From this time to his death his activities were centered on the University Campus, first on the faculty of Ohio State University, and in his later years at the Archaeological Museum. From 1894 to 1896 he was Instructor in Entomology, from 1896-1902, Assistant Professor of Zoology and Entomology, and from 1902 to 1925, Associate Professor of Entomology. In 1925 the Ohio State Archaeological Museum decided to develop a Division of Ohio Natural History which could cooperate with the state high schools and Professor Hine, because of his wide knowledge of the state fauna, was asked to organize the division. During 1925-1927 he devoted half his time to teaching and half to the organization of the Division of Natural History. From 1927 till his death, 1930, he devoted full time to the latter position.

In his earlier years of teaching Professor Hine handled at one time or another the various courses given in entomology, but in later years came more into the teaching of apiculture. He had received his biological education under David Kellicott when the field was almost wholly morphological and systematic. With this start his interests in research through life were almost wholly systematic.

His first extended collecting trip beyond the borders of Ohio was during June to September, 1903, when he worked at the Gulf Biologic Station of the University of Louisiana, at Cameron on the Gulf Coast. His study here, besides general collecting, was on horse flies and at least six subsequent papers were written on this work, the main ones being *A preliminary*

*report on the horseflies of Louisiana, 1906, and A second report on the horseflies of Louisiana, 1907.*

His second extensive collecting trip was taken during January to March, 1905, in Central America with E. B. Williamson, and C. C. Deam, where Hine collected Odonata and Diptera. The records of Odonata are given in the Supplement to the Neuroptera of the *Biologia Centrali Americana*, but his bibliography gives no papers on the Diptera of this trip.

The third trip was during July and August, 1907, to Southern California, the Huachuca Mountains of Arizona and to Northern Mexico. The Odonata of this trip are in the Williamson Collection. No special papers were written on the material.

From about this time on Hine had built up by collecting and trading such a large collection of Diptera, particularly Tabanidae and Asilidae that the majority of his subsequent papers were revisions of groups and papers on new species.

During the ten years from 1907 to 1917 Hine spent his vacations in the development of his apple farm at Ira, Ohio, a few miles from Akron. While regretting the loss of time for collecting trips he felt that getting his four children onto a farm each summer more than paid for his time lost from entomological work. Eventually the orchard became very profitable and as the city of Akron grew it became very valuable.

In 1917 Professor Hine went as entomologist and ornithologist on the first National Geographic Society expedition under the direction of Robert Griggs to the Katmai volcanic region of Alaska. Hine arrived at Kodiak Island June 8, 1917, collected there until June 14, when the expedition crossed to Katmai Bay, June 15th. He spent the greater part of his time collecting birds, small mammals and insects in the region within 15-20 miles of the base camp on Katmai Bay, but made trips into Katmai Valley and into the Valley of 10,000 Smokes. August 30 to September 20 was spent on Kodiak Island, when the expedition returned to the States.

In 1919 Professor Hine went as entomologist and ornithologist on the second National Geographic Society expedition to

the Katmai region. He arrived at the base camp at the head of Naknek Lake, June 21, and spent the most of the summer collecting in the vicinity of the base camp. During June 26-30 and July 6-10 trips were made by boat down Naknek Lake. Starting August 17, he made a trip over Katmai Range to Katmai Crater and back to Katmai Bay, Kodiak Island and Seattle, where he arrived September 26.\*

The only papers specifically on these trips appear to be *The birds of the Katmai Region*, 1919, *Description of Alaskan Diptera of the Family Syrphidae*, 1922, and *Alaskan species of Diptera of the genus Helophilus*, 1923.

During the winter of 1922-23 Hine studied at the Zoological Museum of the University of Michigan with two or three weeks during this period at the U. S. National Museum.

In 1925 he made a trip with the writer to England during August and September for the purpose of studying types of Tabanidae, particularly those of Walker, in the British Museum. Except for a few short trips into the region about London his whole time was spent at the Museum studying tabanid types.

In 1923 Professor Hine made a trip to southern Florida and Cuba lasting from March to May 15. He made extensive collections of Diptera and Odonata.†

When Professor Hine shifted in 1925 from the Department of Zoology and Entomology of Ohio State University to the Directorship of the Division of Natural History in the Archaeological Museum, he found the type of work and the opportunity for which he proved to be especially fitted. His work here involved the building of collections of all types of animal life found in Ohio. He was given a staff of three assistants and worked at every opportunity through a group of enthusiastic amateur collectors, some of whom have already developed a broad knowledge of the Ohio fauna. Besides the extensive insect collections the Museum already has very complete collections of the birds, mammals, amphibians and fishes of Ohio.

\* I wish to thank Dr. J. O. Sayre for the data from his field notes on the Alaskan trips.

† The latter have been found, while examining his collections since his death, to have been ruined by dermestids.

An excellent ornithological library has been assembled by purchase. For the first time in his life Hine showed his great ability to interest others in natural history to the extent of giving time and money to the building up of Ohio collections.

All during his life Professor Hine's interest, second to that in insects, was in birds. He was a charter member of the first Wheaton Club organized in 1896 and its record book shows that he gave the first formal paper on its first program, "The Order Pygopodes". After a few years this club became a social thing and eventually died. In 1921 a second Wheaton Club was organized. Hine was its president from 1921 to 1927. The latter took in permanent Columbus members as well as University students and has become a stable organization.

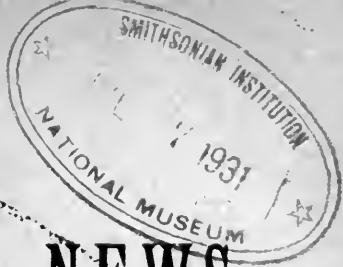
Through his teaching of apiculture he became interested in Ohio apicultural problems and was active for many years in the Ohio Beekeepers Association, being its president for several years.

To Professor Hine the real joy of life came in collecting in the field and in systematic work in his laboratory. He was an inveterate collector and brought together by field work and trading very fine collections of Tabanidae and Asilidae with much material on other large Diptera. He was equally a collector of books and, having purchased the C. H. T. Townsend library, built on it an excellent library on the systematics of Diptera.

His bibliography includes 92 titles which can be roughly divided as follows: Diptera, 52 titles, mostly descriptions and generic revision; Odonata 10; other groups of insects 23; mammals 2; birds 3; and on horticulture 2. At the time of his death he had completed all the basic work on a volume on the mammals of Ohio and on a monograph of the Tabanidae of North America.

Professor Hine had the gift of patience and a very great gift in his ability to interest others in birds and insects. He has left a lasting impression on faunal work in Ohio and on systematic work in Tabanidae and Asilidae.

—CLARENCE HAMILTON KENNEDY.

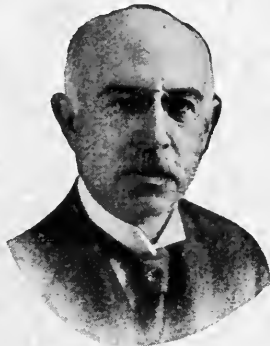


JULY, 1931

# ENTOMOLOGICAL NEWS

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No. 7



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1861-1926

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F. Pitt

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# ENTOMOLOGICAL NEWS

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## **Dr. Friedrich Ris.**

(Portrait and autograph Plate IV)

Dr. Friedrich Ris was born in Glarus, Switzerland, January 8, 1867, as the second oldest of four children, three brothers and one sister. The family since the sixteenth century were citizens of Glarus, the little capital of the canton Glarus, one of the old mountain cantons. In 1873 he entered the school of the little town. It was a Volksschule and there was no other, but it was of good standing, so that when the family moved to Zürich in 1881 F. Ris could attend, without trouble, Class III B of the Lower Gymnasium, with the Züricher boys of his own age. He attended the Zürich Gymnasium up to the Maturitätsprüfung in 1885. He selected the study of medicine and completed all five semesters at the University of Zürich. In 1890 he passed the State Examination and acquired the doctor's diploma in the same year. His doctor's thesis concerned a surgical question and was approved by the then Professor of Surgery of the University, Dr. Krönlein.

In order to see something of the world after his student years, passed entirely in Zürich, he entered the employ of the Norddeutscher Lloyd at Bremen as a ship's doctor. He made four voyages, one to North America, two to South America and one to the East as far as Shanghai. His brief shore leaves he used preferably for entomological excursions.

After his return he was in the surgical division of the cantonal hospital at Zürich as assistant physician, 1892-93, under Prof. Krönlein. It was a time of extremely severe hospital work. Free days were used for high mountain tours and entomological excursions. In 1892 there was a short visit to the Eppendorf Hospital in Hamburg, where his student friend Dr. L. Manchot worked. A cholera epidemic prevailed at Hamburg and his friend had asked Dr. Ris to come and study the disease on the spot. Dr. Ris possessed an unusual gift for

surgical medicine, thanks to his sure and light touch. Indeed, as assistant physician in the Insane Hospital at Rheinau, and later as Director, he performed for years all major and minor operations both in the Institute and in the village of Rheinau. Later, as he himself said, the technique changed in many respects and since the Winterthür Hospital was near he had his surgical patients treated there. In serious cases, however, he would always take part.

In 1895 he left the Cantonal Hospital at Zürich, as exclusively surgical activity had not pleased him. He entered the service of the Insane Hospital at Rheinau as Assistant Physician under Bleuler, who was then Director. In 1897 the canton Tessin began the construction of its Insane Hospital and called Dr. Ris as Director thereof. He accepted the call and went to Mendrisio after some months of study with Prof. Forel in Burghölzli. In Mendrisio, building came first, but as overseeing the building did not fully occupy his time and mind, he obtained permission to dwell in Pavia and to work in Golgi's laboratory there. When in 1898 Prof. Forel retired from his office, Bleuler became his successor as Director of Burghölzli and professor of Psychiatry. Dr. Ris was chosen as Director of the Insane Hospital at Rheinau, where he remained to his death.

This is an outline of the medical career of Dr. Ris. It is accompanied by another, that of the learned investigator of Nature. This begins in early youth and is really the main career and that of the physician is added to it. Dr. Ris began butterfly collecting as a boyish sport, which was soon cultivated with great earnestness and thoroughness, as I well remember. He was encouraged in this in early boyhood years, not by a teacher, but by a notable woman who practised the calling of taxidermist, that is, she stuffed animals of all kinds for collections and museums. She had thereby acquired, self-taught, a well-founded knowledge in diverse fields of natural science, that is of zoology. She showed the boy the knack of spreading insects and preparing them, and lent him her books on Natural History. At the Zürich Gymnasium, Prof. Gustav

Schoch, who taught Zoology, soon noticed his scholar Ris. He introduced him into the "Entomologische Kränzchen," a small society of Zürich entomologists from the most varied walks of life. In 1886 he made the acquaintance of Dr. Max Standfuss, who had become Conservator at the "Eidgenössische Technische Hochschule." This acquaintance became a life-long friendship. At the end of the eighties began the correspondence with Baron de Selys-Longchamps.<sup>1</sup> That with K. J. Morton was "begun in 1893 on the introduction of the late Mr. McLachlan", that with the writer in 1896. Sixty-four of his letters and cards, from December 22, 1896, to September 23, 1930, lie before me and I shall let them tell, as nearly as possible, the story of his entomological work. Two of the earliest are in German, the remainder in English: "schreiben Sie mir Englisch", so runs the first letter, "ich verstehe es vollständig, schreibe es auch, aber dies doch nicht so leicht, dass ich da, wo es möglich ist, nicht lieber meine Muttersprache anwendete."

That same letter, of December 22, 1896, is prophetic of what was to be his greatest work:

Einen Plan den ich einst hegte, nämlich Material zu sammeln, um selbst die Synopsis der Libellulinen auszuarbeiten, habe ich so ziemlich wieder ausgegeben. Meine Berufsarbeiten als Arzt und Direktor einer (allerdings sehr kleiner) Irrenanstalt gestatten mir kaum so weitreichende entomologische Arbeiten zu unternehmen. Ich bemühe mich aber sehr meine Sammlung von Libellen der ganzen Welt zu vergrössern, oder eigentlich ist zu schaffen, denn zur Zeit ist sie noch sehr klein.

In the same epistle too, he wrote: Beside the Odonata I concern myself also with other Neuroptera, particularly the Trichoptera in recent years have absorbed a large part of my time available for entomology. (Transl.)

Many of his letters are, naturally, occupied with remarks on one or other of our entomological papers which we were constantly exchanging, or on work in progress.

In July I was with M. de Selys Longchamps at Liège and Longchamps and with M. René Martin at Le Blanc. The study of the two great collections was extraordinarily interesting to me. (1. Aug. 1899.)

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<sup>1</sup>Up to this point I am indebted to the kindness of Fräulein ELISABETH RIS for this account of her brother.

My own interest in Odonata is as active as is possible with regard to my time for entomology. I am engaged in rather heavy work, having agreed to the wishes of Baron de Selys Longchamps' son (and his own as deposited in his testament) and undertaken the collaboration in a Catalogue of the Selysian collection. Sometimes I am really afraid that I have undertaken too much and am not able to finish what I have begun—not by want of zeal (and insight, as I might perhaps venture to add) but merely by lack of time. But I hope still and am busy in that time which I can dispose of. My part in the work is the Libellulinae and I earnestly try to make of it not a mere catalogue of the collection, but a review and synopsis of all that is described to date. More especially will I try to bring Brauer's system (which is still the best) up to date and to group the genera as well as may be done without knowledge of the early stages. Then a careful study and in many cases a new description of the Ramburian types is necessary. My idea of the work (more especially of my part, the Libellulinae) is to give:

1. A critical catalogue of species (Kirby's work will be of great value as an almost complete bibliographical reference, much less so for systematics and for critical examination of species and descriptions).

2. A system of Libellulinae up to date.

3. Keys to the more numerous [in species] and more difficult genera.

4. Complete descriptions of such species as might prove new and of the Ramburian types as far as there is need of such.

5. Special reference to where a complete description may be found.

I do not care to have any great number of nov. spec. to present (I really think there are not so many as one might suppose) but will earnestly try to know not only what is really described but also distinct. Mr. Kirby has collected the *names* with marvellous patience and learning, but I would try to get through the names on the matter itself, as M. de Selys has done on those groups that he has worked out. The task is, indeed, very heavy, but if I can get through, something good might be done.

I repeat that priority questions to me are absolutely of no consequence in the present work and that my only ambition is to get up a tolerably reliable systematic and critical catalogue of Libellulinae with here and there a description where there is need for it and some good keys for the large and difficult genera. In not a few genera (I may name *Tramea*, *Orthetrum*,

Old World *Trithemis*, etc.) great slaughter of old (and sometimes new) names will be necessary to bring some order into the matter. (1 Dec. 1901.)

Sometimes the work seems interminable and courage is nearly failing. (2 Feb. 1906.) I am much more inclined to reduction than to multiplication of genera. (18 Feb. 1906.)

I will not be long in telling you what I have done in London.<sup>2</sup> My time was too short for paying a visit to Mr. Champion without being in a hurry and so I did not use the letter of introduction that you had so kindly given me. So besides the Natural History Museum and a Sunday afternoon at Kew, I have seen nothing of the sights of London, the greatest sight being indeed always the Metropolis itself. My stay was of but one week. From the many notes that I have taken at the British Museum, I will take out such as might interest you for the B[iologia] C[entrali-] A[mericana], together with such observations in the same line from the de Selys collection where I have again worked for eight days before going to London, (5 Nov. 1906.)

A serious injury to an eye (received, I believe, in the institute at Rheinau) threatened the continuance of his work on the Catalogue; it is referred to in two of his letters:

I have to thank you heartily for two very kind letters. The first I received when in the hospital at Winterthür for treatment after that bad accident, the second when I was just leaving home for Italy. I think the best I can do for myself, and to merit all those good wishes I received from many friends is to be courageous and try to get on again as if things were unchanged. That of course they are not; but the deep mental, and to some degree also physical, depression that immediately followed the accident, is now fairly over. I am here at Ischia with a good friend (Prof. Lang, zoologist of Zürich University) where we both take long walks for health and distraction and do some little work. I have here my Libellulinae notes and am working at the printer's copy, getting on pretty well . . . The oculist told me that the right eye, although short-sighted, is good for any kind of work and that I have not to take any special regards. (Porto Is., Ischia, Italy, 24 March 1907.)

<sup>2</sup> This was in May, 1906, when he made his only visit to Great Britain and spent a few days at Edinburgh with Mr. Morton (K. J. M. in litt. 9. June, 1906, and Ent. Mo. Mag. lxxvii, p. 66, March, 1931; the latter reference is to an appreciative obituary of Dr. Ris).

You were so kind as to ask about my personal health, etc. Well, I think I overcame pretty well the great blow which the entire loss (such it was) of my left eye was at first and to a certain extent continues to be . . . I dare say I am doing, since about the end of the year 1907, when the immediate effects of the disaster began slowly to vanish, my fair share of work. In professional duties, I have gradually taken up again all my work . . . In entomology, I think I have done, since the end of 1907, more work than in any corresponding period of my life. The reason is simple, for I was soon aware that the best way to forget and not to haunt after regrets for the past and better days was to give way to a certain working fever that from time to time came over me. Formerly I had sometimes thought of giving up entomology, at least temporarily, as being in contrast [conflict] with my duties; but now I feel I owe too much to that science to give way at any time to such a thought. (27 Feb. 1909.)

Printing of the Libelluline portion of the Selys Catalogue began at Brussels in the Spring of 1909 and continued until 1913, forming fascicles 9-16 (1re partie) of the whole series. In the meantime, as is usual in such cases, a large amount of additional material was placed at Ris's disposition for study, especially the extensive Guatemalan, Guianan and Trinidad collections of E. B. Williamson. Work on a supplement dealing with these was begun. The World War broke out, interfering with further publication at Brussels.

The following is the situation of the last part of the Libellulinen of the Selysian Catalogue. It is very nearly finished; proofs are now being read of the alphabetical index; besides the rest of this index and some title pages, everything is printed. But—as far as I am aware, M. Severin had not the intention to send off the edition before the end of the war. (20 March 1916.)

Various plans were considered for the preliminary publication of the new species in the United States or in Holland. Finally

My friend Severin writes to me that the last installment of my Libellulinae monograph (with the indices and bibliography) has been deposited on March 1, 1919, at the National Library, Academy of Sciences, etc. It therefore may be regarded as published at that date. (11 March, 1919.)

This monograph of "Libellulinen" of 1248 quarto pages, 692 text figures and 8 colored plates is undoubtedly Ris' great and lasting contribution to science. It has been reviewed in the NEWS<sup>3</sup> at some length and therefore will not be further discussed here.

Ris's general papers on the Odonata, seven in number, include, in addition to the Libelluline monograph, *Untersuchungen ü. die Gestalt des Kaumagens bei den Libellen u. ihren Larven* (1896)<sup>4</sup>, with phylogenetic conclusions, *Oviposition in Cordulegaster* (1905), *Kopulationsmarken bei Libellen* (1910), *Die Atmungsorgane d. anisopteren Libellenlarven* (1913), *Ueber Ontogenese d. Flügeladerung bei den Libellen* (1916), and *Gynandromorphismus bei Odonaten* (1929). Seventeen papers refer to the palaeartic fauna (Switzerland 1886, 1890, 1894, 1897, 1916, 1919; Spain 1927; central Europe 1900, 1909, 1910, 1920; Europe in general 1906, 1927; Central Asia 1897, Persian Gulf 1928; China 1928, Northern Africa 1911, 1928), twelve to the Oriental (six to the Asiatic mainland or nearby islands, 1912, 1914, 1916, 1917, 1927, 1930, six to the Malay Archipelago 1911, 1912, 1915, 1916, 1927, 1930). Seven papers are concerned with the Australasian area (1898, 1900, 1910, 1913 two, 1915, 1929), eleven with the Ethiopian region (1909, 1911 two, 1912, 1913, 1915 two, 1917, 1921, 1924, 1931). Four relate to Nearctic species (1902, 1903, 1910, 1930) although the last of these, that on *Perithemis*, is even more concerned with neotropical forms. Nine more papers are restricted to the neotropical fauna (1904, 1908, 1912, 1913, 1914, 1917, 1918, 1928<sup>5</sup> two).

Of these faunal papers, special importance is to be assigned to the larval studies on central European material (1909, 1910, 1920), the extensive memoirs on Odonata of Formosa (1912, 1916), on E. Jacobson's collections in Java (1912) and Sumatra (1927), the handbook, as it really is, for South African

<sup>3</sup> Vol. XXXI, pp. 26-28, Jan. 1920. The editorial in our issue for November, 1918, entitled "Entomology in Central Europe," gives extracts from Ris's letters of 3 March and 16 Sept., 1918, without mention of his name, and testify to the depression produced by the war.

<sup>4</sup> See Ent. News, viii, pp. 39-40, 1897, for an abstract.

<sup>5</sup> Reference to the Zoological Record for the years given for the papers will give the place of publication.

Dragonflies (1921) and *Libellen aus der Region der amerikanischen Kordilleren von Costa Rica bis Catamarca* (1918).

At least five of the papers enumerated above as referring to the Swiss fauna contain data on other "Neuroptera" as well. There are besides at least five papers especially concerned with Perlidae (1896, 1902, 1903, 1905, 1913) four with Trichoptera (1893, 1895, 1903, 1904) one with Plecoptera, Neuroptera and Trichoptera (1923)—all of the Swiss fauna.

There are four general entomological papers: *Ueber Richtungslinien der Systematik* (1916), *Der Artbegriff, insbesondere in der Entomologie* (1918), *Beobachtungen und Gedanken über Zoogeographie auf kleinstem Raum* (1924) and *Die geographische Verbreitung der Insekten der Schweiz* (1926), the last being one of the opening addresses at the Third Entomological Congress at Zürich, in July, 1925.

In later years his interest in collecting and rearing Lepidoptera revived. His friendship with Dr. M. Standfuss, to which his sister has referred, had led to a detailed summary (1895) of Standfuss' experiments on the effect of extreme temperatures on Lepidopterous pupae and a review (1896) of the second edition of the latter's *Handbuch der paläarktischen Grossschmetterlinge*. After the Libelluline monograph was well out of the way, the fruits of butterfly studies appeared in papers on sexual characters of pupae (1920), the sphragis of *Parnassius* (1924), the generations of *Pieris napi* (1928), and seasonal forms of Swiss butterflies (1930).

Several fairly extensive pieces of taxonomic research were still on his hands when he passed away—the African Pseudaegrions, *Orthemis*, Neotropical Trameas with new materials, Chinese and Philippine collections.

And in the background of all stands preparatory work for a new Catalogue of Odonata. If I live (in good condition for work) to 1932, when I can retire, and if nobody else does the work in the meantime, I hope I shall do it. When a year ago I made a summary extract of the Calopterygidae for Sjöstedt, I found that three-fifths of the species were represented in Kirby's work, two-fifths not yet catalogued. Similar proportions supposed to exist all over the order, it is evident that a new catalogue would be desirable (17 Nov. 1928).



Regarding catalogs: My idea is not to put Kirby's Cat. up to date, but to make an entirely new thing. It is very questionable if I ever arrive to do that; the possibilities fully depend on the condition in which I may eventually retire from my office; the date would be 1932; it is a long way to that and before I am retired I can only undertake minor work in entomology, since the forces are no more sufficient to do both things: professional duties and serious research work. But I am, as a means that eventually could also serve another person and successor, keeping up to date a manuscript catalog of all described living Odonata, into which every record of Odonata, that passes through my hands, is put down. Every name has a sheet; in the newer parts cross references are regularly entered and such are also made as soon as they turn up for the older parts. The whole is divided into subfamilies for Anisoptera, 'legions' for Zygoptera; within the subfamilies or 'legions' genera are arranged alphabetically, so are species within genera. Geographical notes are always extracted, other remarks often added. The whole thing is very nearly complete. For a printed catalog, the great question would be to arrange systematically the alphabetical rough material. This latter task would, to my view, need a volume of comment. . . . If I live up to 1932 in good form for such work, it shall be the first thing that I undertake; if not, the MS. catalog may pass to somebody else for similar use. . . . The catalog is written on writing paper (octavo), not cards, and in a number of portfolios, measures 55 cm. over the back. Together with the set of books and the collection it makes my odonatological working outfit and makes me almost independent from the resources of a great city and enables me to do some work in this out of the way place. (25 Feb., 1929.)

The technical solution of a general collection in the hands of a private man of very limited means was given, as soon as I made up my mind to renounce the setting of specimens altogether; the whole collection is papered, and I find that for working purposes this condition is even preferable to a set collection. (9 Jan. 1913.) My collection (I say it again when examining some parts with Tillyard) must now be one of the largest in existence (the Museums included). It is in good working condition, but not fit for show. (7 Sept. 1926.)

You may be right with your intentions to concentrate your activities on the Costarican and similar materials. But I freely admit that I must regret such a decision. I see the moment coming when I shall thus be alone to try for a comprehensive knowledge of the whole field. The Americans conspicuously limit their investigations to the inhabitants of their own two

continents;<sup>6</sup> Laidlaw, Fraser, Lieftinck have never touched American materials; Morton has his great love for the Palaearctics; Schmidt is hesitating, also with Palaearctic sympathies. So it may sometime appear that my own work, rambling over the five continents, must necessarily be somewhat superficial. Nevertheless I think I shall continue in the old way, partly from real interest in the whole series, which interest I can only temporarily concentrate on one geographic unit, partly from a feeling that there should be at least one representative of the older generation, who tries to be able to give (with due allowance for time and otherwise limited possibilities) an answer to any single question that might be put to him on dragonflies of any part of the world—thus continuing (perhaps as a kind of 'glacial relic') the traditions of Selys and McLachlan. If my hope of realizing some day a new catalogue is not vain, the necessity of continuing the studies on the universal line is, of course, imperative. (23 Sept. 1930—the last letter I had from him!)

The students of the Odonata found their way to Rheinau: Morton in 1904 (and in August, 1928, at Zürich), R. J. Tillyard and Mrs. Tillyard in 1926, E. M. Walker in the summer of 1928, the writer and Mrs. Calvert in August, 1929.

Indeed one of the great services that entomology has done me, and continues to do, has been the development of friendships that have given color and distinction to an existence which otherwise might have been a rather dull one in many respects. So nature pays to her lovers not only with her own admirable and sublime productions, but also with the friendships of fellow admirers and followers of her beauty and profound secrets. Like to yourself, so to me, correspondence of days to come will be enlivened by the remembrance of a personal intercourse, which was delightful in every respect (3 Sept. 1929.)

On Tuesday, January 27, 1931, his sister writes us, Dr. Ris attended the funeral of a long-time associate in Zürich. On Thursday evening, the 29th, he was arranging lantern slides for a lecture to the patients to be given in the first week of February. On the following morning, when he did not appear long after his usual hour, he was found to have passed away—apparently peacefully and painlessly.

From her letter and from one from Mr. K. J. Morton, we learn that, under Dr. Ris's will, his dragonfly collection with

<sup>6</sup>This, of course, was written before the appearance of Prof. Needham's extensive *Handbook of the Dragonflies of China*.

that part of his library, printed and written, referring to the Odonata, and his entomological correspondence, goes to the Senckenberg Museum in Frankfurt am Main; the Trichoptera, and presumably the other "Neuroptera", and pertinent literature, to the Entomologisches Institut der schweizerischen technischen Hochschule in Zürich; his Swiss butterflies to the Naturforschenden Verein in Schaffhausen.

Ris was truly the successor of de Selys, Brauer and McLachlan. Morton, in his obituary notice, and Needham, in a private letter, both use the word "foremost" to designate his place as an authority, a student, of the Odonata of the world, and rightly so. When I read a sentence in his letter of 14 Jan., 1930, to me: "do not forget to think about the possibilities of writing on history of entomology!", I hope that this present endeavor to record his life and work may be a fulfillment of his injunction. The loss of a sympathetic correspondent of more than thirty years' standing is no little thing, nor can we ever quite replace in our affections those of our own, or of an older, generation,

"Treasuring the look we cannot find,  
The words that are not heard again."

PHILIP P. CALVERT.

### A Scarcity of Specialists.

From the *Annual Report of the Institute for Medical Research of the Federated Malay States* at Kuala Lumpur for 1929, we take the following: "Mites in oil palms: At the beginning of the year, monthly collections of mites from the decayed male flowers of oil palms were commenced. This material again yielded large numbers of mites, but in this country, owing to the absence of literature and types for comparison, there was no opportunity of identifying the great number of forms met with, a large percentage of which is probably undescribed. Dr. Guy A. K. Marshall, C. M. G., F. R. S., Director of the Imperial Bureau of Entomology, very kindly endeavoured to find someone in Europe who would undertake the work of identifying the mites. His efforts were unsuccessful, however, owing to the great shortage of competent acarologists, and these collections were therefore abandoned. Enough mounted material was retained to indicate whether or not a mite found on a coolie on the estate had its origin in the oil palm. (P. 14.)

**Parachernes ronnaii, a New Genus and Species  
of False Scorpion from Brazil  
(Arachnida-Chelonethida).**

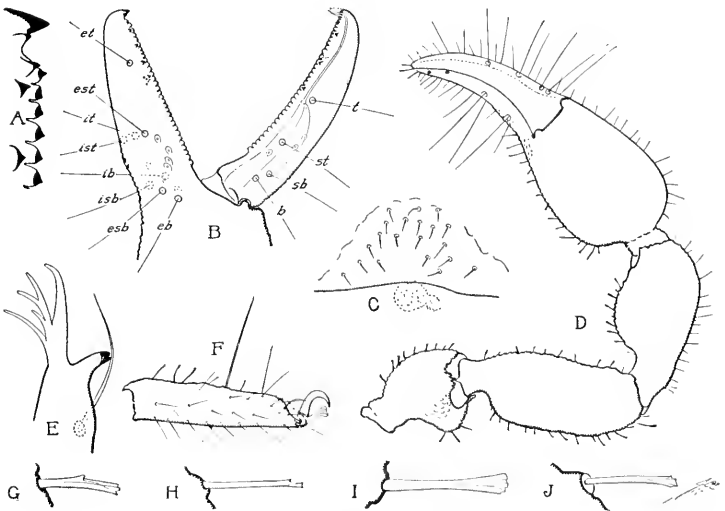
By JOSEPH CONRAD CHAMBERLIN,  
Twin Falls, Idaho.

I am indebted to Dr. Antonio Ronna of Caxias, Rio Grande do Sul, Brazil, for the specimen upon which this paper is based. I take pleasure in dedicating this interesting species to its discoverer.

**PARACHERNES** gen. nov.

Orthotype. *Parachernes ronnaii* sp. nov. Brazil.

*Diagnosis.* Typical cheliferoïd genus belonging to the family Chernetidae, and related to *Chernes*, *Hesperochernes*, and *Dinocheirus*. Eye spots present but inconspicuous; carapace of usual form and provided with two procurved transverse furrows;



*Parachernes ronnaii* gen. and sp. nov. ♀.

A. Tip of fixed finger of chela showing type of dentition. Note accessory as well as marginal teeth. B. Exterior aspect of right chela showing chaetotaxy, dentition, and venom apparatus. C. Genital operculum. D. Ventral aspect of left pedipalpus or cheliped. E. Galea. F. Tarsus of leg IV. G, H, I, J. Characteristic types of setae. G, from anterior face of tibia of pedipalp; H, from fourth pedal tibia; I, from pedipalpal trochanter and J, from pedal femur. All same scale of magnification.

flagellum of 3 blades: sexual development of galea unknown but probably dimorphic; the normal 5 setae of palm of chelicera present, b and sb showing typical terminal denticles as in *Hesperochnes*; lamina interior with dentate terminal tooth and 3 dentate subterminal lobes; basal lamella of serrula exterior elongated to about twice normal length and acute; other lamellae of typical ligulate form. The chaetotaxy of the chela differs markedly from that occurring in *Chernes*, *Hesperochnes*, or *Dinocheirus* and is characterized principally by a marked basal concentration of the interior series of tactile setae (fig. B). Sense spots occur on both fixed and mobile fingers of the chela but are few (fig. B). Chela provided with accessory teeth both interiorly and exteriorly (fig. A and B). Venom duct of long type, the nodus ramosus lying barely proximad of the terminal seta of the movable finger (fig. B). Dorsal sclerites of body and most of pedipalps beset by thickened, scarcely clavate, terminally dentate setae (fig. G-J). Expanded abdomen normally ovate, extending well beyond the fourth legs when these are normally flexed. All tergites and sternites except the eleventh longitudinally divided into scutae by a relatively broad membranous strip; each bearing the usual border series of 14 to 16 setae. Posterior tergites normal, definitely transverse (*not recurved*). Eleventh tergite bearing a lateral pair of pseudotactile setae, the 11th sternite with a submedian pair. Female genital area characterized by a loose cluster of about 20 short acute setae (fig. C) much as occurs in *Hesperochnes*. Legs typical, claws and subterminal setae simple; fourth tibia without tactile seta; tactile seta of tarsus IV half as long as tarsus and placed midway between the base and tip of the segment (fig. F). Tracheal trunks without internal papillate projections.

*Remarks.* From all previously named segregates of *Chernes*, *Parachernes* differs markedly in the chaetotaxy of the chela; from *Hesperochnes* it differs in possessing a 3 instead of 4 bladed flagellum; from *Hesperochnes* and *Chernes sens. str.* it differs in the possession of a tactile seta on the 4th tarsus; from *Dinocheirus*, *Hesperochnes*, and *Chernes* it differs in the non-clavate setae of the dorsal sclerites and pedipalps; from *Dinocheirus* and *Chernes* it differs in having the sub-basal and basal setae of the chelicerae both terminally dentate. In the absence of a male example the presence or absence of sexual dimorphism in the chela can not be directly ascertained. The

following considerations may, however, yield a clue as to the facts in the case. The orthotype of the genus seems to find its nearest described relative in "*Chernes*" *michaelseni* Sim. as redescribed by With.<sup>1</sup> With's redescription was based upon a single male. According to his figures the chaetotaxy, etc., of the chela is quite similar to that here figured for *P. ronnaii*, and it is likely that the two are congeneric. He represents the chela fingers as clearly gaping. From this we may tentatively infer that the chela is sexually dimorphic in *Parachernes*. Since With would rarely describe as new a species which by any possibility could be assigned to one already named, it is impossible to be sure that *michaelseni* Simon and *michaelseni* (Sim.) With are really the same species because of the serious inadequacy of Simon's original description as seen in the light of present knowledge.

***Parachernes ronnaii* sp. nov. (Figs. A-J)**

*Holotype*, ♀, (JC-716. 01001) taken clinging to a fly at Caxias (Rio Grande do Sul), Brazil, by Dr. Antonio Romm. Deposited in Stanford University Collections.

*Diagnosis.* Anterior carapacial furrow most distinct of the two, median in position and laterally procurved; posterior furrow nearer posterior carapacial margin than anterior furrow and only slightly procurved laterally. Carapace longer than broad behind, bordered posteriorly by 12 short thickened setae. Scutae of third tergite narrower than either those preceding or succeeding; tergites bordered by about 14 to 16 thickened setae each, the median ones at least bearing in addition a single slender and slightly subclavate, terminally denticulate seta anterior to the marginal series on either side. Each tergal scutum with a weak central spot. Fingers of chela with about 32 or 33 well defined slightly retro-conical marginal teeth (fig. A and B); with an exterior series 3 and 4 evenly spaced, small and inconspicuous accessory teeth exteriorly on the movable and fixed fingers of the chela respectively (fig. B); interiorly there is on either finger a single large accessory tooth about 1/3 removed from finger tip (fig. B); sense spots sub-basal exteriorly on both fingers and interiorly on the fixed finger (fig. B). Palps as illustrated (fig. D); maxilla smooth except on post-

<sup>1</sup>With, Carl. 1908. Cheliferinae. Trans. Zool. Soc. London 18:282. Figs. 22 a-c.

clivus; remainder of palps, except posteriorly on tibia and chela and on fingers, evenly granulate and beset by thickened setae (fig. G and I). Trochanter with a distinctly conical protuberance or heel behind, 1.3 times as long as broad; femur typical, 2.3 times as long as broad; tibia normal, subequal to femur in length, 2.1 times as long as broad and 1.2 times as long as hand; chela 2.7 times as long as broad and almost 1.3 times as long as breadth of trochanter; fingers scarcely longer than hand but clearly longer than its breadth; hand very slightly broader than deep and 1.3 times as long as broad. Chelicerae typical, galea with 6 branches (fig. E). Length of adult, ♀ 2.1 mm.

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### **A New Louse from Domestic Chickens (Mallophaga: Philopteridae).**

By HAROLD S. PETERS,

Bureau of Entomology, U. S. Department of Agriculture.

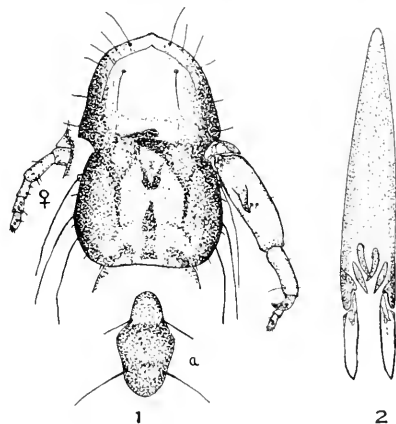
During a collecting trip in the southern Bahama Islands in the summer of 1930 I found a new biting louse (order Mallophaga) on the heads of chickens in four localities. The common chicken head louse (*Lipeurus heterographus* Nitzsch) was not found. Four other species of lice common on chickens throughout the world were found in connection with the new species; namely, the wing louse (*Lipeurus caponis* Linn.), the fluff louse (*Goniocotes hologaster* Nitz.), the shaft louse (*Menopon gallinae* Linn.), and the brown chicken louse (*Goniodes dissimilis* Nitz.). According to the natives, the original stock of their poultry was obtained from Haiti or Santo Domingo, so this is evidently a tropical species. This is further evidenced by the fact that specimens from domestic chickens from Venezuela and Liberia were found in the collection of the National Museum.

#### ***Lipeurus tropicalis* n. sp.**

Described from 42 individuals collected from chickens in the Bahama Islands, by myself, as follows: Four males, two females, and one immature form from Great Ragged Island, July 3, 1930 (Bishopp No. 15063); eight males, nine females, and one immature form from Providenciales, Caicos Islands, July 23, 1930 (Bishopp No. 15144); one male, one female,

and four immature forms from Grand Turks Island, July 31, 1930 (Bishopp No. 15193); and three males, three females, and five immature forms from Great Inagua Island, August 10, 1930 (Bishopp No. 15276). Also described from specimens in the National Museum as follows: One female collected from chicken at Ciudad Bolivar, Venezuela, July, 1925, by L. H. Dunn; and two males and two females collected from chicken at Reppo's Town, Liberia, August 31, 1926, by Prof. Jos. Bequaert.

Description of MALE. *Head* one and one-half times as long as wide, obtusely angled in front; forehead widest just before the large and movable trabeculae. Head little wider across temples than before trabeculae. Temples broadly rounded. Posterior edge of head slightly concave. Eyes clear and protruding, with a long dorsal ocular seta. Color light brown with dark brown lateral borders, antennal and occipital bands, esophageal sclerite, mandibles, and a long narrow gular signature. Antennae almost as long as head, reaching, if extended backwards, beyond the prothorax. First segment pale, greatly enlarged, and elongated, being as long as the remaining four segments combined and bearing a dorsal projection from the middle of the segment. Segment 2 half as long as segment one and longer than segments 3, 4, and 5 combined. Segment 3 dark brown and formed into a dorsal inward pro-



Explanation of Figures.

Fig. 1. Head of male, dorsal; female antenna at left. All  $\times 44$ . a, Sternum.  $\times 44$ .

Fig. 2. Male genitalia.  $\times 44$ .



jecting hook slightly longer than either segments 4 or 5, which are about equal in length. (Fig. 1.)

*Thorax* almost as long as head, pale brown in color with dark brown lateral margins and with a typical, somewhat pear-shaped sternum (Fig. 1, a). Prothorax about two-thirds as wide as head, and about one and one-third times as wide as long, roughly rectangular in shape, the sides almost parallel, the posterior edge slightly convex, and with a seta at each latero-posterior rounded angle. Pterothorax roughly trapezoidal in shape and slightly broader than the head or the first abdominal segment, and twice as long as the prothorax. The sides are slightly diverging, with broadly rounded latero-posterior angles in which one seta is situated. Slightly nearer the middle, on the posterior border, there is a group of four very long pustulated setae situated in a small uncolored area. Posterior border slightly angulated on abdomen. Legs pale, with brown borders. Forelegs short, with the coxae narrowly separated, middle and hind legs long, hind legs longest, and with widely separated coxae.

*Abdomen* of nine segments, elongate with sides somewhat parallel, and with a peculiar, somewhat spade-shaped ninth segment. Segments 1 to 8 about equal in length except segments 3 and 4, which are somewhat shorter than the rest; widest at segment 3. Segment 9 slightly bilobed, elongated, slightly longer than wide, and about three-fifths as wide as segment 8. Light brown in color, with dark brown pleurites forming a lateral band interrupted at sutures, lighter brown median markings, and with a clear space or band just inside the lateral band in which the small spiracles on segments 2 to 7 are situated. The general color of the ninth segment is very light brown, with medium dark brown anterior border and lateral borders, thus leaving a clear central portion. On the dorsal surface segment 1 has two setae near middle of anterior border and a curved row of four setae behind these. Segments 2 to 6 have a curved row of six setae near the posterior border of each segment. Segment 7 has four setae, segment 8 has two setae near anterior border and a group of three setae in an elongated triangular uncolored area on each side near the posterior border, the outermost being much the longest. A few setae are present on the ventral surface. On the lateral margins of segments 1 and 2 there are no setae; segments three and four have one seta in posterior angles, and segments five and six have two setae, segment 7 has four setae, and segment 8 has two setae near the anterior border of the segment, one being very long. Segment 9 has three small setae near the anterior border of

the segment. Genitalia distinctive, having an elongated basal plate extending forward into the third abdominal segment (fig. 2).

Description of FEMALE. *Head* as in the male except that the trabeculae and antennae are each about half as large, and the trabeculae are not movable. The antennae, if extended backwards, will not reach the posterior border of head. (See fig. 1.)

*Thorax* and legs as in the male except that the thorax is somewhat shorter and broader.

*Abdomen* slightly longer and somewhat broader than that of the male. Segments 1 to 8 about equal in length; widest at fourth segment. Eighth and ninth segments fused, somewhat trapezoidal in shape, about two-fifths as wide posteriorly as anteriorly, and slightly bilobed. The color is somewhat different from that of the male. The pleurites and the area between them and the spiracles are dark brown, forming a wide dark brown continuous lateral band as the pleurites extend into the preceding segment. The median markings are dark brown also, are separate on segments 1 to 7, and are shaped like an hour-glass, with a diamond-shaped median golden brown area. On segments 5, 6, 7, and 8 there is a longitudinal median brown rod lying in the clear lateral area. The posterior half of segment 8 is dark brown, shading to light brown posteriorly, with a narrow median uncolored area. Setae about the same as on the male.

Description of IMMATURE FORMS. The eleven immature specimens at hand, all over half grown, show the typical angulated front and have the same number of setae in about the same position as the adults.

Average Measurements in mm.

	Male		Female	
	Length	Width	Length	Width
Head .....	0.721	0.483	0.742	0.516
Thorax .....	.612	.583	.606	.611
Abdomen .....	1.863	.637	1.916	.837
Total .....	<hr/> 3.196		<hr/> 3.264	

*Type Host*.—*Gallus domesticus*, chicken.

*Type Locality*.—Great Ragged Island, BAHAMA ISLANDS, BRITISH WEST INDIES.

*Type Slide*.—Cat. No. 43488 U. S. N. M.

The *holotype* male and *allotype* female on the type slide were collected from chicken at the type locality on July 3, 1930, by myself (Bishopp No. 15063). The *paratypes* are in the collection of the Bureau of Entomology and in my personal collection.

This species is most closely related to *Lipcurus laearensis* Bedford (1929), described from a wild guinea fowl from Africa, but is easily separated by the angulated front, posterior segment of male, differences in coloration and chaetotaxy, and by being about three-fourths mm. shorter in length. *L. tropicalis* possibly originated from a wild guinea, as I find specimens in the National Museum, collected from five species of wild guineas from Africa, which may be referred to this species, all having the angulated front, although they may be separated as varieties at some future time. *L. tropicalis* is very easily differentiated from *L. heterographus* and *L. caponis*, commonly found on chickens, by its larger size, angulated front, and male genitalia.

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### Notes on the Homing of Several Species of Wasps (Hym. : Chrysididae, Sphegoidea, Vespoidea).

By PHIL RAU, Kirkwood, Missouri.

While taking carpenter-bees and burrowing-bees afield\* to test their ability to find their way back home, it was sometimes possible to pick up various species of wasps also, paint them with distinguishing marks and liberate them, along with the others, at fixed distances from their homes. The results of these experiments are noted below.

Two cuckoo-bees, *Chrysis (Tetrachrysis) laminifera* Bischoff [G. Sandhouse] and *Chrysis (Hexachrysis)* sp. [G. Sandhouse] were liberated on July 10, at 4:20 p.m., one mile from the place of their capture. Both returned the next morning, at 9:10 and 9:50 o'clock. These are parasitic bees, and it is surprising that they should remember and manifest so much interest in the nest of the host and return to it in the same way as does a nesting bee.

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\* Journ. Comp. Psychol. 9: 35-70, 1929.

A mud-daubing wasp, *Sceliphron caementarium* female, was carried one-third mile east of the clay bank where it was found getting mud, and liberated at midday, September 1. She returned in 25 minutes.

Three females of *Trypoxylon clavatum* were liberated on July 10, at 4:20 p.m., one mile from the clay bank in which they were nesting in old bee burrows. One returned the next morning at 10:05.

Four *Trypoxylon albopilosum* (females) nesting in the clay bank, were taken away one mile and liberated at 4:20 p.m. Three returned the same afternoon, in 15 minutes, 1 hour and 1¼ hours, respectively. The fourth never arrived home. Another one, liberated at a distance of two miles, did not return.

*Ancistrocerus fulvipes* was liberated on July 10, one mile from home at 2:15 p.m.; it returned at 4:30.

Two males and four females of *Monobia quadridens* were liberated at two miles distance at midday; none returned. One female was captured as she brought in a caterpillar to her nest, and was carried away one mile at 1:20 p.m. She reappeared the next morning at 10 o'clock, but her sister, liberated at the same time, did not return.

A marked female of the grass-carrier, *Chlorion auripes*, was set free June 22 at 11:45, at a point two miles from the building where it nested. Up to noon the next day it did not return. However, it later found its way home, because one week later it was taken, still wearing its dot of red paint, while bringing in a cricket to its nest. It was again carried to the two-mile point and liberated at 2:57 p.m. It found its way home more quickly this time, consuming only two hours and two minutes in the flight.

One queen of *Polistes pallipes* was marked and liberated two miles from home at 10:30 a.m. Sunday, and it returned at 8:50 a.m. Monday. It took her over 22 hours, but she eventually reached home. It may actually have taken this length of time to find her way home from a distance of two miles, and again she may have indulged in a little loafing along the way, as we know *Polistes* sometimes do.

## Some Unusual Occurrences of Butterflies in Connecticut (Lepid.: Pieridae, Nymphalidae).

By J. R. HASKIN, Waterford, Connecticut.

From California the land of sunshine and butterflies to Connecticut is a far cry but I find that even in Connecticut, my new home, many interesting field notes can be made if one is observant.

In the January, 1931, NEWS, is reported the capture of *Catopsilia philca* in Missouri in June, 1930. This was of particular interest to me because we took one in Connecticut also. On August 26, 1930, my daughter observed and netted a large showy butterfly hovering about the flowers on our lawn at Oswegatchie Point. From the fresh appearance of the butterfly I doubt very much if it had flown a great distance. My theory is that it came up from the tropics in chrysalis form, presumably on a bunch of bananas or in a box of tropical fruits or vegetables. Such occurrences have been noted in connection with other species also.

On September 25, I took a specimen of *Euptoicta claudia* Cramer. This specimen was so recently hatched from its chrysalis that it was hardly able to fly. The wings were still quite fragile. It certainly must have existed in chrysalis form here in Waterford, and one wonders how this could have happened. A very careful search of the locality during several days succeeding failed to discover any others of the species.

The summer of 1930 was particularly dry and hot and reminded me continually of the average Southern California weather. Throughout the entire season *Colias philodice* was one of the commonest butterflies in this vicinity. Its size and color varied as the spring, summer, and autumn seasons advanced. On October 13, I had taken several in an open field, and much to my surprise I then captured a very fresh and weak-flying female butterfly that compared exactly with some of the richest colored *Colias eurhytheme amphidusa* that I took in California. The color of the black borders is very wide and dark and very heavily developed on the secondaries. The primaries are heavily suffused with orange, while the orange spot on the secondaries is very dark and large and the second-

daries are heavily suffused with black overlaid with a tinge of orange. I took this specimen late in the afternoon and found only one or two more normal *philodice* after a careful search of the field. The next day it turned cold and stormy and October 13 proved to be the last successful collecting day of the season. I intend to watch this field very carefully during the coming spring to see whether any more of this unusual type appear. Query:—Did the unusually dry and hot summer of 1930 result in this fall-hatched specimen from the normal *philodice* or is it only a freak specimen?

I noticed throughout the latter part of the season that *Terias lisa* was unusually abundant. These are not uncommon in this vicinity but one generally takes only an occasional specimen.

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**A Coleopterous Enemy of *Corydalis cornuta* L.  
(Anthicidae; Neur.: Sialididae).\***

By PAUL N. MUSGRAVE, Fairmont, West Virginia.

Last August while collecting aquatic insects in the South Branch of the Potomac River, Pendleton County, West Virginia, practically all egg masses of *Corydalis cornuta* L. were found to be infested by an Anthicid beetle, *Anthicus heroicus* Casey. At least 95% of egg masses examined were found to have from one to four small holes cut through the outer coating and into the center of the mass. The size, shape and location of the openings varied a great deal, some being only large enough to admit the adult beetle, 2-3 mm. in diameter, while others were much larger and irregular in shape. Some openings were cut in the center of the mass and others at the edge. The only variation in the percentage of infestation was found in masses placed on leaves of trees, or stones on the shore, where it was possible for ants to reach them. Whether or not the ants were the controlling factor, masses found on shore rocks and ledges were much more likely to be free from infestation than those laid on stones in the middle of the stream.

Opening an infested mass usually meant the discovery of from one to eight adult beetles which immediately tried to

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\* Contribution from Department of Entomology, West Virginia University.

escape. Sometimes they flew directly from the mass, sometimes dropped to the water and then flew from the surface of the water but usually they ran to a crevice in the stone or into another egg mass. Often a stone would have twenty to thirty masses on one surface with most of them infested and then the disturbed beetles resembled an opened ant hill as they ran here and there trying to find a hiding place. Besides the adults, larvae of different sizes and ages were found. As many as fourteen small larvae were found in one mass and eight or ten was a common number. Adults and larvae were regularly found in the same mass but usually adults would be in company with larger larvae only.

When the larvae are ready to pupate they hollow out a small cell in the crevice-soil, or more rarely in the debris of the egg mass itself. In examining several hundreds of egg masses only three pupae were found in the masses, while they were common in the sandy soil in which moss (*Grimmia apocarpa* (L.) Hedw.) was growing. However many cells containing full-grown larvae were found in the egg masses and it may be that they commonly pupate there. Adults emerged August 30-September 5 from pupae collected in August.

The larvae were determined by Dr. Adam G. Böving and adults by Mr. H. S. Barber, both of the United States National Museum and to whom thanks are due. Dr. L. O. Howard apparently first discovered an Anthicid (*Anthicus haldemanni* Lec.) in the egg mass of the Dobson in 1895 on the rocky shores of the Potomac near Washington and since that time Schwartz, Knab, Barber and others have noticed the same occurrence but apparently nothing has appeared in print.

Three other species of adult *Anthicus* were found in company with *heroicus*: *A. cinctus* Say, *A. pubescens* Laf. and *A. cervinus* Laf. No larvae of any of these were discovered however.

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#### Congratulations to Dr. L. O. Howard.

The daily papers of June 13 reported that Dr. L. O. Howard was awarded for 1931 a gold medal and \$5000 for distinguished service to agriculture, given annually by Senator Arthur Capper of Kansas. The hearty congratulations of the NEWS are extended to Dr. Howard.

## Notes on Blattidae, Adventive to the United States (Orthop.).

By A. N. CAUDELL,

United States National Museum, Washington, D. C.

Among miscellaneous material in the National Museum are the following species of cockroaches, the first four being apparently new to our fauna:

*HOLOCOMPSA AZTECA* Saussure. One mature female taken at Nogales, Arizona, June 8, 1919, by F. J. Dyer. This is the second species of this genus found within our borders, *Holocompsa nitidula* Fabricius having been taken by Rehn and Hebard. An adventive specimen of this latter species was also recorded from Washington, D. C., by the present writer in 1907.

*HEMIBLABERA TENEBRICOZA* Rehn and Hebard. An adult pair of this large West Indian roach was taken on Key Largo, Florida, in January, 1896, by E. A. Popenoe.

*CAPUCINELLA DELICATULA* Hebard. One female specimen of this Panamanian roach was taken at Los Angeles, California, by H. M. Armitage in October, 1929, in a bunch of bananas. This specimen, unquestionably an adventive, is in the National Museum.

*EURYCOTIS CARAIBEA* Bolivar. An adult male of this insect was taken at Brainerd, Minnesota, in July, 1921, by D. Sanders, who found it in a crate of peaches, presumably in a market. This is certainly adventive.

*EURYCOTIS DIMIDIATA* Bolivar. Under the name *Eurycotis caraimba*, Mr. Hebard recorded a specimen of this roach as occurring adventive at Berwick, Pennsylvania (1). This determination was later corrected to *dimidiata* (2). On February 13, 1924, another adventive of this species was taken on bananas in the public market in Washington, D. C. This was a nymph in the last instar when taken and the reared adult, a male, exhibits some characters not agreeing wholly with those of *dimidiata*. It seems nearer that species, however, than any other described form and Mr. Hebard, who examined the specimen, pronounced it *dimidiata* or a closely allied species.

<sup>1</sup> Mem. Amer. Ent. Soc., No. 2, p. 266 (1917).

<sup>2</sup> Bull. Amer. Mus. Nat. Hist., vol. liv, p. 174, foot-note 1 (1927).



## Entomological Literature

COMPILED BY LAURA S. MACKEY UNDER THE SUPERVISION OF  
E. T. CRESSON, JR.

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 **within brackets** [ ] refer to the journals, as numbered in the list of Periodicals and Serials published in the January and June numbers (or which may be secured from the publisher of Entomological News for 10c), in which the paper appeared. The number of, or annual volume, and in some cases the part, heft, &c. the latter **within** ( ) follows; then the pagination follows the **colon** :

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

\*Papers containing new forms or names have an \* preceding the author's name.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

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.

 *Note the change in the method of citing the bibliographical references, as explained above.*

Papers published in the Entomological News are not listed.

**GENERAL.**—**Bather, F. A.**—Is an international zoological nomenclature practicable? [68] 73: 612-613. (S). **Bedford, H. W.**—A description of the methods adopted in the Sudan in the organization of the insect collections and the systematic compilation of records. [Wellcome Trop. Res. Lab.] Ent. Bull. 32: 21 pp., ill. **Carpenter, F. M., et al.**—The evolution of the class Insecta. [16] 21: 531-539. **Hayward, K. J.**—News from the Argentine. [21] 43: 77-81. **Hendrickson, G. O.**—Subterranean insects of marsh grass (*Spartina michauxiana*). [4] 63: 109-110. **McGlashan, C. F.**—Obituary. By E. O. Essig. [55] 7: 97-99. **Sherborn, C. D.**—Index animalium. Sec. 2. Pts. 23-24. **Thorpe, W. H.**—Miscellaneous records of insects inhabiting the saline waters of the Californian desert regions. [55] 7: 145-153. **Tillyard, R. J.**—The evolution of the class Insecta. [Pap. & Pro. R. Soc. Tasmania] 1930: 1-89, ill. **Uvarov, B. P.**—Insects and climate. [36] 79: 1-247, ill. **Wimmers, C.**—Ed. Study, ein mathematiker und entomologe. [14] 44: 316-318.

**ANATOMY, PHYSIOLOGY, ETC.**—**Bertholf, L. M.**—Reactions of the honeybee to light. [113] 42: 379-419, ill. **Chow, C. H.**—Sur le développement du carpophore chez *Coprinus tomentosus*. [69] 192: 1121-1123. **Corset, J.**—Les coaptations chez les insectes. [Sup. Bull. Biol. Fr. et Belg.] 13: 337 pp., ill. **Goldschmidt, R.**—Analysis of intersexuality in the gypsy-moth. [73] 6: 125-142. **Metz, C. W.**—Chromosomal differences between germ cells and soma in *Sciara*. [97] 51: 119-124, ill. **Reith, F.**—Zur experimentellen

analyse der primitiventwicklung bei insekten. [88] 19: 398-399. **Schmucker, T.**—Ueber asymmetrisches verhalten von Hymenopteren an blüten. [97] 51: 15-18, ill. **Schrader, F.**—The chromosome cycle of *Protortonia primitiva* and a consideration of the meiotic division apparatus in the male. [94] 138: 386-408, ill. **Smirnow, G. G.**—Ueber die wirkung der Anthelminthica auf die wanderung der Ascaridenlarven. Experimentelle untersuchungen. [Zeit. Parasit., Berlin] 3: 173-184. **Thompson, W. R.**—On the reproduction of organisms with overlapping generations. [4] 63: 147-172, ill. **Walker, E. M.**—On the clypens and labium of primitive insects. [4] 63: 75-81, ill.

**ARACHNIDA AND MYRIOPODA.**—**Chamberlin, R. V.**—On three new new chilopods. [55] 7: 189-191. **Matheson, R.**—Note on the tick *Ornithodoros talaje*. [Parasit.] 23: 270.

**THE SMALLER ORDERS OF INSECTS.**—**Bailey, S. F.**—A thrips new to California. [55] 7: 175-178. **Borror, D. J.**—The genus *Oligoclada*. [Univ. Michigan Mus. Zool.] Misc. Publ. 22: 42 pp., ill. **Hood, J. D.**—Synonyms in the North American Thysanoptera. [55] 7: 170-172. \***Jordan, K.**—Flöhe aus Venezuela. [Zeit. Parasit., Berlin] 3: 264-266, ill. \***McDunnough, J.**—New species of North American Ephemeroptera. [4] 63: 82-93. \***Moulton, D.**—An interesting new California thrips. [55] 7: 173-174. \***Moulton, D.**—A new Acolothrips from Nevada with notes on three other species found in California. [55] 7: 122-123. **Sikes, E. K.**—Notes on breeding fleas, with reference to humidity and feeding. [Parasit.] 23: 243-249, ill. \***Traver, J. R.**—A new mayfly genus from North America. [4] 63: 103-109, ill.

**ORTHOPTERA.**—**Buckell, E. R.**—The Dermaptera and Orthoptera of Vancouver Island, British Columbia. [Pro. Ent. Soc. Brit. Col.] No. 27: 17-51. \***Hebard, M.**—The Orthoptera of Kansas. [Pro. Acad. Nat. Sci. Phila.] 83: 119-227. **Karny, H. H.**—Ueber das flügelgeäder der Gryllacriden. [Arch. Zool. Italiano] 15: 193-244, ill. \***Vignon, M. P.**—Recherches sur les sauterelles-fenilles de l'Amérique tropicale. [Arch. Mus. Nat. Hist., Paris] (6) 5: 57-214, ill. \***Silvestri, F.**—Notes on *Grylloblatta campodeiformis* and a description of a new variety (*Grylloblattidae*). [1] 57: 291-295, ill.

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[55] 7: 115-118, ill. **Bueker, E. D.**—Mealy-bugs (Coccidae) of nests of ants (*Lasius*). [Univ. Col. Studies] 18: 151-162, ill. **Drake, C. J.**—Two new species of *Tigara* from South America. (Tingitidae). [37] 7: 405-406. \***Klyver, F. D.**—Chermidae from Utah, Nevada, and Arizona, including three new species. [55] 7: 131-143, 157-158, ill. **Klyver, F. D.**—Notes on the Chermidae. Part II. [4] 63: 111-115, ill. **Lawson, P. B.**—The genus *Xerophloea* in North America. [55] 7: 159-169, ill. **Mahdihassan, S.**—The males of lac and pseudo-lac insects. [94] 138: 371-385, ill. \***Michalk, O.**—Anomalie in der antennenbildung bei Lygaeiden. [45] 26: 66-73, ill. **Muir, F.**—New and little-known Fulgoroidea from South America. [37] 7: 469-480, ill. **Scrivener, J. W.**—Notes on *Gypona octolineata*. [91] 21: 222-223, ill. \***Usinger, R. L.**—A new species of *Platylygus* (Miridae) [55] 7: 129-130, ill. \***Van Duzee, E. P.**—A new *Ischnorrhynchus* (Lygaeidae). [55] 7: 110. **Woodbury, L. A.**—A list of the Pentatomidae of Zion National Park, Utah. [55] 7: 124-125.

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RECENT ADVANCES IN ENTOMOLOGY. By A. D. IMMS. Philadelphia, P. Blakiston's Son & Company. 1931. 374 pp., 84 illustrations. \$3.50.—It was a happy thought which led Dr. Imms to write this book, and a fortunate thing for us that he was the man to whom this thought occurred. The fifteen chapters deal with many diverse aspects of modern Entomology, including aspects of Morphology, Metamorphosis, Palaeontol-

ogy, Sense Organs and Behaviour, Coloration, Aspects and Practical Applications of Ecology, Parasitism and Biological Control. It is true that five other volumes of the same sort might be written, without exhausting the ramifications of Entomological Science; but although they would be very interesting, they would not be so interesting as the menu which Imms has prepared for us. He has chosen the most significant lines of advance, and has recorded an astonishing number of observations and discoveries, often in fields which were hardly explored until very recently. If any critic wishes to complain of omissions, he may not only refer to many large topics ignored, but also to the lack of all reference to numerous papers on the topics included. I do not think these are valid criticisms, because from the standpoint of the reader a lucid, intelligible and thoroughly readable story is infinitely preferable to a catalogue of miscellaneous contributions. If we ask ourselves what impressions may be derived from reading the book, perhaps the following will come uppermost. First, the extraordinary diversity of Entomological Science as now understood, its numerous points of contact with fundamental biological problems, and no less with the practical affairs of life. Whereas formerly the Entomologist was thought of as a rather isolated and erratic member of the biological fraternity, now he finds himself in the front ranks of biological progress. Second, the novelty of much that is recorded, and the fact that we stand on the edge of a vast territory to be explored. Not only this, but such exploration may be undertaken by any serious student of reasonable ability, with almost no expense. The field lies before us, and time and persistence are the prime necessities for success. Third, the interrelations between Entomology and the other natural sciences, Botany, Geology, Physics, Chemistry. The Entomologist stands on his own particular hill, but he surveys the universe. The physicist and chemist may ignore Entomology, but the Entomologist cannot ignore Physics and Chemistry. Thus, in the long run, he may be the better trained man, with a larger outlook on the realities of existence. Indeed, he also has to concern himself with certain aspects of economics and sociology, and may make bold to have scientific opinions on political questions.

But perhaps we have said too much. The aspiring student may retire in terror before such a program. How much simpler to become a teacher of College Algebra! Who can, being a mere mortal of limited powers, pretend in these days to be a competent Entomologist? I think that we of that profession are doomed to go through life with a sense of our

inadequacy, with the feeling that we are not equal to our task. But the same is true of life itself, which has always presented an insoluble enigma to many. This very sense of incompleteness, of things unfulfilled, is the greatest attraction. The road may be hard and difficult and we cannot see where it ends, but it is a fine thing to be moving along, with a new vista around each bend. It is to such adventurers that Imms appeals, with rare skill and judgment.

How rapidly we are moving is shown by the criticism which is naturally suggested on reading the chapter on Fossil Insects. There is no evidence that the author has ever heard of F. M. Carpenter. But actually, Carpenter's most important papers, those which might well have affected the conclusions set forth in the chapter, are too recent to have been available when it was written. It does seem, that in the chapters on Morphology, some reference might have been made to the work of Petrunkevitch on the organization of the Arthropoda. Referring to the distribution of the tsetse fly, the author remarks: "The tsetse fly, for example, is unable to survive the ecological conditions presented by the Sahara Desert, and consequently has not penetrated north of that vast area. Similarly, it has not spread into Asia, where the Arabian Desert presents a more formidable barrier than the relatively narrow strip of water forming the Red Sea." If we write "does" for "has", this is sound enough; but probably Dr. Imms had forgotten that several species of tsetse flies are fossil in the Miocene of Colorado. The statement (p. 82) that there are no fossil Micropterygidae overlooks the existence of a species (to be seen in the British Museum) in Burmese amber. (Tillyard wrongly says in Baltic amber.) Some other details in the account of fossil insects need revision, and especially it is necessary to offer a warning against the uncritical acceptance of "restorations", and the undue significance often attributed to names which appear in the literature, but actually have no very sound basis. Thus, reference is made to *Genaphis* Handlirsch (the type of a family Genaphididae Handlirsch), from the Mesozoic of England. It is known by the figure in Brodie's work, and does appear to be an aphid, but we have little information concerning it. Is it not possible to take a small figure like this of a very minute object too seriously? Paleontomology is full of pitfalls, and it is all too easy to make mistakes of interpretation. A curious recent example of this is afforded by the discussion of *Odynerus palaeophilus* in *Psyche*, December, 1929 (issued March, 1930) page 368. Two such competent experts as Bequaert and Brues

looked at the type with a lens, and decided that it was not one of the *Diploptera*. But later, Carpenter very kindly made for me a greatly enlarged photograph of the type, and a more typical *Diplopteron*, and *Odynerid*, it would be hard to find. As stated in my original description (1906), "it would be easy to misinterpret the venation of this insect." See Plate V in this issue of *ENTOMOLOGICAL NEWS*.

T. D. A. COCKERELL.

## OBITUARY.

FERDINAND F. CREVECOEUR, an amateur entomologist and naturalist who has been the source of many insect records from Onaga, Kansas, died suddenly on April 7, 1931. He was buried in the Onaga cemetery. Mr. Crevecoeur was born at Chicago, Illinois, June 23, 1862. Following the death of his father, he, in April, 1870, came with his mother to live on a farm near Onaga, Kansas, where he lived until his death. He remained a bachelor and lived alone after his mother's death in 1908. A United States Department of Agriculture Yearbook came into his possession, which opened up to him a field of biological science and geology. He had much correspondence with officials of the United States Department of Agriculture, who gave him much encouragement. The U. S. Department of Agriculture, the Smithsonian Institution and the National Museum sent him their publications in the biological and geological fields. To these services and the Kansas Academy of Science he gave the major credit for his technical knowledge and encouragement.

In 1917, Mr. Crevecoeur gave practically all of his natural history collection to Ottawa University, at Ottawa, Kansas. As an amateur, he published quite extensively. There have been published several more or less popular articles in the *Onaga Republican*, one article in *ENTOMOLOGICAL NEWS*, 1903, and nine articles in the *Transactions* of the Kansas Academy of Science (1903-1922). A biography and also a bibliography have been prepared by Dr. Roger C. Smith for publication in the *Transactions* of the Kansas Academy of Science.

R. L. PARKER.





ODYNERUS PALAEOPHILUS.—COCKERELL.



OCTOBER, 1931

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Vol. XLII

No. 8



HENRY SKINNER  
1861-1926

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# ENTOMOLOGICAL NEWS

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## Sub-sub-Specific Names in Lepidoptera.

A. GLENN RICHARDS, JR.,

Entomology Dept., Cornell University, Ithaca, New York.

In the NEWS for November and December, 1930, pages 298-302, 324-328, an article on the naming of individual variants in Lepidoptera by Mr. A. B. Klots appeared, which may be briefly summarized as showing the untenability of Gunder's system of classification within the species and giving a substantiated argument as to why "Scientific names should not be applied to any concept lower than subspecies". More recently (ENT. NEWS, March, 1931, pages 80-82) Mr. Talbot has written on the same subject in these pages, and agrees wholeheartedly with the point as to the untenability of Gunder's system, but would not go so far as to second the latter statement. He adds more examples as to the inadvisability of aberrational or "transition form" names, but beyond this would not be inclined to go. And then concludes, "A name should be given to any specimen or specimens which show definite differentiating characters, provided these characters are not of a teratological or pathological type," but "If the requisite data be not available, the classification of the new form must remain *sub judice*."

In other words, Mr. Talbot would put such work upon a breeding basis when possible, and then, if the character is not "teratological or pathological", would name it regardless of what its true nature is, so long as he thinks such a name might be of convenient use.

Let us glance at this for a moment from a genetic point of view, as Mr. Klots has done, and see if that will help us any. There are the well-proven Mendelian characters (which seem

so repulsive to some who apparently know nothing about them). First there are the simple Mendelian characters or factors or combinations of them; second there are lethals, linked lethals, sex-linked lethals and partial lethals or teratological factors—all of which would certainly come within the scope of "pathological types"; third we may have sex-linked characters which travel criss-cross in heredity; fourth sex-limited characters which are transmitted equally by both sexes but expressed in only one; and other types which we need not consider here. These types all have the same biological basis, though in outward appearance they may seem quite different.<sup>1</sup>

How does this affect the question? In the first place many of our "forms" are seasonal, which means only a certain type of environmental effect—not heritable—and no more deserving a "scientific name" on biological grounds than say chrysalis burns. Secondly many of our forms are merely sex-linked, sex-limited, or even simple Mendelian characters or combinations thereof, and as such should not be given scientific names.

Seasonal forms have been dispensed with; mimetics usually go in one of these—at least those which have been investigated genetically (that is mimetic forms within a normally non-mimetic or polymorphic species), and are frequently sex-limited; local forms however, present a somewhat different situation for there is every gradation from "field forms" (species which differ slightly and rather constantly from one field to the next) to local forms and to races of great distribution with or without sharp boundaries. The boundary must be arbitrary here regardless of the point. No one would want a name for every field and glen, yet I think everyone would agree that names for the great races are of use. It seems to me that the best place to draw a line here is between the great regional races.

Thus we have disposed of most, at least, of the forms lower than subspecies on a biological basis, and leave their naming to the equally arbitrary and highly specialized genetical nomen-

<sup>1</sup> Sex-linked lethals would be quite a stumbling block here, because while technically "pathological" in Mr. Talbot's sense, they would not appear so, and would make themselves manifest only by the disturbed sex ratio.

clature which is much better fitted to handle them; or for environmental forms to simple descriptive phrases which seem to me much more satisfactory. It is noteworthy that many of the forms which Mr. Talbot would retain have the same biological basis as the aberrations, "teratological and pathological" forms which he would discard.<sup>2</sup>

But is this the standpoint from which he is viewing the subject? There are some who would say that any form which is sufficiently different to cause any possible confusion should be named, and many of these referred to above would be such (including aberrations); or that any form which may need to be specially referred to from time to time should have a name. Such a nomenclature is not a *scientific* one; it is one of *convenience*. And so to adopt either standard we must use either a biological or a convenience basis. On dead specimens a biological basis is impossible, except perhaps in some cases by analogy with well-known related forms. Shall we make of nomenclature purely a tool, and adopt the convenience basis? or shall we give our nomenclature a biological basis?

Before finally committing myself, I would like to draw attention to Mr. Talbot's parting point, "If the requisite data be not available the classification of the new Form must remain *sub judice*". This is a definite commitment to the convenience form of nomenclature, and means, in short, that, whenever a specimen comes to hand which will not fit conveniently into the present set of names, it should be named, and left for future workers to retain or discard when the data are obtained. This is the usual procedure in description from single specimens, but for forms within the species would it not be better to let such specimens go nameless until something is known about them? For if, as is often the case, this "form" never reappears, then there is another name which will clutter lists forever, though it is useless and perhaps baseless.

Let us glance for a moment at other fields to see how such

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<sup>2</sup> It might be worth noting in passing that intermediates in and of themselves mean nothing. It is only when genetical data concerning the nature of this intermediacy are available that they become intelligible. (See Morgan, T. H. "A Critique of the Theory of Evolution". Princeton Univ. Press, 1916, or any of the standard texts.)

cases are treated. Mr. Talbot draws a comparison with mammals which I am inclined to think would discourage subspecific names. But let us look still further afield into the other phase of biology, Botany, and see what is the general custom in such matters. From my acquaintance with the field, backed by some botanical friends, I would say that the practice today is not to name such forms, but to include them in the general discussion. Yet the analogues of all these we have been considering exist among plants (except possibly mimicry), and botanists get along quite satisfactorily without *scientific names* for them.

With these two bases before us, which shall we adopt? Some may be inclined to look for a compromise, but such a plan would be practically impossible to apply and, due to personal opinion, would leave things in about as bad a muddle as they are now. And so it seems to me that the best method would be to use the biological basis below subspecies, and to agree with Klots that "Scientific names should not be applied to any concept lower than subspecies".

In discussions dealing with these forms, or for recording of data, they might then be referred to much as the geneticist refers to his characters today, or for environmental effects by a phrase designating the effect (spring form, wet form, etc.). The results of such a system would be a much simpler tool (nomenclature), and as good, or I think better, handling of these forms with a consequent better understanding of their real nature. We are all agreed, however, that Gunder's system is untenable, and that aberration or "transition form" names should be abolished as such. Therefore we hope that rulings made by made in the near future to cover this point.<sup>3</sup>

<sup>3</sup> Attention might be called to the loose appellation of insects as among the "lower groups of organisms" from an evolutionary standpoint. One commonly thinks of them as lower than the Vertebrates, but in any discussion involving evolution thus to place such a specialized group not at all ancestral to the "higher forms" is not good. Some of them are "low" without doubt, but many of them are quite as highly specialized as any mammal, and the particular order under consideration is among the higher ones. Even such a "low" insect as a cockroach is known far back into geologic times with little change. The difference in length of life cycle is important in this connection, but it is not because insects are "lower organisms".



**A New *Sarcophaga* from South Carolina  
(Diptera: Sarcophagidae).**

By DAVID G. HALL, Asst. Entomologist, U. S. Bureau of Entomology, Charleston, South Carolina.

Among the species of *Sarcophaga* which are rarely found in collections and uncommonly taken in the field are those having three posterior dorsocentral bristles, the genital segments black, and the hind tibia of the male without villosity. Of these, only ten species and one variety have been described from North America, two from Europe, and two from Asia. The following species herein described belongs to this group.

***Sarcophaga nox*, n. sp.**

♂. Head; front 0.227 of the head width (average of three specimens: 0.208, 0.208, 0.227); height,\* 10, length at the antennae, 9, length at the vibrissae, 8; parafrontals and parafacials silvery gray pollinose, slightly golden above, the former with a single row of rather long bristles below near eye; frontal bristles about 8 in number, diverging rapidly below in the lower two or three; outer verticals developed; orbitals absent. Antennae black, third joint hardly twice second, reaching two-thirds the distance to the vibrissae which are normal and at the oral margin; arista with short plumosity for about half its length; palpi and proboscis black, ordinary. Bucca about one-fifth the eye height, with numerous black hairs, none pale before the metacephalic suture; back of head with two distinct rows of post-ocular ciliae, a few pale hairs about the middle and below; metacephalon a little elongated.

Thorax: Only slightly grayish pollinose, with the usual three to five black stripes which are not apparent; posterior dorsocentral bristles three; anterior dorsocentral bristles two; anterior acrostichal bristles only slightly larger than surrounding hairs; prescutellar bristles one; sternopleurals three; propleura bare; scutellum with two marginal and no preapical nor apical bristles.

Abdomen: Very dark, slightly grayish pollinose with three faint stripes, tessellated, the third and fourth segments slightly golden pollinose; second and third segments with medium marginal bristles, fourth with a row of about twelve; fifth sternite

\* The height of the head in comparison with the length of the head at both the antennae and vibrissae, in units of one. This, if given, will satisfactory yield an impression of the head shape, a point that separates such divergent genera as *Amobia* and *Brachycoma*.

divided, heavily chintinized, black, the inside edges with numerous long hair and abundant golden pile. Hypopygium black; first segment large, rounded, with a slight covering of golden pollen, a row of about 7 long bristles on the posterior edge; several scattered bristles and numerous hairs; second segment small, short, with scattered hair and bristles; forceps black with numerous hairs behind, blunt, tips truncated; accessory plate dull orange with numerous scattered hairs; genital features as illustrated in Fig. 1.

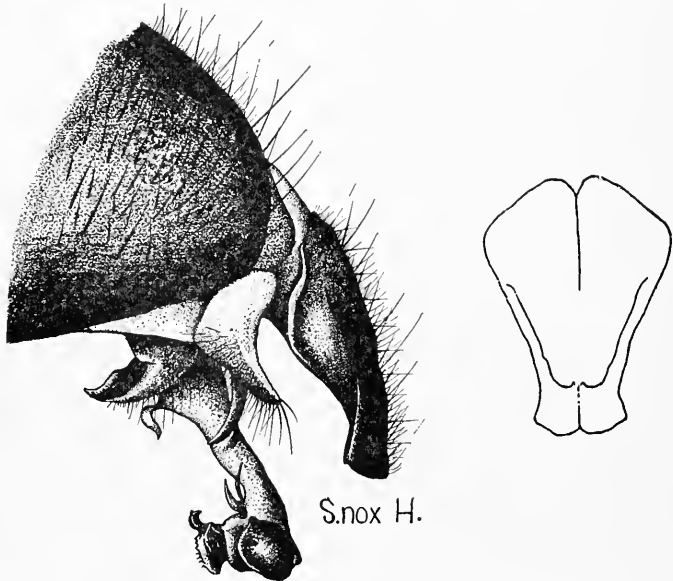


Fig. 1.—*Sarcophaga nox* Hall. Left lateral view of male hypopygium and rear view of forceps.

Wings somewhat darkened; first vein bare, third with several setulae; costal spine developed; third costal segment about three-fifths as long as fifth.

Legs black; hind tibia without villosity; middle femur without comb; middle tibia with two long and one short antero-dorsal bristles.

♀. Head; front, 0.308 of head width in the single specimen; the parafacials and parafrontals slightly less pollinose than in the male; the thorax and abdomen more grayish, the stripes on the thorax more apparent; chaetotaxy as in the male except for the usual female characteristics. Genital segments black.

This species superficially resembles *S. pulla* Ald., which belongs to the provisional "A" group, in nature, owing to the dark color and lack of pollinosity. It goes to Couplet 5, Group C, p. 95, in Aldrich, 1916, Sarcophaga and Allies, but is separated from *S. fletcheri* Ald., the first of the two species indicated in the couplet, by the general lack of pollinosity, and from the second, *Xenoppia hypopygialis* Townsend, by the lack of a single bristle or macrochaeta on the lower parafacial.

*Male holotype and female allotype* No. 43315, U. S. National Museum.

Described from three males and one female collected November 18 and 19, 1930, in the sand dunes about 200 feet from the shore line of the Atlantic, at Folly Beach, Charleston, SOUTH CAROLINA, by Mr. F. J. Krueger and the author, and one male collected at Mayport, FLORIDA, March 25, 1931, by the author. The males were collected upon foliage, and the female upon a wooden box which contained decaying meat.

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#### Another Entomological Society.

I would like to add another entomological society to the list in the May number of the NEWS.

THE CALIFORNIA ENTOMOLOGICAL CLUB, composed of Government, State, county, university, and commercial entomologists residing in northern California was organized April 25, 1930, at Sacramento, Calif. Stewart Lockwood of the State Department of Agriculture was elected president, Prof. E. O. Essig of the University of California vice-president, and Dr. H. E. Burke of the United States Bureau of Entomology secretary-treasurer. Sixty-one signed the roll as charter members.

The officers for 1931 are Prof. E. O. Essig, president; A. J. Flebut of the California Spray-Chemical Co., vice-president; Dr. H. E. Burke, secretary-treasurer. There are 136 active members, 0 corresponding members and 0 honorary members.—H. E. BURKE, Secretary-Treasurer, Forest Insect Laboratory, Stanford University, California.

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#### Dr. A. B. Klots at Rochester, New York

DR. ALEXANDER B. KLOTS, of Cornell University, has accepted a position with Ward's Natural Science Establishment as head of the entomological department. He will also be an associate in entomology at the University of Rochester.—*Science*, August 14, 1931.

## A New Species of Hesperiidæ from Jamaica, British West Indies.

By E. L. BELL, Flushing, New York.

*Choranthus lilliaë* new species.

♂. *Upperside*. Primaries, costal margin from cell-end to base, cell, basal area and basal two-thirds of inner margin below vein I, deep fulvous; an oblique band of three discal spots of the same color, a little paler, between veins 1-2, 2-3, 3-4, the lowest spot the longest, and all slightly excavate on the outer edge; three elongate subapical dashes, followed by two similar ones in interspaces 9 and 10, all of the same color; apical area and outer margin broadly black; a thin, black, longitudinal line through the center of the cell; veins black; an oblique, narrow, grayish-black stigma of two parts, below the cell, the first part from just below and outside the rise of vein 3 to vein 2, the second part continued obliquely inward from vein 2 to vein 1; the narrow space between the stigma and the cell is black.

Secondaries, deep fulvous crossed by black veins, the costal and outer margins broadly black, the black outer border projecting inwardly between veins 1 and 2; long fulvous hairs extend over the cell and basal three-quarters of the wing from vein 2 to the abdominal fold.

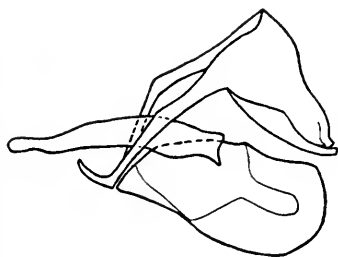
*Beneath*. Primaries, base black below the costal vein, extending outward to a point below the end of the cell; costal margin as far as the end of the cell and the outer half of the cell, deep fulvous; the three discal spots repeated, the two upper ones slightly paler than above and the lower one yellowish; apical area red-brown; lower half of the outer margin and the inner margin black. Secondaries, red brown, a large black spot at the anal angle; a hazy, ill-defined accumulation of paler scales forming a short discal band of three spots, which may be absent; a pale, ill-defined spot in the end of the cell.

Fringes of primaries fulvous at the anal angle, black above, sometimes with a few fulvous hairs intermixed; of the secondaries fulvous, sometimes with a few black hairs at the end of the veins and at the outer angle. Thorax above, fulvous-brown with a greenish reflection; beneath fulvous. Abdomen above, basally the same as the thorax, becoming deep fulvous toward the apex and on the sides; beneath sordid whitish. Legs fulvous. Head and collar greenish with a small yellow spot at the base of the antennæ and behind the eyes. Palpi yellowish intermixed with black, especially toward the tip; the

tip black. Pectus yellowish-fulvous. Antennæ black above; beneath yellow with black joints; the club yellow; apiculus black. Eyes black.

Expanse: 36 to 40 mm. (Center of thorax to apex of primary x 2.)

Type material: nine males from the upper part of the gorge at Bath, St. Thomas Parish, Jamaica, B. W. I. *Holotype male*, April 4th, 1931, deposited in the American Museum of Natural History, New York City; *one male paratype*, April 6th, 1931, in collection of the British Museum, London, England; *one male paratype* April 6th, 1931, in collection of the Academy of Natural Sciences, Philadelphia, Penna.; *one male paratype*, April 1st, 1931, in collection of the U. S. National Museum, Washington, D. C.; *five male paratypes*, April 1st, 4th, 5th, 1931, in collection of the author.



*Choranthus lilliae*, ♂ genitalia.

The figure of the genitalia is from one of the paratypes.

This handsome species is named for Miss Lilly G. Perkins, of Claremont, Jamaica, B. W. I., whose zeal in collecting has added much to the knowledge of the insect fauna of that island.

During a visit to Jamaica, in March and April, 1931, the

writer collected the specimens here described, in the gorge above the Baths of St. Thomas, at Bath. They were found in a very restricted area on the bank of the small stream that flows through the gorge. With one exception they were found only in the morning and but one or two at a time, four being the most for any one day. They did not visit any of the flowers, but rested on the leaves of low vegetation. Although the steep sides of the gorge were thoroughly searched in the vicinity of where they were found, not a single individual was seen anywhere but in this one small place. No females were found.

This species is larger than *Choranthus haitensis* Skinner and *Choranthus radians* Lucas, and has a much darker ground color

and more prominent black veins than either of those species. On the under side it differs from *haitensis* in the broad black border of the primaries and the dark red-brown color of the secondaries with the prominent black anal spot; from *radians* it differs on the under side in the ground color and the lack of the pale veins.

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### **Cerambycinae from Kartabo, Bartica District, British Guiana (Coleop.)**

By SAMUEL H. WILLIAMS, University of Pittsburgh.

In the joint collections of the writer and the New York Zoological Society, the Cerambycinae are represented by twenty-five genera, and thirty-seven species. Additional species taken at other places in British Guiana are not included in this list, which is only a contribution to the Kartabo fauna, which has been so intensively studied by Dr. William Beebe and his associates. Material collected in the hinterland of British Guiana and in the other Guianas indicates a wide diversification and distribution of coleopterous insects in the region between the Amazon and Orinoco rivers, with a localization of certain species, and an extensive range characterizing others. Most of the work done in this region has been more or less scattered with the emphasis having been placed on Central American, Amazonian and Cayenne<sup>1</sup> faunae. British Guiana connects these regions and offers untold possibilities in distributional studies.

The writer has spent considerable time in an attempt to make an intensive, systematic survey of the Coleoptera of the lower jungle area in British Guiana and in an endeavor to obtain some information as to the effects of altitude on the general distribution of species. Specimens collected between the coastland and Mt. Roraima, which is a considerable distance back of Kaieteur Falls, show that some of the species taken at Kartabo are quite generally distributed, while other species are confined to the narrow strip of dense jungle along the coastal lowlands.

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<sup>1</sup> French Guiana.

Within certain species, having a wide range, there seems to be considerable variation and in one or two cases the identities listed here are not absolutely certain. There is some justification for creating varieties and subspecies but, inasmuch as the types were not available and because of the fact that the original descriptions are frequently so inadequate, the observed differences do not appear to the writer as being of sufficient value for the creation of new species. To avoid additional synonyms, the writer has decided to allow the listed identities to stand until the opportunity is presented to compare the specimens with more examples, although the identified list has already been checked against collections in England, Germany, France, Austria, and Czechoslovakia.

Studies in this section of South America reveal the need of monographic works on the numerous genera described from the region. Most of the generic descriptions are contained in very early works which are not accessible to the average student and the lack of generic keys makes it necessary to plough through endless volumes of descriptions in order to properly locate collected specimens. In the numerous museums visited by the writer, myriads of Coleoptera collected in South America are not identified. To assume that the majority of these are new species would be a serious mistake, because, while the fauna is large, much work on the beetles of the region has been done by Olivier, Fabricius, Thomson, Serville, Chevrolat, Gounelle, Bates and others.

As indicated in previous papers on the Coleopterous fauna of British Guiana by the writer,<sup>2</sup> the present list is not presented as complete but is given only as a contribution to our knowledge of the Kartabo region.

British Guiana is a fertile field for investigations. The pleasure of studies in the magnificent jungles is greatly en-

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<sup>2</sup>Williams, Samuel H.—A List of Prionid Beetles Taken at Kartabo, Bartica District, British Guiana with the Description of a New Species. *Annals of the Carnegie Museum*, Volume XIX, Number 2, 1929.

The Cicindelidae at Kartabo, Bartica District, British Guiana.—*ENT. NEWS*, Volume XL, Number 6, June 1929.

Eine Neue Oreodera Art aus Sudamerika. *Deutsch. Entom. Zeitsch.* heft 3 1928.

hanced by the cooperation of the public-spirited officials of the country and the Department of Science and Agriculture which incorporates a staff of well-trained and broadminded scientists of the highest character.

The writer wishes to thank Professor Dr. Ferdinand Pax of The Zoologisches Institut und Museum der Universität in Breslau; Professor Doctor H. Kuntzen of the Zoologisches Museum in Berlin and Doctor W. Arndt of the Berlin Museum, for their assistance in securing necessary literature. He is also indebted to Mr. G. K. Arrow and Major Austen of the British Museum for courtesies extended. The New York Zoological Society collections were made available through the kindness of Dr. William Beebe, from whom the writer has been the recipient of many friendly favors.

The nomenclature used in this list is according to the Junk-Schenkling Catalogus Coleopterorum, part 39, representing the list made by Aurivillius.

#### Family CERAMBYCIDAE.

##### Sub family CERAMBYCINAE.

- |  |                                 |
|--|---------------------------------|
| Group II. DISTENIINI.  | Group XIV. CERAMBYCINI.         |
| Genus <i>Distenia</i> Serv.  | Genus <i>Hamaticherus</i> Serv. |
| <i>D. bicolor</i> Thomson.   | <i>H. batus</i> Linn.           |
| Group XI. ACHRYSONINI.   | <i>H. castaneus</i> Bates.      |
| Genus <i>Achryson</i> Serv.  | <i>H. lacordairei</i> Gah.      |
| <i>A. surinamum</i> Linn.  | <i>H. plicatus</i> Oliv.        |
| Group XII. TORNEUTINI.   | <i>H. rugosus</i> Oliv.         |
| Genus <i>Torneutes</i> Reich.  | Genus <i>Sphallenum</i> Bates.  |
| <i>T. lansbergei</i> Thoms.  | <i>S. robustum</i> Bates.       |
| Group XV. HESPEROPHANINI.  | Genus <i>Chlorida</i> Serv.     |
| <i>C. festiva</i> Linn. An extremely abundant species attracted to lights at night. Of the hundreds of specimens of <i>Chlorida</i> taken, only one specimen of <i>C. denticulata</i> was found. |                                 |
| <i>C. denticulata</i> Buquet.  |                                 |
| Group XVI. EBURIINI.   | <i>E. 6-guttata</i> Lameere.    |
| Genus <i>Eburodacrys</i> Thoms.  | <i>E. sex maculata</i> Oliv.    |
| Group XVIII. SPAHERIONINI.   | Genus <i>Periboetum</i> Thoms.  |
| <i>P. pubescens</i> Oliv.  |                                 |

It is difficult to distinguish among several related genera here because of rather inadequate generic descriptions. Thomson's description of the genus *Peribocum* says "Thorax strongly



tubercled on the sides in both sexes, thinly clothed with long hairs. Antennae hairy, with distinct spines externally at the end of each segment and with two spines on the terminal segment, the external spine being the smaller. Femur swollen and club like, spineless and with a short peduncle at the base. Middle coxal cavities open on the outside. Femur and tibia smooth, more or less clothed with bristle-like or silken hairs."

Thomson states that the thorax carries a spine but in most species the structure is a conical tubercle, even in the types of this genus. Gounelle<sup>3</sup> insists that the above formula is too rigid for the members of the genus and indicates that certain species lack the two terminal spines on the antennae while others, although the elytra are smooth and shining, have the head, thorax and ventral side of the body covered with a thin pubescence.

*Peribocum* is apt to be confused with *Stizocera*, *Sphaerion* and *Nephalius*. It may be distinguished from these in the following manner:

- (1) Middle coxal cavities closed on the outside, femur spiny  
—*Stizocera* Serv.
- (2) Middle coxal cavities open on the outside, femur without spines—3.
- (3) Elytra smooth and shining; thorax furnished on each side with a prominent tubercle in both sexes, rarely spiny  
—*Peribocum* Thoms.
- (4) Sides of the thorax rounded and punctuated in the same manner at the sternum of the male, thin and tubercular in the male; antennae without or with very small and inconspicuous spines in the male  
—*Sphaerion* Serv.
- (5) Thorax bearing a series of small conical tubercles on each side in both sexes, frequently without sexual punctuation; spines of the antennae longer and more numerous in the male  
—*Nephalius* Newman.

Genus <i>Pantonyssus</i> Bates.	Group LVI. RHINOTRAGINI.
<i>P. nigriceps</i> Bates.	Genus <i>Omata</i> White.
Genus <i>Mallocera</i> Serv.	<i>O. elegans</i> White.
<i>M. glauca</i> Serv.	Genus <i>Acyphoderes</i> Serv.
Group XX. IBIDIIONINI.	<i>A. abdominalis</i> Oliv.
Genus <i>Ibidion</i> Serv.	Genus <i>Odontocera</i> Serv.
<i>I. maronicum</i> Thoms.	<i>O. fasciata</i> Oliv.
Group XXII. CALLIDIOPINI.	Group LXV. CALLICHROMINI.
Genus <i>Cylindera</i> Newman.	Genus <i>Callichroma</i> Lat.
<i>C. flava</i> Fab.	<i>C. vittatum</i> Fab.

<sup>3</sup>Gounelle—Listes des Cerambycides de la region de Jatahy, etat de Goyaz Brazil. Ann. Ent. Soc. France LXXVII, 1909.

C. auronicum Linn.	Group LXXXIV.
Group LXVI. CAMPSOCERINI.	STERNACANTHINI.
Genus Orthoschema Thoms.	Genus Sternacanthus Serv.
O. albicorne Fab.	S. undatus Oliv.
Group LXIX. CLYTINI.	Genus Batus Thunb.
Genus Neoclytus Thoms.	B. barbicornis Linn.
N. rufus Oliv.	B. hirticornis Gyllh.
Genus Mecometopus Thoms.	Genus Ceragenia Serv.
M. jansonii Bates.	C. bicornis Fab.
Group LXXXV.	Group LXXXV.
RHOPALOPHORINI.	PTEROPLATINI.
Genus Cosmisoma Serv.	Genus Pteroplatus Buquet.
C. ammiralis Linn.	P. lycoides Guer.
Group LXXXVII.	Group LXXXVII.
HETEROPSINI.	TRACHYDERINI.
Genus Chrysoprasis Serv.	Genus Trachyderes Dalm.
C. auricollis Dalm.	T. melas Bates.
C. festiva Serv.	T. succintus Linn.
	T. bicolor Voet.

The collection will be placed at the disposition of the New York Zoological Society.

### Oligolectic Andrenidae (Hymen.).

Lately Cockerell says: "Graenicher, in his Wisconsin list, catalogues five species of *Andrena* which gather pollen from *Salix*, ten from the Compositae, four from Umbelliferae, and one each from *Claytonia virginica*, *Hydrophyllum*, *Geranium maculatum*, *Fragaria*, and *Parnassia*."

Graenicher (1905) gave a list of 13 species which were the same as those recorded in my local list of 21 species (1899) and added 11 species (2 erroneous and 2 doubtful). What he contributed to my list was one species from *Salix*, five from Compositae, one from Umbelliferae, and one each from *Fragaria* and *Parnassia*. And this list would not have been published if it had not been preceded by that of 1899.

My local list of local oligolectic bees (Ecology 7:378-9, 1926) shows 9 Andrenidae oligoleges of *Salix*, 8 of Compositae, and one each of Cruciferae, Umbelliferae, *Aruncus sylvester*, *Claytonia virginica*, *Geranium maculatum*, *Nothoscordum bivalve*, *Polemonium reptans* and *Viola*. *Andrena geranii* and *nasonii*, given in my first list, are not oligoleges of *Hydrophyllum* and Umbelliferae.—CHARLES ROBERTSON, Carlinville, Illinois.

## Some Observations on the Biology of the Sarcophaginae (Diptera: Sarcophagidae).

By S. GRAENICHER, South Miami, Florida.

As stated by Dr. J. M. Aldrich<sup>1</sup> "the species of Sarcophaga range in larval habits from scavengers to parasites of warm-blooded animals". The species mentioned below<sup>2</sup> have been bred from dead animals and excrements exposed in the open in my immediate neighborhood, or from material picked up at random at various points in the Miami region.

Along with this part of the work, some feeding experiments have been carried on with the larvae of three of the species for the purpose of testing the tolerance of the larvae to various food substances upon which, so far as we know, they do not occur under natural conditions.

### SPECIES BRED FROM DEAD ANIMALS AND EXCREMENTS.

From 8 rats: *Sarcophaga bullata* Park. from all 8, *S. sternodontis* Towns. from 3, *S. plinthopyga* Wied. from 1.

From 2 birds (quail & chick): *bullata* from both.

From 5 snakes: *bullata* from all 5, *sternodontis* from 2.

From 3 fish: *bullata* from all 3, *sternodontis* from 2.

From 2 marine snails (*Strombus gigas* and *Janthina fragilis*) exposed at South Miami: *bullata* from both—from a *Janthina fragilis* found on the beach at Miami Beach: *Sarothromyia femoralis* Sch. var. *simplex* Ald.

From 3 crustaceans (2 landcrabs, *Cardisoma guanhumi*, and 1 bluecrab, *Callinectes* sp.): *bullata* from 2 (landcrabs), *sternodontis* from 1 (bluecrab), *S. impar* Ald. from 1 (landcrab), *S. welchi* Hall from 3 (landcrabs and bluecrab).

From insects (a quantity of dead cockroaches, *Periplaneta australasiac* Fabr.): *bullata*.

From 2 dead myriapods (*Spirobolus* sp.): *sternodontis* from 1, and *S. singularis* Aldr. from 1.

From a dead whip scorpion (*Mastigoproctus giganteus*): *sternodontis*.

From rotten beef: *bullata*, *sternodontis* and *Sarcophagula occidua* Fabr.

From human excrement: *bullata* 3 times and *S. floridensis* Aldr. once. On three occasions human excrement deposited in privy vaults was found swarming with maggots from which *bullata* came forth.

<sup>1</sup> J. M. Aldrich, *Sarcophaga and Allies in North America*, p. 16.

<sup>2</sup> My thanks are due Mr. David G. Hall, who has given me some valuable help in the identification of the material.

From dog excrement: *occidua* once.

With exposed chicken manure and cow manure no results were obtained.

From all of this material *bullata* was bred 27 times, *sternodontis* 11 times, *plinthopyga* once, *impar* once, *welchi* 3 times, *floridensis* once, *singularis* once, *femoralis* var. *simplex* once, *occidua* twice. It will be noticed that *helicis* Towns. (undoubtedly *rapax* Walk., according to Aldrich<sup>3</sup>) does not figure at all in these results.

According to the information contained in Aldrich's "Sarcophaga and Allies" *bullata* has been bred from carrion and dead fish, *sternodontis* from insects, *helicis* from dead and live insects, *plinthopyga* from carcasses (Bishopp), *impar* from insects (live pupae) and beef refuse, *singularis* from *Spirobolus* myriapod); no records for *floridensis*, *femoralis* var. *simplex* and *occidua*.

Plank<sup>4</sup> has found *sternodontis* to be the most important of the minor parasites of the sugar cane stalk borer, *Diatraea saccharalis* Fabr., in Cuba. It has been reared from pupae and injured larvae. *Helicis* has also been obtained from the larvae of *Diatraea*.

The evidence on hand points to *bullata* as a most important scavenger with no parasitic leanings whatever, to *sternodontis* as a scavenger with pronounced parasitic tendencies, and to *helicis* as a scavenger on dead insects and a true parasite on live ones (also reared from a myriapod, *Spirobolus* sp.).

#### FEEDING EXPERIMENTS WITH THE LARVAE OF HELICIS, STERNODONTIS AND BULLATA.

Since the Sarcophagidae deposit larvae instead of eggs, it is a comparatively simple procedure to press the larvae from the body of a female when the latter is ready to larviposit, as Allen<sup>5</sup> has done in his studies of the habits of *Scnотainia*

<sup>3</sup> J. M. Aldrich, Notes on the types of Am. two-winged flies of the genus Sarcophaga, etc. Proc. U. S. Nat. Mus. 78, Art. 12, pp. 1-39, pls. 1-3 (1930).

<sup>4</sup> H. K. Plank. Natural enemies of the sugar moth stalk borer in Cuba. Ann. Ent. Soc. Am. 22, 621-640 (1929).

<sup>5</sup> H. W. Allen. N. Am. species of two-winged flies belonging to the tribe *Miltogrammini*. Proc. U. S. Nat. Mus. 68, Art. 9, pp. 1-106, pls. 1-5 (1926).

*trilineata*. The larvae from 10 females of *helicis*, 11 of *sternodontis*, and 11 of *bullata* were used in these experiments. Identification of the species was based on the males of the offspring.

*Helicis*. From female No. 1: Fed up on decaying rat meat exclusively. Full development after 5 days; 2 male and 2 female adults on 22nd day.

From female No. 2: Given at first rat meat, later beef. Ready to pupate on 5th day. Adults on 23rd day.

From female No. 3: Fed for the first 3 days on beef with good results, for the next 24 hours on chicken manure with very poor results. From then on reaching a rapid and full development on 2 dead large cockroaches. Adults on 21st day.

From female No. 4: Fed like those from No. 3, with the same results.

The larvae from the remaining 6 females were brought to maturity either on decayed or fresh cockroaches (disabled by crushing the head), and no differences noted in the outcome.

In summing up the results with the larvae of *helicis*, it may be stated that they fed and thrived on the meat of warm-blooded animals (rat and beef) just as well as on fresh or decaying insects (cockroaches). Chicken manure is evidently not a proper kind of diet.

*Sternodontis*. Feeding experiments with the larvae were carried on in the same manner as with those of *helicis*. No noteworthy differences were observed, whether they were fed on meat from various sources (beef, rat and fish) or on fresh or decaying insects (cockroaches). Chicken manure was found to be entirely unsuitable; the larvae made poor headway and finally succumbed, not a single one reaching maturity. Duration of the larval and pupal stages from 15 to 18 days.

*Bullata*. As was to be expected in view of the known habits of this species, the larvae thrived on various kinds of decomposed meat, as also on fresh and putrid cockroaches. They developed normally on human excrement; my efforts, however, to bring them up on chicken excrement were entirely unsuccessful. Adults after 22 to 25 days.

Under natural conditions the larva of a *Sarcophaga* is restricted to the particular kind or kinds of food upon which it is deposited by the female, while in the feeding experiments

the larvae were given a wider range in their diet. The larvae of the three species under consideration showed a remarkable agreement in the acceptance and utilization of the various kinds of food substances offered them, irrespective of the differences displayed by the females in the selection of food for their offspring. Hallock<sup>6</sup> had a similar experience with *S. latisterna* Park., gravid females of which were confined in cages and offered larvae of the Japanese beetle; they failed to larviposit on these larvae, while maggots dissected from the abdomen of the fly, and placed on freshly killed larvae of the same beetle "fed rapidly, and developed normally."

Referring to the parasitism of *Sarcophaga*, Aldrich ("Sarcophaga and Allies," p. 246) states that we are dealing with a group, the habits of which are still more plastic than in the Tachinidae. Plasticity is evidently more pronounced in the larvae than in the adults, as indicated by the manner in which the former accept food substances differing in kind from those selected for them by the mother flies.

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#### Mr. F. H. Benjamin at the U. S. National Museum.

MR. FOSTER H. BENJAMIN, who was for some years assistant to Dr. Barnes at Decatur, Illinois, has been transferred to the U. S. Bureau of Entomology and assigned to a position in the National Museum where he will devote most of his time to identification work on North American Lepidoptera. Mr. Benjamin has been for the last three years engaged in work on the Mexican orange worms and the Mediterranean fruit fly for the Plant Quarantine and Control Administration of the U. S. Department of Agriculture at Orlando, Florida.—*Science*, August 14, 1931.

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#### A New Entomological Journal in South America.

*Revista de Entomologia* is the name of a new journal of which the first fascicle is dated April 25, 1931. It is under the editorship of Thomas Borgmeier, O. F. M., Caixa Postal 1302, Sao Paulo, Brazil, and subscriptions are received by Mario Antuori, at the same address. It is a quarterly, and the first fascicle contains 128 pages. The price is three dollars a year postpaid.

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<sup>6</sup>H. C. Hallock. Notes on methods of rearing *Sarcophaginae* (Diptera) and the biology of *Sarcophaga latisterna* Park. Ann. Ent. Soc. Am. 22, 246-250 (1929).

The fascicle is handsomely gotten up, comparing favorably with the best European and other journals. The contributions are by Melzer, Bruch, Horn, Fonseca, Spitz, Autuori, Leuderwaldt and Townsend, and are in Portuguese, Spanish, German and English, with incidental Latin. A single plate and numerous text figures are well printed. The article by Townsend is especially noteworthy, as it contains a resumé in 40 pages of the results of his examination of muscoid types in the European museums in 1928, as far as the American genera and species are concerned.

Father Borgmeier is to be congratulated on the fine appearance and excellent contents of this first number. The journal is worthy of the support of all entomologists who are not limited to "north of Mexico,"—a class which is happily increasing.—J. M. ALDRICH.

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#### A New Entomological Journal in England.

The Council of the Entomological Society of London has decided to issue a new entomological journal, beginning in January 1932, in 12 parts per annum, entitled *Stylops*, *A Journal of Taxonomic Entomology*, under the editorship of S. A. Neave, M.A., D.Sc., as Secretary of the Society, assisted by F. W. Edwards, M.A., Sc.D.; A. D. Imms, M.A., Sc.D., F.R.S.; Sir Guy A. K. Marshall, C.M.G.; D.Sc., F.R.S., Martin E. Mosely, Hugh Scott, M.A., Sc.D., and W. H. T. Tams. The annual subscription to *Stylops* will be 24s., or \$6.00, post free, single parts 3s. each, but Fellows of the Society will have the right to subscribe for one copy at the special rate of 16s per volume. The journal is primarily designed to meet the demand for the prompt publication of short taxonomic papers. For this reason papers exceeding 10,000 words, or occupying more than 12 pages, cannot be accepted for it, and preference will be given to appreciably shorter ones. The Society is prepared to undertake the provision of a reasonable number of text-figures or plates when only line-blocks are required, though authors will be expected to supply the original drawings. In the case of half-tone or colour work, authors will also be required to pay for, or supply, the necessary blocks. Authors, who need not be Fellows of the Society, will be entitled to receive 25 copies of their papers free of charge and will be permitted to purchase additional quantities at a fixed scale. Papers in English, French or German may be submitted, but must be typewritten on one side of the paper only. Those desiring to offer papers should send them to the Editor, at 41 *Queen's Gate, South Kensington, London, S.W. 7.*

## Entomological Literature

COMPILED BY LAURA S. MACKEY UNDER THE SUPERVISION OF  
E. T. CRESSON, JR.

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 within brackets [ ] refer to the journals, as numbered in the list of Periodicals and Serials published in the January and June numbers (or which may be secured from the publisher of Entomological News for 10c), in which the paper appeared. The number of, or annual volume, and in some cases the part, heft, &c. the latter within ( ) follows; then the pagination follows the colon :

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

\*Papers containing new forms or names have an \* preceding the author's name.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

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.

 Note the change in the method of citing the bibliographical references, as explained above.

Papers published in the Entomological News are not listed.

**GENERAL.**—**Aaron, S. F.**—The little wonder flies [Nat. Mag.] 18: 158-162, ill. **Barber, H. S.**—Traps for cave-inhabiting insects. [Jour. E. Mitchell Sc. Soc.] 46: 259-266, ill. \***Carpenter, F. M., et al.**—Insects from the Miocene (Latah) of Washington. [7] 24: 307-322, ill. \***Carpenter, F. M.**—The lower permian insects of Kansas, Part 4. The order Hemiptera, and additions to the Paleodictyoptera and Protohymenoptera. [16] 22: 113-130, ill. \***Cockerell and LeVeque.**—The antiquity of insect structures. [90] 65: 351-359, ill. **Comstock, J. H.**—Obituary. By G. W. Herrick. [7] 24: 199-204, ill. **Crevecoeur, F. F.**—Obituary. By R. L. Parker. [103] 4: 76, ill. **Ewing, H. E.**—Some factors affecting the distribution of and variation in North American ectoparasites. [90] 65: 360-369. **Fage, L.**—Les Araignées cavernicoles. [Arch. Zool. Exp., Paris] 71: 99-291, ill. **Faulkner, P.**—Insects in English poetry. [76] 1931: 53-73. **Johnson, C. W.**—An interesting copy of Wiedemann's *Diptera Exotica*. [5] 38: 25-26. **Puri, D. R.**—Mimicry and protective colouration. [Bull. Dept. Zool. Panjab Univ.] 1: 53-56. **Robinson, W.**—The thermopile for temperature determinations in entomology. [7] 24: 417-423, ill. **Waldron, L. R.**—Insects as pollen carriers. [68] 73: 703. **Weiss, H. B.**—John Southall's "Treatise of Buggs". [6] 39: 253-258.

**ANATOMY, PHYSIOLOGY, ETC.**—**Baumgartner & Payne.**—"Intravital" technic used in studies on the living cells of grasshoppers. [42] 59: 359-393, ill. **Buxton, P. A.**—The thermal death-point of *Rhodnius* (Heteroptera) under



controlled conditions of humidity. [Jour. Exp. Biol.] 8: 275-278, ill. **Chorine, V.**—Contribution a l'etude de l'immunité chez les insectes. [78] 65: 291-387, ill. **Eyer, J. R.**—The relation of temperature and rainfall to outbreaks of the grape leafhopper, *Erythroneura comae*. [7] 24: 238-259, ill. **Hadjinicolaou, J.**—Effect of certain radio waves on insects affecting certain stored products. [6] 39: 145-150. **Heberdey, R. F.**—Zur entwicklungsgeschichte, vergleichenden anatomic und physiologie der weiblichen geschlechtsausführwege der insekten. [46] 22: 416-586, ill. **Hilton, W. A.**—Nervous system and sense organs. [13] 23: 27-41, ill. **Janisch, E.**—Experimentelle untersuchungen über die wirkung der umweltafaktoren auf insekten. [46] 22: 287-348, ill. **Jodlowski, M. J.**—Ueber den histologischen Bau der spinnrüsen bei ameisenlarven. [100] 1930: 745-761, ill. **Kawaguchi, E.**—Ueber den dimorphismus der epithelzellen im mitteldarm der seidenraupe (*Bombyx mori*). [Jour. Dept. Agric. Kyushu Imp. Univ.] 3: 47-64, ill. **Klingstedt, H.**—Digametrie beim weibchen der trichopteren *Linnophilus decipiens*. [Acta Zool. Fennica, Helsingforsiae] 10-11: 66 pp., ill. **Kratky, E.**—Morphologie und physiologie der drüsen in kopf und thorax der honigbiene (*Apis mellifica*) [94] 139: 120-200, ill. **Marcu, O.**—Die stridulationsorgane der gattungen *Aparapion* und *Rhinastus* unter den Curculioniden. [34] 95: 331-333, ill. **Maziarski, M. S.**—Sur le tissu musculaire des insectes. III. Les réseaux musculaires (mysyndesmium) des gaines ovariiques des Coléoptères. [100] 1930: 657-690, ill. **Maziarski, M. S.**—Sur le tissu musculaire des insectes. IV. Les éléments contractiles dans les couches musculaires de l'intestin moyen chez les Coléoptères. [Comptes Rendus Men. Classe Sci. Math. et Nat., Cracovie] 1931: 8. **Meyer, E.**—Ueber den blutkreislauf der ephemeriden. [46] 22: 1-52, ill. **Miczynski, M. K.**—Etudes génétiques du genre *Aegilops*. II. Morphologie et cytologie des hybrides interspécifiques. [Comptes Rendus Men. Classe Sci. Math. et Nat., Cracovie] 1931: 8-9. **Millot, J.**—Les glandes séricigènes des Dysdérides. [Arch. Zool. Exp., Paris] 71: 38-45, ill. **Minnich, D. E.**—The sensitivity of the oral lobes of the proboscis of the blowfly, *Calliphora vomitoria*, to various sugars. [42] 60: 129-131, ill. **Regen, J.**—Ueber den aufbau der stridulationslaute der saltatoren Orthopteren. [Sitzungsber. Akad. Wissen., Wien] 139: 539-544. **Richmond, E. A.**—The external morphology of *Hydrophilus obtusatus* (Hydrophilidae). [6] 39: 191-250, ill. **Roubaud, M. E.**—Fatigue évolutive cyclique et lignées infatigables chez la mouche verte commune *Lucilia sericata*.

[69] 193: 204-205. **Saint-Hilaire, K.**—Ueber vorderdarmanhänge bei Lophyrus-larven und ihre bedeutung. [46] 21: 608-616, ill. **Spett u. Schaposchnikow.**—Die variabilität des männlichen und weiblichen geschlechts bei käfern. [46] 22: 121-162. **Stehr, W. C.**—The activating influence of light upon certain aquatic arthropods. [42] 59: 297-335, ill. **Verlaine, L.**—L'instinct et l'intelligence chez les Hyménoptères. [Mem. Soc. Ent. Belgique] 23: 191-222. **Willrich, U.**—Beiträge zur kenntnis der lichtkompassbewegung und des farbennnnes der insekten. [89] 49: 157-204, ill. **Zacwilichowski, M. J.**—Sur l'innervation et les organes sensoriels des ailes chez les insectes. [Comptes Rendus Men. Classe Sci. Math. et Nat., Cracovie] 1931: 10.

**ARACHNIDA AND MYRIOPODA.**—\***Beier, M.**—Neue pseudoscorpione der U. O. Neobisiinae. [Mitt. Zool. Mus., Berlin] 17: 299-318, ill. \***Roewer, C. F.**—Drei neue Cosmetiden (Opilioniden) aus Mexiko. [34] 95: 247-250, ill. **Thor, S.**—Das Tierreich . . . Lief. 56. Acarina. Bdellidae, Nicoletiellidae, Cryptognathidae. 87 pp., ill. **Verhoeff, K. W.**—Bronns Klassen und Ordnungen des Tierreichs. Bd. 5. Myriapoda. Diplopoda. 1675-1834, ill.

**THE SMALLER ORDERS OF INSECTS.**—**Ball, A.**—Note descriptive concernant un Ectopsocus des états-unis (Psocoptera-Peripsocidae). [Mem. Soc. Ent. Belgique] 23: 188-190. \***Bondar, G.**—Um novo genero e tres novas especies de Thysanopteros Heliethripineos, Encontrados na Bahia. [Arch. Inst. Biol., São Paulo] 4: 83-88, ill. **Briand, L. J.**—Notes on Chrysopa oculata and its relation to the oriental peach moth (Laspeyresia molesta) infestation in 1930. [4] 63: 123-126. **Carpenter, F. M.**—The biology of the Mecoptera. [5] 38: 41-55, ill. **Crampton, G. C.**—The genitalia and terminal structures of the male of the archaic mecopteran, Notiothauma reedi, compared with related Holometabola from the standpoint of phylogeny. [5] 38: 1-21, ill. **Dow, R.**—Odonata from Santa Clara, Cuba. [95] 44: 55-60. **Hottes, F. C.**—Notes concerning the first papers dealing with the aphid fauna of America. [95] 44: 61-69. **Killington, F. J.**—Osmylus fulvicephalus: The fore coxae of the female, with remarks on a confusion of the sexes. [9] 64: 135-136, ill. **Knowlton & Janes.**—Studies on the biology of Paratrioza cockerelli. [7] 24: 283-290, ill. **Pope, T. E. B.**—[See under Lepidoptera.] **Steger, A. L.**—Some preliminary notes on the genus Ephemerella. [5] 38: 27-35. \***Watson, J. R.**—A new Haplothrips from Panama. [39] 155: 11-12. **Williamson, E. B.**—A new North American Somatochlora (Cordulinae). [Occas. Pap. Mus. Zool. Univ. Mich.] No. 225; 8 pp., ill.

**ORTHOPTERA.**—\*Fulton, B. B.—A study of the genus *Nemobius* (Gryllidae). [7] 24: 205-237, ill.

**HEMIPTERA.**—\*Ball, E. D.—Some new genera and species of leafhoppers related to *Eutettix*. [39] 15: 1-6.

\*Ball, E. D.—Some new genera and species of leaf-hoppers related to *Mesamia*. [19] 26: 91-95. Beamer, R. H.—Notes on the 17-year cicada in Kansas. [103] 4: 53-58, ill. Beamer, R. H.—Some *Erythroneura* (Grape leafhoppers) of the *maculata* group (Cicadellidae). [5] 63: 127-135. Buys, J. L.—Leafhoppers of Mt. Marcy and Mt. Macintyre, Essex Co., New York (Cicadellidae). [6] 39: 139-143. China, W. E.—An interesting relationship between a crayfish and a water bug. [Nat. Hist. Mag. London] 3: 57-62, ill. \*Drake & Harris.—An undescribed water-strider from Brazil. [3] 20: 267-268. Herrick, G. W.—The magnolia scale (*Neolecanium cornuparvum*). [7] 24: 302-305, ill. \*Jaczewski, T.—Die Corixiden (Corixidae, Heteroptera) Zool. Staatsint. u. Zool. Mus. Hamburg. [Mitt. Zool. Staatsinst. u. Zool. Mus. Hamb.] 44: 140-148, ill. (S). Kemper, H.—Beiträge biologie der bettwanze (*Cimex lectularius*). [46] 22: 53-120, ill. \*Lawson, P. B.—Three new species of *Acinopterus* with notes on other species (Cicadellidae). [103] 4: 59-61. Martin, R. S.—Two new *Euphyllura* (Chermidae). [103] 4: 68-70. Mills, H. B.—Notes on the oviposition of *Metapterus annulipes*. (Reduviidae). [19] 26: 84, ill. \*Oman, P. W.—Some new *Neocoelidia* with notes on other species. (Cicadellidae). [103] 4: 62-68. Wadley, F. M.—Ecology of *Toxoptera graminum*, especially as to factors affecting importance in the northern United States. [7] 24: 325-395, ill.

**LEPIDOPTERA.**—Bonniwell, J. C.—Notes on *Megathymus mariae*. [3] 20: 264-265. Bratley, H. E.—*Euvanessa antiopa*. The mourning cloak. [39] 15: 7. \*Cassino, S. E.—New Geometridae. [The Lepid.] 5: 17-24. Clark, A. H.—The extirpation of one butterfly by another. [Pop. Sci. Month.] Aug. 1931: 173-174. \*Clark, B. P.—Descriptions of seven new Sphingidae and a note on one other. [Pro. New England Zool. Club] 12: 77-83. Clayhills, T. H.—Zur kenntnis der temperaturabhängigkeit der jährlichen abundanzkurven von *Calymnia trapezina*. [Mem. Soc. Pro Fauna et Flora Fennica] 5: 91-95, ill. \*Heinrich, C.—Notes on and descriptions of some American moths. [50] 79, Art. 13: 16 pp., ill. (S). \*Holland, W. J.—Notes on some

American butterflies mainly relating to classification and nomenclature. [3] 20: 255-264. **Klots, A. B.**—Notes on lepidoptera collected in a Connecticut-Rhode Island woodland. [19] 26: 57-70, ill. **Klots, A. B.**—Notes on some moths collected at Silver Lake, Chesham, New Hampshire. [5] 38: 36-37. **\*Meyrick, E.**—Micro-lepidoptera from South Chile and Argentina. [An. Mus. Hist. Nat., Buenos Aires] 36: 377-415. **Pollard, C. L.**—Habits of South American equatorial butterflies. [6] 39: 167-170. **Pope, T. E. B.**—Collecting along the Yellowstone Trail. [Yr. Book Public Mus. Milwaukee] 1929: 36-68, ill. **Risbec, M. J.**—Un pentatome parasite de la Chenille épineuse du Cotonnier (*Earias huegeli*). [69] 193: 247-250. **Rockwood & Zimmerman.**—A seed caterpillar, *Grapholitha conversana*, on a native clover in the North Pacific region. [47] 43: 57-65, ill. **\*Williams, R. C.**—Cuban Hesperiidæ. [1] 57: 305-318, ill. **Wucherpfennig, F.**—Sammeltage im Urwalde am Rio Madeira. [18] 25: 100-105, ill.

**DIPTERA.**—**\*Alexander, C. P.**—Records and descriptions of neotropical crane-flies (Tipulidæ). [6] 39: 109-122. **\*Alexander, C. P.**—A list of the crane-flies of Quebec. [4] 63: 135-147. **Bishop & Hart.**—Note on a migration of mosquito larvae. [19] 26: 88-90, ill. **\*Borgmeier, T.**—Sobre alguns Phorideos que parasitam a saúva e outras Formigas Cortadeiras (Phoridae). (S). [Arch. Inst. Biol., São Paulo] 4: 209-228, ill. **\*Bromley, S. W.**—New Asilidæ, with a revised key to the genus *Stenopogon*. [7] 24: 427-435. **da Costa Lima, A.**—Notas sobre "Culicidæ". (S). [An. Mus. Hist. Nat., Buenos Aires] 36: 359-368, ill. **\*Duda, O.**—Die neotropischen Chloropiden. [Folia Zool et Hydrobiol., Riga] 3: 159-172. **\*Fluke, C. L.**—Notes on certain Syrphus flies related to *Xanthogramma* with descriptions of two n. sps. [Tr. Wisc. Ac. Sci.] 26: 289-309, ill. **Johnson, C. W.**—Two new species of fungus gnats of the genus *Apemon*. [5] 38: 22-24, ill. **\*Kröber, O.**—Neue arten aus dem genus *Esenbeckia* (Tabanidæ). (S). [34] 94: 245-257, ill. **Kröber, O.**—Neue arten der gattung *Fidena* (Tabanidæ). [34] 95: 17-37. (S). **\*Kroeber, O.**—Die Pelecorhynchinae und Melpiinae Südamerikas. [Mitt. Zool. Staatsunst. u. Zool. Mus. Hamb.] 44: 149-196, ill. **Lathrop & Nickels.**—The blueberry maggot from an ecological viewpoint. [7] 24: 260-281, ill. **\*Lindner, E.**—Die ausbeute der deutschen Chaco-Expedition 1925-26. Rhopalomeridæ und Ortalididæ. [56] 9: 282-284. (S). **McNeel, T. E.**—A method for locating the

larvae of the mosquito *Mansonia*. [68] 74: 155. **Melvin, R.**—Notes on the biology of the stable-fly, *Stomoxys calcitrans*. [7] 24: 436-438. **\*Nitzulescu, V.**—Sur un *Phlebotome* nouveau du Venezuela *P. gomezi*. [54] 9: 247-255, ill. **\*Parent, O.**—Diptères Dolichopodides de l'Amérique du Sud. [Abh. Mus. f. Tierk. & Völkerk. Dresden] 18: 21 pp., ill. **\*Rohdendorf, B.**—Calliphorinen-studien. [34] 95: 175-177. **Schwardt, H. H.**—The biology of *Tabanus lineola*. [7] 24: 409-416. **Shannon, R. C.**—On the classification of Brazilian Culicidae with special reference to those capable of harboring the yellow fever virus. [10] 33: 125-164, ill. **\*Van Duzee, M. C.**—New South American species of Dolichopodidae. [40] 483: 26 pp., ill. **\*Van Duzee, M. C.**—New South and Central American Dolichopodidae. [40] 484: 14 pp., ill.

**COLEOPTERA.**—**\*Blackman, M. W.**—A revisional study of the genus *Gnathotrichus* in North America. [91] 21: 264-276, ill. **\*Blake, D. H.**—Notes on West Indian and Central American flea-beetles (Halticinae). [19] 26: 76-82, ill. **Borgmeier, F. T.**—Uma curiosa familia de coleopteros [32] 6: 257-258. **\*Cockerell, T. D. A.**—A supposed insect larva from the Jurassic. [19] 26: 96-97, ill. **Darlington, P. J.**—A new name for *Nebria vandykei*. [5] 38: 24. **Frost, C. A.**—*Hyperaspis paludicola*. *Hyperaspis disconotata*. [5] 38: 35. **Frost, S. W.**—The habits of leaf-mining Coleoptera on Barro Colorado Island, Panama. [7] 24: 396-404, ill. **\*Hoscheck, A. B.**—Beiträge zur kenntnis der Buprestiden. [Mitt. Zool. Mus. Berlin] 17: 133-164, ill. (S). **\*Johnson, P. H.**—A new species of *Myochrous* (Chrysomelidae). [4] 63: 148. **\*Lesne, M. P.**—Notes sur les Coléoptères Térédiles. (S). [Bull. Mus. Nat. Hist. Nat., Paris] 3: 96-105, ill. **\*Luederwaldt, H.**—Novos Lucanideos brasileiros. [32] 6: 123-127. **\*Melzer, J.**—Longicorneos americanos, principalmente do Brasil, novos ou pouco conhecidos (Cerambycidae). [Arch. Inst. Biol., São Paulo] 4: 51-82, ill. **\*Reichensperger, A.**—Die wirt der Mesynodites—gruppe nebst beschreibung neuer ecitophiler und termitophiler Histeridenarten. (S). [89] 61, Syst.: 263-284, ill. **\*Valentine, J. M.**—New cavernicole Carabidae of the subfamily Trechinae. [Jour. E. Mitchell Sc. Soc.] 46: 247-258, ill.

**HYMENOPTERA.**—**Alfonsus, E. C.**—A one-eyed bee (*Apis mellifica*). [7] 24: 405-406, ill. **\*Bondar, G.**—Contribuição para o conhecimento dos Hymenopteros phytophagos Calcidoideos. (S). [32] 6: 111-117, ill. **Bromley, S.**

**W.**—Hornet habits. [6] 39: 123-129. **Crèvecoeur, A.**—Le maraudage occasionnel tendance au cleptoparasitisme chez divers Psammocharidae. [Mem. Soc. Ent. Belgique] 23: 183-187. \***Cushman, R. A.**—Three new Braconidae parasitic on bark beetles. [91] 21: 301-304. **Driggers & Pepper.**—*Macrocentrus ancylicivora* and *M. delicatus* distinct species. [7] 24: 293-301, ill. **Gallardo, A.**—Notas sobre las Dorilinas Argentinas. [An. Mus. Hist. Nat., Buenos Aires] 36: 43-48. **Green, H. E.**—Preliminary study of the ants of Southern California. [13] 23: 25. **Kitao, Z.**—Untersuchungen ueber die larve der kiefernblattwespe, *Nesodison japonica*. [Jour. Coll. Agric. Imp. Univ. Tokyo] 11: 151-191, ill. **Proper, A. B.**—*Eupteromalus nidulans*, a parasite of the brown-tail and satin moths. [47] 43: 37-56, ill. **Rau, P.**—An unusual nest of the yellow-jacket, *Vespa germanica*. [19] 26: 85-88. **Satterthwait, A. F.**—*Anaphoidea calendrae*, a mymarid parasite of eggs of weevils of the genus *Calendra*. [6] 39: 171-190. **Verlaine, L.**—[See under Anatomy & Physiology.] \***Wheeler, W. M.**—New and little known ants of the genera *Macromischa*, *Croesomyrmex* and *Antillaemyrmex*. [Bul. Mus. Comp. Z.] 72: 1-34. **Zimmermann, K.**—Studien ueber individuelle und geographische variabilitat palaearktischer *Polistes* und verwandter vespiden. [46] 22: 173-230, ill.

A LABORATORY GUIDE TO THE STUDY OF THE WINGS OF INSECTS, (iv +) 41 pp., 67 accompanying unbound plates. \$1.25.—SUGGESTIONS FOR THE INSTRUCTOR in Connection with the use of the Laboratory Guide to the Study of the Wings of Insects. 17 pp. (lithoprinted.) 75c.—THE VENATION OF INSECTS' WINGS, a brief laboratory guide and exercises in the study of phylogenetic series and the principle of homology for elementary students of biology. 9 pp., 13 accompanying unbound plates. 50c.—All by JAMES CHESTER BRADLEY, M. S., Ph.D., Professor of Entomology and Curator of Invertebrate Zoology in Cornell University. Ithaca, New York. Daw, Illston & Co., 1931.

THE TEACHING OF THE PRINCIPLE OF HOMOLOGIES TO ELEMENTARY CLASSES IN BIOLOGY, AND THE USE OF PHYLOGENETIC SERIES IN THE LABORATORY. By J. CHESTER BRADLEY. School Science and Mathematics, Vol. XXXI, No. 5, pp. 525-532, 14 figs. May, 1931.

Those eminent expositors of the wing venation of insects, the late Professor Comstock and the living Professor Needham,

have found a successor in their pupil and associate in the Cornell faculty, Professor J. C. Bradley. Dr. Bradley believes that the wings of insects and their venation furnish "the most readily available and altogether satisfactory phylogenetic series that can be placed before all elementary students" of biology, "even in large laboratory sections." Needless to say he also regards their study as very essential to the future entomologist, and for both classes of students he has provided the laboratory manuals above cited. The plates show the actual venation of different insects printed in pale ink. The student, comparing these unlabeled plates with each other and using two or more colored inks or pencils, endeavors to mark the homologous veins with the same color or/and label them to show their homologies. Dr. Bradley rightly says: "If the student is obliged to work out the successive steps of modification with a minimum of guidance from the teacher and with no guidance from literature, except the directions in this guide, the whole course becomes analogous to a simplified research problem. . . . Experience shows that the student, led to work out the problems of the course in the way indicated, finds a compelling interest in their solution. Studied in this way, the work has a distinct value as training in clear and independent thinking." "The instructor should refuse to point out errors which the student is capable of discerning for himself. Compel the student to criticize his own work and discover all errors which are derived from carelessness or failure to apply logical deduction or critical analysis." While the two guides naturally contain directions to the student, the "Suggestions for the Instructor" give Dr. Bradley's own views on various disputed points in venational homologies and, consequently, nomenclature. Of the 67 loose plates ( $8 \times 4\frac{3}{4}$  inches) accompanying the larger guide, 1 is a simplified neopterygote wing, 17 are Dipterous, 1 is Trichopterous, 7 Lepidopterous, 1 Mecopterous, 1 Plecopterous, 7 Neuropterous, 2 Corrodentine, 24 Hymenopterous, 1 of Palaeodictyoptera and Prothephemeroidea, 2 Ephemeroidea, 3 Protodonata and Odonata. In a circular the publishers state that "Coleoptera, Orthoptera and Hemiptera are omitted, owing to the difficulties of their study and to the little practical use made of the venation in those orders." Nothing is said as to the possibility of purchasing this set of plates separately from the guide; we think this might often be desirable. This series of texts and figures seems to be well designed for the purposes for which it has been drawn up and we wish author and publishers all success.—P. P. CALVERT.

## OBITUARY.

Father ERICH WASMANN, S. J., widely known for his writings on instinct and intelligence, psychology of ants and the relations of these insects to other animals, died on February 27, 1931, at St. Ignatius College, Valkenburg, in Southern Holland. He was born at Meran (Merano) in the southern Tyrol, May 29, 1859. An interesting account of his life, accompanied by a portrait of his later years, is given by Franz Heikertinger (*Koleopterologische Rundschau*, xvii, 89-96, July 31, 1931), from which we take these notes. After study in Benedictine and Franciscan schools, he entered the Jesuit order, September 28, 1875, at Exaten, near Roermond, Holland. It was at this time that the first symptoms of an affection of the lungs appeared, a disease which followed him throughout life and which, by his physician's prescription, that he spend much time out of doors, eventually led to his intensive study of ants. From 1890 to 1892 he studied zoology at the University of Prague under Hatschek and Cori. In 1893, again at Exaten, he became a co-editor of a journal of his order, *Stimmen aus Maria-Laach* (later *Stimmen der Zeit*), a position which gave him much time for scientific work. His publications include about 280 contributions to knowledge of myrmecophiles and termitophiles, one of the most valuable of which is his *Kritisches Verzeichniss der myrmekophilen und termitophilen Arthropoden* (Berlin, 1894). Among his more general works are *Instinkt und Intelligenz im Tierreich* (1897), *Vergleichende Studien über das Seelenleben der Ameisen und höheren Tiere* (1897), English translation, St. Louis, 1905, *Die psychischen Fähigkeiten der Ameisen* (1899, 2nd edit. 1909), *Das Gesellschaftsleben der Ameisen* (1915), *Die moderne Biologie und die Entwicklungstheorie* (English transl., London, 1910), *The Berlin Discussion of the Problem of Evolution* (London, 1909).

A *Festschrift* in honor of his 70th birthday was published as Volume 82 of the *Zoologischer Anzeiger*, 1929. It is accompanied by four portraits of Wasmann at different ages.



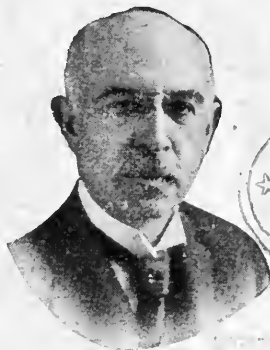
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NOVEMBER, 1931

# ENTOMOLOGICAL NEWS

Vol. XLII

No. 9



HENRY SKINNER  
1861-1926

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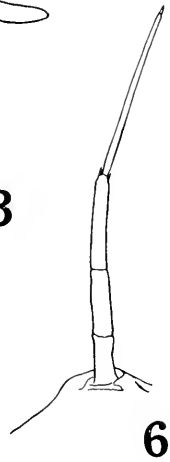
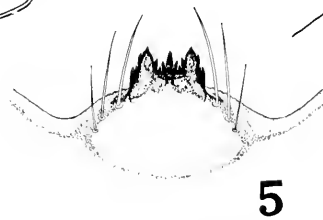
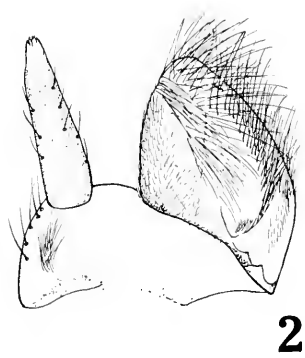
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Communications on observations made in the course of your studies are solicited; also exhibits of any specimens you consider of interest.

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SIMULIID LARVA (FIGS. 1-3, 5, 6) AND PUPA (FIG. 4).—RITCHER.

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## **An Undescribed Species of Simuliid Larva and the Corresponding Pupa (Diptera: Simuliidae).\***

By PAUL OSBORN RITCHER.

(Plate VI).

In the fall of 1929 the author undertook the study of the Simuliidae as a special problem. To aid in this project, Dr. C. L. Metcalf, head of the Department of Entomology, of the University of Illinois, kindly placed at my disposal some 1000 or 1100 vials of black flies, principally larvae and pupae, which he had collected the previous summer in a survey of the resort region in the Adirondack mountains of New York State.

The fall of 1929 was spent in identifying as many of the larvae and pupae as possible. In most cases it was possible to make fairly accurate determinations. The characters furnished by the rectal gills, labia, histoblasts of the respiratory filaments, and head markings were used in all of the determinations.

The majority of the specimens were common, known species, as was to be expected. A few kinds of larvae and pupae were present which, so far as I am able to find, have not been described. It is probable that they may either be larval and pupal stages of species of which only the adults have been described and named or that they may represent new species. Descriptions of at least one of these will be published in the near future. Sufficient material is lacking of the others.

In the routine work of obtaining a general understanding of the Simuliidae and their taxonomy, collections were made of local material. For the most part, *Simulium vittatum* made up the bulk of the collections. However, on March 22, 1930, Mr. Fred Dodd and Mr. J. H. Evans, assistants in the University of Illinois Department of Entomology, brought in a number of Simuliid larvae as the result of an aquatic collecting trip in Brownfield's woods, a piece of virgin timber lying three miles

<sup>1</sup>Contribution from the Entomological Laboratories of the University of Illinois, No. 154.

northeast of the town of Urbana, Illinois. They attempted to keep the black fly larvae alive in a shallow glass dish of water through which air was bubbled. Most of them had died the following day. A few larvae remained alive until March 24.

Upon examination, the larvae proved to be different from any described species. The labium had a peculiar kind of trilobed teeth and each histoblast contained 12 respiratory filaments.

On April 6, I collected a few full grown larvae and one pupa of what I shall call *Undescribed Species No. 2*. They were found clinging to the leaves among logs which caused a number of miniature falls in the stream. I also put out a trap similar to that described by W. T. Emery. Inside the box I placed a number of leaves with larvae on them.

When I revisited the spot April 12, I found that the trap had been molested and taken out of the stream. I collected a number of larvae and one pupa in the same series of miniature falls in which the previous collection was made.

On May 11 I collected a number of full grown larvae and a number of very small larvae from the same stream in Brownfield's woods. Some of the full grown larvae were *Simulium vittatum*.

In order to secure adults of *Undescribed Species No. 2*, I put out a new trap made of crossed wires, covered with a number of layers of cheesecloth. Inside I placed about 25 large larvae. To get a swift current, I made a narrow place in the stream with an old log. This same day I found a number of larvae and empty pupal cases on the under side of an old piece of tin. One pupal case which I examined contained a pupal skin with 12 respiratory filaments on each side so it was of *Undescribed Species No. 2*.

On June 1 I returned to the trap. It had not been disturbed but most of the small stream had dried up. There was no current of course and no larvae, pupae, or adults were to be found in the trap or any place else.

HABITAT SUMMARY—Larvae and pupae of *Undescribed Species No. 2* were taken from several spots in a small woodland stream about three miles northeast of Urbana, Illinois. They were found on leaves and debris in the current where logs

and brush made small falls and eddies. The altitude was approximately 720 feet. The width of the stream was about one yard. The bottom is of mud and the stream is partially choked with leaves and brush. It empties into the Salt Fork.

#### LARVA.

The larva of *Undescribed Species No. 2* measures from 6 to 8 mm. in length. The general body color is grayish white. The head is not strongly pigmented but the pattern is similar to that of *Simulium vittatum*.

The antennae (plate VI, fig. 6) are light yellow in color and are five segmented. The first segment is short. The second segment is approximately  $1\frac{1}{2}$  times the length of the first. The third segment is  $1\frac{1}{2}$  times as large as the second and bears two conical processes at its apical end. The diameter of the first three segments diminishes slightly from the first to the third. The fourth antennal segment is slender and long. It is approximately as long as the first three segments combined. At the apical end of the fourth segment is found the fifth segment which is a small, pointed, conical, process.

The labial plate of *Undescribed Species No. 2* (plate VI, fig. 5) is about the same width as that of *Simulium vittatum* but it is shorter. The cephalic teeth, as a group, stand out from the margin of the mentum. The outer margins of the group of teeth are not parallel.

The entire cephalic margin at each side of the group of teeth is fairly smooth as compared to the serrate condition found in the mentum of *Simulium vittatum*. On either side of the labial plate is found a row of three bristles. The cephalic bristle is large and prominent. The two succeeding are smaller. The third bristle is much smaller than the other two.

The three large teeth in the mentum are prominent and trifid. One small simple tooth is found between each of the large lateral trifid teeth and the middle trifid tooth. Two smaller single teeth are found on the outer margin of each lateral trifid tooth. The central trifid tooth is quite dissimilar in shape and appearance from the two lateral teeth. It is shorter and less prominent than the lateral teeth.

The mandibles (plate VI, fig. 1) are chitinous and elongate. The lateral margins are convex. Each mandible has four large black apical teeth. Close to the large dorsal tooth is a row of approximately 13 small teeth which extends basad. The first or apical tooth in this row is longer than the second but both first and second are much smaller than the third. The rest of the teeth are small. A second row, of teeth is found dorsad and basad of the first row. It contains approximately 17 to 19

teeth. The teeth in this row are more scattered than those of the first row.

Arising from the outer apical margin is a fringe of brown hairs, which partially covers the mandibles. Among these hairs is a row of 10 to 11 large, stout bristles, extending laterad from the base of the black apical teeth. Two large bristles arise near the apex of the mandible, on the ventral surface, a short distance from the outer lateral margin. A series of evenly spaced hairs, arranged in comblike fashion, extends along the distal third of the mesal portion of the mandible, on the dorsal surface. Two clumps of hairs are also found on the basal half of the inner surface of the mandible. The proximal of these clumps of hairs contains a number of large hairs which branch at the apex similar to those of *Simulium simile* Mall., (Cameron, 1912).

The brown maxillae (plate VI, fig. 2) are similar to those of *Simulium vittatum*. The basal portion of the maxillary palpus is brown and bears a few sparse hairs. The distal end is transparent and bears a few small toothlike processes. The lacinia is densely covered with hairs and bears a single spurlike appendage distad.

Each of the fans of the head bears approximately 38 rays.

The three rectal gills are simple in structure and unbranched (plate VI, fig. 3).

The caudal disc bears approximately 64 rows of small brown hooks.

Twelve-branched respiratory filaments are found in the dissected histoblasts.

#### PUPA.

The large-sized, robust pupa of *Undescribed Species No. 2* is golden brown in color. It measures 5 to 6 mm. in length.

There are 12 respiratory filaments in this species (plate VI, fig. 4). Five of the filaments are much longer than the other seven. The method of branching involves two unpaired filaments.

The respiratory filaments are each composed of a single main trunk which divides close from the base into two main branches. The first main branch branches to form two secondary branches. Of these, one secondary branch branches dichotomously to form two filaments. The other secondary branch, not far from its base, gives rise to a single, unpaired filament. Distad from this point the other secondary branch branches dichotomously to form two filaments. Five filaments in all are formed from this first main branch.

The second main branch forks in about the same relative position as the first to form two branches. One of these gives rise to a single unpaired filament and then later divides dichotomously to form two additional filaments. The other



branch of the second main branch, distad of the parts just described, soon divides dichotomously to form two tertiary branches each of which in turn divides to form 2 filaments. Thus 7 filaments are eventually formed from the second main branch. This number, plus the 5 filaments formed from the first main branch, makes a total of 12 respiratory filaments for each respiratory tree of *Undescribed Species No. 2*.

The pupa case is made up of a mass of loosely woven threads. It is open at one end for the protrusion of the respiratory filaments.

#### SUMMARY.

One species of larva and its corresponding pupa is described for the first time.

*Undescribed Species No. 2* is found in a small stream flowing through Brownfield's woods, three miles northeast of Urbana, Illinois. There are twelve respiratory filaments in each respiratory trunk of the pupa.

From the characters found in this species, it is probable that it belongs to the genus *Prosimulium*. It will be necessary to rear adults before any attempt can be made to assign a specific or generic name to it. The drying up of the stream has made this impossible for the present.

#### BIBLIOGRAPHY.

- BISHOPP, F. C. 1912. Some important insect enemies of live stock in the United States. U. S. Dept. of Agric., Yearbook of 1912: 383-386.
- CAMERON, A. E. 1912. The morphology and biology of a Canadian cattle-infesting Black Fly, *Simulium simile* Mall. (Diptera, Simuliidae) Dom. of Canada, Dept. of Agric., Bull. No. 5, New Series.
- COMSTOCK, J. H. 1925. Introduction to Entomology. 1044 pp., 1228 figs. Ithaca, N. Y.
- EMERY, W. T. 1913. Morphology and biology of *Simulium vittatum* and its distribution in Kansas. Kan. Univ. Sci. Bull., 8:321-362.
- CARMAN, H. 1912. A Preliminary study of Kentucky localities in which pellagra is prevalent. Ky. Agric. Exp. Sta. Bull. 159.
- HUNGERFORD, H. S. 1913. Anatomy of *Simulium vittatum*. Kansas Univ. Sci. Bull. 8, No. 10: 365-382.
- HUNTER, S. T. 1914. University experiments with Sandflies and pellagra. Kan. Univ. Sci. Bull., 8: 311-320.
- JOHANNSSEN, O. A. 1903. Aquatic Nematocerous Diptera. New York State Mus. Bull., 68: 328-441.
- MALLOCH, J. R. 1914. American Black Flies or Buffalo

- Gnats. U. S. Dept. Agric., Bureau of Ent., Technical Series, No. 26.
- METCALF, C. L., and SANDERSON, W. E. 1931. Black Flies, Mosquitos and Punkies of the Adirondacks, New York State Museum, Circular 5.
- NEEDHAM, J. O. 1901. Aquatic insects of the Adirondacks. New York State Mus. Bull., 47: 407-408.
- O'KANE, W. C. 1926. Black Flies in New Hampshire. New Hampshire Agric. Exp. Sta., Technical Bull. 32.
- POMEROY, A. W. P. 1916. Notes on five North American Buffalo Gnats of the genus *Simulium*. U. S. Dept. Agric. Bull. 329.
- RILEY, C. V. 1886. Buffalo Gnats. U. S. Dept. Agric., Report for 1885: 492-517.
- WU, YI F. 1930. A contribution to the biology of *Simulium* (Diptera). Papers of the Michigan Academy of Science, Arts, and Letters. 13: 543-599.

#### EXPLANATION OF PLATE VI.

*Simulium* Undescribed Species No. 2. 1. Right mandible of larva, ventral view. 2. Right maxilla of larva, ventral view. 3. Rectal gills and caudal disc of larva. 4. Respiratory filaments of pupa. 5. Labium of larva, ventral view. 6. Antenna of larva. (Original.)

#### Bibliographia Odonatologica.

Fritz Wagner, Vienna XVIII, Haizingergasse 4, has announced the intention to publish a "Bibliographia Odonatologica", a list of titles of papers upon dragonflies of the world, with a subject index compiled by Dr. Erich Schmidt, Berlin. The latter began this work eighteen years ago and has endeavored to make his list as complete as possible. He had the assistance of the late Dr. Ris, of Rheinau, Dr. Zerny, of Vienna, and of several other authors. As far as possible, he has compared each reference with the original paper itself to insure the highest accuracy.

The work will consist of a list of the papers arranged under authors alphabetically and chronologically under each author. This list will be followed by a subject index nearly after the prototype of Hagen in his famous "Bibliotheca Entomologica". It is intended to give short biographical notices for most authors. Photographs of some of them will be reproduced. The price will be 30 cents for each 16 pages in 8vo. The work will be printed *only* if a sufficient number of subscribers be secured. It will appear as a serial in 3-4 numbers, a total of about 250-400 pages in 8vo.

## Noctuidae of Northern Georgia and Tennessee (Lepidoptera).

By A. GLENN RICHARDS, JR.

Entomology Dept., Cornell University, Ithaca, New York.

Since so little work on moths has been done in this region it seems worth while to publish the following list of species largely collected by myself in northern Georgia and Tennessee. The most notable features are the total, or almost total, absence of many of the common northern pests belonging to this group, and the more or less expected inroads of southern forms.

A paper on the butterflies of this region is now in press (Bull. Brooklyn Ent. Soc.), but unfortunately it is impossible to treat the moths in a similar manner at the present. And so I have given here only a brief account of my favorite group, the Noctuidae, plus about a dozen other scattered records of more than usual interest. The Geometers, Pyralids, and Micros have been placed in the Cornell collection, and these records will not be published now, but anyone especially interested in data on these groups may obtain them from the author.

The two localities where most of the collecting was done are Athens, Georgia and Monteagle, Tennessee. The former is in the center of the Piedmont area of the northeastern part of the state at an elevation of 800 ft.; the latter is about half way between Chattanooga and Nashville on the Cumberland Plateau at an elevation of 2000 ft. For detailed descriptions of both of these the reader is referred to the paper on butterfly distribution.

To save space thruout the body of the article, no locality is mentioned when the records are from Athens (where the collecting has been carried on longer). When records are from both Athens and Monteagle, the former are placed first followed by a semicolon, and then the Monteagle records follow after "Monteagle".

A † preceding a name indicates that the dates noted represent all the specimens taken. As a glance at the first one will show, this does not necessarily mean that only a single specimen was taken, although this is usually the case. A \* preceding a name

indicates that these records are thought to extend more or less the known distribution of the species. However, the region has been so little written about that in some instances this may very well not be so, but in the absence of state lists, etc., perhaps the author may be pardoned if he has erred in some cases.

The determinations have been made by comparison with the Cornell Collection supplemented by the literature. The author is greatly indebted to Dr. W. T. M. Forbes for help throughout, especially on the doubtful species.

All the doubtfully determined specimens have been placed in the U. S. National Museum, as also have all possible new species and certain others. The author's thanks are due to Mr. Carl Heinrich also for checking the specimens sent to the U. S. N. M. & Barnes Collections, and sending notes thereon.

## NOCTUIDAE.

## SUBFAMILY AGROTINAE.

- †*HELIOTHIS PARADOXA* Grt. ♂ Aug. '27 ♀ 5-X-28; ♂  
Monteagle 25-VI-30.  
H. *OBSOLETA* Fabr. Everywhere June-late Sept.  
H. *VIRESCENS* Fabr. April-July.
- \*†*RIHODOPHORA FLORIDA* Gn. Monteagle 12-VII-30.  
*LYGRANTHOECIA THOREAUI* G. & R. 9-IX-27; Monteagle  
20-VIII-30.  
L. *MARGINATA* Haw. Aug. Sept., common.  
*SCHINIA TRIFASCIA* Hbn. 18-VIII-29 (2); Catoosa Co., Ga.  
common in Aug. '28; Monteagle Aug.-Sept.  
S. *NUNDINA* Dru. 10-VIII-29, only specimen; Monteagle  
not uncommon in Aug.  
S. *LYNX* Gn. July-Sept.; Monteagle in June.  
S. *SORDIDA* Sm. Common Aug.-Sept.; quite variable.  
S. *ARCIGERA* Gn. Aug.-Oct.; Monteagle Aug. & Sept.
- †*EUXOA VELLERIPENNIS* Grt. Monteagle 26-X-30.  
E. *MESSORIA* Harris. 7-X-26; Monteagle in Sept.
- \*†*E. REDIMICULA* Morr. ? (det.: W. T. M. F.). ♀ Monteagle  
12-VIII-30 (now in U. S. N. M.).
- †*FELTIA GLADIARIA* Morr. Monteagle 26-X-30.  
F. *DUCENS* Wlk. 6-X-26.  
F. *SUBGOTHICA* Haw. Sept.-Oct., not common.  
F. *HERILIS* Grt. Common Sept.-Oct.  
F. *ANNEXA* Treit. Common April-Sept.; Monteagle common  
June-Sept.

- †F. MALEFIDA Gn. 29-IX-27.  
 †AGROTIS BADINODIS Grt. 5-XI-29.  
 A. YPSILON Rott. Athens & Monteagle common.  
 A. C-NIGRUM L. 26-IV-29, only record; Monteagle common.  
 A. PLECTA L. April-Sept.  
 EPIPSILIA FUNGORUM G. & R. Uncommon in Oct.  
 LYCOPHOTIA MARGARITOSA Haw. & forms. Common.  
 L. INFECTA Ochs. (=INCIVIS Gn.). Aug.-Sept.; Monteagle same.  
 †L. LUBRICANS Gn. Monteagle 20-IV-30 & 1-IX-29 (2).

## SUBFAMILY HADENINAE.

- POLIA LEGITIMA Grt. Sept.; Monteagle Aug.  
 \*POLIA near LEGITIMA Grt. ♂ Monteagle 31-VIII-29. It is larger and darker and more uniformly colored than typical LEGITIMA, with little or no difference in the ♂ genitalia. Mr. Heinrich thinks it is a new species, but Dr. Forbes and I are of the opinion that it is only an extreme variant of *legitima* (now in U. S. N. M.).  
 P. RENIGERA Steph. May-June.  
 P. LAUDABILIS Gn. Sept.-Oct. very common; a semimelanic specimen 11-IX-29.  
 \*†TRICHOCLEA RUISA Forbes (det. W. T. M. F.) Greenville, S. C. 13-IX-30 (H. K. Townes Jr.). This ♂ is the only specimen other than the type known, and was taken only about 30 miles from the type locality (Tryon, N. C. 10-VIII-04) (now in Cornell Coll.).  
 CHABUATA SIGNATA Wlk. Monteagle Aug.-Sept.  
 \*†HYSSIA MODESTA Morr. ♀ 18-IV-27.  
 ERIOPYGA CRENUATA Butl. April-Aug., rather common.  
 \*†NEPHELODES EMMEDONIA Cram. (=MINIANS Gn.). ♀ 5-V-29.  
 †MORRISONIA CONFUSA Hbn. Large ♀ 3-IV-29.  
 CIRPHIS PSEUDARGYRIA Gn. 12-VIII-28; Monteagle May & Aug.  
 C. MULTILINEA Wlk. 23-VI-29, 4-VIII-28.  
 †C. PIRAGMATIDICOLA Gn. Monteagle 6-VI-30.  
 C. UNIPUNCTA Haw. Universally common.  
 \*†NELEUCANIA RUBRIPENNIS G. & R. Monteagle 1-IX-30, 2-IX-29.  
 N. ALBILINEA DIFFUSA Wlk. 30-VIII-28.

## SUBFAMILY CUCULLINAE.

- CUCULLIA ASTEROIDES Gn. 7-IV-29, July rare.  
 \*†C. CONVEXIPENNIS G. & R. Monteagle 3-IX-30.

†*HOMOPIADENA INFIXA* Wlk. Queer specimen Monteagle 25-VI-30.

\**PARASTICHTIS BICOLORAGO* Gn. 23-X-26.

P. B. VAR. *FERRUGINEOIDES* Gn. 18-X-28.

†*ATETHMIA PAMPINA* Gn. ♀ 20-X-28.

SUBFAMILY ACRONYCTINAE.

\**AMPHIPIRYA PYRAMIDOIDES* Gn. 9-VIII-28; Monteagle July.

†*MAGUSA ORBIFERA* Wlk. Monteagle 27-VII-30.

\*†*DIPTERYGIA SCABRIUSCULA* L. 28-VIII-26.

†*SEPTIS NIGRIOR* Sm. Clarke Co., no date.

*TRACHEA MISELIOIDES* Gn. Athens & Monteagle April, July & Sept., rather common.

*PERIGEA APAMEOIDES* Gn. Common Aug.-Oct.

P. *XANTHIOIDES* Gn. 25-VIII-26.

P. *CUPENTIA* Cram. Aug.-Oct., not common; Monteagle 26-X-30.

P. *VECORS* Gn. April-May.

P. *SUTOR* Gn. May-Oct.; Monteagle 4-IX-29.

\*†*OLIGIA MISERA* GRT.? (W. T. M. F.). ♂ Monteagle 6-VII-30. Mr. Heinrich says this specimen is "a darker form of *vulgivaga* Morr." (now in U. S. N. M.).

\*†*O. DIVERSICOLOR* Morr. 22-IX-28.

\*†*O. SEMICANA* Wlk. (= *hausta* Grt.) (det.: W. T. M. F.) Monteagle 14-VI-30 (now in U. S. N. M.).

*O. FRACTILINEA* f. *VULGIVAGA* Morr. Monteagle 1-2-IX-29.

\*†*OLIGIA* n. sp.? ♀ 1-VI-29. Nothing like this in the Cornell, U. S. N. M. nor Barnes collections (now in U. S. N. M.).

†*LUPERINA PASSER* Gn. Monteagle 28-VIII-30.

†*CHYTONIX PALLIATRICULA IASPIS* Gn. 12-VIII-28.

†*HARRISIMEMNA TRISIGNATA* Wlk. Monteagle 20-VIII-30.

*POLYGRAMMATE HEBRAEICUM* Hbn. July-Aug., rare; Monteagle June-July, not uncommon.

*LEUCONYCTA DIPHTEROIDES* f. *OBLITERATA* Grt. Monteagle uncommon in July.

*AGRIOPODES TERATOPHORA* H. S. Monteagle June-Sept., uncommon.

*ACRONYCTA CONNECTA* Grt. July-Sept.

A. *HAESITATA* Grt. 5-IV-29; Monteagle 13-VII-30.

A. *PRUNI* Harr. 9-VII-26.

A. *INCRETA* Morr. Athens & Monteagle rather common April-Sept.

A. *RETARDATA* Wlk. 9-VIII-29.

A. *LAETIFICA* Sm. 4-VIII-28 (now in U. S. N. M.).

†A. *HASTA* Gn. ?. ♂ 24-VII-28. Called "*furcifera* Gn." by Mr. Heinrich (now in U. S. N. M.).

†A. *BETULAE* Riley. 23-VII-28.

- A. AMERICANA Harris. 1-VIII-29.  
 †A. LONGA Gn. 15-V-29.  
 †A. LITHOSPILA Grt. 31-V-29.  
 †A. OBLINITA A. & S. Monteagle 29-VI-30.  
 DELTA RAMOSULA Gn. Monteagle 4-IX-29 (several).  
 CATABENA LINEOLATA Wlk. Monteagle June & Aug.  
 PRODENIA DOLICHOS Fabr. (= COMMELINAE A. & S.) Aug.  
 Oct., uncommon.  
 P. ORNITHOGALLI Gn. Common Aug.-Sept.; Monteagle  
 June-Sept.  
 P. ERIDANIA Cram. June-Oct., rare.  
 LAPHYGMA FRUGIPERDA A. & S. Athens & Monteagle Aug.-  
 Oct., common.  
 CARADRINA TARDA Gn. Monteagle April, July-Sept., com-  
 mon.  
 GALGULA PARTITA Gn. Common May-Oct.; Monteagle June-  
 Sept.  
 CRAMBODES TALIDIFORMIS Gn. Monteagle June-Sept., not  
 common.  
 PLATYSENTA VIDENS Gn. June-Sept.  
 BALSAMALANA Fitch. April-Sept.; Monteagle April-June.  
 \*MONODES NUCICOLORA Gn. Sept.-Oct., not common.  
 M. VERSICOLOR Grt. April-Aug., not common.  
 M. CHALCEDONIA Hbn. July-Aug., rather common.  
 M. FESTIVOIDES Gn. Aug.-Sept., not uncommon; Monteagle  
 common April-Sept.  
 M. GRATA Hbn. July-Sept., common; Monteagle June-Aug.,  
 not uncommon.  
 APAMEA NICTITANS AMERICANA Speyer. Monteagle 16-VI-  
 30; on Andrew's Bald in the Smoky Mts. at 5750 ft., com-  
 mon in late Aug.  
 ACHATODES ZEAE Harris. 31-V-29; Monteagle common in  
 June.  
 \*†PYRRHIA UMBRA Hufn. 27-V-29; Monteagle 24-VIII-30.  
 PAPAPEMA NEBRIS Gn. Uncommon in Sept.  
 P. n. f. NITELA Gn. Sept.; Monteagle in Aug.  
 OGDONOTA CINEREOLA Gn. Common June & July; Mon-  
 teagle 4-VI-30.  
 \*EMARGINEA PERCARA Morr. 8-IX-29; Monteagle uncommon  
 mid-Aug.-Sept.  
 COSMIA ORINA Gn. Athens, one no date; Monteagle very  
 common in June and early July.  
 †BASILODES PEPITA Gn. 2-IX-27; Monteagle 4-IX-29.  
 †STIRIODES OBTUSA H. S. 30-VI-28 and one other no date;  
 Monteagle 11-VI-30.  
 †EUTHISANOTIA GRATA Fabr. 31-VII-28.  
 †E. UNIO Hbn. Monteagle 11-VI-30.

## SUBFAMILY ERASTRINIÆ.

†CYDOSIA MAJUSCULA Hy. Edw. Monteagle 20-VII-30.

\*†EUBLEMMA OBLIQUALIS Fabr. 10-IX-29.

\*E. MINIMA Gn. Greenville, S. C., a number breed from *Gnaphalium* by Mr. H. K. Townes, Jr., emerging in Sept.

†ORUZA ALBOSTALIATA Pack. (In B. & McD. list as a "*Plconectyptera*") 9 & 11-VIII-29.

\*†COBUBATHA QUADRIFERA Zell. Monteagle 21-VI-30.

AMYNA BULLULA Grt. Sept.-Oct., not common.

A. OCTO Gn. Aug.-Sept., common; Monteagle one ♀ 26-VIII-30.

CHAMYRIS CERINTHA Treit. July & Aug., rare; Monteagle 27-V-30.

†LITHACODIA SYNOCHITIS G. & R. 6-VI-26.

L. MUSTA G. & R. July-Sept., uncommon; Monteagle common in June.

L. CARNEOLA Gn. Sept.-Oct., common.

L. APICOSA Haw. July & Sept., uncommon; Monteagle April-Sept., not uncommon.

L. MUSCOSULA Gn. 8-VI-28.

PROTCRYPHIA SECTA Grt. 24-VI-29, rare; Monteagle common in June.

CRYPHIA PERVERTENS B. & McD. 1 & 6-VIII-29; Monteagle common May-July.

XANTHOPTERA NIGROFIMBRIA Gn. Common May-Sept.; Monteagle 14-VIII-30.

HELIOCONTIA APICELLA Grt. Common June & July.

SPRAGUEIA LEO Gn. (given as "*onagrus* Gn." in Holland's Moth Book). Common in Aug. & Sept.; Monteagle 14-VIII-30.

S. DAMA Gn. Common June-Sept.; Monteagle July-Sept.

TARACHIDIA ERASTRIOIDES Gn. June, uncommon; Monteagle 9-VI-30.

T. CANDEFACIA Hbn. Common in June; Monteagle same.

T. SEMIFLAVA Gn. Monteagle June & Aug., uncommon.

TARACHE APRICA Hbn. July-Sept.; Monteagle 27-VIII-30.

## SUBFAMILY EUTELIINÆ.

MARATHYSSA INFICITA Wlk. 27-VII-28 & 10-IX-28; Monteagle June-Aug.

PAECTES OCLATRIX Gn. Rare in June & Aug.

P. FLABELLA Grt. (= PYGMAEA Hbn. ?). Monteagle June & Aug., rather common.

P. ABROSTOLOIDES Gn. Mid-May-Sept., rather common.

(To be continued)



## The Generic Synonymy of the North American Pieridae (Lepidoptera).

By ALEXANDER B. KLOTS, University of Rochester,  
Rochester, New York.

The writer has recently completed a study of the genera of *Pieridae* of the world which, it is hoped, will eventually find its way into print. In the meantime it has seemed advisable to publish the present notes on the North American Pierid genera in a periodical in which they will be available to a greater number of North American Lepidopterists than will be the above-mentioned work.

A number of changes have been made from both Barnes and McDunnough's Check List of the Lepidoptera of Boreal America and Barnes and Benjamin's List of the Diurnal Lepidoptera of Boreal America north of Mexico. Some of these are due to a more intensive study of the taxonomic characters of the insects themselves; others have been made because of a somewhat wider acquaintance with the *Pieridae* of the world. At least an outline of the present writer's reasons for such changes has been given here. The order of the genera has been shifted considerably, those which are considered more primitive having been placed first. The Rhodocerini as a group average slightly more primitive than the Pierini, although many of the Rhodocerine genera are far more highly specialized than many of those of the Pierini.

Free use has been made of subgenera, as an excellent means of showing relationships. For those who object to the subgenus it may be pointed out that this category can always easily be dropped out of an individual's pet system.

In stating the genotypes, the method and date of fixation of the type has been stated. In this "sole sp." means that the type was the sole species included by the author of the genus in his original proposal (type of monotypical genus); "des. in O. D." means that the type was designated by the author in his original description of the genus (type by original designation); "des. Butler 1870" would mean that the type was designated by Butler in 1870 (type by subsequent designation).

## PIERIDAE.

There is nothing in the Code governing the method of designating family names. In the present case the application of a strict rule of priority to enforce the use of the term "*Asciidae*" merely sinks an ancient and familiar name to one that nobody has ever heard of, and that most people do not wish to hear of again.

## Subfamily DISMORPHIINÆ.

Genus DISMORPHIA Huebner, type *laia* Huebner, des. Butler 1870

Subgenus ENANTIA Huebner, type *licinia* Huebner, des. Scudder 1875. *Melitæ* L., the sole North American Dismorphiine, is without doubt congeneric with *licinia*

## Subfamily PIERINÆ.

## Tribe EUCILOINI.

Genus EUCILOË Huebner, type *belia* Esper, des. Butler 1870

All of the North American species belong in the nymotypical subgenus, *Euchloë* (*Elphinstonia*) Klots, type *charlonia* Donzel having been erected for some Palearctic species. *Olympia* Edw. belongs in *Euchloë*. It bears a merely superficial resemblance to the species of *Zegris* Rambur, type *eupheme* Esper.

Genus ANTHOCHARIS Boisduval, type *cardamines* L. des Scudder 1875

Subgenus FALCAPICA Klots, type *genutia* Fabricius, des. in O. D.

*Genutia* cannot serve as type of *Anthocharis*, inasmuch as it was not included in the original list of species.

According to the Code the above use of *Anthocharis* is wrong. With the formal invalidation of Huebner's *Tantamen*, *Mancipium* Huebner becomes invalid, and *Mancipium* Stephens ceases to be a homonym. This would result in the necessity of having to place *Anthocharis* Boisduval (1832) as a synonym of *Mancipium* Stephens (1828). While the present author does not believe very strongly in the sanctity of usage he does feel that too much confusion would be caused by this change, and therefore retains *Anthocharis*. Of the North American species *lanccolata* and *genutia* go in *Falcapica*, while *cethura*, *pima* and *sara* belong in *Anthocharis* proper.

## Tribe RHODOCERINI.

Genus *COLIAS* Fabricius, type *hyale* L., des. Leach 1815

Subgenus *ZERENE* Huebner, type *cacsonia* Stoll, des. Scudder 1872

Again the writer transgresses the Code for the sake of simplicity. The type of *Colias* was designated by Latreille in 1810 as *rhamni* L., and this designation has been validated by Opinion 11 of the International Commission of Zoological Nomenclature. If this designation were followed we should have to use *Colias* instead of *Gonepteryx* for a genus of Palearctic butterflies, and *Zerene* (*Scalidoucura*) Butler 1871, (type *herminia* Butler des. in O. D.) for *Colias* Leach *et auct.* *Eurymus* Swainson is, as has been pointed out by Holland, a homonym of *Eurymus* Rafinesque 1815.

Most of the North American species belong in *C. (Colias)*; *cacsonia* and *curydice* only go in *C. (Zerene)*. The most striking difference between the two subgenera is the wing-form, which is hardly a generic character.

Genus *ANTEOS* Huebner, type *macrula* Fabricius, des. Godman & Salvin 1889

*Clorinde* Godart, the sole North American species, belongs in the nymotypical subgenus.

Genus *PHOEBIS* Huebner, type *argante* Fabricius, des. Butler 1870

Subgenus *APHRISSA* Butler, type *statira* Cramer, des. in O. D.

All of the North American species except *statira* belong in the nymotypical subgenus.

Genus *KRICOCONIA* Reakirt, type *lyside* Godart, sole sp.

Genus *EUREMA* Huebner, type *daira* Godart, des. Butler 1870

Subgenus *ABAEIS* Huebner, type *nicippe* Cramer, des. Butler 1870

Subgenus *PYRISITIA* Butler, type *proterpia* Fabricius, des. and sole sp. in O. D.

*Nicippe* is the sole species in *E. (Abacis)*. *Proterpia*, *gundluchia* Poey and probably *linda* Edw. (a subsp. of *nise* Cramer) belong in *E. (Pyrisitia)*. The rest of the species go in *E. (Eurema)*. The subgeneric separations are based largely on the sex-scaling and male genitalia.

Genus NATHALIS Boisduval, type *iole* Boisduval sole sp.

Possessing but three radials in the primary, and weird genitalia, *Nathalis* is the most highly specialized Rhodocerine genus.

Genus NEOPHASIA Behr, type *menapia* Felder sole sp.

Genus APPIAS Huebner, type *zelmira* Cramer, des. Butler 1870

Subgenus GLUTOPHRISSA Butler, type *ilaire* Godart, des. in O. D. (as *pocyi* Butler).

*Ilaire*, the sole North American species, is at least sub-generically distinct from *zelmira*.

Genus PIERIS Schrank, type *brassicac* L. des. Latreille 1810

Subgenus SYNCHLOË Huebner, type *callidice* Esper, des. Butler 1870

The North American species *beckerii* Edwards, *sisymbrii* Boisduval, *occidentalis* Reakirt, *protodice* Boisduval & Leconte, *napi* L., *virginicensis* Edwards, *ochsenheimeri* Staudinger (is this a valid species?) and *rapae* L. all belong in *P.* (*Synchloë*). *P.* (*Pontia*) is restricted to the Palearctic *duplidice* and its related species *chloridice* with only three radials in the primary. *Brassicac* is the sole species in *P.* (*Pieris*).

Genus ASCIA Scopoli, type *monuste* L., des. Scudder 1872.

Subgenus GANYRA Dalman, type *amaryllis* Fabricius, des. Scudder 1875.

*Monuste* is the sole species in *A.* (*Ascia*). *Amaryllis* is the only North American representative of *A.* (*Ganyra*), of which other species are found further south. The subgeneric characters are mainly differences in size, sex-scaling and genitalia.

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### An Improvised Spreading Board for Small Moths.

The following suggestion for a spreading board for small moths, or other small insects which one wishes to spread, may not be a new thing to some entomologists, but when the writer recently conceived the idea for spreading a few Microlepidoptera he felt that it might be worth passing on to others. It may be especially valuable in cases where large numbers of moths are to be pinned, or where one does not have the material and equipment to make the usual spreading boards. The spreading board used was made from a piece of fairly soft corrugated cardboard covered on one side only. A piece of common corrugated boxing would undoubtedly serve the pur-

pose but might be rather tough to pin through readily, thus making the spreading of the wings more difficult. A strip of the covering cardboard sheet is cut out between two corrugations, forming a trough in which to place the body of the insect. This leaves a good smooth surface on which to spread the wings and also holds the two portions together. This piece of cardboard may then be made into a spreading board by placing it on any kind of material that is easily pinned through, to allow for running the insect pin down to the desired depth. Some ordinary pinning pith which happened to be available was used in the case just mentioned.

Such a spreading board will accommodate insects with a body as large or slightly larger than ordinary cutworm moths and might prove satisfactory for many of the smaller butterflies.

RAYMOND ROBERTS, University of Nebraska, Lincoln.

#### **Parnassius in the Black Hills, South Dakota (Lepid.: Papilionidae).**

Prospecting over the Black Hills, South Dakota in July, 1928, I found to my great surprise *Parnassius* flying there on some isolated fields. The first specimens I found at an altitude of about only four thousand feet, near Spearfish, which greatly aroused my interest. Going up on the higher altitude, I expected to find these Alpine butterflies in greater numbers so going up to Harney Peak, which rises to about seven thousand feet, and covering as much territory as possible, I did not find a single specimen flying and I did not either find the food plant of the larvae, *Sedum*. Going down to the altitude of about five thousand feet, where the *Sedum* was growing profusely, I again found *Parnassius* flying sometimes in great numbers.

Up to that date I did not know that east of the Rocky Mountains these *Parnassii* appeared and even in "Seitz" of the Macro-lepidoptera world, it is stated that while *Parnassius* appears from Alaska down to Mexico, they are not found east of the Rocky Mountains. The specimens found in the Black Hills have been determined by Professor John A. Comstock of the Los Angeles Museum as being *Parnassius smintheus magnus* Wright and *Parnassius smintheus nanus*, varying greatly in size and colors.—EMIL KRAUTH, Hebron, North Dakota.

#### **Bookseller's Separates.**

\* When an author writes an article for an entomological journal, he usually receives free, upon request, from that journal a quantity of author's separates, or what are variously termed, excerpts, extras, reprints, etc. These separates are generally sent out by the author to friends and fellow workers who may

or may not have seen the article, but who like to have inscribed copies for personal use. Such separates generally carry an extra line or two of printing by the publication stating that they are separates and also give date of number, volume, page, etc. By this means of the special printing and other characteristics, one is reasonably certain of recognizing a genuine author's separate.

Of late years there has been an increasing tendency on the part of some booksellers to take any entomological journal and cut it up into as many unit articles as possible, selling these individually to interested parties. Such cut-out articles are *not* genuine separates. They may serve a restricted clientele, but they are not author's copies and to sell them with an inference as such is misleading. Of course booksellers make a greater profit by disposing of odd back numbers in this way. I don't know that any special harm is done, but perhaps this is one of the reasons why it is so hard to complete sets of certain journals. The above is written simply to call attention to the difference between "author's separates" and "bookseller's separates".—J. D. GUNDER, Pasadena, California.

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## Entomological Literature

COMPILED BY LAURA S. MACKAY UNDER THE SUPERVISION OF  
E. T. CRESSON, JR.

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 within brackets [ ] refer to the journals, as numbered in the list of Periodicals and Serials published in the January and June numbers (or which may be secured from the publisher of Entomological News for 10c), in which the paper appeared. The number of, or annual volume, and in some cases the part, heft, &c. the latter within ( ) follows; then the pagination follows the colon :

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

\*Papers containing new forms or names have an \* preceding the author's name.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

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.

☛ Note the change in the method of citing the bibliographical references, as explained above.

Papers published in the Entomological News are not listed.

**GENERAL.**—Balfour-Browne, F.—A plea for uniformity in the method of recording insect captures. [8] 67: 183-192. Crampton, G. C.—A criticism of the current theories concerning the origin of metamorphosis in insects with suggestions for a theory based on mutation. [9] 64: 154-158.

**Fulda, O.**—Sammeln in Haiti. [17] 48: 169-170, 176-179.  
**Fulton & Chamberlin.**—A new automatic insect trap for the study of insect dispersion and flight associations. [12] 24: 757-761, ill. **Melnikov, P.**—Wie soll der falter in der Tüte liegen? [18] 25: 137-140, ill. **Muir, F. A. G.**—Obituaries. By J. J. Walker and W. E. China. [8] 67: 160-162. [9] 64: 166-168. **Nicholson, A. J.**—Methods of photographing living insects. [22] 22: 307-320, ill. **Poulton, E. B.**—A hundred years of evolution. [68] 74: 345-360. **Poulton, E. B.**—Two specially significant examples of insect mimicry. [36] 79: 395-398, ill. **Smith, F. F.**—A new type of insect cage. [12] 24: 914-916, ill. **Wasmann, P. E.**—Obituary. By F. Heikertinger. [79] 17: 89-96, ill. **Wucherpfenig, F.**—Entomologische Amazonas-fahrt. [17] 48: 153-156, ill., cont.

**ANATOMY, PHYSIOLOGY, ETC.**—**Beer, S.**—Ricerche sull' applicazione dei raggi X alla ginecrimatura dei . . . Bombyx mori. [Bol. Zool. Agr. e Bach., Milano] 2: 207-241, ill. **Bugini, F.**—La partenogenesi naturale dimostrata nel filugello. [Bol. Zool. Agr. e Bach., Milano] 2: 116-149, ill. **Buxton, P. A.**—The law governing the loss of water from an insect. [Pro. Ent. Soc. London] 6: 27-31. **Cockayne, E. A.**—Three rare abnormalities in lepidopterous larvae homoeosis, somatic mutation, spiral segmentation. [36] 79: 305-309, ill. **Dover, C.**—Effects of inadequate feeding on insect metamorphosis. [31] 128: 303-304. **Gargiulo, F.**—Studi e ricerche sul giallume del Baco da seta. [Bol. Zool. Agr. e Bach., Milano] 2: 72-115, ill. **Grandori, R.**—Studi sulla nascita della larve del Bombyx mori. [Bol. Zool. Agr. e Bach., Milano] 2: 22-45, ill. **Hawkins, C. N.**—Numerical variation in the ecdyses of lepidopterous larvae. [Pro. So. Lond. Ent. & Nat. Hist. Soc.] 1931-32: 21-29. **Hsü, Y.**—Morphology, anatomy and ethology of *Gryllus mitratus*. [Lingnar Sci. Jour.] 10: 187-216, ill. **Huges, A. W. McK.**—Inheritance of melanism in moths. [31] 128: 496. **Imms, A. D.**—Recent research on the wing-venation of insects. [8] 67: 145-148, ill. **Misra, A. B.**—On the internal anatomy of the female lac insect, *Laccifer lacca* (Coccidae). [93] 1931: 297-323, ill. **Muir, F.**—The critical point of parasitism and the law of Malthus. [22] 22: 249-251. **Pickles, A.**—On the metamorphosis of the alimentary canal in certain Ephemeroptera. [36] 79: 263-274, ill. **Rühle, H.**—Die riechporen der Lepidopteren. [18] 25: 182-187, ill. **Sicard, H.**—Note préliminaire sur la biologie et la morphologie larvaires de *Degeeria luctuosa* (funebri) Tachinaire

parasite de l'altise de la vigne. [25] 1931: 158-162, ill. **Sulc, K.**—Die wachsdrüsen und ihre produkte bei den imagen der sf. Cixiinae. Die wachsdrüsen und ihre produkte bei den larven von *Flata* (*Phromnia*) *marginella* d'Olivier. [Biol. Spisy Acad. Vet., Brno] 8: 1-53, 1-23, ill. **Timo-féeff-Ressovsky, H.**—Ueber phänotypische manifestierung der polytopen (pleiotropen) genovariation polyphaen von *Drosophila funebris*. [88] 19: 765-768, ill. **Warren, E.**—The spermatogenesis of ticks. [31] 128: 454-455. **Wigglesworth.**—How are the tracheae of insects kept full of air? [Pro. Ent. Soc. London] 6: 11-12. **Zimmermann, K.**—Wirkung von selektion und temperatur auf die pigmentierung von *Epilachna chrysomelina*. [88] 19: 768-771, ill.

**ARACHNIDA AND MYRIOPODA.**—**Chamberlin, J. C.**—The arachnid order Chelonethida. [Stanford Univ. Pub., Biol. Sci.] 7: 284 pp., ill. **\*Jacot, A. P.**—A common arboreal moss mite *Humerobates humeralis*. [Occas. Pap. Boston Soc. Nat. Hist.] 5: 369-381, ill.

**THE SMALLER ORDERS OF INSECTS.**—**Boelsche, W.**—Der Termitenstaat schilderung eines geheimnisvollen volkes. Stuttgart 1931. 79 pp., ill. **\*Geijskes, D. C.**—A new species of *Oligoclada* from Trinidad, B. W. I. [58] 8: 213-214. **\*Jordan, K.**—Three new South American fleas. [71] 36: 311-316, ill. **\*Longinos Navas, R. P.**—Veinticinco formas nuevas de insectos. [Bol. Soc. Iberica Cien. Nat.] 26: 48-75, ill. (S). **\*McDunnough, J.**—The genus *Isonychia* (Ephemeroptera). [4] 63: 157-163, ill. **Mosely, M. E.**—Trichoptera and Ephemeroptera of British Guiana, with special reference to the Oxford University Expedition to British Guiana, 1929. [9] 64: 169-170. **Moulton, D.**—*Dendrothrips ornatus*, 1894. [19] 26: 75.

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THE FABRICIAN TYPES OF INSECTS IN THE HUNTERIAN COLLECTION AT GLASGOW UNIVERSITY. Coleoptera, Part I, by ROBERT A. STAIG, M.A., F.R.S.E., Lecturer in Zoology (Entomology) University of Glasgow. Cambridge: at the University Press. New York: The Macmillan Co., 1931.

This is a small volume of 107 pp. of text, an introduction (7 pp.) and index, and is illustrated by twenty-eight plates,

each showing a single enlarged colored drawing of a Fabrician or Olivierian type.

The introduction contains some account of the Hunter Collection, together with a short biographical sketch of Fabricius, more especially of his connection with English collectors and collections, and is interesting reading throughout. It seems that Fabricius made a lengthy visit to England 1772-75, where, as he says in his autobiography, "I now lived very pleasantly. With Banks, Hunter and Drury I found plenty of objects to engage my time and everything which could possibly be of service to me. My situation was not only very delightful but it afforded the means of gaining much instruction." It was at this time, as the author of the present volume says, that "Fabricius worked through Dr. Hunter's Cabinets of Insects, he identified and labelled the various specimens and a large number of them were named and described by him (in his *Systema Entomologiae* and his later works) as species new to science". The author goes on to say—"It has long been desired that the Fabrician types in the Hunterian Collection should be made accessible for purposes of systematic entomology, by the publication of accurate up-to-date descriptions together with accurate figures."

That a most capable beginning of this work has been made by Mr. Staig will be obvious to anyone who will examine this little volume attentively. The task has been complicated from the fact that the labels were pinned or gummed to the bottom of the box instead of being attached to the specimens, many of which through careless or irresponsible handling had become separated therefrom. The author states, however, that the specimens in the Hunterian cabinets, although more than one hundred and fifty years old, are for the most part in a remarkably good state of preservation and that by careful comparison with the descriptions and with representative modern examples of the species he has been able to locate with certainty most of the misplaced types though with "considerable trouble and deplorable loss of time".

In pursuance of the project as outlined we find in the body of the work "up-to-date" descriptions of forty-three types, thirty-five of which are of Fabricius' species, six of Oliver's and two of Drury's. The descriptions are very carefully drawn, designedly of course with sufficient detail to permit identification by systematists in the absence of the types. The actual accomplishment of this theoretical result is a very difficult matter and its complete realization is all but impossible. I believe, however, that the author has attained an unusually high level of

success in his characterizations. The figures have evidently been made with painstaking effort to faithfully reproduce the form, outline, relative dimensions and broader features of sculpture. The coloring has not in all cases been so successfully accomplished. While it may add to the artistic effect, it sometimes prevents or obscures details of sculpture, and in certain instances it is at variance with the descriptions—*c.g.*, in *Scaphinotus unicolor* and *Pasimachus depressus*, which are respectively described as “concolorous, dull glossy black” and “glossy black,” whereas the figures indicate the presence of a distinct violaceous lustre.

To students of Coleoptera in general the gain from Mr. Staig's volume is, of course, in great part formal rather than actual, inasmuch as the vast majority of Fabricius' species are already so well known. Here in America, where there are no types to be consulted, our conceptions of the Fabrician species are traditional; they are the crystallized and generally accepted results of the combined efforts of many subsequent writers, some of whom at least have seen and studied the original types or other authentic material and have written fuller descriptions and drawn better figures. In the main we feel that we know the American species of Fabricius, but there are still a few concerning which some doubt exists and our coleopterists will therefore be especially interested in the discussion of the Hunterian types belonging to our fauna. Of these there are twelve, as follows:

4. *Cicindela unipunctata* Fab., Syst. Ent., p. 225, No. 8 (1775).
6. *Scaphinotus (Carabus) elevatus* Fab., Mant. Ins. I, p. 198, No. 37 (1787).
7. *Scaphinotus (Carabus) unicolor* Fab., Mant. Ins. I, p. 198, No. 38 (1787).
9. *Pasimachus (Scarites) depressus* Fab., Mant. Ins. I, p. 206, No. 1 (1787).\*
10. *Pasimachus (Scarites) marginatus* Fab., Mant. Ins. I, p. 206, No. 2 (1787).
16. *Agonoderus (Carabus) pallipes* Fab., Mant. Ins. I, p. 202, No. 86 (1787).
21. *Deltotilium (Scarabacus) gibbosum* Fab., Syst. Ent., p. 28, No. 112 (1775).
23. *Copris (Scarabacus) lar* Fab., Mant. Ins. I, p. 13, No. 124 (1787).

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\* The author points out that the references to original descriptions of Nos. 9, 10 and 16 above, and also of *Scarites subterraneus* Fab. are incorrectly given in the Leng List.

This is the same as the previously described *Copris* (*Scarabaeus*) *minutus* of Drury (1770).

32. *Anomala* (*Melolontha*) *errans* Oliv., Ent. I, 5, p. 45, pl. 8, fig. 92 (1789).

According to Mr. Arrow this is the same as the *Anomala lucicola* Fab. and antedates the latter by nine years. See p. 67 of text.

34. *Anomala* (*Melolontha*) *innuba* Fab., Mant. Ins. I, p. 22, No. 45 (1787).
48. *Trichiotinus* (*Cetonia*) *bidens* Oliv., Ent. I, 6, p. 62, pl. 10, fig. 87 (1789).

The same as *Trichius bibens* Fab. (1775), the type of which is not in the Hunter Coll. "The word '*bibens*' is a printer's error as pointed out by F. W. Hope."

51. *Silpha surinamensis* Fab., Syst. Ent., p. 72, No. 1 (1775).

Of nine of the above species nothing need be said, our interpretations being apparently in harmony with the descriptions of the types or, in the case of *Copris minutus* and *Anomala lucicola*, of their equivalents.

*Scaphinotus unicolor* Fab. There are still some unsettled doubts as to the precise relationship between *unicolor*, *heros* Harris and *shoemakeri* Leng, and neither the description nor the figure of the Fabrician type enables us to resolve the doubts. In the text *unicolor* and *heros* are assumed to be synonymous but just why the species is recorded under the latter and much later name is not clear.

*Pasimachus depressus* Fab. According to Staig's description the type is entirely black without trace of bluish or violaceous border. It is apparently the form to which Le Conte gave the name *morio* in his earliest paper on the genus, but which he later united with *depressus*. If the South American locality (Cayenne) given by Fabricius for his type is correct, it may introduce complications, otherwise it would appear that *morio* is a straight synonym of *depressus*, while *limbatus* Zimm, may be used if desired for the form with bluish margins.

*Agonoderus pallipes* Fab. The name label covers two specimens in the Hunter collection, the larger of which is said by the author to answer best the descriptions of Fabricius and Olivier. Both specimens are described but no figure is given. Judging from the descriptions the two examples are of different species and I cannot satisfy myself that either of them is the same as the *pallipes* of our American authorities; in fact certain characters ascribed to the larger specimen would exclude it from the genus *Agonoderus* altogether. I shall endeavor to get further information on this matter.

Thus far only the types in the families Cicindelidae, Carabidae, Dytiscidae, Scarabaeidae, Silphidae, Histeridae, and Erotylidae have been treated. We shall look forward with interest to the appearance of further installments of the work and trust it may ultimately be brought to completion as planned.—H. C. FALL.

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## Doings of Societies.

The eighth annual meeting of the ROCKY MOUNTAIN CONFERENCE OF ENTOMOLOGISTS was held in Pingree Park, Colorado, August 17 to 22, 1931, inclusive. The Colorado State Agricultural College Forestry Lodge, which is located in Pingree Park at an altitude of about 9000 feet, was made the headquarters. The entomologists brought members of their families that enjoyed the outing. A total of 82 registered during the week, 44 of these being directly interested in entomology. The following is a list of these:

E. G. Kelly, Geo. A. Dean, R. L. Parker, Roger C. Smith, Donald A. Wilbur, Manhattan, Kansas; Paul B. Lawson, R. H. Beamer, J. O. Nottingham, H. T. Peters, M. W. Anderson, Lawrence, Kansas; Edwin W. Howe, Wichita, Kansas; L. D. Anderson, Morganville, Kansas; E. W. Davis, H. E. Dorst, Leland Jones, Richard C. Newton, Geo. I. Reeves, John C. Hamlin, Ralph Bunn, Salt Lake City, Utah; K. D. Arbethnot, Monroe, Michigan; F. E. Whitehead, Stillwater, Okla., M. C. Parker, Madison, Wisconsin; Lester Hanna, Del Norte, Colorado; Jean Sutherland, J. W. Horn, Carl Hopkins, Boulder, Colorado; Harry Newton, Paonia, Colorado; Chas. M. Drage, Loveland, Colorado; Louis G. Davis, Grand Junction, Colorado; John L. Hoerner, R. G. Richmond, Miriam A. Palmer, Geo. M. List, F. T. Cowan, C. P. Gillette, Rellie G. Mack, Sam C. McCampbell, John Weaver, Leslie B. Daniels, C. W. Kearns, Harold Willis, Carl A. Bjurman, C. R. Jones, Albert White, Fort Collins, Colorado.

Ten sessions were held during the week for discussion and presentation of papers. The remainder of the time was given to collecting by those that were interested in this, and to recreation.

The following is a list of the more formal subjects discussed:

ORTHOPTERA.—Grasshopper Control Work in Colorado during 1931, F. T. Cowan; Grasshopper Control in Kansas and Results of Correlated Program of Work in Extension, E. G.

Kelly; A review of the Grasshopper Situation with a Summary of Our Present Control Information, Geo. A. Dean.

COLEOPTERA. — Alfalfa Weevil Studies, Geo. I. Reeves and J. C. Hamlin.

HYMENOPTERA. — Status of Experiments with *Trichogramma minutum* (Riley), Geo. M. List; Liberation of *Trichogramma minutum* (Riley) in Mesa and Delta counties, Colorado, with Other Notes on Codling Moth, L. G. Davis and J. H. Newton.

HOMOPTERA. — Taxonomy of Corn Root Louse, *Aphis maidi-radidis*, and Some Allied Species of Aphidiae, Miriam A. Palmer; Beet Leaf-hopper Studies in Utah, E. W. Davis.

LEPIDOPTERA. — Temperature and Its Relation to Rate of Hatch of Codling Moth Eggs, Edwin W. Howe; Codling Moth Work at Manhattan, Kansas, R. L. Parker.

GENERAL. — Illustrated Lecture on the Phillipines with Reference to Entomological Problems, C. R. Jones; The Effect of Arsenic as Used in the Control of Grasshoppers Upon Birds, F. E. Whitehead; European Corn Borer Parasites in Middle Western Area, K. D. Arbethnot; Some Phases of Work on Pasture Insects, Donald A. Wilbur; Some Insects that Attack Honey Locust in Colorado, S. C. McCampbell; Elm Tree Borers, R. L. Parker; The Summer's Collecting Trip Under the Auspices of the University of Kansas; R. H. Beamer; A Recent Insect Survey of Kansas by Questionnaire, R. C. Smith; Mill Fumigation, Geo. A. Dean; An Illustrated Lecture on Haiti, R. C. Smith.

SYMPOSIUM. — The use of Mathematics in Analyzing Entomological Data. The Use of Mathematics in Alfalfa Weevil Investigation, Geo. I. Reeves and J. C. Hamlin; Curve Fitting, Ralph Bunn; Probable Error, Richard Newton; Chi-square, Leland Jones.

The officers elected for 1932 were C. P. Gillette, Chairman; P. B. Lawson, Vice-chairman; Geo. M. List, Secretary, and C. R. Jones, Treasurer.

GEORGE M. LIST, *Secretary*.

## OBITUARY.

HENRY LORENZ VIERECK, known for his work on the Hymenoptera, died at Loudonville, Ohio, October 8, 1931, as the result of an accident. A biographical notice will appear in a later issue of the NEWS.



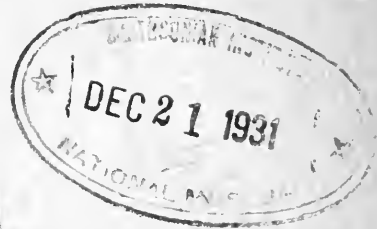
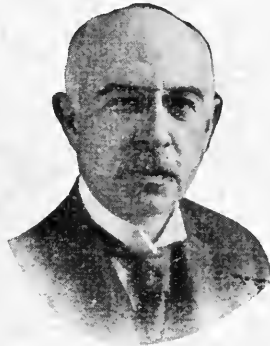
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## **Digger Wasps and Buprestidae (Hym.: Cerceridae, Coleop.: Buprestidae).**

By O. L. CARTWRIGHT, South Carolina Experiment Station,  
Clemson College, S. C.

On July 4, 1931, several members of the Entomology Division of the South Carolina Experiment Station, enjoyed a holiday collecting trip to Jocassee, South Carolina. Near this delightful little mountain community they were attracted to a sandy knoll-like elevation in the narrow road by many wasps flying a few inches above the ground. The particular area apparently most attractive to the wasps was somewhat wider than most of the road and used by motorists in turning their cars, in all a space covering not more than one hundred square yards. A number of the wasps were caught and found to be of several species, *Stictia carolina* (Fab.) being most numerous, followed in order by *Bicyrtes quadrifasciata* (Say), *Cerceris fumipennis* Say, *Elis carolina* (Panz.) and *Cerceris mandibularis* Patton. *C. fumipennis* were observed bringing Buprestidae to their numerous burrows in the roadway. *C. mandibularis* brought in a grasshopper nymph. The other species seemed to be flying about rather aimlessly over the area.

The most interesting and perhaps unusual find, however, was the discovery of a surprising number of Buprestidae scattered about on the ground. The infrequent cars passing, backing and turning at the point doubtless caused the abandonment of some of the beetles by the wasps, since at the party's approach wasps were observed to drop larger specimens of their prey and fly away. Other agencies probably also caused abandonment, however, for a few beetles were found near another colony of wasps in a field not far away. Whether or not other species of wasps present were interfering with the activity of *Cerceris fumipennis* was not determined. Many of the beetles were alive but paralyzed. *C. fumipennis* was the only species

observed with the Buprestidae and perhaps had brought in all of the beetles found.

The number of specimens of the twenty species of Buprestidae picked up from the surface of the roadway—the wasps burrows were not disturbed—on this and two later visits to the spot were as follows:

51 <i>Buprestis rufipes</i> (Oliv.)	2 <i>Chrysobothris verdigrispennis</i>
26 <i>Dicerca lurida</i> (Fab.)	Frost
12 <i>Dicerca americana</i> (Hbst.)	2 <i>Agrilus bilineatus</i> (Web.)
8 <i>Buprestis fasciata</i> Fab.	1 <i>Dicerca tuberculata</i> (Cast.)
6 <i>Dicerca punctulata</i> (Schon)	1 <i>Chrysobothris blanchardi</i> Horn
5 <i>Buprestis striata</i> Fab.	1 <i>Chrysobothris dentipes</i>
5 <i>Chrysobothris femorata</i> (Oliv.)	(Germar)
3 <i>Dicerca nuttalli</i> var.	1 <i>Chrysobothris floricola</i> Gory
<i>consularis</i> Gory	1 <i>Chrysobothris lesucuri</i> Cast.
3 <i>Buprestis lineata</i> Fab.	1 <i>Agrilus arcuatus</i> (Say)
3 <i>Actenodes acornis</i> (Say)	
2 <i>Buprestis maculipennis</i> Gory	136 specimens of Buprestidae (20
2 <i>Chrysobothris sexsignata</i> (Say)	species).

This list of Buprestidae includes several which according to our records had not previously been taken in South Carolina and while of biological interest it is also of considerable economic significance to those interested in forests and forest entomology.

The writer gratefully acknowledges his indebtedness to Miss Grace Sandhouse of the United States National Museum for determinations of the Hymenoptera and to Mr. J. N. Knull of the Pennsylvania Forest Research Laboratories for determinations of the Buprestidae.

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### Flight of Corixids (Hemip.: Corixidae).

An immense number of *Corisella dispersa* (Uhler) came into the city of Davis, California, during the evening and night of June 23, 1931. After arrival, they were attracted to the street lights until the air looked as during a heavy fog. Many of the insects died at each light, piling up to a depth of 2-3 inches. The temperature was high (90° F), with no wind movement. The breeding place of these migrating individuals is unknown to me.

Flights of Corixids have been recorded before but the interesting thing concerning this flight is the distance apparently traveled. At this season no lakes or streams containing water are close. The Sacramento River with its sloughs is over ten miles away in an air line. No other such flight has been observed during my nine years of residence here.—GEORGE H. VANSSELL.

## Noctuidae of Northern Georgia and Tennessee (Lepidoptera).

By A. GLENN RICHARDS, JR.

(Continued from page 252.)

### SUBFAMILY SARROTHRIPINAE.

CHARACOMA NILOTICA Rogenh. Common July-Aug.; Monteagle rather common June-Sept., one 26-X-30. Two specimens of a variant of this protean species were taken at Monteagle (16-VII-30 & 1-IX-29) which is not mentioned by Hampson among his "abs.". They each have rather uniform gray wings with two longitudinal black streaks extending the length of the wing (now in Cornell Coll. & U. S. N. M.).

SARROTHRIPS REVAYANA LINTNERANA Speyer. 29-V-28; Monteagle in June.

BAILEYA OPHTHALMICA Gn. (*dornitans* Gn. & *levitans* Sm. seem best placed as synonyms of this since the superficial characters intergrade hopelessly and the genitalia offer no characters; I am not familiar with *australis* Grt., but the figures indicate that it belongs in this species also.) Monteagle, common in June, uncommon in July.

### SUBFAMILY CATOCALINAE.

\*EUPARTHENOS NUBILIS Hbn. Aug. '28 (only specimen); Monteagle June-Aug. One variant from Monteagle (13-VI-30) has only half the usual amount of yellow on the hind wing (now in U. S. N. M.).

ALLOTRIA ELONYMPHA Hbn. 14-VI-26, rare; Monteagle rather common in Sept.

PARALLELIA BISTRIARIS Hbn. Common June-Aug.

CAENURGIA CONVALESCENS Gn. Common March, June & Aug.; Monteagle rather common in late Aug.

C. CRASSIUSCULA Haw. Common at Athens & Monteagle May-Sept.

PELAMIA LATIPES Gn. Rather common Aug.-Oct.; Monteagle 11-V-30 & 9-IX-29.

PHURYS LIMA Gn. Early April-June, rare.

P. BISTRIGATA Hbn. June & Aug., rare.

CELIPTERA FRUSTULUM Gn. July-Aug., common; Monteagle April & Aug.

ARGYROSTROTIS ANILIS Dru. May-June; Monteagle Aug.-Sept.; rare.

ZALE LUNATA Dru. June-July; Monteagle May & Sept., rather common.

- Z. UNDULARIS Dru. June '29; Lake Rabun, Ga., 11-VII-26.  
 Z. LUNIFERA Hbn. April-Sept.  
 †Z. BETHUNEI Sm. Monteagle ♀ 23-VI-30 (now in U. S. N. M.).  
 Z. OBLIQUA Gn. 5 & 6-V-27; Monteagle 29-VI-30.  
 †Z. CINGULIFERA Wlk. 8-IV-29.  
 †Z. HORRIDA Hbn. Monteagle 12-VII-30.

## SUBFAMILY PANTHEINAE.

- †COLOCASIA PROPINQUILINEA Grt. Monteagle 20-IV-30.

## SUBFAMILY PLUSHINAE.

- AUTOGRAPHA FALCIFERA Kirby. June-Aug.  
 \*†A. EGENA Gn. 17-VI-28 & 6-VIII-28.  
 A. VERRUCA Fabr. July-Aug., common.  
 A. BRASSICAE Riley. June-Sept. very common; Monteagle same.  
 A. BASIGERA Wlk. Aug.-Sept., rather common; Monteagle 4-IX-29.  
 A. OXYGRAMMA Geyer. Common July-Aug.; Monteagle 31-VIII-29.  
 A. BILOBA Steph. May & June, rather common; Monteagle 20-VII-30.  
 A. OO Cram. (= ROGATIONIS Gn.). Rather common July-Oct.  
 A. PRECATIONIS Gn. Odd specimens in March, Aug. & Oct.; Monteagle July-Oct., not common.  
 A. OU Gn. Common April-Sept.; Monteagle June-July, rare.  
 †PLUSIA AEREA Hbn. One specimen at Athens without date.

## SUBFAMILY EREBINAE.

- RAPHIS ABRUPTA Grt. April & Aug., very uncommon; Monteagle rare in June & July.  
 MELIPOTIS JUCUNDA Hbn. July-Aug., rare.  
 †SYNEDA LIMOLARIS Geyer. Monteagle 9-X-30.  
 PHOBERIA ATOMARIS Hbn. 26-IV-27; Monteagle 17-IV-30.  
 PANAPODA RUFIMARGO Hbn. Uncommon in April.  
 P. R. f. CARNEICOSTA Gn. April & July, this is the common form here; Monteagle June-July. Many intermediates, and several in which the discal spot on the fore wing is somewhat suffused.  
 ANTICARSIA GEMMATILIS Hbn. Sept.-Oct., common in some seasons.  
 †ANTIBLEMMA INEXACTA Wlk. ♀ 18-V-29.  
 STRENOLOMA LUNILINEA Grt. May & June, rare; one near Monteagle 11-V-30.

- BENDIS (= TRAMA) DETRAHENS Wlk. April-May, not common.
- †EREBUS ODORA L. One in May '27.
- \*CALPE CANADENSIS Beth. Smithsburg, Md. 7 & 8-VI-21 (F. M. Brown).
- †SCOLIOPTERYX LIBATRIX L. One specimen at Athens, no date.
- PLUSIODONTA COMPRESSIPALPIS Gn. June-July, common in some seasons.
- \*†HYPSOROPHA MONILIS Fabr. ♀ 18-IV-27; Monteagle ♂ 17-IV-30 (fresh).
- H. NORMOS Hbn. April-Aug.; Monteagle June & July, not uncommon.
- ALABAMA ARGILLACEA Hbn. Very abundant.
- ANOMIS EROSA Hbn. June-Oct., rather common.

## SUBFAMILY HYPENINAE.

- SCOLECOCAMPA LIBURNA Geyer. July-Aug., uncommon.
- GABARA (= EUCALYPTRA) sps. Monteagle in June & July, and Catoosa Co., Ga., in late Aug. Several species including *bipuncta* Morr.
- ISOGONA NATATRIX Gn. Rare in April & May.
- PHIPROSOPUS CALLITRICHOIDES Grt. Uncommon in April & May; one very dark, grey-brown specimen with the marking indistinct 6-V-29 (now in U. S. N. M.).
- \*†PARAHYPENODES QUADRALIS B. & McD. Lake Rabun, Ga. (in the mountains) 13-VII-27. Described recently from Canada, and I have seen specimens from New York and New Hampshire, but never further south. It is a rare insect, easily overlooked, but seemingly should be found all along the Alleghany chain.
- \*†DIALLAGMA LATIORELLA Wlk. (= LUTEA Sm.) 9-VIII-29 & 3-IX-29. "Known only from Florida" (Grossbeck's state list).
- PLEONECTYPTERA PYRALIS Hbn. June-Aug., uncommon.
- P. p. f. GEOMETRALIS Grt. March & April, uncommon. One specimen intermediate to these types 2-VII-29.
- †P. HISTORIALIS Grt. 22 & 24-IV-29.
- PHYTOMETRA SEMIPURPUREA Wlk. May, rare; Monteagle April, June & Sept., rare.
- †HORMOSCHISTA LATIPALPIS Wlk. (= PAGENSTECHERI Moesch.). 3-IX-28; Monteagle 2-IX-29.
- †OXYCILLA MALACA Grt. Monteagle 21-VII-30.
- \*†O. MITOGRAPHIA Grt. 11-VI-29. The types were taken in Central Alabama in August, and described in 1873. I

- know of no others having been taken since (this specimen has been deposited in the U. S. N. M.).
- PHALAENOSTOLA LARENTIOIDES Grt. Rare in Sept.; Mont-eagle 15-VI-30 (2).
- PANGRAPTA DECORALIS Hbn. Uncommon May & June; Monteagle very common in woods June-Aug.
- †SPARGALOMA PERDITALIS Wlk. Monteagle 15-VI-30.
- †DYSPYRALIS NIGELLUS Stkr. 9-VIII-29.
- METALECTRA DISCALIS Grt. Rather common in July; Mont-eagle in June.
- M. QUADRISIGNATA Wlk. (= CONTRACTA Wlk.). April & June; Monteagle June & Aug., not common.
- M. TANTILLUS Grt. May-Aug., uncommon.
- M. MONODIA Dyar (synonym of TANTILLUS ??) May-July, uncommon.
- EPIZEUXIS AMERICANIS Gn. April, July & Aug. (only three specimens).
- E. AEMULA Hbn. 21-VI-28; Monteagle common June-Aug.
- E. ROTUNDALIS Wlk. 29-V-29; Monteagle common June-Sept.
- E. LUBRICALIS Geyer. Athens & Monteagle June-Sept.
- †E. MAJORALIS Sm. Monteagle 10-VI-30.
- ZANCLOGNATHA LITURALIS Hbn. Lake Rabun, Ga. 10-VII-28; Monteagle 14-VI-30.
- Z. CRURALIS Gn. 27-V-28.
- Z. JACCHUSALIS Wlk. (= MARCIDILINEA Grt.). Monteagle rare in July & Sept.
- \*†CHYTOLITA MORBIDALIS Gn. Monteagle 6-VI-30.
- \*†C. PETREALIS Grt. Monteagle 28-VI-30, and the spotted form 25 & 28-VI-30.
- RENIA SALUSALIS Wlk. May-Aug.; Monteagle common June-Sept.
- R. DISCOLORALIS Gn. May-June; Monteagle common June-Aug.
- R. FLAVIPUNCTALIS Geyer. Lake Rabun, Ga. 12-VII-27; Monteagle June-Aug.
- R. SOBRIALIS Wlk. Monteagle 6 & 8-VI-30.
- BLEPTINA CARADRINALIS Gn. May-July; Monteagle April-Aug., common.
- B. INFERIOR Grt. Rare in Sept.
- \*B. SANGAMONIA B. & McD. Known only from the holotype ♂ taken at Decatur, Illinois (May 8-15) and one other specimen also in the Barnes collection. Monteagle 24-VI-30 and a series of nearly 40 specimens late July-middle Aug., 1931. Entire series compared with type by author.



- TETANOLITA MYNESALIS Wlk. July-Sept.; Lake Rabun, Ga., 24-VI-28; Monteagle June-Aug. common.
- T. FLORIDANA Sm. 18-VIII-29 & 8-IX-29.
- PHALAENOPHANA PYRAMUSALIS Wlk. Uncommon April & May; Lake Rabun, Ga., 24-VII-28; Monteagle April-July.
- LASCORIA AMBIGUALIS Wlk. 5-IV-29, 18-VII-28, common Aug.-Sept.
- PALTHIS ANGULALIS Hbn. Rather common April-Sept.; Monteagle June-Sept.
- P. ASOPIALIS Gn. 12-VIII-28 & 8-X-29; Lake Rabun, Ga., 4-VII-28.
- †DERCETIS VITREA Grt. One at Athens, no date.
- †SALIA INTERPUNCTA Grt. 24-VI-29.
- BOMOLOCHA BALTIMORALIS Gn. Common in April.
- †B. PALPARIA Wlk. (= SCUTELLARIS Grt.) 6-IV-29 & 27-VII-29.
- B. ABALINEALIS Wlk. April-Sept., rather common.
- B. DECEPTALIS Wlk. 6-VIII-29; Monteagle 24-VI-30.
- B. MADEFACTALIS Gn. Common April-Aug.; Monteagle 31-VII-30.
- †B. SORDIDULA Grt. Monteagle 5-VIII-30.
- †ANEPISCHETOS MINUALIS Gn. ("BOMOLOCHA CITATA Grt." of B. & McD. list) 22-VII-29 & 9-IX-28.
- PLATHYPENA SCABER Fabr. Athens & Monteagle, common April-Sept.
- \*†An unknown Hypenid apparently representing a new species and new genus taken at Athens. It looks like a small *EPIZEUXIS* species, but has no areole. (This specimen also has been deposited in the U. S. N. M.).

## ARCTIIDAE.

## SUBFAMILY NOLINAE.

CELAMA TRIQUETRANA Fitch. Monteagle common in April.

## SUBFAMILY ARCTIINAE.

- \*†HALISIDOTA LONGA Grt. 3-IX-28 (now in Cornell Coll.).  
"Known only from Florida" (Grossbeck's state list).
- †EUBAPIHE LAETA Guer. 14-VI-26.
- †E. OPELLA Grt. 3-VIII-26.

## NOTODONTIDAE.

HETEROCAMPA SUBROTATA Harv. Rare in Sept.

H. BILINEATA EXSANGUIS Dyar. Aug.-Sept., Monteagle in July.

## LASIOCAMPIDAE.

ARTACE PUNCTISTRIGA Wlk. Several at Athens and Monteagle in June, rare.

MALACOSOMA AMERICANA Fabr. Rare at Athens.

†HETEROPACHA RILEYANA Harv. 7-IV-29, 9-VII-28 & 1-VIII-29.

## DREPANIDAE.

\*†ORETA ROSEA Wlk. Monteagle 4-IX-29 (now in U. S. N. M.).

## LACOSOMIDAE.

†LACOSOMA CHIRIDOTA Grt. 1 ♂ & 10 ♀♀ at Monteagle in June '30.

## GEOMETRIDAE.

†EXELIS PYROLARIA Gu. Monteagle 9, 25, 28-VIII-30.

## PYRALIDAE.

DIAPHANIA SIBILLALIS Wlk. Quite common late July-Aug. in some seasons.

\*†CRAMBUS BIDENS Zeller. Monteagle 15-VI-30 (2) (now in Cornell Coll. & U. S. N. M.).

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**The Nymph of *Enallagma basidens* Calvert  
(Odonata: Agrionidae).**

R. D. BIRD, Dept. of Zoology, University of Oklahoma,  
Norman, Oklahoma.

*Enallagma basidens* Calvert occurs commonly in Oklahoma. As its nymph appears to be undescribed (Byers '28)\* the following description has been drawn up from a number of reared specimens.

*Color:* buff or greenish.

*Head:* caudo-lateral angles hemispherical as in figure, with small inconspicuous setae. Antennae 6-segmented, the first two segments dark except distal third of the second, second slightly shorter, third the longest, fourth shorter, fifth and sixth still shorter and equal. Labium extending caudad of procoxae, with two mental setae and five laterals as is shown in the figure.

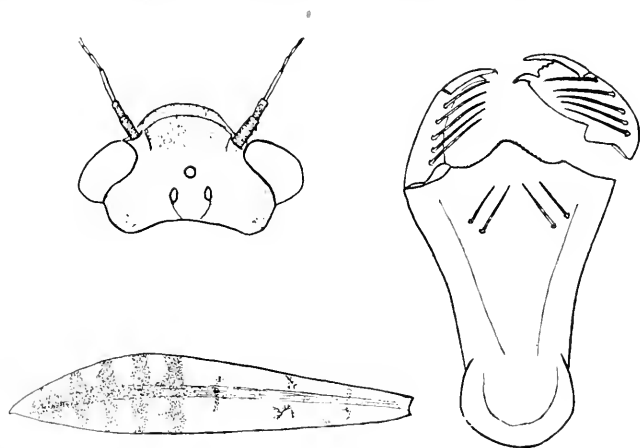
*Thorax:* legs lighter in color except dark ring on each femur and tibia a short distance from their articulation which is also dark. A few short black dashes along the outer side of each

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\* BYERS, C. FRANCIS—The unknown nymphs of N. A. Odonata. Can. Ent. 60:4-6, 1928.

tibia. Metathoracic wing cases reach to end of third abdominal segment.

*Abdomen*: gradually tapering, nonsetaceous, covered with numerous black spots giving a freckled appearance. Gills as in figure with five transverse black bands on the apical half. Sometimes a slight development of a sixth band.



*Measurements of mature nymphs*: length, 18 mm.; length of abdomen, 11 mm.; length of gills, 5.75 mm.; width of gills, 1.05 mm.; length of metathoracic wing-cases, 3.5 mm.; length of mentum, 4 mm.

*Habitat*: the nymphs have been found in clear, small, spring-fed streams with rocky or sandy bottoms. They crawl about watercress or other plants where there is a gentle current of water.

### Note on *Odynerus bermudensis*, with a Description of the Male (Hymenoptera: Vespidae).

By J. BEQUAERT, Harvard Medical School,  
Boston, Massachusetts.

*Odynerus (Stenodynerus) bermudensis* J. Bequaert was described in the Annals of the Entomological Society of America for 1929 (vol. XXII, p. 578). It is thus far the only truly indigenous diplopterous wasp known from the Bermudas. A

pair of this species has recently been found in the collections of the United States National Museum.

*Male* (undescribed).—Length (h.+th.+t. 1+2): 5.5 mm.

Agrees structurally with the female, except as follows: Head, seen in front, subcircular, not higher than wide. Cheeks narrower in their upper half, where they are much narrower than the upper part of the eye in profile. Inner orbits nearly twice as far apart on the vertex as at the clypeus. Interocellar depression not more pronounced than in the female. Clypeus wider than long, in outline irregularly pentagonal, the base being twice as long as each of the upper sides, the upper and lower sides nearly equal; its anterior, free portion about as long as the upper, interocular part; its truncate apex about one-fifth of the maximum width of the clypeus, with a deep, even inward curve, preceded by a slightly depressed area; its apical angles well marked, but bluntly rounded off and not raised. Antenna elongate; flagellum over three times the length of the scape; third antennal segment one and one-third times the length of the fourth; fourth to ninth subequal and distinctly longer than wide; tenth about as wide as long; eleventh longer than wide, slightly excavated on the under side; twelfth small, longer than wide, less than half the length of the eleventh; thirteenth (hook) moderately thick, about the length of the eleventh, scarcely curved, slightly and very gradually narrowed to the blunt and somewhat flattened apex, which reaches the tip of the tenth segment. Abdomen more slender than in the female.

Sculpture as in the female; but the clypeus with the punctures larger and more evenly distributed and with the irregular striation barely indicated.

Black. Most of the upper side of scape, tip of mandibles, most of the legs (except the tibiae), most of the propodeum, and nearly the entire first abdominal segment, ferruginous to red. Clypeus, most of the mandibles, broad under side of scape, interantennal ridge, most of the ocular sinuses (extending downward along the inner orbits), an elongate spot on the upper half of the outer orbit, a transverse spot on each side of the anterior margin of the pronotum (more or less divided by a ferruginous blotch), postscutellum, most of the upper plate of the mesepisternum, tegulae (except the ferruginous center), post-tegulae, tibiae (somewhat ferruginous on the underside), hind margins of first and second segments as in the female, small lateral free spots on the second tergite (suffused with ferruginous along the edges), narrow hind margin of fourth tergite, and traces of a margin on fifth tergite, pale sulphur

yellow. Wings as in the female, slightly and fairly uniformly smoky throughout, with a faint purplish tinge.

*Allotype*.—Bermuda, May 13, 1909 (F. M. Jones.—U. S. N. M.).

Since the female holotype was stylopized, it is interesting to compare it with a second female, not parasitized, obtained by Mr. F. M. Jones on May 10, 1909. After a careful comparison I am unable to find any differences in structure or sculpture between these two specimens. There are, however, a few differences in color. Mr. Jones' insect is in some respects more like the male described above, since it has a distinct yellow apical margin on the fourth tergite (traces of this may be seen on the holotype). The lateral yellow spots on the second tergite are large and only slightly bordered with ferruginous. The clypeus is black, with two rather indistinct ferruginous blotches on the basal third. The propodeum is blotched with ferruginous on the sides. This second female measures 6 mm. only, from the frons to the apex of the second tergite.

It seems improbable that the slight differences in color exhibited by the holotype were due to stylopization, unless perhaps the extension of the yellow over the basal third of the clypeus might be attributed to the action of the parasite.

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#### **Catopsilia philea in Pennsylvania. (Lepid.: Pieridae).**

In the July 1931 number of ENTOMOLOGICAL NEWS, Mr. Haskin, of Waterford, Connecticut, states that he captured a specimen of *Catopsilia philea* in that State on August 26, 1930. Evidently *philea* wandered out of bounds that year for the writer took one specimen in front of the zoology building of the Pennsylvania State College, State College, Pennsylvania, on August 8, 1930. The specimen flew around the gladiolus flowers avoiding the red and darkly-colored blossoms but alighting on all the yellow and orange ones. The writer watched the specimen for over an hour before capturing it. Some other species of this group when they are seen far from their natural habitat are most elusive, stopping only a short time, and then flying on. This specimen, however, was in no hurry and seemed more like a resident than a migrant. It would be interesting to know just what factors were instrumental in the dispersion of this species during 1930.—HARRISON M. TIETZ, Dept. Zoology and Entomology, Pennsylvania State College.

**New Texas Sarcophaginae (Diptera: Calliphoridae).**

By DAVID G. HALL,<sup>1</sup> Bureau of Entomology,<sup>2</sup> Charleston, S. C.

Among a large number of Sarcophaginae from Texas sent to the author for determination during the past few years were the four species described below.

Most of these flies were collected in ecological traps set for the screw-worm fly *Cochliomyia macellaria* Fab. Specimens obtained in such traps are usually rubbed and in general poor condition. Numerous specimens of the species herein described were not saved, and the actual abundance of the species is not shown in the type series.

**Comasarcophaga<sup>3</sup> n. gen.**

Black medium sized species with the usual Sarcophagid appearance.

*Male*.—Head length at antennae and vibrissae about equal; vibrissae above the oral margin and slightly approximated; parafrontals with numerous small irregular scattered hairs; antennae and palpi red; second antennal joint bright red, third joint darkened above; arista with very short pubescence at base only, not longer than diameter of arista. Chaetotaxy as in following description.

This genus shows closest affinities to the *Agria-Hypopelta* group, but can be instantly separated from these by the nearly bare arista, which appears in *Brachycoma*, *Neophyto* and *Amobia*. The head shape of these is entirely different from that of the genus herein described.

*Genotype* and sole species, *texana*, new.

**Comasarcophaga texana, n. sp.**

*Male*. (Fig. 1)—Front 0.376 of head width (average of four specimens which measured respectively 0.412, 0.366, 0.333, and 0.396; parafrontals and parafacials silvery gray pollinose.

<sup>1</sup>Thanks are due and herewith gratefully given to Mr. E. W. Laake, Mr. E. C. Cushing, Mr. A. E. Parish, and Mr. E. F. Knippling, who have made the trap collections at Menard, Texas; to Mr. H. J. Reinhard, who sent me his series of *Comasarcophaga texana*, new genus and species, for study and description; and to Mr. R. A. Roberts, who sent a collection of reared Sarcophaga from Mexico and southern Texas for determination.

<sup>2</sup>Contribution from the Division of Insects Affecting Man and Animals.

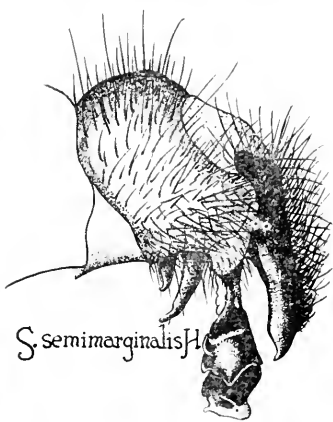
<sup>3</sup>Κόμη, hair; ὄαρκο φάγος, flesh devouring.

the former with the usual row of slight hairs below near eye; the parafacials with numerous slight hairs over the entire surface; frontal bristles about eight, diverging sharply below to about the middle of the second antennal joint; antennae red; third segment darkened apically and above; arista with ex-



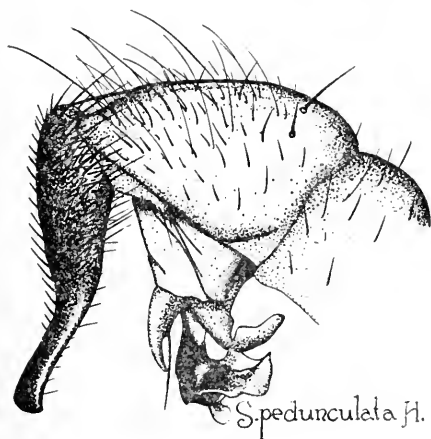
*Comasarcophaga  
texana* Jt.

Fig. 1



*S. semimarginalis* Jt.

Fig. 2



*S. pedunculata* Jt.

Fig. 3



*S. scelestus* Jt.

Fig. 4

tremely short hairs, almost microscopic; third segment about two and one-half times second, reaching almost to the vibrissae which are approximated and above the oral margin; palpi yellow, proboscis black, both normal; bucca about one-third the eye height; postocular bristles in three rows; around the middle

and below with numerous pale yellow hairs; outer verticals not differentiated.

Thorax with the usual three to five black stripes; anterior dorsocentrals two, postsutural dorsocentrals four, prescutellars slight, sternopleurals two, scutellum with two marginals, one subapical and one apical.

Abdomen with the usual grey tessellation; median marginal and lateral bristles on the second and third segments, fourth with a marginal row of about 18; fifth sternite composed of two slightly diverging yellow arms, the anterior and inside edges covered with a brush thickly set with small black setae which grow longer posteriorly.

Hypopygium small, first segment red, slightly gray pollinose with a marginal row of about eight long bristles; second segment shining red; forceps reddish at base, black at tips, gradually curving anteriorly into sharp points, divergent in rear view; accessory plate small, yellow; posterior clasper short, black, hooked at tip with a short seta on anterior edge just before hook; anterior clasper black, strongly hooked anteriorly; penis evidently composed of two segments, the first joint hidden and short, the second yellow, ending in several black processes.

Wings hyaline; costal spine rather large; third costal segment about equal to fifth and sixth; first vein bare, third with setulae almost to cross vein; legs black, middle tibia with two anterodorsal bristles, middle femur with comb, both middle and hind tibiae with long villosity.

*Female*.—Front 0.475 of head width in single specimen; like male in chaetotaxy, except a small third sternopleural, fairly large prescutellars, no apicals on scutellum, no median marginals on second abdominal segment, a small third anterodorsal bristle on the middle tibia, and usual female differences; genital segments reddish; two main lateral plates, cleft dorsocentrally, pointed posteriorly, the ventral edge with a row of bristles, the spiracle located one-third closer to the ventral than to the dorsal edge; fifth and sixth sternites elongated with numerous black hairs.

*Types*.—Fifteen male and one female specimens collected as follows: one male, October 1, 1921; four males, April 27, 1929, two males, April 26, 1929, one male and one female April 30, 1929, College Station, TEXAS (H. J. Reinhard); one male, June 13, 1908, Cotulla, TEXAS (in cotton fields) (E. S. Tucker); one male, June 11, 1904, Victoria, Texas (Pratt); one male, June 19, 1905 (A. C. Morgan); one male, June 1, 1917,



Helotes, Bexas County, TEXAS; one male, June 25, 1929, Coachella, CALIFORNIA (in trap baited with decaying liver) (Hall); two males, June, 1929, Menard, TEXAS (from traps baited with decaying meat) (E. C. Cushing).

*Holotype* and *Allotype* from College Station, TEXAS, in U. S. National Museum. Two *paratypes* in U. S. National Museum, and four each in the American Museum of Natural History, in collections of H. J. Reinhard and the author.

***Sarcophaga semimarginalis*, n. sp.**

*Malc.* (Fig. 2)—Front, 0.215 of head width; parafrontals and parafacials silvery gray pollinose, the latter with the usual row of minute hairs below near eye; frontal bristles about 11 in number, reaching to about the middle of the second antennal joint and widely diverging in the lower two or three; orbitals and outer verticals absent; antennae black, third joint hardly twice the length of the second, and reaching four-fifths the distance to the vibrissae, which are approximated and above the oral margin somewhat less than the length of the second antennal joint; arista with rather short plumosity for three-fifths its length; palpi and proboscis black, ordinary; bucca one-fourth the eye height, black, thinly whitish pollinose, with only black hair before the metacephalic suture; back of head with three rows of postocular cilia, and with pale hair around the middle and below.

Thorax with the usual three to five black stripes; anterior acrostichals absent, prescutellars one, anterior dorsocentrals three, postsutural dorsocentrals four, sternopleurals three, scutellum with two marginals, one subapical and one apical.

Abdomen tessellated, three shifting black stripes, somewhat golden pollinose in certain lights; first and second segments with lateral bristles only; third with a median marginal pair; fourth segment red and with a submarginal row of approximately 16 bristles, the two median ones being about one-fourth the total length of the visible segment in front of the margin, the others gradually becoming marginal laterally and below. Fifth sternite reddish, divided, the two arms diverging "V"-like, the inside margins covered with numerous hairs.

Terminalia quite small, red; first segment dark basally, with numerous black hairs, none bristly; second segment with numerous long hairs, globose, forceps black, with long sinuating teeth at tips, posteriorly covered with long curling hair; genital parts as figured.

Wings hyaline; costal spine small; third costal segment about

as long as fifth; first vein bare, third with setulae about half-way to the cross vein; bend in fourth vein more acute than usual.

Legs black; middle femur with comb; middle tibia with one antero-dorsal bristle; hind tibia with long sparse villosity.

*Female*.—Unknown.

Related to the species *Sarcophaga subdiscalis* Aldrich, *Sarcophaga* and Allies, 1916, p. 219, fig. 104, from which it differs in the extension of red on the fourth abdominal segment, the much shorter bucca, the lack of red or brown in the forceps and in the shape and character of the genital parts.

Described from two male specimens trapped at Menard, TEXAS, July 15-24, 1929 (Cushing), and July 11-21, 1930 (Parish).

*Types*.—*Holotype* in the U. S. National Museum. *Paratype* in the author's collection.

### ***Sarcophaga pedunculata*, n. sp.**

*Male*. (Fig. 3)—Front, 0.271 of head width (average of three specimens 0.272; 0.250; 0.292); parafrontals and parafacials yellowish pollinose; the former with a row of minute hairs below near the eye, several rather coarse; frontals about 10, slightly diverging below to about the middle of the second antennal joint; antennae black, third joint two and one-half times the length of the second, and reaching three-fourths the distance to the vibrissae, which are normal and at the oral margin; arista with long plumosity for three-fifths its length; facial ridges with short strong setae one-third the distance from the vibrissae to the base of the antennae; outer verticals absent; bucca one-third the eye height and with abundant black and pale hairs before the metacephalic suture; back of head with two rows of postocular ciliae and with numerous pale hairs around the middle and below.

Thorax with the usual three-to-five black stripes; the pleurae with yellowish cast; anterior acrostichals absent; anterior dorso-centrals two; prescutellars one, posterior dorso-centrals four, sternopleurals three. Scutellum with two marginals, one subapical and a very pronounced patch of long whitish yellow hair on each side between the marginals.

Abdomen silvery gray pollinose, tessellated, with three shifting black stripes; first and second segments with lateral bristles only; third with a median marginal pair; fourth reddish, with a marginal row of about twelve bristles; the second, third, and

fourth segments with long hair below, increasing in abundance posteriorly. Fifth sternite divided, elongate, reddish brown, with numerous short hairs.

Hypopygium red, somewhat pollinose; first segment red, short, with scattered hairs; second segment red, curiously elongate, with numerous scattered hairs; and several long bristles above on the hump; genital characteristics as figured.

Legs black, middle femur with comb; middle tibia with one long antero-dorsal bristle; hind tibia without villosity.

Wings hyaline; no costal spine; third costal segment about as long as the fifth and sixth together; first vein bare; third with a number of setulae.

*Female*.—Chaetotaxy as in male, except the usual female differences.

This species is unlike any previously described. It belongs to the provisional "II" Group and the genitalia are very distinctive. The scutellar patches of light colored hair should make it readily determinable in both sexes.

Described from 100 males and females reared by Mr. R. A. Roberts at Victoria, TEXAS, March, 1931; three males, Brownsville, Texas, April 14, 1927 (T. C. Barber); one male, Reagan Wells, Texas, June 27, 1924 (E. W. Laake); and one male, Las Parras, BAJA CALIFORNIA, (W. M. Mann).

*Types*.—*Holotype* and *allotype*, Victoria, TEXAS, in the U. S. National Museum. Paratypes in the U. S. National Museum and in the collections of Mr. R. A. Roberts, Mr. E. W. Laake, and the author.

### **Sarcophaga scelesta**, n. sp.

*Male*: (Fig. 4)—Front very narrow, 0.237 of headwidth (average of five specimens 0.224; 0.200; 0.261; 0.250; 0.251); parafrontals and parafacials coarsely dusted with whitish yellow pollen, the former with the usual row of minute hairs below near eye; frontal bristles about 11, slightly diverging below to about the middle of the second antennal joint; orbitals absent; outer verticals distinct; antennae black, third joint twice second, reaching three-fourths the distance to the vibrissae, which are normal and at the oral margin; palpi and proboscis black, ordinary; arista with long plumosity for over three-fifths of its length; bucca about one-fourth the eye height, with black hair; back of head with one distinct row of post-ocular cilia and numerous dark hairs around the middle and below.

Thorax with the usual three to five black stripes; anterior acrostichals not larger than surrounding hairs; prescutellars rather long; anterior dorsocentrals three, postsutural dorsocentrals four, sternopleurals three; scutellum with two marginals, one subapical and one apical.

Abdomen with three changeable black stripes, tessellated; first and second segments with lateral bristles only; third with median marginals; fourth with a marginal row of about 18.

Hypopygium black, very small, thinly grayish pollinose, with scattered hairs; first segment with a posterior row of about six bristles; genital characteristics as figured.

Legs black; middle femur with a short comb; middle tibia with one antero-dorsal bristle; hind tibia without villosity.

Wings hyaline; costal spine absent; third costal segment about as long as fifth; first vein without setae; third vein hairy almost to the cross-vein.

*Female*:—No apicals on scutellum, otherwise as in male except for usual female differences.

This species belongs to the provisional "G" Group, having the genitalia of the male black, four posterior dorsocentrals, and the hind tibia without villosity. It differs from any described species known to the author in the genital features.

Described from a male selected from a long series of males trapped during the fall of 1929, at Menard, TEXAS, by Mr. Laake and Mr. Cushing; one male, Itaquaquecetuba, Sao Paulo, BRAZIL, January 1929 (Townsend); one male and one female, Brownsville, Texas (Townsend); and two males from Sao Paulo, Brazil, sent to the author by Dr. R. R. Parker.

*Types*:—*Holotype* (Menard, Tex.) and *allotype* (Brownsville, Tex.) in the U. S. National Museum. Paratypes in the collections of Mr. E. W. Laake, Dr. R. R. Parker, and the author.

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### Rex Research Foundation.

Intensification of man's perpetual warfare on his insect enemies is foreseen as the result of the establishment in Chicago of the Rex Research Foundation, Chicago Bank of Commerce Building.

The Foundation is an expansion of the Rex Research Fellowship created sixteen years ago at Mellon Institute of Industrial Research, Pittsburgh, Pa., by F. O. Moburg, of Toledo,

Ohio. Dr. O. F. Hedenburg, who has headed the work of the Fellowship from the beginning, now becomes director of the Foundation.

One of the principal objectives of the Foundation, outside of research, will be a program of public education intended to show the necessity of continued warfare against flies and other insect pests that yearly claim thousands of lives in the United States by spreading communicable diseases. In many sections, largely due to the warm, moist weather, and the fact that the public has become indifferent in its fight on the fly, the numbers have increased. With the cooperation of health authorities, the Foundation proposes to teach the public the perils that lurk in the visits of insect pests to the household, and to show the steps to be taken to prevent the spread of disease through these carriers.

"Swat the fly" campaigns kill the fly but leave the germs it carries to spread disease. In their place the Foundation seeks to launch a "chemical warfare" that will effectively rid the household of the fly and also the germs.

E. G. HORST, *Secretary*.

#### A Night-Flying Butterfly and Some Unusual Locality Records (Lepid.).

The renewed attention recently given to the night flight of diurnal butterflies leads me to record a capture of *Ianessa virginiensis* Drury (*Pyramcis huntera*) (Nymphalidae). The specimen, which from its perfect condition appeared to have emerged not long before capture, was attracted to a light from a second story window at 9:30 P. M. on June 3, 1931. The window faces the garden of my home in a residential section of Milwaukee.

In the January issue of the News Mr. Harold O'Byrne noted the occurrence of *Catopsilia phileca* Joh. (Pieridae) in Missouri. A far more northern record of this species was obtained by a friend of mine, Mr. Wm. E. Sieker, who took this species at Baileys Harbor, Door County, Wisconsin on July 19, 1930.

Other unusual locality records worth noting include a specimen of *Aclopos titan* Cramer (Sphingidae), which I caught in Milwaukee, June 24, 1930; a specimen of *Utetheisa ornatrix* Lin. (Arctiidae), also caught in Milwaukee, October 4, 1924; and a specimen of *Alypia langtoni* Couper (Agaristidae), taken at Embarrass, Waupaca County, Wisconsin, July 12, 1926.

ERNST J. DORNFELD, Milwaukee, Wisconsin.

## Entomological Literature

COMPILED BY LAURA S. MACKEY UNDER THE SUPERVISION OF  
E. T. CRESSON, JR.

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 figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the list of Periodicals and Serials published in our January and June issues. This list may be secured from the publisher of ENTOMOLOGICAL NEWS for 10c. The number of, or annual volume, and in some cases the part, heft, &c. the latter within ( ) follows; then the pagination follows the colon :

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

\*Papers containing new forms or names have an \* preceding the author's name.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

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.

*Note the change in the method of citing the bibliographical references, as explained above.*

*Papers published in the Entomological News are not listed.*

**GENERAL.**—Bailey, S. F.—Invaluable words. [4] 63: 197-198. Bishopp, F. C.—How insects affect our health and comfort. [76] 1931: 443-445. Dury, C.—Obituary. Anon. [Hobbies] 36: 92, ill. Griffin, F. J.—The dates of publication of Wood (W): "Index Entomologicus", 1833-1838. [75] 8: 178. Sclater, W. L.—Names of new genera and subgenera. [Zool. Record] 67: 20 pp. Walker, J. J.—Insects at sea. [8] 67: 211-232, cont.

**ANATOMY, PHYSIOLOGY, ETC.**—Alfonso & Braun.—Preliminary studies of the internal structures of *Braula coeca*. [7] 24: 561-582, ill. Bigham, J. T.—The alimentary canal of *Asaphes memnonius*. [43] 31: 386-395, ill. Buxton, P. A.—The measurement and control of atmospheric humidity in relation to entomological problems. [22] 22: 431-447, ill. Cappe de Baillon, P.—La descendance des monstres de Phasmides. [59] 15: 316 pp., ill. Davidson, R. H.—The alimentary canal of *Crioceris asparagi*. [43] 31: 396-405, ill. Ludwig, D.—Studies on the metamorphosis of the Japanese beetle. (*Popillia japonica*). [42] 60: 309-323, ill. Lutz, F. E.—Notes on the animal life of thermal waters in the Yellowstone National Park. [40] 498: 10 pp. Melvin, R.—A quantitative study of copper in insects. [7] 24: 485-488. Miles, H. W.—Growth in the larvae of Tenthredinidae. [J. Exp. Biol.] 8: 355-364. Richardson, Burdette & Eagleson.—The determination of the blood volume of insect larvae. [7] 24: 503-507. Sato, H.—Untersuchungen über die künstliche parthenogenese des seidenspinners

*Bombyx mori*. [97] 51: 382-394, ill. **Schaefer, P. E.**—The alimentary canal of *Sphaeroderus nitidicollis* var. *schaumi*. [43] 31: 406-415, ill. **Steel, A.**—On the structure of the immature stages of the frit fly (*Oscinella frit*). [35] 18: 352-369, ill. **Swingle, M. C.**—Hydrogen ion concentration within the digestive tract of certain insects. [7] 24: 489-495. **Swingle, M. C.**—The influence of soil acidity on the pH value of the contents of the digestive tract of Japanese beetle larvae. [7] 24: 496-502, ill. **Verlaine, L.**—L'instinct et l'intelligence chez les Hyménoptères. [33] 71: 123-130. **Walker, E. M.**—On the anatomy of *Grylloblatta campodeiformis*. [7] 24: 519-536, ill. **Wigglesworth, V. B.**—The physiology of excretions in a blood-sucking insect, *Rhodnius prolixus*. (Hem.). [J. Exp. Biol.] 8: 411-451.

**ARACHNIDA AND MYRIOPODA.**—\***Hilton, W. A.**—Symphyla from North America. [7] 24: 537-553, ill. \***Pelegrín Franganillo, R. P.**—Arácnidos de Cuba. [Mem. Mus. Hist. Nat., Habana] 1: 47-97, ill.

**THE SMALLER ORDERS OF INSECTS.**—\***McDunnough, J.**—The eastern North American species of the genus *Ephemerella* and their nymphs (Ephemeroptera). [4] 63: 187-197, 201-216, ill. **Setty, L. R.**—The biology of *Bittacus stigmaterus* (Mecoptera, Bittacusidae). [7] 24: 467-484, ill. \***Traver, J. R.**—Seven new southern species of the mayfly genus *Hexagenia*, with notes on the genus. [7] 24: 591-621, ill. **Weyer, F.**—Das problem der kastendifferenzierung bei den Termiten. [97] 51: 353-373, ill.

**ORTHOPTERA.**—\***Chopard, L.**—Biospeologica. Insectes Orthoptères. [Arch. Zool. Exp. et Gen., Paris] 71: 389-401, ill. \***Moreira, C.**—Contribuição para o conhecimento dos insectos Dermapteros do Brasil. [Rev. Ent., São Paulo] 1: 257-265, ill.

**HEMIPTERA.**—\***Ball, E. D.**—Some new North American genera and species in the group formerly called *Platymetopius* (Rhynchotha). [4] 63: 216-222, cont. \***China, W. E.**—A remarkable mirid larva from Cuba, apparently belonging to a new species of the genus *Paracarnus* (Miridae). [75] 8: 283-288, ill. **DeLong & Davidson.**—The genus *Agallia*—External characters used to distinguish the species injuring economic crops. [43] 31: 377-385, ill. \***Drake, C. J.**—Neotropical Tingitidae. [75] 8: 225-227. \***Drake, C. J.**—The Cornell University Entomological Expedition to South America, 1919 and 1920, scientific results, Number 5, Hemiptera-Tingitidae. [7] 24: 510-514. \***Lawson P. B.**—The genus *Drylix* in North America, (Cicadellidae). [7] 24:

587-590, ill. **Norland, C.**—List of California Pentatomidae, especially from the South. [13] 23: 45-46. **\*Oman, P. W.**—New Jassinae, with notes on other species. [91] 21: 430-436, ill. **\*Peters, H. S.**—Two new Mallophaga from two closely related shorebirds. [7] 24: 583-586, ill.

**LEPIDOPTERA.**—**\*Bell, E. L.**—New species of *Yan-guna*: Lepidoptera, Rhopalocera. [9] 64: 233-236. **Bird, H.**—The *Papaipema* species of the Pacific coast. [4] 63: 183-187, ill. **Comstock & Dammers.**—Notes on the early stages of four California argynmids. [38] 30: 40-44, ill. **Griffin, F. J.**—On the dates of publication and contents of the parts of Strecker (H), "Lepidoptera, etc." 1872-1900. [75] 8: 257-258. **\*Gunder, J. D.**—Some new butterflies. [38] 30: 45-48. **Miller, E. R.**—*Athena peleus* (*Timetes petreus*). [39] 15: 34-36, ill. **Rothke, M.**—Einige notizen über vorkommen und lebensgewohnheit von *Pieris napi* in Nordamerika. [18] 25: 262-263. **Spencer, G. J.**—An important breeding place of clothes moths in homes. [4] 63: 199-200. **Talbot, G.**—On the status of some generic names in the family Pieridae. [9] 64: 227-232. **Wucherpfennig, F.**—São Paulo de Olivença-Borba. [18] 25: 255-258, ill.

**DIPTERA.**—**\*Alexander, C. P.**—New species of crane flies from South America. (Tipulidae). [7] 24: 622-642. **\*Lindner, E.**—Beitrag zur kenntnis der südamerikanischen Stratiomyidenfauna. [Rev. Ent., São Paulo] 1: 304-312, ill. **\*Malloch, J. R.**—Flies of the genus *Pseudotephritis* (Ortaliidae). [50] 79, (34): 6 pp. **\*Rowe, J. A.**—A revision of the males of the nearctic species in the genus *Fabriciella* (Tachinidae). [7] 24: 642-678, ill. **Taylor, R. L.**—On "Dyar's Rule" and its application to sawfly larvae. [7] 24: 451-466, ill. **\*Townsend, C. H. T.**—New genera and species of American Oestromuscoid flies. (S). [Rev. Ent., São Paulo] 1: 313-354, ill. **\*Van Duzee, M. C.**—Dolichopidae of the Canal Zone. [Bull. Am. Mus. Nat. Hist.] 61: 161-205, ill.

**COLEOPTERA.**—**de Basilewsky, P.**—Additions et rectifications aux Carabidae du "Coleopterorum Catalogus" de M. E. Csiki. [33] 71: 145-149. **\*Blaisdell, F. E.**—Studies in the Melyridae, No. 9 [4] 63: 178-183. **\*Borgmeier, T.**—Sobre alguns coleopteros ecitofilos do Brasil (Staphylinidae). [Rev. Ent., São Paulo] 1: 355-367, ill. **Jaynes, H. A.**—*Acrotomopus atropunctellus* in Argentina sugarcane. [7] 24: 554-560, ill. **\*Jeannel, R.**—Biospeologica. Insectes Coléoptères et révision des Trechinae de l'Amérique du nord. [Arch. Zool. Exp. et Gen., Paris] 71: 403-499, ill. **\*Luederwaldt, H.**—Novos subsidios para o conhecimento do genero *Pinotus* (Lamell. Copridae). [Rev. Ent., São Paulo] 1: 298-304, ill.



**HYMENOPTERA.**—\***Cockerell, T. D. A.**—A new bee of the genus *Andrena* from Canada. [4] 63: 200-201. \***Cockerell, T. D. A.**—Descriptions and records of bees. (S). [75] 8: 411-418. **Fernald, H. T.**—Notes on some American Sphecinae. [7] 24: 439-450. **Hicks, C. H.**—Notes on certain bees, with a consideration of the use of the abdomen in nest construction. [4] 63: 4: 173-178. \***Mann, W. M.**—A new ant from Porto Rico. [91] 21: 440-441, ill. \***Santschi, F.**—Fourmis de Cuba et de Panama. [Rev. Ent., São Paulo] 1: 265-282, ill. **Rau, P.**—An additional note on the behavior of hibernating *Polistes* wasps. [7] 24: 515-518. **Smith & Haug.**—An ergatandrous form in *Ponera opaciceps*. [7] 24: 507-509, ill.

### Dr. Holland's New Butterfly Book.

THE BUTTERFLY BOOK, new and revised edition by W. J. HOLLAND, Sc.D., etc., Doubleday, Doran and Co., New York, 1931. 436 pp. and 77 plates and numerous text figures with over 2000 figures of North American Butterflies. \$10. net.

The first edition published in 1898 described and figured about 450 of the then known 650 species of butterflies flying north of the Mexican line. The present volume has been brought up to date and all of the known species are included, involving 25 additional color plates and 4 uncolored.

Dr. Holland has had unusual access to the principal collections in America and through the cooperation of the leading lepidopterists of the country has been able to figure, in addition to the types contained in his own Edwards Collection, practically all of the types or typical butterflies of the North America Fauna. Dr. Holland is to be congratulated on completing this tremendous work and launching it on his 82nd birthday. Only the students will know the amount of painstaking labor involved, a labor of love, however, as all will recognize who have met this learned, kindly gentleman. This book, while offered as a popular work, containing information on the life history, collecting, classification and literature of the subject with lucid descriptions of the species, but free from unnecessary discussion, is, however, a remarkably scientific work, indispensable to the student and specialist, and this volume of the Dean of American lepidopterists will be consulted as long as men and women are interested in nature.

The book is clearly and carefully printed and the colored plates are the best that have been produced so far.

As to the nomenclature, Dr. Holland is conservative and has not accepted all of the findings of what he calls the younger school of entomologists (some of whom are grandfathers) but these things are frequently a matter of individual opinion and

only time and the International Entomological Congress will tell. In the mean time no possible harm can come from labeling a collection with the names used in the Butterfly book; in fact, they are (in my opinion) far more accurate than those used in any recent list before me.

The book should be in the library of every entomologist, will give thousands of others a knowledge of the most beautiful flying things in nature, and will be a great stimulus to the study of the most fascinating things among the insects, the Butterflies.

ROSWELL C. WILLIAMS, JR.

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SOCIAL BEHAVIOR IN INSECTS. By A. D. IMMS, M.A., D. Sc., F.R.S. The Dial Press Monographs on Biological Subjects. Lincoln MacVeagh, The Dial Press, Publishers. New York. MCMXXXI. Pp. ix, 117, 20 illustrations. \$1.50

This little volume contains a very condensed account of the main features of the nervous structures and of the habits of the wasps, bees, ants and termites, including a brief presentation of current theories of the evolution of the social habit and of the origin of the castes and forms occurring in the social species. It will be of use to those wishing to obtain some acquaintance with the subject without expending the time required to read the more extensive accounts available. In discussing "organic memory", the author has chosen rather poorly in citing as an example (on p. 103) the observation of von Büttel-Reepen that honey-bees will be seen in buckwheat fields only during those hours of the day when nectar secretion is occurring; the assumption being that the bees remember these hours from one day to the next. This phenomenon, as von Frisch has so carefully demonstrated, is better explained on the basis of known instinctive behavior reactions. Bees will cease visiting a source of nectar whenever it becomes difficult or impossible to secure a load. Occasional bees, however, will continue to visit at intervals even an exhausted source, and whenever one or more bees return from such an "inspection", filled with nectar, their appearance in the hive "informs" (in a manner described by von Frisch) the other habitués of that particular source that nectar is again flowing. Thereupon the latter resume their foraging activities which had ceased with the temporary exhaustion of the nectar supply. The absence of some account of the work of von Frisch, which has been so enlightening as regards the mechanism of social behavior as to be beyond comparison with much of the arbitrary theorizing of other recent authors, seems to the reviewer to be a serious omission. Such an account could profitably have displaced other topics less germane to the general subject. The volume contains no bibliography but mention is made of the principal books and memoirs pertaining to social insects.—R. G. SCHMIEDER.

## OBITUARY.

The death of CHARLES DURY on July 20, 1931, in his eighty-fourth year, after a few days' illness, has removed from the ranks of American entomology one of its oldest workers. His interests were, however, broader than the branch in which he specialized and by which he is best known among entomologists. He belonged to that old-time group of naturalists—so few in these days of specialization—whose studies embraced the whole field of natural history. In this broader field, his chief interest lay in ornithology; many published papers attest to his careful observations of birds.

Charles Dury was born in Cincinnati, Ohio, November 14, 1847, the son of Francis W. Dury and Louisa M. Gibson. In 1862, Francis Dury settled in the suburb of Avondale (now a part of Cincinnati) and in the immediate vicinity of the original Dury homestead, Charles Dury passed the remainder of his long and active life.

Mr. Dury early acquired a taste for natural history, and in those days, his immediate surroundings offered ample opportunity for the development of his studies. His first active work was in ornithology. To his field observations he added a study of taxidermy, and about 1867, opened a shop for that work, which he carried on some forty years. Many beautifully mounted birds and mammals show his skill in taxidermy, for which he received a number of competitive awards. Early in life he attended the Miami Medical College, but did not carry his studies to completion.

Entomology later increasingly claimed his time and attention, and his collection of insects, particularly of Coleoptera, brought together from all part of the world, is for North American forms, one of the finest and most complete in this country. This collection is left to his son, Ralph Dury, now Director of the Cincinnati Society of Natural History.

Although he published a number of papers on North American Coleoptera and described many new species, these but poorly represent the extent of his knowledge and the wealth of his observations in his chosen field. An authority on the Coleop-

tera, it is the regret of his friends and fellow students that he could not be induced to publish his observations more freely.

An indefatigable collector and observer of nature, Mr. Dury acquired a fund of first-hand knowledge. The benefit of his experience he was always ready to give to others, and through advice and encouragement started many young students along the path to success. The writer of this article will never forget the sympathetic aid given her at the beginning of her entomological studies by this veteran entomologist, nor the opportunity for the exchange of ideas throughout many years.

Among the intimate friends of a long lifetime were such scientists as Alfred Russell Wallace, E. D. Cope, Spencer F. Baird, George Horn, John L. LeConte, Robert Ridgway, Elliot Coues, and a host of others. Entomologists throughout the country will mourn his passing.

Mr. Dury held membership in many scientific societies. He was a charter and life member of the Cincinnati Society of Natural History, its curator of ornithology and entomology, its secretary in 1912 and its president from 1914 until his death. The oldest member and a life member of the Cuvier Press Club, he was the custodian of their collection, a generous donor to the collection, and the preparator of nearly all of the specimens. He had served as president and as secretary of the Ohio Academy of Science; and on the advisory board of the Audubon Society. He was a former member of the American Association for the Advancement of Science, and at the time of his death, a member of the Brooklyn Entomological Society.

His straightforwardness and integrity of character won for him the respect of all; he was a gracious teacher and a faithful friend.

Surviving him are his widow, Mrs. Pearl Welch Dury; two sons, Ralph and Arthur; a daughter, Mrs. Louise Hippert, and two grandsons. To these, his friends and fellow scientists offer their sympathy in the loss they have sustained.

ANNETTE F. BRAUN.

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### Published Writings on Insects by Charles Dury.

(From the list of his writings in the same Proceedings, pp. 60-63, and the Bibliographies in C. W. Leng's Catalogue of the Coleoptera of America, North of Mexico, 1920, and Supplement of 1927. Except where otherwise stated, they were published in the Journal of the Cincinnati Society of Natural History.)

Catalogue of the Lepidoptera Observed in the vicinity of Cincinnati, Ohio. Vol. I, No. 1, pp. 12-23, 1878.

List of Coleoptera Observed in the Vicinity of Cincinnati. Vol. II, No. 4, pp. 162-178, 1879.

Coleoptera of the Vicinity of Cincinnati. Vol. V, No. 3, pp. 218-220, 1882.

Notes on Coleoptera, with additions to the List of the Coleoptera of Cincinnati. Vol. VII, No. 2, pp. 91-92, 1884.

Mordellidae in the Vicinity of Cincinnati, Ohio. Vol. XV, No. 3 and 4, pp. 123-126, 1892.

What I found in nest of Field Mouse. Vol. XV, p. 183, 1892.

The Preparation and Care of Insect Collections. Vol. XVII, No. 3, pp. 173-180, 1894.

Coleopterological Notes, Faunal Changes in the Vicinity of Cincinnati, Ohio. Vol. XIX, No. 4, pp. 139-141, 1898.

A Butterfly, New to Cincinnati (*Callidryas cubule* Linn.). "Tomato Worm" Parasites (*Apanteles congregatus*.) *Botys penitialis* Grote. "Squirrel Bot Fly" (*Cuterebra emasculator*.) Parasites on the Common Rabbits (*Lepus sylvaticus* Bach.). Vol. XIX, No. 4, pp. 142-146, 1898.

Beetles and Random Notes. Vol. XIX, pp. 167-172, 1900.

A new Calandrid from Cincinnati, Ohio. Vol. XIX, No. 8, pp. 243-244, 1901.

A Revised List of the Coleoptera Observed near Cincinnati, Ohio, with Notes on Localities, Bibliographical references and Description of Six New Species. Vol. XX, No. 3, pp. 107-196, 1902.

Ecological Notes on some Coleoptera of the Cincinnati Region. Including, Six New Species. Vol. XX, No. 7, pp. 251-256, 1906.

Additions to the List of Cincinnati Coleoptera. Vol. XX, No. 7, pp. 257-260, 1906.

Ecological Notes on Insects. Vol. XXI, No. 2, pp. 61-63, 1910. New Species and Additions to the List of Cincinnati Coleoptera. Vol. XXI, No. 2, pp. 64-67, 1910.

New Coleoptera from Cincinnati, Ohio. (Family Endomychidae). Vol. XXI, No. 3, pp. 102-103, 1912.

- A New *Cychnus* from New Mexico. Vol. XXI, No. 3, p. 104, 1912.
- A New *Rhipidandrus* (Coleoptera) from Florida. Vol. XXI, No. 4, p. 168, 1914.
- Natural History Notes of Southern Arizona. Vol. XXII, No. 1, pp. 4-13, 1916.
- Two New Beetles from Cincinnati, Ohio. Vol. XXII, No. 1, pp. 14-15, 1916.
- Synopsis of the Coleopterous Family Cisidae (Cioidae) North of Mexico. Vol. XXIII, No. 2, pp. 1-27, 1917.
- Note on *Anophthalmus*. ENT. NEWS, IX, p. 202, 1898.
- Note on *Galeruca*. ENT. NEWS, XIV, p. 146, May, 1903.
- Notes on Coleoptera (On Melasini). ENT. NEWS, XV, pp. 52-53, Feb., 1904.
- An Interesting New *Agrilus* from Cincinnati, Ohio. ENT. NEWS, XIX, p. 368, Oct., 1908.
- Marching Through Georgia. ENT. NEWS, XX, pp. 392-394, 1909.
- Some New Beetles from North Carolina with Ecological Notes. ENT. NEWS, XXII, pp. 273-275, 1911.
- Notes on Several Species of Coleoptera with some account of habits. Canad. Ent., X, pp. 210-211, 1878.
- A new Ciside Genus with New Species from Manitoba. Can. Ent., LI, p. 158, 1919.
- On the Occurrence of *Omophron robustum*, *Dacne ulkei* and *Coptodera aerata* near Cincinnati. Bull. Brooklyn Ent. Soc., I, p. 56, 1878.
- What I Found Under a Pile of Grass. Bull. Brooklyn Ent. Soc., IX, No. 5, pp. 101-103, Dec., 1914.
- Lepidocricus herricki* Pierce. Bull. Brooklyn Ent. Soc., XVIII, p. 27, 1923.
- Note on *Anamorphus*. Bull. Brooklyn Ent. Soc., XIX, p. 25, 1924.
- Blaps mucronata* Latr. in Cincinnati, Ohio. Bull. Brookl. Ent. Soc., XXIII, p. 180, 1928.
- Elateridae in the Vicinity of Cincinnati, Ohio. Entom. Amer., IV, pp. 163-164, 1888.
- Natural History Rambles in the Cumberland Mountains. Nature and Culture, V, 1912.
- Insects That Carry Disease. Lancet-Clinic, 1913, pp. 1-8.
- On Cioidae. Journ. N. York Ent. Soc., XXII, pp. 172-173, 1914.

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Portrait of 1884.

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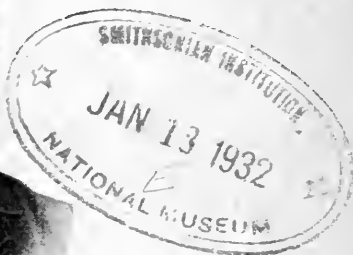
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No. 1

## **Notes on a Collecting Spot in France and a Chalcid Larva (*Stilbula cynipiformis* Rossi). (Hymenop.: Eucharidae).**

By H. L. PARKER, U. S. Bureau of Entomology.

High in the Gapeau Valley near the old convent of Montrieux before the clear waters of this stream come out on to the plains below Soliès Ville—where they are sopped up by the thirsty irrigation ditches—they jump along through shady lanes for several miles. Here and there cold springs rush out from the moss and ivy-covered banks to join the passing waters on their downward journey.

At a certain point which I well know, having visited it many times, there is a small plain where the narrow valley tries to widen out but is prevented by the tree-covered hills. It lies snug at the foot of the steep hills on one side and close against the river on the other, and the river lies close to the opposite hill.

Along the banks of the stream, even in August, all things are fresh and cool. The moss is soft, the ferns are rank, and the ivy twists around every trunk. Ten yards farther out there are dogwood bushes, wild plums, roses and brambles, clematis and small oaks with a carpet of grass tufts thrown in carelessly among them. Farther away from the stream by twenty yards the carpet changes to a thick layer of spiny genet in order to hide the ragged edges of the limestones which have lain in their beds for a thousand years. Here the Spanish broom and the spiny calycotome hold their usual lordly place among the macquís and over the whole is the vague dryish provençale enchantment of mid-summer. Moving from the banks of the stream to the foot of the hill is like passing from one clime to another. Here the dragonflies play and coveys of small moths rise from the ferns, there the cigales sing praises to the heat and the great "eyed" lizard\* suns itself on the Spanish broom.

To say that this spot is a collector's paradise would be somewhat of an exaggeration. It is a good collecting place for a student in any order. Beetles and bugs abound, moths and caterpillars are everywhere. The big tents of the pine processionary dot the plain and their nests are full of parasites, the dogwood leaves hide *Iponomeuta* and she in turn is host to thousands of chalcids. The dead limbs are full of *Xylocopa* nests abounding in cocoons of the rare *Polochrum* parasite. Two species of bumble bees have their nests in spots which I well know, the undersides of the limestone rocks are thick with wasp nests, and their holes and crevices bear colonies of sympathetic little *Leptothorax*. *Formica*<sup>1</sup> nests are as high as my knee and large areas are roped off for use by the ferocious *Camponotus*<sup>2</sup> while their cousins, the dark-loving *aethiops*, have built themselves mud nests in the midst of every grass tuft or beside every stone. The closer I look the smaller they become. Here is the little *Pheidole pallidula*, its tiny neighbors *Plagiolepis pygmaea*, *Tetramorium caespitum*, and minute *Solenopsis fugax* and their nests abound in inquilines<sup>3</sup> and strange-built proctotrypids.

Here then is a fine spot, and it is good to work here and to browse here and to sit here and think, but it is better still to sit here and do nothing. Here at dusk of a summer's evening I can hear the distant axes of the charcoal burners and bark takers, I can hear the twelve Chartreux monks, first to come from their long exile home to their monastery high on the hillside, chant with lusty lungs their praises to the friendly forests of pine and cork oak.

But back to the plain; if I have wandered away from the subject I have not wandered from the plain and for the balance of this harangue we must keep in the second zone about fifteen yards from the stream until we finish our work there, when we adjourn to the microscope.

Here, if I go under the bushes and brambles, and open one

---

\* *L. ocellata* sometimes attains the length of 2¾ feet.

<sup>1</sup> *F. rufa*.

<sup>2</sup> *cruentatus*.

<sup>3</sup> *Solenopsis imitatrix* Wasm. (et al).

of the mud nests of *C. aethiops* at this time of year, I will most certainly find cocoons in abundance in the burrows and chambers near the top of the nest. I must be quick to gather them, however, else the population will seize upon them and disappear into the darkness below.

Upon examining the cocoons I find that they are of several sizes. There is, rarely, a huge one probably bearing a queen, there is a somewhat smaller one bearing wingless workers with big heads, another of about the same size bearing winged forms, probably the males, and still smaller ones bearing the smaller and more abundant workers. In some nests one variety of cocoon will be present almost to the exclusion of others such for example as small workers while in another nest most of the cocoons will be winged forms.

The rare parasite *Stilbula cynipiformis* lives as a larva in the cocoons of this ant, where it sucks the contents from the

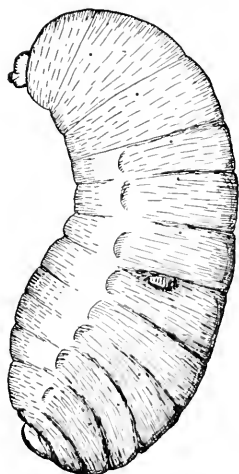


Fig.1

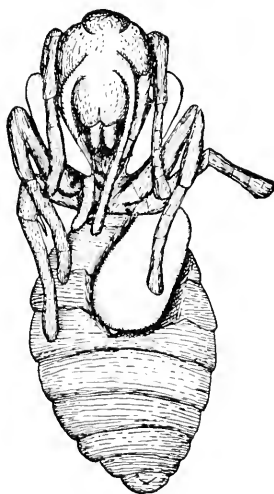


Fig.2

bodies of the large-headed worker and the winged form. How the small larva of the *Stilbula* gets into the nest is a mystery, but it does get there, for I have found it upon a larva of the ant within the cocoon. The illustration (fig. 1) shows a young larva (first stage) near the end of its feeding period, located

on the side of an ant larva. The next illustration (fig. 2) shows a larger (last stage) *Stilbula* attached in its characteristic manner to the abdomen of an ant pupa. Sometimes they are attached to the right side and sometimes to the left, but all that I have seen on pupae are attached somewhat ventrally. In this position the *Stilbula* larva completely empties the ant pupa, leaving the skin a white and useless shell.

I have given elsewhere\* a description of the young *Stilbula* larva but I shall say here that it is an extremely small animal whose body is composed of a dark head with two hooked mandibles and seven brownish ringlike segments with an eighth or terminal spinous segment. So far as I can see it has no spiracles or tracheae. When this larva has stuffed itself with the juices of the ant its body becomes a thousand times more voluminous than when it hatched, and it is so bloated that the dark rings composing the segments are widely separated, owing to the stretching of the skin.

When the skin is finally shed the next-stage larva, which I have not observed except from the remains, is apparently a rather oval whitish blotch without visible segmentation. It appears to have weak mandibles (fig. 2a), some tracheae, and two pairs of spiracles as well as several transverse rows of tiny spines on the skin.

The last-stage larva (fig. 3) is a large whitish oval affair with its rather globular head bent somewhat ventrally. It is absolutely without segmentation except for the head and terminal segment, which latter is a small spherical tubercle (fig. 3 as). The body is soft and flabby and at no time have I ever seen a larva contract or contort its body as hymenopterous larvae often do. I have been unable even with the aid of a powerful microscope to observe the slightest sign of tegumentary muscles; and while I am not willing to affirm that there are not any, for fear there be some, I will say that if they are present they are reduced to the stage of tiny almost invisible fibres or else they have never developed beyond this stage. Whatever be the case, I can say that the larva of this animal

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\* Ann. Ent. Soc. Amer., Vol. XVIII, No. 3, p. 394.



is more nearly deprived of body muscles than any other Chalcid larva I have ever seen.

The head of this parasite larva is prominent enough, and is set off from the body by a slight constriction. Usually a larva of this order of insects will have certain distinguishing marks on its head such as a hard rim above the mouth, stiff cheek plates, and maxillae or else labium and sometimes antennae,

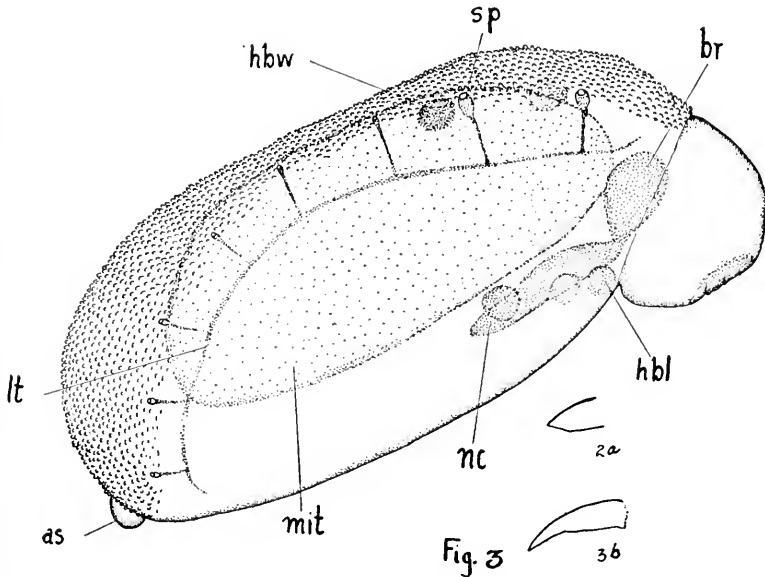


Fig. 3

and sutures. This one has nothing except a slight depression which is the mouth and two weak mandibles (fig. 3*b*) but of the other organs there is no sign.

The back and sides for a way down are covered with small tubercles, and along each side is a row of eight open spiracles (fig. 3 *sp*) by which air is obtained, or else let out, or both; I have also observed a tracheal trunk (*lt*) on each side of the body and branches of various sizes but I can not place the bifurcations of these branches where they quit the main trunks. Inside the body I can also see the nervous system, or a part of it consisting of the brain (*br*) and a short ventral nerve chain (*nc*). There is a large stomach or mid intestine (*mit*)

filled with material, and fat lobes are present. In the head various structures can be seen as a whole but they can not very clearly be discerned separately and the same is true of the hind intestinal region. I have therefore put nothing in these areas in the drawing. In the one whole and stained specimen of *Stilbula* which I have I can not discern separately the salivary glands and malpighian tubes. The pads which will later form the legs and wings can be seen easily (*hbl*, *hbw*).

Thus it would appear that this insect has three larval stages. I have not observed a single individual grow from the first stage to the adult but the cast skins left by a larva during its development are invariably plastered into the skin of the ant pupa, one above the other, the smallest being near the spot where the feeding hole (and there is only one feeding hole) is located. If they are boiled and spread out in liquid gum arabic they can be pulled apart to a considerable extent and this is how I came by my present opinion.

The ants apparently do not harm the parasite but care as tenderly for the parasitized cocoon as for the other ones. The female is allowed to issue and go her way unmolested to the outer world where in late July and early August she can be found sitting on grass blades and bushes in the plain beside the upper Gapeau and often at dusk the writer also can be found sitting close by.

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### **Duration of the Pupal Stage of *Tenebrio molitor* Linnaeus at Constant and at Alternating Tem- peratures (Coleop.: Tenebrionidae).**

By NELLIE M. PAYNE.

According to Uvarov (1931), few data exist on the effect of alternating temperatures on insect development. Therefore these results which were obtained with mealworm pupae will probably be of some interest. Temperature was controlled to within  $\pm 1$  degree Centigrade. Relative humidity was controlled by drawing air through an atmosphere of definite moisture content. In the temperature chambers there was free circulation of air. Freshly formed pupae which were never

more than four hours old and generally two were used. Results obtained were as follows: The figures indicate the number of days required for pupation.

Constant Temperature	Relative Humidity		Alternating Temperature (Alternated every 24 hours)		
	60%	40%	Temperatures	60%	40%
15°	30	33	20°, 30°	10	—
20°	14-16	—	25°, 35°	7	8
25°	9	13	15°, 25°	13	20
30°	6-7	—	15°, 30°	11	—
35°	6	7			

Pupae exposed to alternating temperatures generally developed somewhat faster than would be predicted from their development rate at constant temperatures.

#### LITERATURE CITED.

UVAROV, B. P. (1931) Insects and Climate—Trans. Ent. Soc. London 79: 1-247.

### Biological Notes and New Records of North American Chermidae (Homoptera).

By F. D. KLYVER, San Mateo Junior College, San Mateo, California.

The writer is indebted mainly to the following individuals, to each one of whom he here wishes to express his thanks, for the material on which the following new North American Chermidae (Psyllidae) records are based: Professor G. F. Ferris, Stanford University; Dr. P. N. Annand, Sugar Beet Insect Investigations, United States Bureau of Entomology; Mr. G. F. Knowlton, Agricultural Experiment Station, Logan, Utah; Mr. V. E. Romney, United States Bureau of Entomology, Mesilla Park, N. M.; Mr. H. H. Keifer, Curator Entomology Laboratory, California State Department of Agriculture; Mr. L. E. Myers, State Plant Board, A. & M. College, Mississippi; and Dr. Carl D. Duncan, Stanford University.<sup>1</sup> The biological

<sup>1</sup> Additional new records are to be found in the following papers by the writer: Chermidae From Utah, Nevada, and Arizona, Including Three New Species: *Pan-Pacific Entomologist* 7:131-143, 157-158; January, 1931. New records and Two New Species of Chermidae from British Columbia and Washington, With Biological Notes: *Pan-Pacific Entomologist* 8:11-17, July 1931.

notes here included are, with very few exceptions, based upon field observations made by the writer in California and Nevada during the past two years.

#### HOST PLANT RELATIONSHIPS OF THE CHERMIDAE

Since there apparently exists at the present time no definite statement of chermid host plant relationships it seems desirable to suggest the following criteria.

With very few exceptions the individual species of Chermidae have not been demonstrated to have as hosts any but closely related plant species, in the sense that a host is defined as a plant upon which the insect feeds at some stage of its existence. In the majority of cases definite proof of such feeding exists only for the nymphs, in fact, it apparently remains to be definitely proven that the adults feed at all. *Paratrioza cockerelli* is known to feed in its nymphal stages on a number of widely separated host plants.

Many chermid species have been taken as adults from an almost infinite variety of plants and these plants have been recorded as hosts, although there exists no evidence that the insects actually feed upon them, the plants perhaps serving more or less accidentally merely as shelters. For the purpose of emphasizing the biological connections, the term *host* is here restricted to plants upon which the insect is actually known to feed, as proved by the presence of the nymphs, while the expression *nominal host* is used to designate a plant from which a chermid has been taken without proof of its feeding upon that plant. Field observations indicate that the adults of certain species of chermids are found predominately on different plants at different times of the year. When proof is available that these adults actually feed upon different plant species, the plant upon which a chermid feeds as an adult but does not produce its young may be called an *alternate host*.

#### RECORDS AND BIOLOGICAL NOTES.

Sixty species, approximately one-third of the total number considered by Crawford in his monograph of the Chermidae of North America, are here included.

LIVIA CARICIS Crawford. IDAHO.—Adults only: from unknown host, wet meadow, near Craters of the Moon, June 29, 1930 (Annand); from unknown host, Craters of the Moon, same date (Annand). UTAH.—Adults only: from unknown host, Logan, April 20, 1927 (Knowlton); from unknown host, Richmond, April 29, 1927 (Knowlton). Host: Unknown.<sup>1</sup> Nominal Hosts: *Carcx* spp.

APHALARA CALTHAE (L.) CALIFORNIA.—Adults and nymphs: from *Polygonium ariculare*, Winters, October 22, 1929 (Annand). Nymphs only: from herbarium specimen of *P. muhlenbergii*, 8 miles from Dos Palos, May 15, 1931 (Duncan and Merson). Adults only: from *Baccharis viminea*, Corral Hollow, 10 miles southwest of Tracy, November 4, 1929 (Annand); from *Atriplex*, north of Tracy, October 12, 1929 (Annand); from pear trees, Hood, Sacramento County, April 15, 1931 (Keifer); from *Salix*, Corral Hollow, November 30, 1929<sup>2</sup>; from *Salix*, south of Tehachapi, Kern County, April 13, 1930. IDAHO.—Adults only: from unknown host, Ketchum, July 20, 1930 (Annand); from unknown host, Alturas Lake, Stanley Basin, July 19, 1930 (Annand).

NEW MEXICO. Adults only: from *Salsola pestifer*, 3.1 miles southeast of Mora, July 16, 1929 (Romney). UTAH.—Adults only: from weed, Hooper, October 14, 1927 (Pack: Knowlton). Host: *Polygonum*. Nominal Hosts: *Caltha palustris*, *Artemisia tridentata*, *Salsola pestifer*, cultivated tomatoes, weeds.

The nymphs occur singly on the younger growth, particularly the ventral side of the leaves, unaccompanied by conspicuous wax secretion.

APHALARA RUMICIS Mally. NOVA SCOTIA.—Adults and nymphs: from *Rumex*, no locality data, no date (W. H. Brittain).

Host: *Rumex*. Nominal Hosts: *Rumex altissimus*, *Sophia pinnata*.

Biological data lacking.

APHALARA SUAEDAE Crawford. CALIFORNIA.—Adults and nymphs: from *Suaeda*, Altamont Pass, east of Livermore, October 12, 1929 (Annand); from same host, south of South Dos Palos, December 6, 1929; from same host, Altamont Pass, November 30, 1929; from unrecorded host, Visalia, October 20, 1930 (Keifer: F. T. Scott); from *Suaeda*, Salt Wells Canyon,

<sup>1</sup> No biological data are given for species the nymphs of which are unknown.

<sup>2</sup> Specimens recorded without the collector's name were collected by the writer.

Inyo County, April, 1924 (Ferris). NEVADA.—Adults and nymphs: from *Dondia intermedia* (?), Moapa Valley, 4 miles east of Glendale, April 18, 1930 (Annand). NEW MEXICO.—Adults only: from *Lepidium alyssoides*, 16.5 miles southwest of Alamogordo, July 3, 1929 (Romney); from *Artemisia tridentata*, 6 miles west of Mule Creek, August 8, 1929 (Romney). TEXAS.—Adults only: from *L. alyssoides*, 1 mile north of Almo Alto, December 13, 1930 (Romney). UTAH.—Adults only: from beets, Delta, June 24, 1927 (Knowlton).  
Hosts: *Suaeda* spp. (= *Dondia*.) Nominal Hosts: *Lepidium*, *Artemisia*, beets.

The nymphs produce an abundance of white, cottony wax secretion, within which they become covered, among the younger branches. During the colder part of the year the adults may be found in this same material in a quiescent stage. A witches' broom effect in the younger growth is associated with severe attacks.

APHALARA VEAZIEI Pach. NOVA SCOTIA.—Adult only: from *Solidago*, King's County, no date (W. H. Brittain).  
Host: Unknown. Nominal Host: *Solidago*.

According to Crawford, this is an exceedingly variable and widely distributed species.

APHALARA PULCHELLA Crawford. CALIFORNIA.—Adults only: from *Carcx*, 3 miles west of Corral Hollow, southwest of Tracy, November 30, 1929; from *Frankenia grandifolia*, Tulare Lake Basin, 10 miles south of Corcoran, December 7, 1929; from *Prosopis juliflora* var. *glandulosa*, Corral Hollow, May 16, 1930; from *Ceanothus cuneatus*, Table Mountain, Fresno County, April 16, 1930.  
Host: Unknown. Nominal Hosts: *Carcx*, *Frankenia*, *Prosopis*, *Ceanothus*.

APHALARA GUTIERREZIAE Klyver. CALIFORNIA.—Adults only: from *Gutierrezia*, on desert foothills 10 miles from Coalingo, March 24, 1930 (Annand); from *Chrysothamnus*, Mountain Springs Canyon, Coso Mountains, April 12, 1930; same host, Red Rock Canyon, April 13, 1930. NEW MEXICO.—Adults only: from *Lepidium alyssoides*, 3 miles east of Oro Grande, August 8, 1930 (Romney); from *Salsola pestifer*, Nara Visa, July 28, 1929 (Romney).  
Host: Unknown. Nominal Hosts: *Gutierrezia*, *Salsola*, *Lepidium*, *Chrysothamnus*.

APHALARA MARTINI Van Duzee. CALIFORNIA.—Adults and nymphs: from *Frankenia grandifolia*, Tracy, November 4, 1929 (Annand); from same host, Little Panoche Creek, west of Firebaugh, November 5, 1929 (Annand); from same host, Corcoran, November 20, 1929 (Annand); from same host, salt marsh, San Mateo Point, San Mateo, May 5, 1929; same data, May 10, 1929; same data, May 19, 1929; same data, July 2, 1929; from same host, Livermore Valley, northeast of Livermore, November 30, 1929; same host, Tulare Lake Basin, 10 miles south of Corcoran, December 7, 1929. Adults only: from *Atriplex polycarpa*, 1 mile west of Coalinga, December 7, 1929; from *Frankenia*, same locality, December 8, 1929; from *Salix*, south of Hanford, December 7, 1929.  
Host: *Frankenia*. Nominal Hosts: *Atriplex*, *Salix*.

The nymphs are usually abundant on the ventral side of the younger leaves in which they intensify the natural revolute tendency. They are accompanied by a sticky, slightly amber-colored honey-dew. The chermid has the effect of dwarfing the younger growth.

APHALARA (ANOMOCERA) MINUTISSIMA Crawford. CALIFORNIA.—Adults only: from *Artemisia californica*, Montara, San Mateo County, April 3, 1931; from *A. tridentata*, Volcanic Tableland, north of Bishop, June 19, 1931. IDAHO.—Adults only: from unknown host, Wapi, June 24, 1930 (Annand). UTAH.—Adults only: "feeding on sugar beet", Ogden, June 9, 1927 (Knowlton).  
Host: Unknown. Nominal Hosts: *Artemisia*, sugar beets.

APHALARA (ANOMOCERA) ANOMALA Crawford. NEW MEXICO.—Adults only: from *Artemisia wrightii*, 6 miles west of Mule Creek, August 8, 1929 (Romney).  
Host: Unknown. Nominal Host: *Artemisia*.

APHALAROIDA PITHECOLOBIA Crawford. NEW MEXICO.—Adults only: from *Lepidium alyssoides*, Playas, August 15, 1929 (Romney). TEXAS.—Adults only: from same host, 9 miles from Fabens, June 18, 1930 (Romney).  
Host: Unknown. Nominal Hosts: *Lepidium*, *Pithecolobium*.

PAUROCEPHALA FREMONTIAE Klyver. CALIFORNIA.—Adults and nymphs: from *Fremontia californica*, 2 miles west of Tehachapi, Kern County, April 13, 1930; from same host, 3 miles east of Onyx, South Fork of Kern River, and lower Kern River Canyon west of Bodfish, both June 19, 1931.  
Host: *Fremontia californica*.

This species apparently does not become abundant. The nymphs are found on the ventral side of the leaves. The small amount of wax produced is given off in the form of long, straight, transparent, and somewhat glistening brownish threads. These threads do not intermingle to form a cottony mass.

*HETEROPSYLLA TEXANA* Crawford. NEW MEXICO.—Adults only: from *Lepidium alyssoides*, 10 miles south of State College, Mesilla, April 8, 1930 (Romney); from the same host, Playas, August 15, 1930; from "P-65", 10 miles north of Columbus, same date; from *Salsola pestifer*, 5.7 miles north of Gallegos, July 12, 1929; from same host, 26.6 miles northwest of Logan, same date; from same host, 1.5 miles south of Ranchos de Taos, July 16, 1929; from same host, 4.2 miles northwest of Roy, July 13, 1929; from same host, 12.7 miles west of Clayton, June 29, 1929; from same host .5 mile south of Almo, August 3, 1929; from same host, .5 mile south of Animas, August 15, 1929. TEXAS.—Adults only: from *L. alyssoides*, 9 miles south of Fabens, April 30, 1930; from same host, Sierra Blanca, June 15, 1930. All the foregoing collections by Romney.

Host: *Prosopis glandulosa*. Nominal Hosts: *Pithecolobium*, *Shpacralcea angustifolia*, *Monarda citriodora*, *Chrysopsis*, *Tamarax gallica*, *Celtis pallida*, *Acacia*, *Prosopis juliflor*.

An abundant species in its range. The nymphs are very imperfectly known.

*CALOPHYA TRIOZOMIMA* Schwarz. IDAHO.—Adults only: from unknown host, Shoeshone Falls, July 31, 1930 (Annand).

Host: Unknown. Nominal Host: *Rhus*.

The species of this genus have been taken predominantly from sumac.

*KUWAYAMA MEDICAGINIS* Crawford. NEW MEXICO.—Adults only: from *Chrysothamnus*, 13 miles northwest of Bernalillo, July 20, 1929; from *Parosela*, 5 miles northwest of Bernalillo, same date; from *Trianthema portulacastrum*, 2.5 miles east of Steins, August 15, 1929; from *Chrysothamnus serrulata*, 5 miles south of Datil, August 7, 1929; from *Lepidium alyssoides*, 3 miles west of Las Cruces, November 7, 1930; from same host, 1 mile east of Mesquite, May 19, 1931; from same host, Mesilla Valley, June 9, 1930. All the foregoing collections by Romney.

Host: Unknown. Nominal Hosts: *Medicago sativa*, *Chrysothamnus*, *Parosela*, *Trianthema*.

(To be continued)



## **Nomada amorphae Swenk in Colorado (Hym.: Nomadidae).**

H. G. RODECK, University of Colorado.

*Nomada (Micronomada) amorphae* Swenk was described<sup>1</sup> from specimens taken at Halsey, Nebraska, July 11, 1909, and apparently has not been recorded since then. On July 17, 1930, three specimens were taken in the sand hills north of Roggen, Colorado. Two of them (one male and one female) seem to be the same as the insect described by Swenk, differing in being slightly smaller (6 mm. as compared with 7 mm. in the type), the female having no yellow spot on the supraclypeal area and having the mesopleural and axillary spots red, and the yellow of the face-marks diluted with reddish. The male has no yellow line over the top of the eyes connecting the lateral face-marks with the oval yellow spot behind the eye, the mesopleural spot is divided, and the axillary spots are red as in the female.

The third specimen (male) is like the type in having the axillary spots yellow, but in addition to differing in the characters mentioned above has the thorax, with the exception of the mesonotum, clear red like the legs. The mesonotum is black but is marked with indistinct reddish stains. The third ventral abdominal segment has irregular yellow markings.

The original description of *N. amorphae* did not include the wing venation which, in the above specimens, is as follows: Basal nervure interstitial with the nervulus. Second submarginal cell nearly as broad above as at its base, receiving the first recurrent nervure at about the mid-point, or slightly basad of it. Third submarginal cell narrowed above to about one-third its basal breadth, its outer margin not very strongly curved. The second recurrent nervure joins the base of the third submarginal cell far beyond the mid-point of the latter.

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## **Some Malformations Noted in Genitalia of Phyllophaga (Coleop.: Scarabaeidae).**

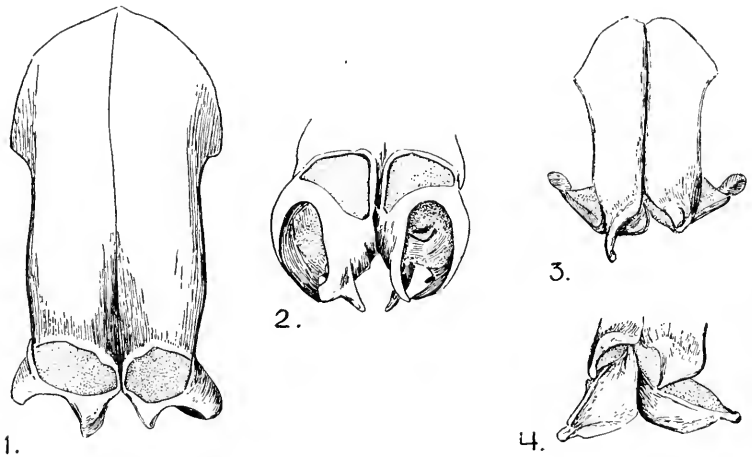
By A. R. ROLFS,

U. S. Bureau of Entomology, Yakima, Wash.

In determining a collection of *Phyllophaga* taken at Ames, Iowa in the spring of 1929, the writer noted two very interest-

<sup>1</sup> Swenk, M. H., University Studies, Lincoln, Nebraska, Vol. XII, No. 1, January, 1912 (Issued Jan. 20, 1913).

ing "sports". These specimens, both of them males, have malformed genital organs. In one specimen the whole organ is double while in the other only the telum is double. So far as I have been able to ascertain, this is the first record of such peculiarities occurring in *Phyllophaga*. The two species which these specimens represent are common around Ames and a number of others have been taken. I have examined many specimens including most of these species but have never found another with such peculiarity.



Figs. 1 and 2. Genitalia of *Phyllophaga fusca* Froel.  
Figs. 3 and 4. Genitalia of *Phyllophaga futilis* Lec.

The first specimen, determined as *Phyllophaga fusca* Froel. (figs. 1, 2), compares with other males of this species as follows: The tela are fused on the dorsum, a slight depression and a well defined suture marking the line of fusion. The double telum is normal in length but is wider than normal by a fourth. The claspers are somewhat smaller than normal. Each pair is compressed laterally and is fastened to the telum at an angle so that the whole structure has somewhat the appearance of a Y. In the normal male of this species the claspers, designated as right and left claspers, differ somewhat in character. In this specimen the claspers resembling the right clasper of the normal male are both on the inside and those resembling

the left are both on the outside. Thus the claspers of the left side are normal as to position while those on the right are reversed in position. The posterior borders of the inside or right claspers are more sharply rounded and more slender than normally.

The second specimen, determined as *Phyllophaga futilis* Lec. (figs. 3, 4), has only the telum double with the claspers abnormal as to position and shape. The tela are only partially fused on the dorsum, a well defined depression and suture marking the line of fusion. The width of the combined tela is somewhat greater than the normal but their length is slightly less. The claspers, which in the normal male are narrowly united on the dorsum to form one solid piece, are separate. The cephalo-lateral portions, which are normally parallel to the body axis, are tipped out toward the sides and caudad so that they are at right angles to the body axis. The caudo-lateral portion of the left clasper is folded over that of the right clasper.

Both specimens are now in the writer's collection. The drawings were made by Mrs. Eleanor A. Carlin of the Bureau of Entomology.

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### **A Melanic Female of *Colias eurytheme* (Lepid.: Pieridae).**

By HAROLD O'BYRNE, Webster Groves, Missouri.

The yellow color prevalent in *Colias* and allied genera is an extremely unstable and variable character. Many shades of yellow and orange occur in some species, and there is in addition a special tendency toward albinism in the females. The opposite condition, melanism, is much less common, and it is almost completely restricted to the males. However, Scudder\* mentions two examples of females of *Colias philodice* Godart whose wings have part of their normally yellow area obscured by black. He mentions none that are entirely black.

On August 1, 1928, a melanic female of *Colias eurytheme* Boisduval was taken by the writer in Webster Groves, Missouri. This specimen has no trace of yellow, the entire upper surface

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\* Scudder, S. H. The Butterflies of the Eastern United States.

being nearly black, and the outline of the black border and the pale spots within it that mark the female sex can be discerned only upon minute examination. The black spot on the fore wing can be seen, but the orange spot on the hind wing is obscured with black; it is a trifle darker than the surrounding area. The color underneath is a little paler and the hind wings and apices of the fore wings are greenish. The markings on the lower surface are normal. The pink edge, above and below, is conspicuous.

When captured, the butterfly had evidently just emerged, as its wings were still a little flabby; the appearance of the abdomen indicated that some time must elapse before oviposition could begin. For this reason no attempt was made to secure eggs. Therefore we are obliged, for the present, to remain ignorant of the genetic status of this butterfly. There is good ground for believing that the white females in this genus are Mendelian forms, but whether this is true of melanic specimens also must be left for future determination.

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### **Notes on the Larval Stages of *Melanchroia cephise* (Lepid.: Geometridae).**

By HARRIET A. WICKWIRE, Cortland, New York.

The Winter of 1930-1931 was an unusually cold one in Southern Florida, and our sojourn there was disappointing so far as collecting was concerned; however, we managed to obtain the following notes. On December 14, 1930, moths of *Melanchroia cephise* were collected, as they swarmed around a hedge of *Phyllanthus nivosus*, var. *rosco-pictus*, at Jupiter Island, Hobe Sound, Florida, thus giving us our ovipositing female, and our only cue to the food plant. By the 15th of December one of their number had oviposited 55 ova, and all the moths were dead.

*Eggs.* Date of laying, December 15; of hatching, December 23. Shape. Obovate with lengthwise ribs, laid on one side, with the micropyle on top and slightly depressed. Color. Light olive green at first, changing to deep rose color in 4 days. Oviposited. Singly or in loose clusters. Length. 1 mm.

*Larvae 1st instar.* Length  $1\frac{1}{2}$  mm. Color. Light horn color with black heads and black rings between the segments. They had horn colored tubercles with black setae radiating from their tops. The middle props were absent. Habits. The egg shells were left colorless and uneaten. During this instar the larvae ate only the parenchima of the leaves. Length of instar. 7 days. Date of 1st molt. Dec. 30, 1930.

*Larvae 2nd instar.* Length 5 mm. Color. Light horn with black rings between the segments, and black dorsal, lateral and substigmatal lines which form checkers with the rings. The heads were black. The tubercles and setae disappeared. Habits. At this instar they ate holes in the leaves without leaving either the veins or the fiber. Length of instar. 4 days. Date of 2nd molt. Jan. 3, 1931.

*Larvae 3rd instar.* Length 8 mm. Color. Yellowish white with black markings as before. The heads became reddish chestnut brown in this stage. Length of instar. 5 days. Date of 3rd molt. Jan. 8, 1931.

*Larvae 4th instar.* Length 12 mm. Color. The same. Habits. They ate their skins as soon as they cast them, and began eating from the edges of the leaves at this stage. They were never very active, but had the geometer trick of dropping from the leaves when disturbed. This was done by means of silken threads. Length of instar. 16 days. Date of 4th molt. Jan. 24, 1931.

*Larvae 5th instar.* Length 16 mm. Color. The same. Habits. One larva was much smaller than the others up to this stage but caught up with them before the next molt. This might have been caused by a lethargy, which overtook the smaller larva in an earlier stage and came upon the others later. No signs of lethargy were noticed, however, as all the larvae seemed to feed about the same and while they were never very active they were always equally so. Length of instar. 9 days. Date of 5th molt. Feb. 2, 1931.

*Larvae 6th instar.* Length 20 mm. Color. The same. Length of instar. 16 days. Mature larva. 35 mm. long.

First attempt to pupate occurred Feb. 18, 1931, but larva died in the attempt. No cocoon was made and apparently under natural conditions the larvae burrow and transform underground. A backward larva pupated successfully on March 22, 1931, and this was the only pupa we raised.

*Pupa.* 10 mm. long, rather slender, shiny dark brown. The moth never emerged.

## Abnormal Antennae in *Tragidion* (Coleoptera: Cerambycidae).

By ORLANDO PARK, Department of Zoology, University of Illinois.

On examining a series of the cerambycid, *Tragidion armatum* Lec., a male was noted with both antennae distorted as follows:

*Left antenna* (Fig. 1a): First and second segments normal; third normal as to size and form but bent sharply in the distal third; fourth normal; fifth short, swollen distally and with a distinct hook-like process on the distal border. What is apparently the sixth segment is fused with the peculiar fifth, the probable line of fusion being indicated by a dotted line in the figure. This probable sixth segment is broad distally and ridged on the dorsal surface; seventh irregularly shaped with a slight swelling on the basal, mesial third and the median

lateral third; probable eighth normal within the limit of specific variation; probable ninth distorted by a large irregular swelling on the basal lateral area; the probable tenth and eleventh are both normal.

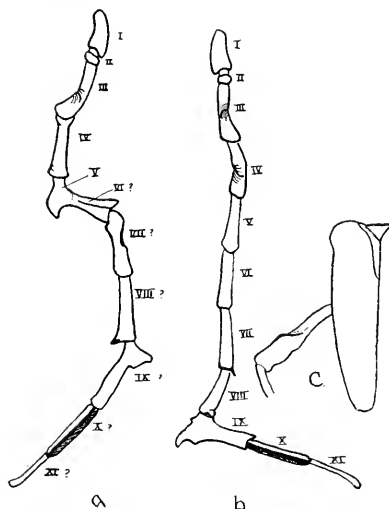


Fig. 1. Abnormality in *Tragidion armatum* Lec.: a, left antenna; b, right antenna; c, left elytron and meta-thoracic femur.

lateral third, ending in a hook-like process. Beyond this basal thickening the segment extends at right angles to articulate with the tenth. The tenth and eleventh segments are normal.

In the case treated here, we find but six segments of the left,

and seven segments of the right antenna normal, normality being determined by comparison with eighteen other individuals of the species taken at the same time. Various distorted antennae are common in cerambycoid species (Bateson, 1894), and the formation of irregular processes from antennal segments has been touched upon by Park (1931). The abnormality of the antennae in the *armatum* under discussion is very probably a consequence of faulty pupation, or injury to the adult insect shortly after emergence from the pupal state and prior to hardening of the integument. This is strengthened by the fact that the left meta-thoracic femur was abnormally formed (Fig. 1c).

I am indebted to Mr. William J. Gerhard and to Mr. Emil Liljeblad of the Field Museum for aid in the identification of this individual. The latter was taken at Las Cruces, New Mexico, on May 20, 1931, while resting twenty feet above the ground on Yucca blooms by Mr. J. G. Keller, of the U. S. Forest Service, and is now in the collection of the writer.

#### LITERATURE CITED.

- BATESON, WILLIAM, 1894. Materials for the study of variation. London: Macmillan and Co., xvi + 598 pp.  
PARK, ORLANDO, 1931. Abnormal antenna in *Eleodes*. ENT. NEWS, 42: 112-113.

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#### Booksellers' Reprints.

Mr. Gunder's article in the November NEWS amuses me. He evidently does not appreciate the time and trouble taken by us GRASPING bookdealers to preserve for *students* the various pamphlets which come to us in hordes and are a source of endless trouble and expense both of time and money (with catalogue costs at about \$10.00 per page). Perhaps he thinks we sit up nights cutting up RARE VOLUMES of serials which are easily worth infinitely more as serials than they could possibly bring even at impossibly exorbitant prices, after dissection, for the various papers! Since the death of dear old Felix Dames (I visited him just two days before he died) I fear I am about the only book dealer who spends much time on entomological pamphlets, probably because I have entomological instincts and

"hang-overs" from my younger days, and an unlimited interest in entomological literature. Junk tries to get rid of his 15,000 papers. I have myself nearer 150,000 of them and still *buy* them and then pay out more money to catalogue them. Friedländer has even given up publishing catalogues. Try to find pamphlets at Quaritch's! My good friend Fiedler now places a \$1.50 minimum price limit for items he catalogues!

"REPRINTS" is the book trade term for papers originally published in serials. I do not think that any book dealer has ever offered for sale as "authors' separates," anything except *genuine* ones, or ever led his customers to believe that mere REPRINTS were "authors' separates." I know of mighty few entomologists who collect "authors' separates": my own customers, I am sure, buy pamphlets to use, and are quite unconcerned about sentimentalities. No doubt they are glad to receive them free of charge — even though they afterwards sell them — and possibly have no objection to inscribed copies, of which, by the way, there are few in circulation in comparison with the vast number distributed by modest authors who perhaps believe that the contents of their papers are sufficiently interesting without a written signature.

There seem to be no entomologists collecting items of the Poe's "Tamerlane" class, merely as units of a book collection. If there were, they would not *bind* such pamphlets — Heavens, no! — but instead have fine morocco slip cases made in which to preserve them in exactly their original published form, unbound, not for use but for exhibition, or occasional examination and worship! — JOHN D. SHERMAN, JR., Mount Vernon, New York.

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### "Termite Treatment" Frauds.

Home owners should beware of overdrawn and alarming reports of injury to building by termites or white ants. In particular they should be wary when exaggerated statements of this kind form a part of the "sales talk" for a "termite treatment." Many of these treatments are expensive and are not correspondingly effective. Reports to the Bureau of Entomology indicate that sharpers, overemphasizing the real injury that termites are likely to do, are filching from home owners hundreds of thousands of dollars and rendering little or no effective service in return.

State officials and others reporting to the Bureau of Entomology reveal that the termite treatment sharpers are particularly active in the South and in some of the Far Western States.



In these areas many cities have in recent years amended their building codes as advocated by the Bureau of Entomology and now require adequate safeguards against termites in new construction.

Salesmen, however, have been exaggerating the danger from termites in an effort to sell treatments, many of which have little or no merit, but which they picture as absolutely necessary to prevent the collapse within a short time of buildings invaded or under alleged danger of being invaded by the termites.

The Bureau of Entomology says that there has been no change in the situation in the South and West as to termite damage; that conditions are substantially the same now as they have been for the last 50 or 100 years. The records indicate that the collapse of a building on account of termite damage is so rare as to be for practical purposes a negligible risk. It is true that where termites have been in buildings for many years—as indicated by emerging swarms of the winged forms—the foundation timbers, and even the floors and adjacent woodwork, may have become so weakened as to make necessary some replacement.

The entomologists point out that an experience of 35 years in termite control indicates that radical reconstruction of the foundations is the only permanent and effective remedy for buildings which, because of original faulty construction, have become heavily infested. Such remedial measures as spraying or fumigation, or even removal of the worst infested timbers, without other protection, are at best temporary. Spraying and fumigation are practically useless.

One of the popular remedies being exploited is the spraying of woodwork with poisons. Spraying of construction timbers or other woodwork, even under a forced stream, is of no real value. The poison has little if any penetration unless the timbers are so badly eaten and rotted that they soak up the mixture like a sponge—in which case they are useless and should be replaced.

Another exploited remedy is the poisoning of soil near the foundation walls or supporting pillars underneath the buildings. All that can be said now of such treatment is that it is still very much in the experimental stage. On present information the Federal entomologists can not recommend it as a permanent remedy.

The only effective remedy for termite damage is to provide termite-proof materials for foundations. This can be done in two ways:

(1) Reconstruct the foundation walls, including cellar and cellar floors, of concrete and stone, using standard mortar; thoroughly fill all openings in masonry or tile construction; and use, where necessary, mechanical barriers, such as metal termite shields. With this protection against entry, movable woodwork placed in such basements and the woodwork of the main and upper floors can be fully and adequately protected from termite damage.

(2) Where in the construction of buildings it is desirable or necessary to use wood touching the ground or near it, this wood and all foundation timbers should be impregnated in an approved manner by one of the standard chemical wood preservatives.

These are the essentials of termite proofing in new construction. In their own interest, house owners are cautioned not to accept any new or easy methods, such as fumigation or spraying of woodwork in place, or soil poisoning, for the control or elimination of termites, until they have assured themselves of the effectiveness of the method by asking advice either from their own State Departments of Agriculture or other competent State authorities, or from the Bureau of Entomology in Washington.

U. S. DEPT. OF AGRICULTURE, OFFICE OF INFORMATION.

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### Some Observations on the Predatory Habits of *Vespula diabolica* (Hymen.: Vespidae).

The benefits derived from the presence of yellow jackets, or hornets, are often overshadowed by the ill reputation and the general fear which prevails with reference to these animals. Their usefulness and importance were emphasized to the writer as he observed them capture numerous flies, *Musca domestica* being their chief victim. These flies were infesting a somewhat anemic cow who, on account of her illness, was unable to wage an effective battle against the impostors. The yellow jackets came to her rescue. One by one these wasps would swoop down on the unwary, unsuspecting fly and carry it off, presumably to the nest. The details of the performance were as follows: The wasp would overpower and with a few jabs from its sting completely paralyze its victim. A near-by wooden fence was the first stop on its journey towards its nest. Here the wasp proceeded to claim and enjoy the spoils that belong to the conqueror. The fly was firmly held between the forelegs and by means of rapid movements of the mandibles the less delectable parts, such as the wings, legs and head, were snipped off, producing a crushing, crunching sound, distinctly audible

List of the Titles of Periodicals and Serials Referred to by  
Numbers in Entomological Literature  
in Entomological News.

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1. Transactions of The American Entomological Society. Philadelphia.
2. Entomologische Blätter, red. v. H. Eckstein etc. Berlin.
3. Annals of the Carnegie Museum. Pittsburgh, Pa.
4. Canadian Entomologist. London, Canada.
5. Psyche, A Journal of Entomology. Boston, Mass.
6. Journal of the New York Entomological Society. New York.
7. Annals of the Entomological Society of America. Columbus, Ohio.
8. Entomologists' Monthly Magazine. London.
9. The Entomologist. London.
10. Proceedings of the Ent. Soc. of Washington. Washington, D. C.
11. Deutsche entomologische Zeitschrift. Berlin.
12. Journal of Economic Entomology, Geneva, N. Y.
13. Journal of Entomology and Zoology. Claremont, Cal.
14. Entomologische Zeitschrift. Frankfurt a. M., Germany.
15. Natural History, American Museum of Natural History. New York.
16. American Journal of Science. New Haven, Conn.
17. Entomologische Rundschau. Stuttgart, Germany.
18. Internationale entomologische Zeitschrift. Guben, Germany.
19. Bulletin of the Brooklyn Entomological Society. Brooklyn, N. Y.
20. Societas entomologica. Stuttgart, Germany.
21. The Entomologists' Record and Journal of Variation. London.
22. Bulletin of Entomological Research. London.
23. Bollettino del Laboratorio di Zoologia generale e agraria della R. Scuola superiore d'Agricoltura in Portici. Italy.
24. Annales de la société entomologique de France. Paris.
25. Bulletin de la société entomologique de France. Paris.
26. Entomologischer Anzeiger, hrsg. Adolf Hoffmann. Wien, Austria.
27. Bollettino della Società Entomologica. Genova, Italy.
28. Ent. Tidskrift utgifen af Ent. Föreningen i Stockholm. Sweden.
29. Annual Report of the Ent. Society of Ontario. Toronto, Canada.
30. The Maine Naturalist. Thornaston, Maine.
31. Nature. London.
32. Boletim do Museu Nacional do Rio de Janeiro. Brazil.
33. Bull. et Annales de la Société entomologique de Belgique. Bruxelles.
34. Zoologischer Anzeiger, hrsg. v. E. Korschelt. Leipzig.
35. The Annals of Applied Biology. Cambridge, England.
36. Transactions of the Entomological Society of London. England.
37. Proceedings of the Hawaiian Entomological Society. Honolulu.
38. Bull. of the Southern California Academy of Sciences. Los Angeles.
39. The Florida Entomologist. Gainesville, Fla.
40. American Museum Novitates. New York.
41. Mitteilungen der schweiz. ent. Gesellschaft. Schaffhausen, Switzerland.
42. The Journal of Experimental Zoology. Philadelphia.
43. Ohio Journal of Sciences. Columbus, Ohio.
44. Revista chilena de historia natural. Valparaiso, Chile.
45. Zeitschrift für wissenschaftliche Insektenbiologie. Berlin.
46. Zeitschrift für Morphologie und Ökologie der Tiere. Berlin.
47. Journal of Agricultural Research. Washington, D. C.
48. Wiener entomologische Zeitung. Wien, Austria.
49. Entomologische Mitteilungen. Berlin.
50. Proceedings of the U. S. National Museum. Washington, D. C.
51. Notulae entomologicae, ed. Soc. ent. helsingfors. Helsingfors, Finland.
52. Archiv für Naturgeschichte, hrsg. v. E. Strand. Berlin.

53. Quarterly Journal of Microscopical Science. London.
54. Annales de Parasitologie Humaine et Comparée. Paris.
55. Pan-Pacific Entomologist. San Francisco, Cal.
56. "Konowia". Zeit. für systematische Insektenkunde. Wien, Austria.
57. La Feuille des Naturalistes. Paris.
58. Entomologische Berichten. Nederlandsche ent. Ver. Amsterdam.
59. Encyclopédie entomologique, ed. P. Lechevalier. Paris.
60. Stettiner entomologische Zeitung. Stettin, Germany.
61. Proceedings of the California Academy of Sciences. San Francisco.
62. Bulletin of the American Museum of Natural History. New York.
63. Deutsche entomologische Zeitschrift "Iris". Berlin.
64. Zeitschrift des österr. entomologen-Vereines. Wien.
65. Zeitschrift für angewandte Entomologie, hrsg. K. Escherich. Berlin.
66. Report of the Proceedings of the Entomological Meeting. Pusa, India.
67. University of California Publications, Entomology. Berkeley, Cal.
68. Science. New York.
69. Comptes rendus hebdoma. des séances de l'Académie des sciences. Paris.
70. Entomologica Americana, Brooklyn Entomological Society. Brooklyn.
71. Novitates Zoologicae. Tring, England.
72. Revue russe d'Entomologie. Leningrad, USSR.
73. Quarterly Review of Biology. Baltimore, Maryland.
74. Šborník entomolog. národního musea v Praze. Prague, Czechoslovakia.
75. Annals and Magazine of Natural History. London.
76. The Scientific Monthly. New York.
77. Comptes rendus heb. des séances et mémo. de la soc. de biologie. Paris.
78. Bulletin Biologique de la France et de la Belgique. Paris.
79. Koleopterologische Rundschau. Wien.
80. Lepidopterologische Rundschau, hrsg. Adolf Hoffmann. Wien.
81. Folia myrmecol. et termitol. hrsg. Anton Krausse. Bernau bei Berlin.
82. Bulletin, Division of the Natural History Survey. Urbana, Illinois.
83. Arkiv för zoologie, K. Svenska Vetenskapsakademien i. Stockholm.
84. Ecology. Brooklyn.
85. Genetics. Princeton, New Jersey.
86. Zoologica, New York Zoological Society. New York.
87. Archiv für Entwicklungsmechanik der Organ., hrsg. v. Roux. Leipzig.
88. Die Naturwissenschaften, hrsg. A. Berliner. Berlin.
89. Zoologische Jahrbücher, hrsg. v. Spengel. Jena, Germany.
90. The American Naturalist. Garrison-on-Hudson, New York.
91. Journal of the Washington Academy of Sciences. Washington, D. C.
92. Biological Bulletin. Wood's Hole, Massachusetts.
93. Proceedings of the Zoological Society of London. England.
94. Zeitschrift für wissenschaftliche Zoologie. Leipzig.
95. Proceedings of the Biological Soc. of Washington, Washington, D. C.
96. La Cellule. Liège, Belgium.
97. Biologisches Zentralblatt. Leipzig.
98. Le Naturaliste Canadien. Cap Rouge, Chicoutimi, Quebec.
99. Mélanges exotico-entomologiques, Par Maurice Pic. Moulins, France.
100. Bulletin Intern., Académie Polonaise des Sci. et des Lett. Cracovie, Poland.
101. Tijdschrift voor entomologie, Nederlandsche Entomol. Ver., Amsterdam.
102. Entomologiske Meddelelser, Entomologisk Forening, Copenhagen.
103. Journal of the Kansas Entomological Society, Lawrence, Kansas.
104. Revista de la Sociedad entomologica Argentina, Buenos Aires.

for a distance of four or five feet; the audibility of the sound perhaps being augmented by the vibrations set up in the wooden fence board. The entrails and the body fluids of the abdomen were eagerly consumed, leaving only the chitinous shell which was quickly rejected. The wasp then would fly off taking with it only the remaining thorax. Whether appetite or instinct was the controlling power in this act is problematical. Perhaps the rejection of the non-digestible materials reduced the weight of the body sufficiently to enable the wasp to carry its booty for a considerable distance to its nest; or perhaps the muscles of the thorax constitute the "choice cut" of the "tenderloin" of the insect carcass and as such were reserved for the precious nurslings in the nest.

A few yellow jackets, altho not the most desirable company, would do much to rid the house or premises of flies, and if left alone will do no harm. Their economic value and importance are apparent.

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## Entomological Literature

COMPILED BY LAURA S. MACKAY UNDER THE SUPERVISION OF  
E. T. CRESSON, JR.

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 figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the list of Periodicals and Serials published in our January and June issues. This list may be secured from the publisher of *Entomological News* for 10c. The number of, or annual volume, and in some cases the part, part, part, &c. the latter within ( ) follows; then the pagination follows the colon :

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

\*Papers containing new forms or names have an \* preceding the author's name.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

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.

⚡ Note the change in the method of citing the bibliographical references, as explained above.

*Papers published in the Entomological News are not listed.*

**GENERAL**—Allard, H. A.—The reactions of some insects to rain. [4] 63: 223-224. Austen, E. E.—The present state of the National Collection of insects. [9] 64: 241-242. Davis, J. J.—Insects of Indiana for 1930. [Pro. Indiana Acad. Sci.] 40: 307-320, ill. Hering, M.—Minierer an Waspflanzen. [Ent. Jahrbuch] 1932: 69-76, ill. Hoffmann, F.

—Ueber das leuchten von insekten in Brasilien. [Ent. Jahrbuch] 1932: 82-83. **Howard, L. O.**—Man and insects. [An. Rep. Smiths. Inst.] 1930: 395-399. **Lindroth, C. H.**—Die insektenfauna islands und ihre probleme. [Zool. Bidrag. Upsal] 13: 105-599, ill. **Meissner, O.**—Ueber das aussterben der insekten. [Ent. Jahrbuch] 1932: 77-80. **Warnecke, G.**—Einige kritische bemerkungen über die frage der verwendbarkeit meteorologischer klimamessungen für zoogeographische untersuchungen. [18] 25: 302-306. **Weiss & Ziegler.** Another miniature portrait of Thomas Say and other Say notes. [6] 39: 287-289, ill. **Wolff, M.**—Eine reiseapparatur für mikrophotographische arbeiten. [Ent. Jahrbuch] 1932: 63-68, ill. **Wolff, M.** Mikrotechnische notizen für Entomologen. [Ent. Jahrbuch] 1932 : 81.

**ANATOMY, PHYSIOLOGY, ETC.**—**Bodenheimer & Schmidt.**—The Robinson method for determination of bound and free water in the insect body [12] 24: 1090-1093. **Combes, M.**—Sur les larves de fourmis promeniées pendant la nuit par des *Formica fusca* et des *F. pratensis* dans six boites a observations. [An. Sci. Nat. Zool., Paris] 14: 275-280. **Crampton, G. C.**—A phylogenetic study of the posterior metathoracic and basal abdominal structures of insects, with particular reference to the holometabola. [6] 39: 323-356, ill. **van Emden, F.**—Zur kenntnis der morphologie und ökologie des brotkäfer-parasiten *Cephalonomia quädridentata*. [46] 23: 425-574, ill. **Hering, M.**—Eine zwillingsflügelbildung bei *Oxyplax ochracea* (Lep.). [46] 23: 369-372, ill. **Hertweck, H.**—Anatomie und variabilität des nervensystems und der sinnesorgane von *Drosophila melanogaster*. [94] 139: 559-663, ill. **Hiestand, W. A.**—The relation of oxygen tension to oxygen consumption in the insects and the crayfish. [Pro. Indiana Acad. Sci.] 40: 345-346. **Koch, A.**—Die symbiose von *Oryzaephilus surinamensis* (Col.). [46] 23: 389-424, ill. **Malhotra, R. C.**—Is a bee attracted to clover blossoms by odor? [6] 39: 273-277. **Newton, H. C. F.**—On the so-called 'Olfactory Pores' in the honeybee. [53] 74: 647-668, ill. **Noll, J.**—Untersuchungen über die zeugung und staatenbildung des *Halictus malachurus*. [46] 23: 285-368, ill. **\*Orska, J.**—Sur un développement atypique du corps mitochondrial chez le male (Faux-Bourdon) de l'abeille domestique (*Apis mellifica*). [77] 108: 680-682, ill. **Portier, P.**—Les chenilles mineuses et la bactériologie. [L'Amateur Papillons] 5:

265-270. **Reith, F.**—Versuche über die determination der keimesanlage bei *Camponotus ligniperda*. [94] 139: 664-734 ill. **Scott, H.**—Note on the use of the hind legs as weapons by the males of *Deporaus betulae*. [8] 67: 241-243. **Snodgrass, R. E.**—Morphology of the insect abdomen. Part I. General structure of the abdomen and its appendages. [Smiths. Misc. Coll.] 85: 128 pp., ill. **Teissier, G.**—Recherches morphologiques et physiologiques sur la croissance des insectes. [Trav. Sta. Biol. Roscoff] Fasc. 9: 29-238. **Weber, H.**—Lebensweise und umweltbeziehungen von *Trialeurodes vaporariorum* (Aleurodina). [46] 23: 575-753, ill.

**ARACHNIDA AND MYRIOPODA.**—\***Bryant, E. B.**—Notes on North American Anyphaeninae in the Museum of Comparative Zoology. [5] 38: 102-126, ill. \***Crosby & Bishop.**—Studies in American spiders: Genera, *Cornicularia*, *Paracornicularia*, *Tigellinus*, *Walckenaera*, *Epiceraticelus* and *Pelecopsis*, with descriptions of new genera and species. [6] 39: 359-402, ill. \***Ewing, H. E.**—A catalogue of the Trombiculinae or chigger mites, of the New World with new genera and species and a key to the genera. [50] 80. Art 8: 19 pp., ill. \***Lundblad, O.**—Sudamerikanische Hydracarinen. [Zool. Bidrag, Upsal] 13: 1-86, ill. \***Mello-Leitão.**—Contribuição ao estudo da tribu Mastophoreas. Notas sobre Arachnideos Argentinos. [An. Acad. Brasileira Sci.] 3: 65-74, 83-97, ill. **Rau, P.**—The mouse-eating Tarantula. [76] 1931: 563-564, ill.

**THE SMALLER ORDERS OF INSECTS.**—\***Carpenter, F. M.**—Revision of the Nearctic Mecoptera [Bull. Mus. Comp. Zool. Harvard Coll.] 72: 205-277, ill. \***Carpenter, F. M.**—The affinities of *Holcorpa maculosa* and other tertiary Mecoptera, with descriptions of new genera. [6] 39: 405-414, ill. \***Milne, L. J.**—Three new Canadian Phryganeana. (Phryganeidae, Trichoptera). [4] 63: 228-232, ill. **Montgomery, B. E.**—Records of Indiana dragonflies. 5. [Pro. Indiana Acad. Sci.] 40: 347-349. \***Navás, R. P. L.**—Insectos del Brasil. [Rev. Mus. Paulista] 17: 455-458, ill.

**ORTHOPTERA.**—**Rehn, J. A. G.**—On the Blattid genera *Abrodiaeta* (=Allacata) and *Margattea*. [1] 57: 297-304, ill.

**HEMIPTERA.**—\***Beamer, R. H.**—Some *Erythroneura* (Grape leaf hoppers) of the *Maculata* group. (Cicadellidae).

[4] 63: 240-244, cont. \***Bruner, S. C.**—Two new species of *Heza* from Cuba (Reduviidae). [19] 26: 124-130, ill. \***Drake, C. J.**—Concerning the genus "*Leptodictya*" (Tingitidea). [Bol. Mus. Nac., Rio de Janeiro] 7: 119-122. (S). \***Hottes & Frison.**—The plant lice, or Aphidae, of Illinois. [Bull. Div. Nat. Hist. Surv.] 19: 121-447, ill. \***Schmidt, E.**—Homopterologisches aus dem Stettiner Museum für naturkunde. [48] 48: 65-77. **Smith & Poos.**—The feeding habits of some leaf hoppers of the genus *Empoasca*. [113] 43: 267-285, ill. **de la Torre-Bueno, J. R.**—*Alveotingis grossocercata*. [19] 26: 149. **de la Torre-Bueno, J. R.**—Heteroptera collected by G. P. Englehardt in the South and West. [19] 26: 135-139. \***Walley, G. S.**—Corixidae from the environs of Hudson Bay (Corixidae). [4] 63: 238-239, ill. \***Werneck, F. L.**—Nota prévia sobre uma nova especie de Mallophaga (Gyropidae). (S). [Bol. Biol., Rio de Janeiro] 1931: 21-22, ill.

**LEPIDOPTERA**—\***Bell, E. L.**—Studies in the Pyrrhopyginae, with descriptions of several new species (Hesperiidae). (S). [6] 39: 417-490, ill. **Bryk & Eisner.**—Variabilität der antennen bei der gattung *Parnassius*. [Parnassiana] 1: 5-6. \***Clark, A. H.**—A new subspecies of *Poanes massa-soit*. [3] 21: 7-9. \***da Costa Lima, A.**—*Amorbia catenana*, microlepidoptero que se desenvolve na banana (Tortricoidae: Sparganothidae). (S). [Bol. Biol., Rio de Janeiro] 1931: 39-43, ill. **Davis, W. T.**—The elliptical goldenrod gall, its maker and destroyer. [19] 26: 120-122, ill. **Ficht, G. A.**—Some observation on the seasonal history of the European corn borer, *Pyrausta nubilalis* in Indiana. [Pro. Indiana Acad. Sci.] 40: 335-338, ill. \***Gehlen, B.**—Neue Sphingiden. (S). [14] 45: 201-204. **Griffin & Griffin-Gillen.**—A hitherto unrecorded "Anzeige" by J. Hübner. [9] 64: 251-252. **Hoffman, F.**—Beiträge zur naturgeschichte brasilianischer schmetterlinge. [45] 26: 109-124, cont. **Klots, A. B.**—New records of Microlepidoptera from New York. [6] 39: 291-293. \***Kruck, A.**—Neue falterformen von Zentralamerika. [17] 48: 234-236, ill. \***de Miranda Ribeiro, V.**—Lepidopteros de Matto Grosso. [Bol. Mus. Nac., Rio de Janeiro] 7: 31-52. **Montgomery, R. W.**—Preliminary list of the butterflies of Indiana. [Pro. Indiana Acad. Sci.] 40: 351-355. \***von Rosen & Prout.** Die Lepidopteren der Deutschen Gran-Chaco-Expedition 1925-26 mit berücksichtigung der sammelerggebnisse von Professor Hossens in der Sierra de Cordoba. [Mitt. Münchner Ent. Gesell.] 21: 14-36. **Spitz, R.**—Especies novas de Macrolepidopteros Brasileiros e suas biologias. [Rev. Mus. Paulista] 17: 459-471.



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## OBITUARY.

The death of **ANDREW GRAY WEEKS, JR.**, student of the Lepidoptera, on December 7, 1931, at Marion, Massachusetts, was announced in the newspapers of the following day. He was born in Boston, October 2, 1861, and received the A. B. degree from Harvard in 1883. For twenty years he was engaged in business. In 1903 he became an Honorary Associate in Entomology in the Museum of Comparative Zoology. He specialized on the diurnal Lepidoptera and among his publications was a volume entitled *Illustrations of Diurnal Lepidoptera with Descriptions*, with fine colored plates (Boston, Printed by the University Press, Cambridge, U. S. A., 1905). It contains also the itinerary of Wm. J. Gerhard (now curator of insects in the Field Museum, Chicago) in Peru and Bolivia in 1898 and 1899, who collected for Mr. Weeks in those countries.

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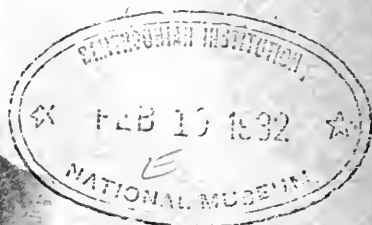
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**FEBRUARY, 1932**

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Vol. XLIII

No. 2



JOHN HENRY COMSTOCK, 1849-1931.  
Portrait of 1884.

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LARVAE OF CHRYSOMYZA DEMANDATA IN CORN SILAGE  
—DRAKE AND DECKER.

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## **A Scavenger Fly, *Chrysomya demandata* Fabr., Breeding in Corn Silage (Dipt. : Ortalidae).\***

By C. J. DRAKE and G. C. DECKER, Ames, Iowa.

Plate I.

A European scavenger fly *Chrysomya demandata* Fabr.,\*\* first recorded in the United States in 1900, was found in large numbers breeding in silage during the month of April, 1931, near Valley Junction, Iowa. According to published records this species is a scavenger of very general breeding habits in decaying plant materials. It has been reared from manure, decaying fruits and vegetables, insect excrement and from situations where decaying and fermenting organic matter was available. In Europe the maggots have been found in fermenting clover which had been subjected to a crude process of ensilage. This seems to be the only record of its breeding in silage or other stock feeds.

On April 6, 1931, Mr. Hoyt Elbert, a farmer and stock-feeder living two and one-half miles southwest of Valley Junction, Iowa, observed a large number of living maggots in his silage as it was being transferred from the silo to the feeding bunks for his cattle. At first he was under the impression that the maggots were generally distributed throughout the silo, but a closer examination revealed that they were restricted largely to small pockets of decaying silage.

The silo in question was of wooden interlocking stave construction, 16 x 36 feet, and in fairly good condition. It had been filled on September 2 and 3, 1930, with corn which had been injured by the drought and, as a result, was a little too dry to make the best grade of corn silage. In addition, the surface was not tramped thoroughly and no water had been added during the siloing process. As a result there were numerous pock-

\* Journal Paper No. B8 of the Iowa Agricultural Experiment Station.

\*\* Determined by Dr. J. M. Aldrich, U. S. N. M., Washington, D. C.

ets of loose dry fodder which did not undergo the normal heating and fermenting process which is essential to the preservation of the silage. In these small pockets of decaying and rotten silage the maggots occurred in great numbers.

When first observed the maggots were nearly full grown and the silage was about 10 or 12 feet above the concrete foundation. As the farmer was feeding over 100 steers a horizontal layer of from 4 to 6 inches of silage was removed daily, the top surface being kept level so as to expose as little as possible of the silage to the air. These small pockets, each containing about one cubic foot of decaying and rotten silage, occurred in different layers here and there throughout the silo. From the time the maggots were first noted, April 6, until the silo was empty, April 30, the maggots were found each day in these pockets in large numbers. It was impossible to determine when the eggs had been deposited or how long the maggots had remained in the larval stage. Samples of infested silage were placed in tight tin cans and transported to the Insectary at Ames. The material was then divided into two lots, one lot being placed in tight tin cans containing about two inches of moist sand, and the other in a similar container without any sand. In the former cages a considerable number of the maggots immediately entered the sand for pupation, whereas the maggots in the container without sand remained quite active and only now and then one transformed into the resting stage. After a few days a little moist sand was added to the second lot of containers and the maggots immediately entered the sand for pupation. From these observations it seems quite evident that the larvae had remained active for several days after reaching maturity because of the unfavorable conditions for pupation.

The farmer and the county agent both considered the silage of a fairly good grade. In removing the silage from the silo no attempt was made to discard the rotten maggoty silage, it being mixed with the good silage as it was loaded on the wagon and placed in the feeding bunks. The cattle relished the silage and did very well on it, consuming thousands of maggots during the month of April without any apparent injury or ill effects.

PLATE I. Larvae of *Chrysomya demandata* Fabr. in corn silage.



## A New Hawaiian Species of *Labia* (Dermaptera : Forficulidae, Labiinae).

By MORGAN HEBARD.

Specimens of an earwig related to *Labia dubronyi* Hebard<sup>1</sup> have been submitted to us by Mr. O. H. Swezey.

Though we realize that decided individual variation occurs in many species of earwigs, these individuals differ from those of *dubronyi* in the features given below, and as no convergence is shown by any specimen of either series, we believe that a distinct species and not a race or mere variation is indicated. This species we take pleasure in naming *Labia swezeyi*.

It averages larger and is distinctly more robust than *dubronyi*, the pronotum broader in proportion to the width across the tegmina and the male forceps are toothed just beyond a median point, instead of having a ventro-internal flange which, gradually widening, terminates in a tooth at the end of the proximal three-fifths.

*Labia swezeyi* new species. Figure 1.

Type: ♂ : Mount Kaala, Oahu, Hawaiian Islands. Elevation 2000 feet. November 11, 1926. (O. H. Swezey; from beneath bark of tree.) [Hebard Collection, Type No. 1205.]

Size medium small, form medium. Head as in *dubronyi*; hirsute, angularly cordiform, the medio-longitudinal suture weakly indicated in occipital portion. Eye small, slightly over half length of cheek. Antennae as in *dubronyi*; with thirteen joints; first large, narrow in proximal third, with parallel sides in distal two-thirds, as long as third and fourth combined; second very small; distal joints elongate spindle-shaped. Pronotum appreciably broader than in *dubronyi* but otherwise similar, very minutely impresso-punctulate and hirsute. Tegmina

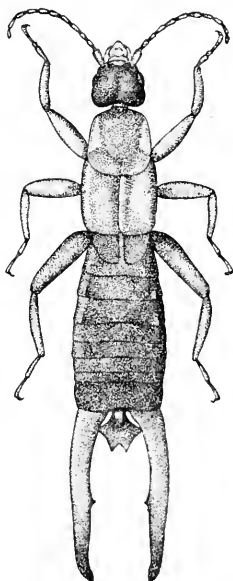


Fig. 1. *Labia swezeyi* n. sp., ♀ allotype X 6.

and wings as in that species; hirsute, the former with apices transversely truncate. Abdomen similar but broader, glands subobsolete, dorsal surface shining and supplied with

<sup>1</sup> Described in Occas. Papers B. P. Bishop Mus., VII, p. 318, pl. XXVI, figs. 5 to 7, (1922).

even finer hairs but ultimate tergite with large smooth areas. Pygidium as in *dubronyi*; strongly declivent, then flattened in a large horizontal plate which is triangularly produced meso-laterad and with apex formed by two smaller triangular productions (thus resembling a four-pointed star). Forceps moderately elongate, hirsute, almost straight but with inner margins concave-convergent proximad and apices moderately incurved, armed slightly beyond the middle on the internal margin with a single small but stout tooth, situated mesad (vertically) and not ventrad as is the apical tooth of the flange in *dubronyi*. Caudal metatarsus similarly with length slightly greater than combined length of succeeding joints and with a row of hairs ventro-internally arranged in a series of lamellae.

*Allotype*: ♀; same data as type. [Hebard Collection.]

Differs from male as follows, agreeing with this sex of *dubronyi* except in averaging larger and more robust and in showing a minor pygidial difference. The node we described for that species, situated meso-distad on the ultimate tergite, could well be termed a small tooth. The pygidium in both species is also slightly narrower than an arm of the forceps at its base; convex-declivent to a very narrowly transverse distal horizontal flange, the disto-lateral angles of this flange sharp in *saweszyi* and its apex slightly broader than in *dubronyi* as in this species the straight lateral margins are appreciably divergent caudad which is not the case in *dubronyi*. Forceps well separated, showing weak curvature as in the male, dorsal and ventral internal margins coarsely and irregularly denticulate and feebly concave in proximal three-fifths, thence unarmed and showing slightly greater concavity to the apex with ventral margin developed into a very feeble flange.

Head, disk of pronotum (in intensive examples), exposed portions of wings and bases of median and caudal femora deep chestnut-brown. Abdomen, base of pygidium in male and all of it in female and apices of forceps russet, horizontal portion of pygidium in male and other portions of forceps in both sexes ochraceous tawny. All but disk of pronotum (in intensive examples), tegmina and limbs (except bases of median and caudal femora) buckthorn brown. Antennae dark prouts brown, becoming paler proximad.

Length of body ♂ 7.4, ♀ 7.8<sup>2</sup>; length of pronotum ♂ 1.24, ♀ 1.27; width of pronotum ♂ 1.21, ♀ 1.22; length of tegmen ♂ 1.75, ♀ 1.77; exposed length of wing ♂ .43, ♀ .57; length of forceps ♂ 3.8, ♀ 3 mm.

A male and two females bear the same data and are paratypes.

<sup>2</sup>The body length of the paratyptic female of *Labia dubronyi* from Opeacula, Oahu, is 7.7 mm., as originally given but the abdomen is greatly pressed out; this dimension in life was probably not over 7 mm.

### Description of a New Race of *Eurema gundlachia* Poey from Ecuador (Lepid.: Pieridae).

By W. JUDSON COXEY.

*EUREMA GUNDLACHIA* race *morleyi* new race.

This race differs from the typical *gundlachia* from Southern United States, Mexico and Cuba in that the head and scapula have a strong admixture of black. The veins of the wing especially at the base are more or less defined by black scales.

♀ paler than the male with basal portion of the wings strongly suffused with black, however leaving the basal costal area wholly yellowish orange.

This race is readily distinguished from *Eurema proterpia watsoni* Klots, also described from Ecuador, by having the tails of the secondaries more acutely produced in both sexes.

*Type*—Male; Huigra, 4000 feet elevation, Ecuador, December, 1928. *Allotype*—Female; collected with type. *Paratypes*—1 ♀, collected with type; 2 ♀ Naranjapata, 1850 feet elevation, Ecuador, November, 1926. Collected by W. Judson Coxe and named for Edward Morley of Huigra, Ecuador, whose hospitality and assistance to the writer are greatly appreciated.

*Types* in the collection of the Academy of Natural Sciences of Philadelphia.

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### Biological Notes and New Records of North American Chermidae (Homoptera).

By F. D. KLYVER, San Mateo Junior College, San Mateo,  
California.

(Continued from page 12.)

KUWAYAMA LAVATERAE Van Duzee. CALIFORNIA.—Adults and nymphs: from *Lavatera assurgentiflora*, Roosevelt High School, Daly City, May 4, 1929; from same host, North Grant Avenue, San Mateo, May 5, 1929; same data, July 2, 1929; from same host, Olympic Golf Course, San Francisco, July 6, 1929; from same host, King City, December 8, 1929; from same host, Spreckels, same date; from same host, Belmont, San Mateo County, November 15, 1930; from "Malva", San Francisco, November 1, 1930 (J. B. Steinweden).

Host: *Lavatera*.

This species becomes exceedingly abundant and apparently is sometimes the primary cause of death of its host. Adults, nymphs of all stages, and numerous eggs are to be found simultaneously on the ventral side of the leaves and on the younger growth including the buds and flowers. In moderate infestation the nymphs occur in blister-like depressions. In more severe cases there may be as many as three hundred or more nymphs on a single leaf. The fact that successive generations overlap in time in this species suggests that something has disturbed its synchronization. Possibly the influence of climate is responsible, since this species was supposedly introduced with its host from the islands off the coast of southern California.

LEURONOTA MACULATA Crawford. NEW MEXICO.—Adults only: from *Lepidium alyssosides*, 1 mile east of Mesquite, May 6, 1931 (Romney); same data, June 4, 1931.

Host: Unknown. Nominal Hosts: *Lepidium*, *Condalia obovata*, *Columbrina texana*.

PARATRIOZA COCKERELLI Sulc. ARIZONA.—Adults only: from *Salsola pestifer*, 2 miles south of Springerville, August 4, 1929 (Romney); same data, 13 miles east of Springerville. CALIFORNIA.—Adults and nymphs: from *Solanum umbelliferum*, Stanford University, April 24, 1929 (Duncan); from same host, Hillsborough, May 12, 1929. Nymphs only: from same host, Tesla, southeast of Livermore, May 11, 1929; from same host, Clark's Canyon, San Mateo, May 20, 1929; from *Convolvulus*, Stanford University, October 17, 1922 (Ferris); from pepper leaves, Santa Ana, August 31, 1930 (Keifer). Adults only: from *S. umbelliferum*, San Mateo, June 15, 1929; from *Pinus monophylla*, Marangue Peak, Argus Mountains, April 12, 1929; from *Chrysothamnus*, Rock Creek, north of Bishop, June 19, 1931; from *Atriplex*, 3 miles south of Lone Pine, June 19, 1931. NEW MEXICO.—Adults only: from *Salsola pestifer*, 3.5 miles west of Datil, August 6, 1929 (Romney); from same host, .5 mile south of Alma, August 3, 1929 (Romney); from *Senecio filifolius*, 21.5 miles north of Lordsburg, August 10, 1929 (Romney); from unknown host, Mesilla Valley, June 9, 1929 (Romney). UTAH.—Adults only: from beets, Delta, July 27, 1927 (Knowlton); from tomatoes, Hooper, October 14, 1927 (Pack: Knowlton); same data, from willow, same date; from unknown host, June 13, 1930 (Knowlton: Melvin Jones).

Hosts: *Solanum umbelliferum*, *S. nigrum*, *S. tuberosum*, *Cap-sicum annuum*, *Convolvulus*. Nominal Hosts: Alfalfa, arborvitae, spruce, tobacco, petunia, pine, beets, willow, *Datura*, *Lochroma*, *Covillea*, *Erigonum*, *Sophia*, *Norta*, *Chrysothamnus*, *Lepidium*, *Hymenoclea*, *Salsola*.

The nymphs of this species are found on the ventral side of the leaves, on the calyx, and the fruit, the eggs being most common on the younger growth as far as available records show. The nymphs are oval in outline, and closely appressed to the leaf in shallow depressions. The younger nymphs are orange in color, the older nymphs have pale green bodies with the wing pads orange, and the eggs are yellow. This species is evidently of considerable, but imperfectly known, economic importance. There is evidence that it may be of some importance as a carrier of pathogenic organisms infesting economic plants.

PARATRIOZA MACULIPENNIS Crawford. CALIFORNIA.—Adults only: from *Atriplex*, north of Tracy, October 12, 1929 (Annand); from *Lycium*, Darwin Wash, near Marangue Peak, Argus Mountains, April 12, 1930; from grass, Carmichael, Sacramento County, June 25, 1931 (Keifer).

Host: Unknown. Nominal Hosts: *Atriplex*, *Lycium*, *Convolvulus occidentalis*, *Salix*, *Convolvulus arvensis*, *Ceanothus cordulatus*, grass.

TRIOZA BAKERI Crawford. CALIFORNIA.—Adults only: from *Arctostaphylos*, 17.2 miles west of Coalinga, December 8, 1929; from pear trees, Kelseyville, April 8, 1931 (Keifer).

Host: Unknown. Nominal Hosts: *Pinus ponderosa*, *Abies*, *Arctostaphylos*, spruce, pear.

TRIOZA BREVIANTENNATA Crawford. CALIFORNIA.—Adult only: from *Atriplex*, north of Tracy, October 12, 1929 (Annand).

Host: Unknown. Nominal Host: *Atriplex*.

TRIOZA COLLARIS Crawford. CALIFORNIA.—Adults only: from *Baccharis viminea*, Corral Hollow, 10 miles southwest of Tracy, November 4, 1929 (Annand); same data, November (Annand and Klyver); from same host, 5 miles west of Coalinga, (adults mating), December 8, 1929; from same host, Keene, Tehachapi Creek, Kern County, April 13, 1930; from *B. pilularis*, sand dunes, San Francisco, April 3, 1931; from *Salix*, 4.7 miles southeast of Byron on Vasco Road, November 30, 1929; from *Ephedra*, Marangue Peak, Argus Mountains, April 12, 1930. NEW MEXICO.—Adults only: from *Lepidium alyssoides*, 1 mile east of Mesquite, May 26, 1931 (Romney).

Host: (*Baccharis*?) Nominal Hosts: *Baccharis*, *Salix*, *Ephedra*, *Lepidium*.

The skins of a number of last stage nymphs were taken from *Baccharis pilularis* on the sand dunes, San Francisco. While this is not positive proof that these are the skins of *T. collaris* nymphs, it is regarded as very strong circumstantial evidence to this effect, especially in view of the frequency with which this chernid has been taken from *Baccharis*.

The nymphal skins were unaccompanied by conspicuous wax secretion.

*TRIOZA ALBIFRONS* Crawford. CALIFORNIA.—Adults and nymphs; from *Urtica gracilis* var. *holoscracca*, San Mateo Creek, San Mateo, October 25, 1929; from same host, Mallard Lake, Golden Gate Park, San Francisco, November 1, 1929; from same host, south of Tehachapi, Kern County, April 13, 1930; from same host, San Remo, south of Carmel, March 30, 1931; from same host, Smith Creek, Mount Hamilton Road, Santa Clara County, April 18, 1931. Nymph only: taken by sweeping weeds, 3 miles west of Corral Hollow, southwest of Tracy, November 30, 1929. Adults only: from *Urtica*, Three Rivers, Tulare County, April 18, 1930. NEW MEXICO.—Adults only: from *Amaranthus retroflexus*, Brazos, July 18, 1929 (Romney); same data, Chama, same date. Host: *Urtica*. Nominal Hosts: *Amaranthus*, weeds.

The nymphs occur without waxy secretion on the ventral side of the leaves and on the younger growth. This species is especially interesting because of its close relationship to *T. urticae* (L.), the European species infesting nettle.

*TRIOZA FRONTALIS* Crawford. NEVADA.—Adults and nymphs: from *Amelanchier alnifolia*, Zephyr Point, Lake Tahoe, July 16, 1929.

Host: *Amelanchier*.

The nymphs are found on the ventral side of the leaves, unaccompanied by wax. They are not known to occur in abundance.

*TRIOZA OBTUSA* Patch. NOVA SCOTIA.—Adults only: from *Pinus*, Smith's Cove, no date (W. H. Brittain).

Host: *Amelanchier canadensis*. Nominal Host: *Pinus*.

The nymphs are found on the ventral side of the leaves. Un-

like the closely related western species, *T. frontalis*, they produce an abundance of white, floss-like wax.

**TRIOZA MAURA** Forster. CALIFORNIA.—Adults and nymphs: from *Salix lasiandra*, Santa Rosa, July 24, 1922 (Duncan); from *Salix*, Rock Creek, northwest of Bishop, June 19, 1931; from same host, Salinis River bridge, King City, December 8, 1929; from same host, south of Tehachapi, Kern County, April 13, 1930; from same host, Crystal Springs Lake, San Mateo County, May 1, 1930. Nymphs only: from same host, south end of Lake Tahoe, July 15, 1929. Adults only: from *Baccharis viminea*, Corral Hollow, 10 miles southwest of Tracy, November 4, 1929 (Annand); from pear trees, Andrus Island, Sacramento County, April, 1931 (Keifer); from same host, Hood, April 16, 1931 (Keifer); from *Salix*, Corral Hollow, November 4, 1929 (Annand); from *Carex* and weeds, 3 miles west of Corral Hollow, November 30, 1929; from *S. lasiandra*, lower Kern River Canyon, west of Bodfish, June 19, 1931; from *Salix*, 4.7 miles southwest of Byron on Vasco Road, November 30, 1929; from same host, Mountain Springs Canyon, Coso Mountains, April 12, 1930; from same host, near Shepherds Canyon, Argus Mountains, same date; from same host, Savory's Tule Pond, south of Fresno, April 15, 1930; from same host, Old Fort Miller, Fresno County, April 16, 1930. NEW MEXICO.—Adults only: from *Salsola pestifer*, 5 miles north of Salt Lake, June 5, 1929 (Romney). Hosts: *Salix* spp. Nominal Hosts: *Baccharis*, *Salsola*.

The nymphs resemble a scale insect. They are oval in outline and occur very closely appressed to the ventral side of the leaves, forming shallow, blister-like depressions. They do not produce any conspicuous waxy secretion. Rarely have the nymphs been found in great abundance.

**TRIOZA SALICIS** Mally. IDAHO.—Adults only: from grass and shrubs, head of Salmon River, July 19, 1930 (Annand).

Host: Unknown. Nominal Hosts: *Salix* spp., grass, shrubs.

**TRIOZA ALACRIS** Flor. CALIFORNIA.—Adults and nymphs: from bay tree, Ontario, August 10, 1914 (Clausen; J. C. Chamberlin); from bay, Domoto Nursery, Oakland, no date (Ferris); from *Laurus nobilis*, Pasadena, January 24, 1929 (Keifer; E. L. Smith). Adults and eggs; from same host, nursery Ellsworth and Poplar avenues, San Mateo, May 17, 1929. Nymphs only: from same plants, June 17, 1929.

Host: *Laurus nobilis*.

The nymphs cause the leaves to curl ventrally and longitudinally, thicken, redden, and finally to drop. In severe infestation the hosts may be seriously defoliated.

*NEOTRIOZELLA LATICEPS* Crawford. NEW MEXICO.—Adults only: from unknown host, no data (Romney).

Host: Unknown.

*PACHYPSYLLA VENUSTA* Osten Sacken. MISSISSIPPI.—Adults and nymphs: from *Celtis occidentalis*, A. & M. College, January 26, 1931 (Myers).

Host: *Celtis occidentalis*.

This species forms numerous woody, polythalamous galls on the smaller branches and petioles of hackberry.

*PACHYPSYLLA C.-MAMMA* Riley. UTAH.—Adults only: from *Celtis*, Hooper, May 29, 1928 (Pack: Knowlton). Host: *Celtis* sp.

*PACHYPSYLLA DUBIA* Patch. UTAH.—Adults only: from *Celtis*, Hooper, May 29, 1928 (Pack: Knowlton). Host: *Celtis* sp.

*EUPHYLLURA ARCTOSTAPHYLI* Schwarz. CALIFORNIA.—Adults and nymphs: from *Arctostaphylos*, Tesla, Alameda County, May 11, 1929; from same host, Pine Ridge, east of Auberry, Fresno County, August 3, 1929; from same host, Pinnacles National Monument, April 1 and 2, 1931 (Hedgpeth and Smith); from same host, General Grant National Park, July 12, 1930. Nymphs only: from same host, near Deer Creek Inn, Placerville, July 15, 1929; from *A. manzanita*, Julian, August, 1916 (J. C. Chamberlin); from *Arctostaphylos*, Mount Hamilton, October 7, 1922 (Ferris); from same host, Stanford University, June 2, 1923 (Ferris); from same host, Clark's Canyon, San Mateo, March 10, 1930 (Hedgpeth). Adults only: from same host, 17.2 miles west of Coalinga, December 8, 1929. NEVADA.—Adults only: from same host, Zephyr Point, Lake Tahoe, September 1, 1930 (Keifer).

Host: *Arctostaphylos* spp.

The nymphs produce an abundance of white flaky or cottony wax and usually are found in individual cells constructed of this material. They are most prevalent on the ventral side of the leaves, but in severe infestations are found on both sides, as well as on the younger growth including the branches and buds. The leaves may be literally covered with wax cells.

*EUPHYLLURA NEVEIPENNIS* (Schwarz). CALIFORNIA.—Adults only: from *Arctostaphylos*, west of Placerville, July 15, 1929;



from same host, near Deer Creek Inn, Placerville, same date; from same host, Westpoint, Amador County, August 31, 1930 (Hedgpeth).

Host: Unknown. (Probably *Arctostaphylos* spp.) Nominal Hosts: *Arctostaphylos* spp.

*EUPHYLLURA ARBUTI* Schwarz. CALIFORNIA.—Adults and nymphs: from *Arbutus menziesii*, Crystal Springs Road, San Mateo, April 10, 1929.

Host: *Arbutus menziesii*. Nominal Host: Honeysuckle.

The nymphs occur under the bark scales in cells constructed of their white cottony wax secretion, which frequently becomes heavily infested with jet black "sooty mold". In severe infestations the nymphs are also found on the leaves and younger growth.

*EUPHYLLERUS VERMICULOSUS* Crawford. CALIFORNIA.—Adults only: from *Ceanothus*, Green Valley, El Dorado County, May 30, 1931 (Keifer). UTAH.—Adults only: from unknown host, Logan Canyon, August 21, 1925 (Knowlton); from sage, Spring Canyon, altitude 6800 feet, August 28, 1925 (Knowlton).

Host: Unknown. Nominal Host: *Ceanothus*.

*ARYTAINA ROBUSTA* Crawford. CALIFORNIA.—Adults and nymphs: from *Ceanothus*, Black Mountain Road, Hillsborough, May 12, 1929. UTAH.—Adults only: from unknown host, Logan Canyon, Logan, July 24, 1930 (Annand).

Host: *Ceanothus*.

The nymphs occur on the ventral side of the leaves in individual cells constructed of white wax secretion, in which all the nymphal stages occur. The last stage nymph leaves its cell a short time before the last molt.

*ARYTAINA FUSCIPENNIS* Crawford. CALIFORNIA.—Adults and nymphs: from *Ceanothus papillosus*, Cone Peak, Santa Lucia Mountains, April 15, 1923 (Ferris). Nymphs only: from same host, Sierra Morena, October 15, 1922 (Ferris).

Host: *Ceanothus papillosus*. Nominal Hosts: *Ceanothus* spp. Biological data lacking.

*ARYTAINA RIBESIAE* Crawford. CALIFORNIA.—Adults and nymphs: from *Ceanothus thyrsiflorus*, San Francisquito Creek, north of Felt Lake, Stanford University, June 20, 1929. Nymphs only: from same host, May 3, 1929. UTAH.—Adults only: from wild current, Hooper, October 14, 1927 (Pack:

Knowlton); from unknown host, Logan Canyon, Logan, July 24, 1930 (Annand).

Host: *Ceanothus thyrsiflorus*. Nominal Hosts: Wild currant, *Ribes aureum*, *Rhus trilobata*, *Ceanothus* spp.

The nymphs are found in great abundance in white, wax cells on the ventral side of the leaves, and in severe infestations on the petioles and branches. By actual count, as many as fifty-six nymphs have been taken from individual cells on a single leaf.

(To be continued).

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### Notes on Some Stag-Beetles (Coleop.: Lucanidae).

By BERNARD BENESH, North Chicago, Illinois.

In plotting the distribution of the Boreal American Lucanids, I had the pleasure of examining the principal collections in the United States, recording as far as possible the localities, date of capture, etc., for a list to be published in the near future.

Some time ago, in the material sent to me for examination, through the courtesy of Mr. Paul H. Johnson, College of Agriculture, University of Missouri, a very interesting form has come under my notice.

The specimen that I am now describing was collected by some unknown student, who unfortunately forgot to record the locality, but Mr. Johnson assured me that the specimen in question is from the neighborhood of Columbia, Missouri.

PSEUDOLUCANUS PLACIDUS (Say).

♂ Mandibles elongate, 4 m/m long, porrect, curved slightly from the center towards the apex, terminating in an acute point. On the inner edge, one-third from the apex, armed with a single bifid tooth. Length, mandibles inclusive, 27 mm.

Differs radically from the typical form of *P. placidus* (Say), only in the mandibular dentition. Mandibles are not so robust, as in the typical form, are more elongate, showing no indication of the other teeth, as in the regular dentition of *P. placidus*. A male in my collection, number 1042.

An additional shipment of specimens from the same locality arrived in such condition that only the heads of the specimens

were saved. In this shipment two more examples of the above described variant were found, and the heads placed in my collections, numbers 1702-1703.

Not confining myself to the study of Lucanidae, North of Mexico, as have most of our students, I have by correspondence with South American entomologists gotten all the available data on their Lucanid fauna.

In a letter from Mr. Juan Tremoleras, of Montevideo, Uruguay, I was informed that he had a specimen of a Lucanid that he could not determine. Upon my request, he very kindly sent the specimen to me, which proved to be *Mctadorcus rotundatus* (Parry).\*

This extends the habitat of this species from Brazil to Uruguay. Mr. Tremoleras informs me that the specimen was presented to him by Mr. F. O. Lucas, who collected it in the Province Cerro Cañada de los Burros, in 1908, and that it is unique in his collection, since that date. From this I judge that the insect must be rather rare in that locality, probably showing the extreme southern limit of its distribution. Parry originally described the species from Brazil (?), (Proc. Ent. Soc. London, 1862, p. 112) and figured it in the Transactions of the Ent. Soc. London, 1864, pl. 7, fig. 8. Inasmuch as the figure given by Parry does not fully agree with this fine beetle, a photograph of the insect was made for record.

Dr. Didier (in *Études sur les Coléoptères Lucanides du Globe*, fascicule 2, III, Notes synonymiques, p. 53) places *Neolucanus lemeei* Houllbert, as a synonym of *N. robustus* Boileau. In the reference given (*Insecta* 1914, p. 276), an error was noted. It should be *Insecta* 1914, p. 260.

Attention is called to the omission of *Mitophyllus curvidens* Broun (*Ann. Mag. Nat. Hist.* 1904, vol. 14, p. 50) by G. van Roon (in *Junk's Catalogus Colcopterorum*, 1910, Pars. 8, Lucanidae). Although this species has been described for many years, no mention was made of it even in the previous van Roon's "Naamlijst der Lucaniden, welke tot heden beschreven zijn" (*Tijdschrift voor Entomologie*, Deel XLVIII).

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\*The writer wishes to acknowledge gratefully the hearty co-operation of Mr. Paul Nagel, Hannover, Germany, who kindly determined the specimen, and has shown him many favors in his study of the Lucanidae.

**Notes on Coleoptera.—No. 3.\***

By J. N. KNULL, Pennsylvania Forest Research Institute.

The following are a number of miscellaneous rearing records and observations which have been made in the last few years. Since most of the rearing was done indoors, the dates of emergence are omitted unless the material was reared under natural conditions. Clark's Valley is located in the Blue Mountains north of Harrisburg. All of the records are from Pennsylvania unless otherwise stated.

## LYCIDAE

EROS HUMERALIS Fab. Larvae of this insect were found hibernating in partly decayed pitch pine (*Pinus rigida* Miller) logs at Mont Alto.

## CLERIDAE

CYMATODERA BICOLOR Say. Pupae of this insect were found at Dauphin, January 18, in pupal cells in dead yellow birch (*Betula lutea* Mich.) infested with *Trichodesma* larvae and adults. The Clerid larvae had been feeding on the Anobiidae.

LECONTELLA CANCELLATA Lec. An adult was reared by the writer from a larva collected in the nest of a bee under the loose bark of a log, March 27, at Mont Alto, by A. B. Champlain. The insect emerged July 1.

THANASIMUS TRIFASCIATUS Say. Since the previous notes on this insect were published,<sup>†</sup> the following observations were made in Clark's Valley. August 11, several unhardened adults, many pupae and three larvae were found in their pupal cells in the thick bark of a dead white pine (*Pinus strobus* Linn.). In December, mature adults were taken from their pupal cells, thereby proving that the species passes the winter as either adults, or larvae in their transformation cells.

PLOEOPTERUS THORACICUS Oliv. March 6, a larva of this species was found in Clark's Valley, in a small dead branch of witch hazel (*Hamamelis virginiana* Linn.) infested with bark beetles determined by Dr. M. W. Blackman as *Lymanator de-*

\* For Nos. 1 and 2 see Can. Ent., Vol. 57, p. 112-115, 1925. ENT. NEWS, Vol. 41, p. 82-86, 101-102, 1930.

† ENT. NEWS, Vol. 41, p. 82, 1930.

*cipiens* Lec. Adults were reared from dead willow branches collected in the same locality and infested with *Micracis steainci* Black., *Anthaxia viridicornis* Say and *Pogonocherus parvulus* Lec.

HYDNOCERA UNIFASCIATA Say. Reared from dead branches of white oak (*Quercus alba* Linn.) collected in Clark's Valley and infested with *Agrilus defectus* Lec.

H.VERTICALIS Say. Adults were reared from river birch (*Betula nigra* Linn.) infested with *Agrilus betulae* Fisher collected in Clark's Valley.

#### CORYNETIDAE

CREGYA OCULATUS Say. Reared from dead branches of chestnut (*Castanea dentata* Marsh.) collected in Clark's Valley and infested with *Eudercus picipes* Fab. and *Ecyrus dasycerus* Say.

ORTHOPLEURA DAMICORNIS Fab. Reared from dead chestnut (*Castanea dentata* Marsh.) collected in Clark's Valley and infested with *Eudercus picipes* Fab. and *Ecyrus dasycerus* Say.

#### ELATERIDAE

ALAUUS MYOPS Fab. A larva of this species was found in a partly decayed pine log at Promised Land Lake, Pike County, feeding on adult carpenter ants (*Camponotus herculeanus pennsylvanicus* De G.), which were working in the same stick of wood.

LEPTOSCHEMA DISCALCEATUM Say. An adult was found in its pupal cell in a decayed pitch pine (*Pinus rigida* Miller) snag at Cold Springs, Adams County, July 26.

LUDIUS SULCICOLLIS Say. An adult was found in its pupal cell in a decayed pitch pine (*Pinus rigida* Miller) snag at Cold Springs, Adams County, August 16.

L. ROTUNDICOLLIS Say. The adults of this insect seem to be rather rare, probably due to their habits. The larvae on the other hand are fairly abundant, and can be found in the burrows of *Encyclops coerulea* Say and *Microclytus gazellula* Hald. in the outer bark of numerous living deciduous trees. The larvae are predaceous on the larvae of the Cerambycids and work through the galleries of the longhorns.

*ELATER LINTEUS* Say. April 21, a living adult was found under the tight bark of a dead pitch pine (*Pinus rigida* Miller) at Mont Alto.

*E. SELLATUS* Dej. An adult was found August 16, in its pupal cell in a decayed pitch pine (*Pinus rigida* Miller) snag at Cold Springs, Adams County.

*E. VITIOSUS* Lec. Numerous adults were collected in their pupal cells in the decayed wood of dead beech (*Fagus grandifolia* Ehr.) trees at Sweden Valley, September 23.

*E. VERTICINUS* Beduv. During the winter months numerous specimens of this species with thoraces ranging from red to black in color, were found in their pupal cells under the loose bark of partly decayed pitch pine (*Pinus rigida* Miller) at Mont Alto.

*E. SEMICINCTUS* Rand. Adults of this species were found in their pupal cells in a decayed hemlock (*Tsuga canadensis* Linn.) stump at Cold Springs, Adams County, on August 30; also in a decayed sycamore (*Platanus occidentalis* Linn.) log at Caledonia, on March 27.

*E. XANTHOMUS* Germ. Many adults were found during the winter months in their pupal cells under the loose bark of partly decayed pitch pine (*Pinus rigida* Miller) logs on the Mont Alto State Forest, Franklin County. The larvae work through the partly decayed inner bark and make pupal cells between the loose bark and the wood where they transform to adults in the fall.

*MELANOTUS COMMUNIS* Gyll. Adults of this species are found through the winter months in their pupal cells under the loose bark of partly decayed pitch pine (*Pinus rigida* Miller) and white pine (*Pinus strobus* Linn.) logs at Mont Alto.

*M. FISSILIS* Say. Adults were found in their pupal cells in decayed pitch pine (*Pinus rigida* Miller) logs at Mont Alto, during the winter months.

#### MELASIDÆ

*MELASIS PECTINICORNIS* Melsh. On January 16, many living adults were chopped from a dead standing black gum (*Nyssa sylvatica* Marsh.) at Dauphin. The tree was about three inches in diameter and contained larvae also.

FORNAX ORCHESIDES Newm. Pupae of this insect were found in cells in the moist decayed wood in a living beech (*Fagus grandifolia* Ehr.) at Laporte, on September 7.

## BUPRESTIDAE

DICERCA DIVARICATA Say. Adults reared from the dead wood of white oak (*Quercus alba* Linn.) and striped maple (*Acer pennsylvanicum* Linn.) collected in Clark's Valley. Also reared from red oak (*Quercus rubra* Linn.) collected at Towanda.

POECILONOTA CYANIPES Say. The larvae of this beetle work in the sapwood of living poplars (*Populus granidentata* Mich. and *P. tremuloides* Mich.) throughout Pennsylvania. The eggs are laid around wounds or roughened areas on trees often four inches in diameter and the irregular burrows frequently extend up the stems five inches.

CINYRA GRACILIPES Melsh. Adults were reared from dead branches of post oak (*Quercus stellata* Wang.) collected in Clark's Valley.

BUPRESTIS LINEATA Fab. Adults reared June 7, from the thick bark of white pine (*Pinus strobus* Linn.) collected at Black Gap. None of the larvae had entered the wood but confined their burrows and pupal cells to the bark.

AGRILUS SUBCINCTUS Gory. This insect was found breeding in the small dead branches of green ash (*Fraxinus pennsylvanica* var. *lanccolata* Sarg.) at Pond Bank. The dead branches had been killed by the oyster shell scale and the adults were numerous on the foliage of the living trees.

## MELANDRYIDAE

MELANDRYA STRIATA Say. Reared from the wood of dead sassafras (*Sassafras variifolium* Salisby.) collected in Clark's Valley.

(To be continued).

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**Honor to Dr. L. O. Howard Abroad.**

Dr. L. O. HOWARD, whose present address is 12 Quai d'Orleans, Paris, France, has recently been elected to honorary membership in la Société Linnéenne de Bordeaux. JOE S. WADE.

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., FEBRUARY, 1932.

## Entomology at the Convocation Week Meetings, December 28, 1931, to January 2, 1932.

Our annual summary of the entomological items of the programs of the American Association for the Advancement of Science and associated societies, held at New Orleans, Louisiana, follows:

The numbers of papers bearing on insects, including those in symposia and non-duplicating demonstrations were:

Entomological Society of America .....	36
American Association of Economic Entomologists .....	104
American Society of Zoologists .....	10
Same, Genetics Section .....	22
Ecological Society of America .....	3
American Society of Parasitologists .....	9
American Nature Study Society .....	1
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Total .....	185

These papers were distributed in subject as follows:

	i	Taxonomy .....	4
General Entomology ....	5	General Economic Entomology .....	13
Collecting Methods .....	2	Insecticides .....	24
Cytology .....	3	Apiculture .....	13
Anatomy .....	7	Insects Affecting Cereals, Forage and Field Crops .....	18
Physiology .....	21	Do. Truck Crops .....	2
Ecology .....	14	Do. Greenhouse Plants..	1
Behavior .....	1	Do. Fruits and Fruit Trees .....	16
Geographical Distribution.	4	Do. Forest and Shade Trees .....	2
Ontogeny .....	7	Insects Carrying Plant Disease Germs .....	1
Phylogeny .....	1		
Variation .....	4		
Genetics .....	21		
Parasites of Insects ....	5		
Insects, etc., Affecting Man and Other Animals	16		



ii		Hymenoptera (excluding	
Acarina .....	1	Honey Bee) .....	14
Araneina .....	1	Honey Bee .....	15
Orthoptera .....	17	Lepidoptera (e x c l u d i n g	
Isoptera .....	2	Codling Moth, Oriental	
Embiidina .....	1	Peach Moth and Corn	
Ephemerida .....	1	Borers) .....	18
Homoptera .....	11	Codling Moth .....	6
Heteroptera .....	3	Oriental Peach Moth...	1
Thysanoptera .....	1	Corn Borer .....	1
Neuroptera .....	1	Diptera (excluding <i>Droso-</i>	
Coleoptera (excluding Jap-		<i>phila</i> ) .....	20
anese Beetle) .....	23	<i>Drosophila</i> .....	8
Japanese Beetle .....	2	Siphonaptera .....	1

Many of these figures are duplications, both between sections i and ii and also within each section.

The total number of papers was 5 more than those listed for the Cleveland meeting in the preceding year, the Economic Entomologists and the Genetics Section showing marked increases. There were decidedly more papers this year on Genetics, Insects Affecting Man and Other Animals, General Economic Entomology, Insecticides, Apiculture, Orthoptera, Coleoptera and the Honey Bee. There was a noticeable falling off in the number of papers on Cytology, Physiology, Geographical Distribution and Corn Borers.

The Entomological Society of America met on December 29 and 30, under the presidency of Dr. J. W. Folsom, Prof. J. J. Davis, secretary. The symposium was on Blood-sucking and Non-blood-sucking Flies in relation to Human Welfare, the announced participants being F. C. Bishopp, H. H. Schwardt, E. H. Hinman, W. B. Herms and Dr. Ernest C. Faust. The annual public address, Waging War on Insect Enemies of Man and Animals, was given by F. C. Bishopp, illustrated by slides and moving pictures.

The American Association of Economic Entomologists, J. W. Houser, president, A. F. Burgess, secretary, met on December 29, 30 and 31, in sections. The Entomologists' Dinner was held on December 30, at 6 P. M.

### The Weeks Collection of Butterflies (Lepid., Rhopalocera).

By the will of the late Mr. A. G. Weeks, of Marion, Massachusetts, his immense collection of butterflies of the world is given to the Museum of Comparative Zoology at Harvard University. With this is also bequeathed his entomological library and the sum of \$100,000. This collection, long known as the finest butterfly collection in this country, was begun by Mr. Weeks when a young man by the purchase of the butterflies of Otto Poling. Later Mr. Weeks employed collectors to gather butterflies in South America, and published two volumes, beautifully illustrated, describing the new species, "Illustrations of Diurnal Lepidoptera Unknown to Science." In recent years he has added a large amount of valuable material both from collectors and from dealers. The collection is contained in forty-five fine cabinets.—*Science*, Jan. 8, 1932.

### An Additional Note on *Andrena hitei* and *A. ribifloris* (Hymenoptera: Andrenidae).

In the effort to increase our knowledge of *Andrena*, Messrs. Elven Nelson and Cecil Williams, at the University of Colorado, made some careful studies of the morphology. Mr. Nelson paid particular attention to the genitalia, Mr. Williams to the mouth parts. The work of these men cannot be fully utilized until further taxonomic studies have been made, but the following explanation appears necessary. Mr. Nelson has already published (*Entomological News*, 1930, p. 322) a discussion of the sexes of *Andrena hitei* Cockerell. Through careful comparison with the male of the related (European) *A. fulva* Schrank, he concluded that the true male of *A. hitei* is the insect which has been known as *A. ribifloris* Viereck and Cockerell. It is now proper for me to explain, that when I edited Viereck's work on Rocky Mountain *Andrena*, and described the various species, (*Proc. U. S. National Museum*, 48, pp. 1-58 1914), I suppressed a number of Viereck's names, believing them not to represent valid species. Subsequent studies have indicated that I should have suppressed a few more, or reduced them to varietal rank, but in the case of *A. ribifloris* I appear to have confused two or more distinct things. The females (none of them *A. hitei*) which I (pp. 40-41) ascribed to *A. ribifloris*, Viereck originally had under no less than three specific names. The males of this series were set forth as *A. ribifloris* (P. 32) and *A. hemileuca* Viereck, the latter having been referred by Viereck to a species based on females from Washington and Oregon. The type of *A. ribifloris* was a male with the cheeks not angled-tuberculate behind, whereas the supposed

male *A. hemileuca* had them very broad, shining, angled behind. I thought at the time that this might well be a matter of individual variation. Returning to the subject, I now discover that the male called *A. hemileuca* has the stipes of the genitalia with the expanded portion elongate, approximately parallel-sided in the middle, like a knife-blade. On the other hand *A. ribifloris* (using Nelson's specimen) has the stipes with a broad subtriangular expansion and a relatively long narrow neck. Thus they are certainly quite different species. If, as now appears, the *A. ribifloris* examined by Nelson is the true male of *A. hitei*, what about the females formerly ascribed to *A. ribifloris*? It is very likely that the supposed *A. hemileuca* is not actually the species described from the Northwest, and it is a candidate for association with the females described as *A. ribifloris*. If we need another specific name, it will be possible to resurrect one of those first proposed by Viereck, and suppressed by me. But I hope to return to the subject later, and deal with it more adequately.

T. D. A. COCKERELL, Boulder, Colorado.

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#### European Excursions for Entomologists in 1932.

American Entomologists who attend the Fifth International Entomological Congress and the Centenary of the French Entomological Society, in Paris, July 16-23, 1932, will doubtless take advantage of the occasion to visit other parts of Europe.

A joint committee was appointed in December, 1930, by the Entomological Society of America and by the Association of Economic Entomologists to arrange for transportation. In addition to providing for those going directly to the Congress, the arrangements of the Committee include two co-operative excursions through Europe at very moderate costs. While intended primarily for entomologists and their families and friends, others, up to certain limits, will be welcome.

Agreements between north Atlantic steamship companies prevent any actual reduction of the rates for ocean transport, but those going in the groups will be given superior accommodations. Furthermore, the Committee will be glad to accord to any one, whether going as a member of one of the groups or independently, the privilege of sharing in very favorable arrangements that have been made covering transportation in Europe and which will amount to a substantial saving of expense. In order to secure such benefit, reservations for ocean transportation should be made through the committee.

The first group will sail from New York on the Leviathan

June 11, visiting (among other places) Copenhagen, the Gota Canal in Sweden, which will be partly traversed on midsummer night when all the village folk hold festival and dance all night in the open air, Stockholm, Upsala, the summer home of Linnaeus at Hammarby, and thence by rail northward to the Swedish National Park in Lappland where a stay of some days will be made on the arctic tundra at Abisko with views of the midnight sun. Those who wish will have time to continue by excursion steamer to the North Cape and back. Returning to the Continent, some days will be spent in Holland and Belgium before going to Paris for the Congress. After that event there will be a week's excursion in the Pyrenees, arranged by the French local committee of the Congress. Then Avignon will be visited, with an excursion to Orange and the home of Fabre at Serignan. Continuing to Grenoble, the party will traverse the Savoyan Alps by motor coach to Argentières at the foot of Mount Blanc, and after some days continue by motor coach to St. Jeanne de Maurienne, and thence into Italy, where Turin, Genoa, Pisa, Naples, Rome, Assisi, Perugia, Florence, Bologna, and Venice will each be visited. Continuing over the Brenner Pass, a short stay will be made on the Eibsee in the Bavarian Alps, with opportunity to ascend the Zugspitze, Germany's highest peak. Munich, and the three beautifully preserved medieval cities Dinkelsbühl, Rothenburg, and Nuremberg will be visited, Leipzig during the autumn fair, Dresden, the Spreewald, and Berlin. After a final few days in England the party will sail for home September 17 from Southampton. Expenses estimated at about \$800.

The second group will sail from New York on the Olympic July 1, joining the first group in Holland and remaining with them until the Alps. Thereafter they will omit Italy, and make a somewhat swifter tour of Germany, with also a few days in England before sailing, August 27, on the luxurious new liner Manhattan. Expenses about \$550.

Those wishing to go directly to the Congress at the last moment will sail on the Majestic July 8. Estimated expenses including twelve days in Paris about \$325. Combinations of portions of the tours can also be arranged.

These are not conducted tours in the usual sense, but are organized for pecuniary benefit to the individuals comprising a group. The members will be free to follow their own inclinations at the stopping places, and in the larger cities in most cases may take their meals at restaurants of their own choosing. While many of the points to be visited have been selected be-

cause of their importance as entomological centers, all are full of interest from other points of view for the general traveller.

Estimates are based upon tourist class (former second class) at sea, second class railway, unpretentious but thoroughly comfortable and clean hotels, and inexpensive restaurants, with an allowance for side-trips, incidental and personal expenses. They have been kept as low as possible, consistent with comfort, in order to make the trips available for students of limited means, who may look upon them as part of their educational equipment.

Reservations should be made at the earliest date possible. For circulars and information address:

O. A. JOHANSEN, Chairman, Joint Committee of the Entomological Society of America and Association of Economic Entomologists on Transportation to Europe. Roberts Hall, Ithaca, New York.

## Entomological Literature

COMPILED BY LAURA S. MACKEY UNDER THE SUPERVISION OF E. T. CRESSON, JR.

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 figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the list of Periodicals and Serials published in our January and June issues. This list may be secured from the publisher of ENTOMOLOGICAL NEWS for 10c. The number of, or annual volume, and in some cases the part, next, &c. the latter within ( ) follows; then the pagination follows the colon :

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

\*Papers containing new forms or names have an \* preceding the author's name.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

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.

⚡ Note the change in the method of citing the bibliographical references, as explained above.

*Papers published in the Entomological News are not listed.*

**GENERAL.**—Aravena, R. O.—Los insectos de la región Sud-Oeste de la Provincia de Buenos Aires. [104] 3: 243-244. Crevecoeur, F. F.—A versatile Kansas Naturalist, 1862-1931. Obituary by R. C. Smith. [Trans. Kansas Acad. Sci.] 34: 138-144, ill. Dury, C.—Obituary. By A. F. Braun. [43] 31: 512-514, ill. Enderlein, G.—Die insektenfauna Süd-Georgiens. [Sitz. Ges. Naturf. Freunde Berlin] 1930: 235-251. Essig, E. O.—A History of Entomology. 1029 pp., ill.

**Hayward, K. J.**—Cuatro insectos anormales. [104] 3: 245-246, ill. **Hine, J. S.**—Obituary. By C. H. Kennedy. [43] 31: 510-511, ill. **Imms, A. D.**—Social behaviour in insects. 117 pp., ill. **Mousley, H.**—Further notes on the birds, orchids, ferns and butterflies of the Province of Quebec, 1929-1930. [Can. Field Nat.] 46: 1-6. **Scott, J. D.**—A practical method of marking insects in quantitative samples taken at regular intervals. [So. Africa Jour. Sci.] 38: 372-375, ill. **Williams, S. H.**—Preliminary report on the animal ecology of Presque Isle, Lake Erie, Pennsylvania. [Pro. Penna. Acad. Sci.] 5: 88-97, ill.

**ANATOMY, PHYSIOLOGY, ETC.** — **Brown, F. M.** — The utilization of Hexose Carbohydrates by lepidopterous larvae. [An. N. Y. Acad. Sci.] 32: 221-234, ill. **Bryk, F.** — Die abhängigkeit der augenflecke vom flügelgeäder in der gattung Parnassius. [89] 62: 149-174, ill. **Friese, H.** — Wie können schmarotzerbienen aus sammelbienen entstehen? [89] 62: 1-14, ill. **Goldschmidt, R.** — Die entwicklungsphysiologische erklärang des falls der sogenannten treppenallelomorphe des gens scute von Drosophila. [97] 51: 507-526, ill. **\*Hemming, A. F.** — On the types of certain genera of the family Pieridae. [9] 64: 272-273. **Krüger, E.** — Ueber die farbenvariationen der hummelart *Bombus agrorum*. [46] 24: 148-237, ill. **Leech, H.** — *Drosophila funebris* as a host of the fungus *Stigmatomyces*. [Pro. Ent. Soc. Brit. Columbia] 1931: 19-20. **MacGill, E. I.** — The biology of Thysanoptera with reference to the cotton plant. [35] 18: 574-583, ill. **Marcu, O.** — Zur kenntnis der geschlechtsunterschiede der stridulationsorgane bei Curculioniden. [Bull. Sect. Sci. Acad., Roumaine] 14: 124-131, ill. **Miller, F. W.** — Study of the reproductive system of the male and female (oviparous) cocklebur aphid. [Pro. Penna. Acad. Sci.] 5: 75-79, ill. **Mukerji, S.** — On the morphology of the terminal segments of Psychodidae larvae and their taxonomic importance. (With a short comparative account of the microscopic structure of the pseudo-leg of *Phlebotomus argentipes*.) [Indian Jour. Med. Res.] 19: 433-466, ill. **Paterson, N. F.** — A contribution to the embryological development of *Euryope terminalis* (Phytophaga, Chrysomelidae). [So. African Jour. Sci.] 38: 344-371, ill. **Perkins, M.** — Light of glow-worms. [31] 128: 905. **Schmuck & Metz.** — A method for the study of chromosomes in entire insect eggs. [68] 74: 600-601. **Speicher, B. R.** — The effects of

desiccation upon the growth and development of the Mediterranean flourmoth. [Pro. Penna. Acad. Sci.] 5: 79-82, ill. **Uvarov, E. B.**—The ash content of insects. [22] 22: 453-457. **Wigglesworth, V. B.**—The extent of air in the tracheoles of some terrestrial insects. [Pro. R. Soc., Lond.] 109, (B). 354-359, ill.

**ARACHNIDA AND MYRIOPODA.**—*Handbuch der zoologie.*—Kukenthal u. Krumbach. Bd. 3, heft 2. Lief. 1. Th. 3. 160 pp. Arachnida. **Pinkus, L. F.**—How a spider caught and dined upon a six-inch snake. [76] 1932: 80-83, ill.

**THE SMALLER ORDERS OF INSECTS.**—**Beall, G.**—Notes on the termites of British Columbia. [Pro. Ent. Soc. Brit. Columbia] 1931: 33-35. **Geist, R. M.**—Additional Mallophaga from Ohio birds. [43] 31: 505-509. **\*Gemignany, E. V.**—El alotipo de Mallophora vegeta y descripción de una nueva especie. [104] 3: 265-266. (S). **\*Goellner, E. J.**—A new species of termite, *Reticulitermes arenicola*, from the sand dunes of Indiana and Michigan, along the shores of Lake Michigan. [10] 33: 227-234, ill. **\*Liebermann, J.**—Un nuevo género y dos nuevas especies de Thyranópteros argentinos. [104] 3: 211-216, ill. **\*Tillyard, R. J.**—Kansas Permian insects. Part 14. The order Neuroptera. [16] 23: 1-30, ill. **\*Watson, J. R.**—Two new Thyranoptera from Colorado. [39] 15: 51-54.

**HEMIPTERA.**—**\*Ball, E. D.**—New genera and species of leafhoppers related to *Scaphoideus*. [91] 22: 9-19. **Breyer, A.**—Notas sobre cuatro Heterocera argentinos. [104] 3: 207-209, ill. **\*de Carlo, J. A.**—Una nueva especie del género *Lethocerus* y el alotipo de *Lethocerus* (*Belostomidae*). [104] 3: 217-218, ill. (S). **\*Dozier, H. L.**—New and interesting West Indian Homoptera. [40] 510: 24 pp., ill. **\*Haviland, M. D.**—The Reduviidae of Kartabo, Bartica District, British Guiana. [86] 7: 129-154, ill. **Orfila, R. N.**—El genotipo de *Lachnus* (Aphid). [104] 3: 249-250.

**LEPIDOPTERA.**—**Ancona, L.**—Los chilocuiles o gusanitos de la sal de Oaxaca. [An. Inst. Biol., Mexico] 2: 265-277, ill. **Anon.**—Scarcity of the Zebra butterfly. [39] 15: 50. **Breyer, A.**—Los Castniidae argentinos. [104] 3: 233-238, ill. **Gaede, M.**—*Lepidopterorum Catalogus*. Pars 48. *Satyridae* III. 545-759. Pars 49. *Drepanidae*. 60 pp. Pars 50. *Mimallonidae*. 21 pp. **\*Gemignani, E. V.**—Un nuevo *Saturniidae*. [104] 3: 251-252, ill. (S). **Hayward, K. J.**—

Notas sobre una migración de *Pieris phileta* automate. Normas para describir biologías de lepidópteros. [104] 3: 225-232, 257-264, ill. \***Meyrick, E.**—Exotic Microlepidoptera. 4: 129-192. (S). **Miller, E. R.**—*Pholus fasciatus*. [39] 15: 49-50. **Orfila, R. N.**—Adición al catálogo de los Lepidópteros argentinos. [104] 3: 267-268. \***Orfila, R. N.** Estudios de Lepidopterología Argentina. [104] 3: 185-202, ill. \***Prout, L. B.**—Three new Cuban Larentiinae (Geometridae). [71] 37: 133-134. \***Rothschild, L.**—Notes on Syntomidae (Amatidae) with descriptions of new species. (S). [71] 37: 149-158. **Shepard, H. H.**—Lepidopterorum Catalogus. Pars 47. Hesperidae: Subfam. Pyrginae I. 144 pp.

**DIPTERA.**—**Coatney, G. R.**—On the biology of the pigeon fly, *Pseudolynchia maura* (Hippoboscidae). [Parasitology] 23: 525-532. \***da Costa Lima, A.**—Sobre as espécies de Megarbinus do Brasil (Culicidae). [Mem. Inst. Oswaldo Cruz] 25: 307-315, ill. \***Duda, O.**—Die neotropischen Chloropiden. [Folia Zool. & Hydrobiol., Riga] 2: 46-128. **Edwards, F. W.**—Oxford University Greenland Expedition, 1928. Diptera Nematocera. [75] 8: 617-618. \***Enderlein, G.**—Klassifikation der Pantophthalmiden. [Sitz. Ges. Naturf. Freunde Berlin] 1930: 361-376, ill. **England, H. W.**—A bibliographical note on a copy of Wiedemann's "Diptera Exotica," 1820-1821. [75] 8: 613-615. **Hoffman, C. C.** Los simúlidos de la región Onchocerosa de Chiapas. [An. Inst. Biol., Mexico] 2: 207-218, ill. \***Jordan, K.**—Further records and descriptions of fleas from Ecuador. Three new Old World fleas. [71] 37: 135-143, 144-147, ill. \***Malloch, J. R.**—Exotic Muscaridae. [75] 8: 425-446, ill. \***Malloch, Greene & McAtee.** District of Columbia Diptera: Rhagionidae. [10] 33: 213-220. **Marshall, J. F.**—Artificial breeding-places for arboreal mosquitoes. [9] 64: 283. \***Reinhard, H. J.**—Revision of the American parasitic flies belonging to the genus *Winthemia*. [50] 79, Art. 20: 54 pp., ill. **Spencer, G. J.**—The oviposition habits of *Rhyncocephalus sackeni*. (Nemestrinidae). [Pro. Ent. Soc. Brit. Columbia] 1931: 21-24, ill.

**COLEOPTERA.**—\***Arrow, G. J.**—The coleopterous genus *Trichillum* (Copridae) with a key to the species. (S). [75] 8: 609-611. **Daguerre, J. B.**—Costumbres nupciales del *Diloboderus abderus*. [104] 3: 253-256, ill. **Dallas, E. D.**—



Cópula entre Calosomas de diferentes especies. [104] 3: 219-224, ill. **Dallas, E. D.**—*Euchroma gigantea* anormal. [104] 3: 269-270, ill. **Gamble, J. T.**—Studies on the ecology and distribution of Aquatic beetles of Presque Isle, Lake Erie, Penn. [Pro. Penna. Acad. Sci.] 5: 97-100. \***Hustache, A.**—Six nouveaux Coléoptères (Curculionidae, Zygopini) de l'Amérique méridionale. [75] 8: 522-528. \***Pic. M.**—Notes diverses, nouveautés. (S). [L'Ech. Rev. Linné., Moulins] 47: 103-108. **Roberts, A. W. R.**—A note on the hatching of some weevils (Curculionidae) from the egg. [75] 8: 593-596. **Stichter, G. B.**—Is the flight of the Japanese beetle necessarily restricted to a few months of the year? [Pro. Penn. Acad. Sci.] 5: 40-42. **Tremoleras, J.**—Notas sobre Carabidos platenes. [104] 3: 239-242. \***Tremoleras, J.**—Deux Carabiques nouveaux de l'Uruguay. [104] 3: 247-248. \***Uhman, E.**—Neue Hispinen von Costa Rica. [Folia Zool. & Hydrobiol., Riga] 2: 135-144.

**HYMENOPTERA.**—**Bischoff, H.**—Zur kenntnis der gattung *Pseudovespa*. [Sitz. Ges. Naturf. Freunde Berlin] 1930: 329-346, ill. **Bischoff & Hedicke.**—Ueber einige von Illiger beschriebene Apiden. (S). [Sitz. Ges. Naturf. Freunde Berlin] 1930: 385-392. \***Cockerell, T. D. A.**—Descriptions and records of bees. (S). [75] 8: 537-553. **Hinman, E. H.**—*Pediculus* (*Parapediculus*) *atelophilus* 1926 from the red spider monkey, *Ateles geoffroyi*. (S). [Parasitology] 23: 488-491, ill. **Lahille, F.**—Un hormiguero en una espma. [104] 3: 203-205, ill. \***Santschi, F.**—Contribution a l'étude des fourmis de l'Argentine. [An. Soc. Cien. Argentina] 112: 273-282, ill. \***Weld, L. H.**—Additional notes on types with description of a new genus (*Cynipidae*). [10] 33: 220-227, ill.

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COMMON PESTS. How to Control Some of the Pests That Affect Man's Health, Happiness and Welfare. By RENNIE W. DOANE. 384 pp., ill.. Springfield, Illinois, Charles C. Thomas, Publishers. 1931. \$4.00. This handy-sized book should find a welcome place in the reference library of the farmer, the stockman, the gardener and the householder. Herein the author has given, in such sequence and groupings as to be most readily referred to, the essential facts, gleaned from the many larger and more expensive books and the many government and state bulletins, about the more common pests that

directly affect man, his domestic animals, his plants, his crops, his storehouse, and his home and health, with practical suggestions as to their control. Insects, on account of their numbers, being man's greatest enemies, comprise the bulk of the items; but other animal pests such as spiders, mites, ticks, parasitic worms, mammals and birds are included. The book is divided into two sections: Pests of man and domestic animals, and insect control and some important pests of the orchard, garden, field and household. Unfortunately no bibliography is given, but this was probably omitted in order to keep the book within reasonable bounds and price.

E. T. CRESSON, JR.

### OBITUARY.

Although late in publishing this record, the NEWS should not allow the passing of FREDERICK ARTHUR GODFREY MUIR to go unnoticed. He was born at Clapham, England, April 24, 1872, and died near Horsham, Sussex, May 13, 1931. Obituaries by W. E. China and J. J. Walker appeared in the July, 1931, numbers of *The Entomologist* and *The Entomologist's Monthly Magazine* respectively. Muir was in the employ of the Eastern Telegraph Company at various African stations from 1886 to 1905, but was always intensely interested in insects, encouraged by Dr. David Sharp, who induced him to turn to the career of a practical entomologist. From 1905 to 1927 he was one of the entomologists of the Hawaiian Sugar Planters' Association and, as such, the successful introducer of insect enemies of the cane-borer beetle, the sugar-cane leaf hopper and injurious lamellicorns. Dr. Howard also, in his recent book, *The Insect Menace*, has given an interesting account of Muir's labors, difficulties and final triumph in bringing the first of these parasites, the Tachinid, *Ceromasia sphenophori*, into Hawaii. Muir did excellent work on the anatomy of the male genital tube of Coleoptera, the head and mouth parts of Homoptera and, above all, on the structure and classification of the Fulgoroidea. He attended the International Congress of Entomology at Ithaca, in August, 1928, where many Americans had the pleasure of making his acquaintance.

MARCH, 1932

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JOHN HENRY COMSTOCK, 1849-1931.  
Portrait of 1884.



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**TO CONTRIBUTORS.** All contributions will be considered and passed upon at our earliest convenience and, as far as may be, will be published according to date of reception. The receipt of all papers will be acknowledged. Owing to the limited size of each number of the News, articles longer than six printed pages will be published in two or more installments, unless the author be willing to pay for the cost of a sufficient number of additional pages in any one issue to enable such an article to appear without division.

Proof will be sent to authors. Twenty-five "extras" of an author's contribution, without change in form and without covers, will be given free when they are wanted; if more than twenty-five copies are desired *this should be stated on the MS.*

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 American Entomological Society will be held at 7.30 o'clock P. M., on the fourth Thursday of each month, excepting June, July, August, November and December, and on the third Thursday of November and December.

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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## **The Probable Occurrence in the Thysanuroid Insect *Machilis heteropus* Silv. of a Structure Homo- logous with the Second Antenna.**

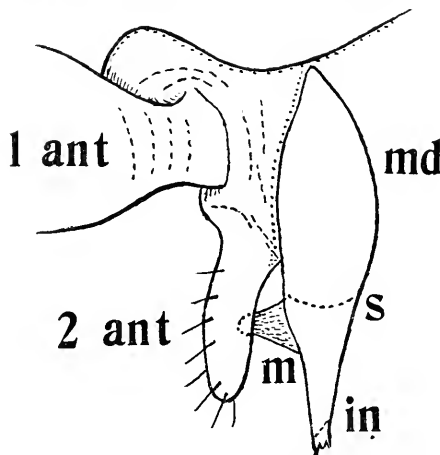
By G. C. CRAMPTON, Ph.D., Massachusetts State College,  
Amherst, Mass.

Several years ago, the late Mr. F. Muir sent to me a pencil sketch of a peculiar structure which he had found in a Machiloid insect, presumably *Machilis heteropus* Silv., which was probably captured in Hawaii, where Mr. Muir was living at that time. I no longer have the letter which accompanied the sketch, so that I am unable to say whether the structure in question occurs in only one, or both sexes of *M. heteropus*, but as I recall his description of it, the structure is a lobe-like projection occurring between the base of the antenna and the mandible, as is shown in the accompanying drawing, which I have made from the rough pencil sketch sent by Mr. Muir.

Mr. Muir suggested that, from its location, and the fact that it serves to connect the base of the antenna with the mandible, this structure might represent the lobe of a basal segment of the antenna ("ischiopodite") while the mandible might represent another lobe of a basal segment of the antenna. I pointed out to him that embryology would permit no such interpretation of these parts, and made the suggestion that this structure might represent the second antenna, which, according to Uebl 1897 (Beitr. zur Entwicklungsgeschichte von *Campodea staphylinus* Westw., Zool. Anzeiger, 20, p. 125) is also preserved in the head of adults of *Campodea*, as a small lobe situated between the labrum and the maxilla, in the space left free by the retracted mandible (*teste* Snodgrass, 1928, Smith. Misc. Collections, Vol. 81, No. 3, p. 59- who likewise finds a papilla in this region in the grasshopper *Dissosteira*).

I urged Mr. Muir to publish an account of this structure in *Machilis*, but other matters intervened, and this was never done. The matter should not be allowed to lapse, however, since I

think that this discovery is of the greatest importance. *Machilis* is one of the most "crustaceoid" of the Insecta and if it can be proved that a structure homologous with the second antennae of Crustacea actually occurs in any species of *Machilis*, this would be proof positive that the Insecta are descended from Crustacea, since the Crustacea are the only forms typically exhibiting two pairs of antennae. The other structures of *Machilis* are so "crustaceoid" that the occurrence of a second pair of antennae in *Machilis* is all that is needed to prove beyond all doubt that it is a more or less direct descendant of the Crustacean stock! I have therefore reproduced Mr. Muir's figure in the hopes that anyone having specimens of *Machilis heteropus* Silv., will examine both sexes of this insect and publish a detailed account of the structures in question—and if the embryology of *Machilis* can be studied with a view to tracing



The figure shows the sinistral mandible and the base of the sinistral antenna of *Machilis heteropus* Silv., in which there apparently occurs a pair of vestigial second antennae located between the bases of the antennae and the mandibles. 1, *ant* is the base of the antenna; 2, *ant* is the supposed second antenna; *md* is the mandible; *m* is the mola; *m* is the incisor region; and *s* is the suture dividing the mandible into a basal and distal region.

the development of the tritocerebral appendages in its embryo (and also the development of its paragnatha to prove that these are homologous with the paragnatha of Crustacea) such a study would be invaluable for deciding the moot question of the origin of the class Insecta.

In the meantime, I would suggest that the structure labelled *2 ant* in the accompanying figure of *Machilis heteropus* Silv., is actually the homologue of the second antennae of Crustacea, since it occupies exactly the correct position for such a structure (*i. e.* between the base of the first antenna and the mandible). Some species of *Machilis* is exactly the type of crustaceoid insect in which one would expect to find vestigial second antennae located in their normal position between the bases of the first antennae and the mandibles, instead of being in the unnatural position between the labrum and maxilla characteristic of the supposed vestiges of the second antennae in the adult of *Camptodeca*, or the small papilla supposedly representing the second antennae in *Dissosteira* (which is a rather specialized insect to have preserved vestiges of the second antennae which are lost even in the embryonic stages of most insects above the Apterygota). I have no reason to doubt that Mr. Muir's figure was correct in all essential details, and I am convinced that *Machilis heteropus* Silv., has actually preserved a pair of vestigial second antennae, if Mr. Muir's identification of the insect sketched by him is correct.

That the accompanying figure is of a Machiloid insect is proven by the fact that it has a typical Machiloid mandible with a set-off incisor region labelled *in* in the accompanying figure, and with a prolonged molar region, or mola, labelled *m* in the figure. There is also a typical suture labelled *s*, dividing the mandible *md* into a basal and distal region characteristic of *Machilis*, so that there can be no doubt that the figure was sketched from a Machilid originally, the only question in my mind being whether the identification of the Machiloid was correct or not, and on this account I would again urge those possessing specimens of *Machilis heteropus* to examine these insects and either publish on their findings, or allow me to study them with this in view, since the finding of such comparatively well developed relics of the second antennae in the crustaceoid insect *Machilis* is of intense interest to every student of the phylogeny of insects, and the importance of such a find cannot be overemphasized!

## A New Species of *Loboptera* Brunner (Orthoptera : Blattidae, Pseudomopinae).

By MORGAN HEBARD, Philadelphia, Pennsylvania.

Dr. Roland Thaxter last year sent us a series of a small subapterous cockroach, which he had found common in rubbish and leaf litter in a small wood-lot, planted on the grounds of the Normal School of Agriculture at Llavallol, near Buenos Aires, Argentina.

This insect proves to represent a new species of the Old World genus *Loboptera*, which we take pleasure in naming in honor of its captor. We are convinced that it is an introduction in South America from southern Europe or northern Africa, where closely related species are native. Furthermore, it may be parthenogenetic in the Argentine, as all of the fifteen specimens secured are females.<sup>1</sup>

*Loboptera thaxteri* new species. Figures 1 and 2.

This insect is closely related to the south European *Loboptera decipiens* (Germar), differing in the structure of the female subgenital plate and in features of coloration. Some resemblance to *Loboptera maroccana* Bolivar is also shown, but that larger species is quickly distinguished by the solidly dark abdomen.

*Type*: ♀; Llavallol, Buenos Aires, Argentina. April, 1916. (R. Thaxter.) [Museum of Comparative Zoology.]

Agrees with *decipiens* in all structural features except the subgenital plate. Surface glabrous, microscopic hairs scarcely perceptible except caudad. Head slightly broader than deep, vertex rounding evenly into face, interocular width distinctly greater than that between the antennal sockets, minute ocellar spots indicated.<sup>2</sup> Palpi very short,<sup>2</sup> fourth joint about three quarters as long as fifth. Pronotum evenly weakly convex;<sup>2</sup> caudal margin almost transverse, weakly convex. Tegmina represented by pads<sup>2</sup> which faintly surpass the mesonotum, less than twice as long as greatest width; sutural margin briefly weakly divergent from costal margin, then evenly con-

<sup>1</sup> We know *Pycnoscelus surinamensis* to be almost always parthenogenetic in America, whereas in the Asiatic portions of its distribution males are often if not always as frequently found as females.

<sup>2</sup> These features are probably of generic rather than specific importance.



verging toward that margin to the rather broadly rounded apex. Supra-anal plate strongly transverse, triangular, with sides very broadly concave and apex broadly rounded (sometimes showing a trace of incision). Subgenital plate ample, with a medio-longitudinal distal cleft, thus forming two rounded triangular, slightly produced apical flaps, the area which they occupy concave (in this material, dried after immersion in a liquid preservative, these flaps are sometimes curled inward very strongly). Ventro-cephalic margin of cephalic femora armed with a series of heavy elongate spines which distad gradually de-

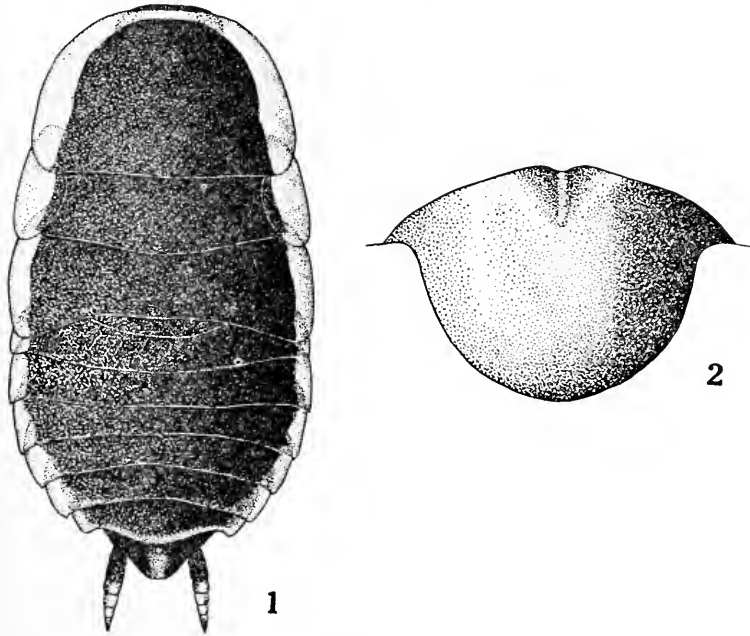


Fig. 1.—*Lobopectera thaxteri* new species. Dorsal view of type. ( $\times 6$  ).  
 Fig. 2.—Same. Dorsal view of subgenital plate, of female type.  
 (Much enlarged.)

crease to a series of minute piliform spines, terminating in three heavy spines, elongate in strongly increasing ratio distad.<sup>2</sup> Caudal metatarsus slightly longer than combined length of the succeeding joints, with two rows of minute spines ventrad and a distal pulvillus; ventral surface of succeeding joints fully occupied by pulvilli. A moderately large arolium present between the simple, symmetrical tarsal claws.<sup>2</sup>

Surface shining blackish brown. Margined dorsad by a moderately broad buffy band which, unlike in *decipiens*, is continued around the cephalic margin of the pronotum and also covers all (instead of only slightly over half) but the sutural margin of the tegminal pads. Caudad the fifth and sixth abdominal tergites have their free margins narrowly paler, the succeeding tergites (two of these very narrow and often hidden) wholly dark, but the supra-anal plate buffy disto-mesad. Cerci dorsad solidly dark proximad but with distal half buffy, ventrad buffy with extensive proximal portions of proximal segments alone dark. Ocellar spots and limbs brownish buff. Abdomen ventrad, unlike in *decipiens*, with lateral margins (but not distal margin of subgenital plate) narrowly buffy.

The color differences from *decipiens* are more significant since the described series of *thaxteri* is very dark in general coloration but the pale markings are both more numerous and more extensive.

The fourteen paratypic females are divided between the Museum of Comparative Zoology and the author's collection.

Length of body 7.7 to 9.6, length of pronotum 2.13 to 2.84, width of pronotum 3.12 to 4.26, exposed length of tegmen 1.06 to 1.49, greatest width of tegmen .62 to .80 mm. (by micrometer).

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### Notes on Coleoptera.—No. 3.

By J. N. KNOLL, Pennsylvania Forest Research Institute.

(Continued from page 45.)

#### BOSTRICHIDAE

*XYLOBIOPS BASILLARE* Say. Reared in numbers from dead wild grape vine collected at Mont Alto.

#### CERAMBYCIDAE

*TESSAROPA TENUIPES* Hald. Adults were reared from dead chestnut (*Castanea dentata* Marsh.) branches about 3/16 of an inch in thickness collected at Mont Alto. The insect was found to pass the winter in both the larval and pupal stages.

*HYPERMALLUS INCERTUS* Newm. This insect was found working in the thick outer bark of dead rock oak (*Quercus prinus* Linn.) in Clark's Valley. The larvae had made irreg-

ular galleries through the bark and were passing the winter in their pupal cells.

*CENTRODERA PICTA* Hald. A living unhardened adult was chopped from its pupal cell in the decayed part of a living yellow birch (*Betula lutea* Mich.) at Laporte, September 7.

*ANOPLODERA RUBRICA* Say. Reared from the dead decayed wood of hickory collected in Clark's Valley.

*A. MINNESOTANA* Csy. Reared from the dead decayed wood of hickory and black gum (*Nyssa sylvatica* Marsh.) collected in Clark's Valley.

*A. BIFORIS* Newm. This insect was found breeding in decayed hemlock (*Tsuga canadensis* Linn.) stumps at Cold Springs, Adams County.

*A. MUTABILIS* Newm. Reared from the dead decayed wood of willow and black gum (*Nyssa sylvatica* Marsh.), wild black cherry (*Prunus serotina* Ehr.) and black birch (*Betula nigra* Linn.) collected in Clark's Valley.

*TYPOCERUS VELUTINUS* Oliv. Reared from the dead decayed wood of hickory collected in Clark's Valley.

*ENCYCLOPS COERULEA* Say. Found breeding in the outer bark of living black ash (*Fraxinus nigra* Marsh.) on the Mont Alto State Forest.

*NEOCLYTUS KIRBYI* Auriv. Reared from the dead branches of post oak (*Quercus stellata* Wang.) collected in Clark's Valley.

*ANTHOBOSCUS RURICOLA* Oliv. Reared from the wood of dead red maple (*Acer rubrum* Linn.), linden (*Tilia americana* Linn.) and striped maple (*Acer pennsylvanicum* Linn.) collected in Clark's Valley.

*CLYTUS MARGINICOLLIS* Cast. Reared from the dead branches of long-leaved pine (*Pinus palustris* Mill.) collected at Cape Henry, Va.

*PURPURICENUS HUMERALIS* Fab. Reared from dead black locust (*Robinia pseudo-acacia* Linn.) seedling about  $\frac{3}{4}$  of an inch in diameter collected in Clark's Valley.

*P. AXILLARIS* Hald. Reared from pruned branches of rock

oak (*Quercus prinus* Linn.) and post oak (*Q. stellata* Wang.) collected in Clark's Valley.

AEGOMORPHUS DECIPENS Hald. Reared from dead blue beech (*Ostrya virginiana* Miller) collected at Bald Eagle and from dead willow collected in Clark's Valley.

LEPTURGES SIGNATUS Lec. Reared from dead branches of basswood (*Tilia americana* Linn.), black oak (*Quercus velutina* Lamb.) and chestnut (*Castanea dentata* Marsh.) collected in Clark's Valley.

HYPERPLATYS MACULATA Hald. Reared from a dead branch of willow collected in Clark's Valley

H. ASPERSA Say. Reared from dead shadbush (*Amelanchier canadensis* Linn.) branches collected in Clark's Valley.

ACANTHOCINUS NODOSUS Fab. Reared from the bark of dead pitch pine (*Pinus rigida* Miller) collected at Mont Alto. The larvae work through the bark and form pupal cells within it the latter part of July.

ECYRUS DASYCERUS Say. Adults reared from dead basswood (*Tilia americana* Linn.) branches collected in Clark's Valley.

EUPOGONIUS TOMENTOSUS Hald. Reared from dead long-leaved pine (*Pinus palustris* Miller) branches collected at Cape Henry, Va.

OBBEREA SCHAUMI Lec. Adults reared from living large-toothed aspen (*Populus grandidentata* Mich.) and American aspen (*Populus tremuloides* Mich.) collected at various points on the Allegheny Plateau. Trees up to 3 inches in diameter are some times infested and the larvae do not work down into the roots as some of the other members of the genus do. The work is usually up the stem including side branches, with holes to the exterior at different points for exuding frass.

O. TRIPUNCTATA Swed. Reared from branches of living mocker nut hickory (*Cary alba* Linn.) collected in Hinton County; also from a living branch of witch-hazel (*Hamamelis virginiana* Linn.) collected in Clark's Valley.

O. TRIPUNCTATA var. *mandarina* Fab. Reared from a living branch of sweet viburnum (*Viburnum lentago* Linn.) collected at Pond Bank.

## CURCULIONIDAE

EUSPHYRUS WALSHI Lec. Reared from dead bittersweet (*Celastrus scandens* Linn.) vine collected in Clark's Valley.

BRACHYRHINUS SULCATUS Fab. Numerous plants of English ivy (*Hedera helix* Linn.) were practically defoliated by the adults of this species which appeared in numbers the latter part of June. The adults are nocturnal and could not be found in the day time.

THYSANOCNEMUS BISCHOFFI Blatch. White ash (*Fraxinus americana* Linn.) seeds infested with the larvae of this insect were found at Good Siding, Franklin County, by Prof. G. S. Perry and Chester A. Coover. The larvae crawl from the seeds in the spring after they have fallen to the ground and enter the soil for pupation. Not more than one larva was found to a seed and dark spots on the outside of the infested seeds indicated the points where the eggs had been laid. Mr. Coover figured that 7.3% of the seeds on the trees were infested. The seeds from the tops showed 3.65% weeviling; the middle portions 6.85% and seeds from the bases of the trees showed 11.3% infestation. (Species determined by L. L. Buchanan.)

CEUTORHYNCHUS RAPAE Gyll. Adults were destructive to nasturtium foliage during June and the fore-part of July, at Mont Alto. The feeding was usually at the edges of the leaves. (Species determined by L. I. Buchanan.)

CRYPTORHYNCHUS FALLAX Lec. Reared from dead basswood (*Tilia americana* Linn.) branches collected in Clark's Valley. (Determined by Chas. Liebeck.)

## SCOLYTIDAE

SCOLYTUS PICEA Sw. Near Bernice, small black spruce (*Picea mariana* Miller) affected by the 1930-31 drought were infested with this insect. The adults emerged from caged sticks in September.

CNESINUS STRIGICOLLIS Lec. This insect was found overwintering in the adult stage in small twigs of dead chestnut (*Castanea dentata* Marsh.) at Mont Alto. The adults had burrowed out the central portions of the stems and usually

two beetles were found in one gallery. (Determined by Dr. M. W. Blackman.)

*MICRACIS OPACIOLLIS* Lec. Adults found through the winter months in small dead chestnut (*Castanea dentata* Marsh.) twigs at Mont Alto.

*CORTHYLUS PUNCTATISSIMUS* Zimm. August 1, F. M. Trimble called the writer's attention to this species working in the stems of fetter bush (*Leucothoe catesbaei* Walt.) at Frazer.

*CONOPHTHORUS CONIPERDA* Sz. Dead adults of this species were found in small immature cones of pitch pine (*Pinus rigida* Miller) at Mont Alto.

*PITYOPHTHORUS PULCARIUS* Zimm. This insect was found working in the immature cones of pitch Pine (*Pinus rigida* Miller) at Mont Alto, and in the small stems of Austrian pine (*Pinus laricio* var. *austriaca* Endl.) affected by the 1930-31 drought at Philadelphia. (Determined by Dr. M. W. Blackman.)

*P. NUDUS* Sw. Found breeding in the small dead branchlets of Scotch pine (*Pinus sylvestris* Linn.) at Pond Bank.

*P. BELLUS* Blackm. Adults were taken under the bark of dead Scotch pine (*Pinus sylvestris* Linn.) collected at Pond Bank on July 24. (Determined by Dr. M. W. Blackman.)

*P. MUDUS* Blackm. July 31, adults were found under the bark of black spruce (*Picea mariana* Miller) trees killed by drought near Bernice. (Determined by Dr. M. W. Blackman.)

*P. PULCHELLUS* Eich. Adults were found under the bark of pruned Austrian pine (*Pinus laricio* var. *austriaca* Endl.) branches at Mt. Carmel, August 1.

*PITYOGENES LECONTEI* Sw. Adults of this species were found under the bark of dead Scotch pine (*Pinus sylvestris* Linn.) at Pond Bank, on March 8; working under Virginia scrub pine (*Pinus virginiana* Miller) bark in Kansas Valley, Perry County, on May 11 and under the bark of red pine (*Pinus resinosa* Aiton) at York, on May 20.

Dr. M. W. Blackman kindly determined the specimens and compared the material with the type in the Leconte collection.

Since this species was described\* from a unique female in

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\* J. M. Swaine—Tech. Publication No. 2, N. Y. State Col. Forestry, v. 16, No. 1, 1915.

the Leconte collection, a brief description of the male is as follows:

Robust, reddish brown in color. Head with front broad, slightly convex, punctate toward vertex, granulate punctate below, a shining flat impunctate median area; clothed with fine pubescence. Eyes oval, coarsely granulate, inner margin sinuate. Antennae lighter in color than the rest of the insect, club flattened, circular in outline, first and second sutures nearly straight.

Pronotum longer than wide, slightly wider than elytra, widest back of middle, constricted at base, sides subparallel, broadly arcuate anteriorly, anterior margin elevated, serrulate, surface covered with blunt asperities toward front, posteriorly coarsely but not closely punctate, a medium longitudinal raised smooth impunctate area and an oval lateral areas on each side, pubescence of disk sparse, longer and denser laterally.

Elytra with sides subparallel, accurate anteriorly, surface shining, coarsely punctured toward base, punctures diminishing in size and surface becoming somewhat rugose near declivity, punctures irregularly placed, those of interspaces nearly equal in size, pubescence long, sparse. A long slender tooth curved downward at tip, arising from opposite the end of the second atria, elevated margin of declivity with several blunt tubercles, a prominent tooth on each side near apex.

Size of males ranging from 2 mm. long, .8 mm. wide, to 2.8 mm. long and 1 mm. wide.

*ANISANDRUS OBESUS* Lec. Adults were chopped from their burrows in dying large-toothed aspen (*Populus grandidentata* Mich.) on July 3, at Promised Land Lake, Pike County. (Determined by Dr. M. W. Blackman.)

*A. SAYI* Hopk. Adults were found working in dying fire cherry (*Prunus pennsylvanica* Linn.) at Laporte, July 24, and dead chestnut (*Castanea dentata* Marsh.) branch in Clark's Valley, February 14. (Determination by Dr. M. W. Blackman.)

*DRYOCOETES BETULAE* Hopk. Adults, larvae and pupae of this insect were found under the bark of a dying mountain ash (*Pyrus americana* Marsh.) at Ricketts, on September 7.

*LYMANTOR DECIPIENS* Lec. Adults were found in a small branch of dead witch-hazel (*Hamelis virginiana* Linn.) in Clark's Valley. (Determined by Dr. M. W. Blackman.)

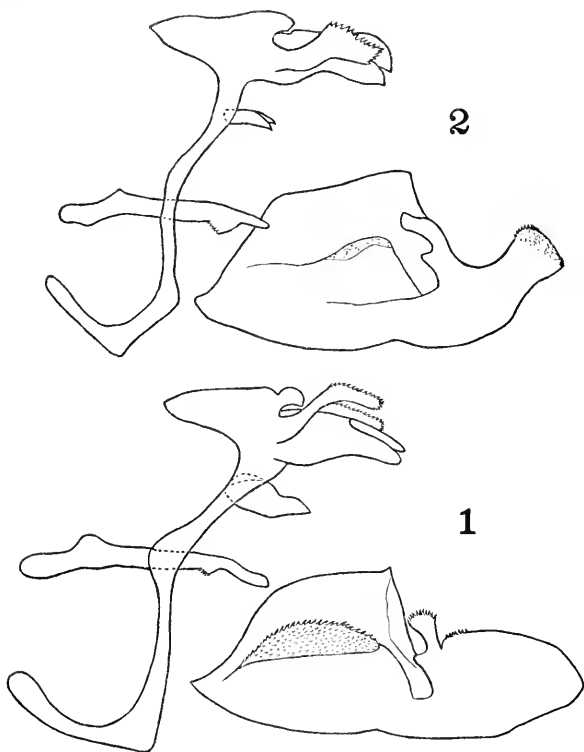
**New Species of *Pyrrhopyge* (Lepid.: Hesperidae).**

By E. L. BELL, Flushing, New York.

***Pyrrhopyge guianae* new species. (Fig. 1).**

Male. *Upperside*. Primaries and secondaries greenish-black. *Beneath*. Both wings greenish-black, primaries paler at the base and inner marginal area. Fringes of both wings white, darkened at the apex of the primaries. Thorax and abdomen on both surfaces greenish-black. Shoulder-covers, tegulae and pectus greenish-black. Head, collar, palpi and anal tuft red. Antennae black, the club brown beneath.

Expanse: 58 mm.



*Holotype* male, French Guiana, in collection of the Academy of Natural Sciences, Philadelphia, Pa.

This species belongs in the division of the typical group of the genus *Pyrrhopyge* containing *zenodorus* Godman and Sal-



vin, to which it bears a superficial resemblance, the color of the head, collar, palpi and anal tuft being a little darker red. It also bears more or less superficial resemblance to the other members of this division, but may be distinguished from them all by the peculiar form of the male genitalia.

The flanges at the base of the uncus are rather narrow and serrate on the dorsal edge and apex. The claspers terminate in a broad, irregularly rounded arm with a few small serrations at the base of the dorsal edge, back of which rises a short projection, serrate on the rounded apex. The inner plate of the disc carries a considerable number of short teeth.

***Pyrrhopyge cressoni* new species.** (Fig. 2).

Male. *Upperside*. Primaries and secondaries greenish-black. *Beneath*. Same color as above, the primaries at the base and below vein 2 paler; the secondaries with a rather irregular white basal area, poorly defined on the outer edge, and sometimes sprinkled with black scales. In the paratype from Ecuador there is also a small white dot on the underside of the primaries below the costal vein toward the base.

Fringes white on both wings, darkened at the apex of the primaries. Thorax and abdomen greenish-black on both surfaces. Shoulder-covers and tegulae greenish-black. Collar black. Head, palpi, pectus and anal tuft red. Antennae black, the club brown beneath.

Expanse: 54 mm.

*Holotype* male, Buena Vista, 75 km. n. w. of Santa Cruz, Bolivia, 450 m. alt. (Steinbach), and one male *paratype*, Ecuador, in collection of the Academy of Natural Sciences, Philadelphia, Pa.; one male *paratype*, same data as the holotype, in the collection of the author.

Named for Mr. E. T. Cresson, Jr., of Philadelphia, Pa.

This species is a member of the typical group of the genus *Pyrrhopyge* and belongs in the division containing *phidias* Linnaeus and the other species associated with it in having a white basal area of the secondaries beneath, from all of which *cressoni* may be superficially distinguished by the red pectus.

The termination of the claspers is somewhat like that of *draudti* Bell, but the projection arising from the dorsal edge

of the terminal arm at the base is quite different in shape. The flanges arising from the base of the uncus are very large and deeply serrate on the dorsal edge and apex, in *draudti* they are narrower and more elongate.

The measurement of expanse is twice the distance from the center of the thorax to the apex of one primary.

### Biological Notes and New Records of North American Chermidae (Homoptera).

By F. D. KLYVER, San Mateo Junior College, San Mateo, California.

(Continued from page 40.)

*ARYTAINA ASSIMILIS* Crawford. CALIFORNIA.—Adults only: from *Ceanothus*, Black Mountain Road, Hillsborough, May 5, 1929; from *C. cuneatus*, Clark's Canyon, San Mateo, May 21, 1929; from same host, Tehachapi Pass, Kern County, April 13, 1930; from same host, Table Mountain, Fresno County, April 16, 1930.

Host: Not definitely known. (Probably *C. cuneatus*.) Nominal Hosts: *Ceanothus* spp.

*ARYTAINA MINUTA* Crawford. CALIFORNIA.—Adults and nymphs: from *Ceanothus cuneatus*, Clark's Canyon, San Mateo, May 20, 1929; same data, June 24, 1929. Adults only: from *Ceanothus*, summit of Peachtree Grade, west of Coalinga, December 8, 1929; from *C. cuneatus*, lower Kern River Canyon, west of Bodfish, June 19, 1931.

Host: *Ceanothus*.

Biological data incomplete.

*ARYTAINA CEANOTHIAE* Crawford. CALIFORNIA.—Adults and nymphs: from *Ceanothus*, Black Mountain Road, Hillsborough, May 12, 1929; from *C. cuneatus*, Table Mountain, Auberry, Fresno County, April 16, 1930; from *C. thyrsiflorus*, San Remo, south of Carmel, March 30, 1931.

Host: *Ceanothus*.

Biological data incomplete.

*ARYTAINA ACULEATA* Crawford. CALIFORNIA.—Adults only: from *Cercocarpus betuloides*, Soda Creek, Napa County, May 3, 1931 (Keifer).

Host: Unknown. Nominal Host: *Cercocarpus*.

*ARYTAINA PUBESCENS* Crawford. CALIFORNIA.—Adults only: from *Purshia tridentata*, Rock Creek, northwest of Bishop,

June 19, 1931. IDAHO.—Adults only: from Antelope Bush, Craters of the Moon, June 29, 1930 (Annand).

Host: *Purshia tridentata*.

This species becomes very abundant. The nymphs are found among the younger branches and leaves, where they produce large amounts of wax secretion. Severe infestations are associated with the dwarfing of the host and the formation of a witches' broom effect in the parts most subject to attack.

PSYLLIA FIBULATA Crawford. IDAHO.—Adults only: from unknown host, wet meadow, near Craters of the Moon, June 29, 1930 (Annand); same data, Alturas Lake, August 2, 1930.

Host: Unknown. Nominal Hosts: None recorded.

PSYLLIA SINUATA Crawford. IDAHO.—Adults only: from grass and shrubs, head of Salmon River, July 19, 1930 (Annand).

Host: Unknown. Nominal Hosts: Grass and shrubs.

PSYLLIA MINUTA Crawford. CALIFORNIA.—Adults and nymphs: from *Purshia*, Marangue Peak, Argus Mountains, April 12, 1930. IDAHO.—Adults only: from unknown host, wet meadow, near Craters of the Moon, June 29, 1930 (Annand).

Host: *Purshia*. (Probably *P. tridentata*.)

This species and *Arytaina pubescens* Crawford, a distinct species, both have *Purshia tridentata* for a host. Although our biological data is incomplete, it appears that this species does not produce wax to the same extent as does *A. pubescens*.

PSYLLIA ALBA Crawford. CALIFORNIA.—Adults and nymphs: from *Salix*, Isabella Creek, Mountain Hamilton Range, October, 1922 (Ferris).

Host: *Salix*. Nominal Host: *S. longifolia*.

The available data are incomplete.

PSYLLIA HARTIGHI Flor. NEW YORK.—Adults only: from pine, Cranberry Lake, July 26, 1920 (McLellan). NOVA SCOTIA.—Adults only: from unknown host, King's County, no date (Britain).

Host: Unknown. Nominal Hosts: Pine, *Betula populifolia*.

PSYLLIA AMERICANA Crawford. CALIFORNIA.—Adults and nymphs: from *Salix*, Sacramento, March 30, 1929 (Keifer); from same host, south of Tehachapi, Kern County, April 13, 1930; from same host, Savory's Tule Pond, south of Fresno,

April 15, 1930; from same host, Old Fort Miller, Friant, Fresno County, April 16, 1930; from same host, Crystal Springs Lake, San Mateo County, May 1, 1930; from same host, San Remo, south of Carmel, March 30, 1931; from same host, sand dunes, San Francisco, April 3, 1931; from same host, Rock Creek, northwest of Bishop, June 19, 1931. Adults only: from *Salix* and *Artemisia heterophylla*, Sacramento, March 30, 1929 (Keifer); from pear trees, Andrus Island, Sacramento County, April, 1931 (Keifer); from same host, Hood, Sacramento County, April 16, 1931 (Keifer); from same host, Kelseyville, April 8, 1931 (Keifer); from *Salix*, Mountain Springs Canyon, Coso Mountains, April 12, 1930; from same host, Smith Creek, Mount Hamilton Road, April 18, 1931; from *Pinus monophylla*, south of Tehachapi, Kern County, April 13, 1930. IDAHO.—Adults only: from grass and shrubs, head of Salmon River, July 19, 1930 (Annand). NOVA SCOTIA.—Adults only: from *Salix*, 1924 (Brittain).  
 Hosts: *Salix* spp. Nominal Hosts: *Pinus ponderosa*, *P. monophylla*, *Artemisia heterophylla*, pear, grass, shrubs.

The nymphs are found, unaccompanied by conspicuous wax secretion, on the leaves, petioles, smaller branches, and buds. Early in the season they are found most abundantly on the axillary buds.

PSYLLIA AMERICANA MINOR Crawford. CALIFORNIA.—Adults and nymphs: from *Salix*, Crystal Springs Lake, San Mateo County, May 1, 1930; from same host, San Remo, south of Carmel, March 30, 1931; from same host, sand dunes San Francisco, April 3, 1931; from same host, Rock Creek, northwest of Bishop, June 19, 1931. Adults only: from *Salix*, Donner Pass, Placer County, July 16, 1929; from same host, Corral Hollow, southwest of Tracy, November 30, 1929; from same host, lower Kern River Canyon, west of Bodfish, June 19, 1931; from *Baccharis viminea*, Corral Hollow, November 4, 1929 (Annand); from pear trees, Andrus Island, Sacramento County, April, 1931 (Keifer); from same host, Kelseyville, April 8, 1931 (Keifer). UTAH.—Adults only: from willow, Hooper, October 14, 1927 (Pack: Knowlton).  
 Hosts: *Salix* spp. Nominal Hosts: *Baccharis viminea*, pear.

Biology similar to that of species.

PSYLLIA MAGNICAUDA Crawford. CALIFORNIA.—Adults and nymphs (?): from *Prunus* sp., Rock Creek Gorge, northwest of Bishop, June 19, 1931.  
 Host: *Prunus* sp. (?)

A number of nymphs were taken with the adults from the same plants. These nymphs may not be those of this particular species, inasmuch as they are very distinctly *triozine* in form, superficially resembling those of *Trioza maura* in structure and habit. This situation is especially interesting because of the great number of adults of *P. magnicauda* found on several plants from which only this species was taken with the nymphs.

PSYLLIA STRIATA Patch. CALIFORNIA.—Adults only, from *Betula fontanalis*, Rock Creek, northwest of Bishop, June 19, 1931. NOVA SCOTIA.—Adults only: from unknown host, King's County, June, 1924 (McLellan).  
Host: *Betula*. Nominal Host: *Corylus rostrata*?

According to Miss Patch, the nymphs are found on the leaves and terminal leaves and shoots of *Betula*. The nymphs cover themselves with inconspicuous wax. The adults emerge late in June in Maine.

PSYLLIA BREVISTIGMATA Patch. CALIFORNIA.—Adults and nymphs: from *Cercocarpus*, Santa Lucia Mountains, April 15, 1923 (Ferris); from same host, Rock Creek, northwest of Bishop, June 19, 1931; from *C. betuloides*, Stanford University, April 10, 1930 (Duncan), Nymphs only: from same host, south of Tehachapi, Kern County, April 13, 1930.

NEVADA.—Adults and nymphs: from *C. ledifolius*, Zephyr Point, Lake Tahoe, July 16, 1929. Adults only: from *Juncus*, Spooner, Tahoe-Carson City Road, July 16, 1929.  
Hosts: *Cercocarpus betuloides* and *C. ledifolius*. Nominal Host: *C. parviflorus*.

This species has been found wherever an effort has been made to find it on *Cercocarpus*, but it is not known to ever occur in abundance. The nymphs occur on the ventral side of the leaves. The wax secretion produced is given off in the form of long, straight, transparent, and somewhat glistening brownish threads. These threads do not intermingle to form a cottony wax.

PSYLLIA FLOCCOSA Patch. NOVA SCOTIA.—Adults only: from *Alnus*, no date (W. H. Brittain).  
Host: *Alnus*.

According to Miss Patch, the nymphs appear early in the spring, when they are found on the ventral side of the leaves. They produce an abundance of white, flocculent wax.

*PSYLLIA ASTIGMATA* Crawford. CALIFORNIA.—Adults and nymphs: from *Prunus emarginata*, Rock Creek, northwest of Bishop, June 19, 1931. Nymphs only: from same host, Cha-goopa Creek, southern Sierra Nevada, 7000 feet, June 21, 1923 (Ferris); from *Prunus*, Donner Pass, Placer County, July 16, 1929; from *P. emarginata*, General Grant National Park, July 12, 1930. NOVA SCOTIA.—Adults and nymphs: from unknown host, no date (W. H. Brittain).

Host: *Prunus emarginata*. Nominal Host: *P. demissa*.

This species frequently becomes excessively abundant. The nymphs produce large amounts of floss-like, cottony wax. They usually occur on the ventral side of the leaves but in severe attacks they are found on the petioles, smaller branches, flowers and fruit, moving about freely and carrying their wax secretion, plume-like, about with them. Even in cases of very abundant attack the host does not seem to suffer any serious loss of vitality. The nymphs of this species superficially resemble those of *Psyllia mali*.

*PSYLLIA TRIMACULATA* Crawford. NEW YORK.—Adults only: from *Prunus*, Cranberry Lake, 1925 (W. H. Brittain).

Host: Unknown. Nominal Host: *Prunus*.

*PSYLLIA ALNI AMERICANA* Crawford. CALIFORNIA.—Adults and nymphs: from *Alnus rhombifolia*, San Francisquito Creek, Stanford University, May 3 and June 20, 1929; from same host, southern end of Lake Tahoe, July 15, 1929; from same host, Smith Creek, Mount Hamilton Road, April 18, 1931; from same host, Placerville, July 15, 1929. Adults only: from unknown host, Placerville, no date (E. O. Essig; Keifer). IDAHO.—Adults only: from unknown host, Alturas Lake, Stanley Basin, July 19, 1930 (Annand). WASHINGTON.—Adults and nymphs: from *Alnus*, Cathlamet, August 7, 1923 (Duncan).

Host: *Alnus rhombifolia*.

The nymphs occur, sometimes in exceedingly great abundance, on the younger leaves and smaller branches early in spring. They are usually conspicuous because of the vast amounts of white wax secretion, which may sometimes completely cover the leaves. Alder trees at the south end of Lake Tahoe and at Bass Lake, Madera County, California, were defoliated to a considerable degree, apparently by the chermid.

PSYLLIA BUXI (L.) CALIFORNIA.—Adults and nymphs: from *Buxus*, San Jose, June 12, 1920 (R. D. Hartman); from *B. sempervirens*, North Clarmont Street, San Mateo, May 5, 1929; same host, North Eldorado Street, San Mateo, May 10, 1929; from same host, Ellsworth Avenue, San Mateo, June 30, 1931. Nymphs only: from same host, North Clarmont Street, San Mateo, April 15, 1929; from same host, Parrott Estate, San Mateo, May 18, 1929.

Host: *Buxus sempervirens*.

The nymphs attack the young terminal leaves causing them to curl into a loosely cabbage-like growth. In severe infestations, which apparently are not uncommon, these growths considerably impair the beauty of the plants.

PSYLLIA CAUDATA Crawford. IDAHO.—Adults only: from unknown host, Alturas Lake, Stanley Basin, July 19, 1930 (Annan).

Host: Unknown. Nominal Host: *Alnus tenuifolia*.

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### ***Cordylura tricincta* Loew, a Leaf-miner on *Smilacina racemosa* (L) Desf. (Dipt.: Scatophagidae).**

By S. W. FROST, The Pennsylvania State College.

For a number of years the writer has noticed mines on the leaves of *Smilacina racemosa*. In 1924,<sup>1</sup> he recorded the leaf-miner as an undetermined species of Diptera. In 1928,<sup>2</sup> the same miner was noted, its habits briefly summarized and the mine figured. At this time, adults had not been reared and it was thought to be a species of *Parallclomma*. Later an adult emerged and Mr. E. T. Cresson determined it as *Hexamitocera flavida* Coq. Mr. C. H. Curran has recently studied the types of this subfamily and states that *H. flavida* Coq., is a synonym of *Cordylura tricincta* Loew.

*Cordylura tricincta* Loew, appears to be somewhat rare in collections. It was originally described by Loew<sup>3</sup> as *Cocnosia tricincta* from the White Mountains, New Hampshire. As *Hexamitocera flavida*, Coquillett<sup>5</sup> recorded it from Franconia, N. H. Mr. E. T. Cresson took one specimen at Caroline, New York, from which the record in the "List of Insects of New York"<sup>4</sup> was obtained. In the National Museum, there is one specimen, besides the type, collected by Dr. J. M. Aldrich from Moscow, Idaho. Mr. C. W. Johnson<sup>6</sup> took it at Eastport, Maine, and he has a specimen taken by Dr. C. P. Alexander at Orono, Maine. The writer has found the mines of

this species fairly common at Ithaca and Florida, N. Y., and Arendtsville, Pa.

*Egg.* The egg is pure white and always laid at the base and on the under surface of the leaf. It is about 1 mm. long and .5 mm. in diameter, somewhat larger than most leaf-mining eggs with the exception of the Anthomyiidae, and strikingly conspicuous against the green color of the leaf. It is distinctly different from the eggs of any of the other North American leaf-mining insects. In cross section, an egg shows a central rounded portion with two lateral wing-like expansions which, in the plump newly laid egg, are folded over the egg and nearly meet down the center. After the egg hatches, the egg shell shrivels and the lateral expansions spread so that the egg has three longitudinal ribs.

*Larva.* There is nothing particularly striking about the larva. It is elongate and resembles, superficially, an Anthomyid larva, especially *Hylemyia*. The anterior spiracles are fan-shaped with twelve lobes, (Frost<sup>1</sup> Plate XII, fig. 13). The intersegmental areas are thickly beset with six or eight rows of ambulatory setae. The posterior spiracles each have three openings, (Frost<sup>1</sup> Plate XI, fig. 17). Surrounding the posterior spiracles is a circle of eight rather prominent fleshy tubercles.

*Puparium.* The puparium is elongate, chestnut brown in color with distinctly protruding spiracles and with a circle of prominent tubercles as in the larva. The anterior end of the larva is somewhat truncate on the dorsal and ventral sides.

*Mine.* The larva, on hatching, enters directly into the leaf and starts mining. The mine is confined, more or less, between the parallel veins of the leaf which are broadly spaced. An elongate blotch mine is produced from the base towards the tip of the leaf. Usually but one mine occurs on a leaf although sometimes two eggs are laid side by side and the larvae from these eggs produce a common mine. In mining, the parenchyma and palisade cells are entirely removed leaving only the upper and lower epidermis. The fresh mine is pale green or white in color. Later the mine turns brown or red along the edges.

*Host plant.* *Cordylura tricincta* has been reared only from false solomon's seal, *Smilacina racemosa*. Similar eggs and mines have been found on *Polygonatum commutatum*. As the eggs on the latter plant are invariably laid upon the upper surface of the leaves, there is no doubt that a closely related species is involved.



*Adult.* Some difficulty was experienced in rearing adults of *Cordylura tricincta*. Tenanted mines were fairly common in New York and Pennsylvania where *Smilacina racemosa* grew, larvae matured freely in the mines and puparia were obtained in considerable numbers, but it was found difficult to secure adults from these puparia. The pupal period is long and it is not easy to maintain satisfactory temperature and humidity during this long period to assure a fair emergence of adults. Larvae that transformed June 30, 1927, did not emerge until May 1, 1928. There is obviously only one generation a year. The adults are most active during May and June.

## REFERENCES CITED.

1. FROST, S. W., Cornell Memoir 78: 128, 1924.
2. NEEDHAM, J. G., & FROST, S. W. Leaf-mining insects: 269-270, 1928.
3. LOEW, H. Cent. IX. Berlin. ent. Zeit. 9: 83, 1865.
4. LEONARD, M. D. Cornell Memoir 101: 841, 1926
5. COQUILLET, D. W. Proc. U. S. N. Mus. 23: 612, 1900.
6. JOHNSON, C. W. Dip. New Eng.: 240, 1925.

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### An Additional Record for *Dynastes tityus* in Pennsylvania (Coleop.: Scarabaeidae).

[Mr. Samuel Henshaw has kindly sent me the following information concerning this species from Asa Fitch's manuscript notes. See the NEWS, xli, pp. 195, 305, 1930. P. P. CALVERT.]

Fitch's manuscript notes were acquired by Mr. Scudder, who later gave them to me when I was connected with the Boston Society of Natural History. I planned having them bound and giving them to the Society, as Mr. Scudder left his library to the Society. They are on loose sheets and not easily or inexpensively bound and save for two or three small volumes given to the Society in his name many years ago, I have them still.

Fitch's records are:

"Date and Situation

- ♂ 3360 July 1847 from Thaddeus A. Culbertson, Chambersburgh, Pa.
- ♀ 6077 July 1852 from Wm. S. Robertson, Tallahassie, Ark.
- ♂ 1123 July 1855 from Wm. S. Robertson, Tallabassie, Ark.
- ♀ 1201 July 1852 from Sara S. [?] Fitch, Jackson, Mi.

SAMUEL HENSHAW.

## Entomological Literature

COMPILED BY LAURA S. MACKEY UNDER THE SUPERVISION OF  
E. T. CRESSON, JR.

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 figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the list of Periodicals and Serials published in our January and June issues. This list may be secured from the publisher of ENTOMOLOGICAL NEWS for 10c. The number of, or annual volume, and in some cases the part, heft, &c. the latter within ( ) follows; then the pagination follows the colon :

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

\*Papers containing new forms or names have an \* preceding the author's name.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

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.

⚡Note the change in the method of citing the bibliographical references, as explained above.

*Papers published in the Entomological News are not listed.*

**GENERAL.**—**Arnhart, L.**—Ein einfacher mikrophoto-graphischer Reiseapparat. [56] 10: 286-289, ill. **Common names of insects** approved for general use by The American Association of Economic Entomologists. [12] 24: 1273-1310. **Davis, A. C.**—California collecting notes II. [19] 26: 187-188. **Dustan, G. G.**—A handy type of oviposition cage. [4] 63: 273-275, ill. **Emery, C.**—Obituary. [5] 33: 171. **Ewing, H. E.**—The relative importance of Amphibians, reptiles, birds and mammals as hosts for chiggers and other ectoparasites. [7] 24: 746-750, ill. **Forel, A.**—Obituary. By R. Brun. [Mitt. Deutschen Ent. Gesell.] 2: 129-136, ill. **Forel, A.**—Obituary. By H. Donisthorpe. [21] 43: 176. **Hentz, N. M.**—Obituary. By C. Cobb. [Jour. E. Mitchell Sc. Soc.] 47: 47-51, ill. **Mann, B. P.**—Obituary. [5] 33: 172, ill. **Palmer, E. L.**—Fall insects. [Cornell Rural School Leaflet] 25: 43 pp., ill. **Prout, L. B.**—Generic names and genera. [9] 65: 8-9. **Waterhouse, G. A.**—Butterflies and ants. [Australian Mus. Mag.] 4: 219-226, ill.

**ANATOMY, PHYSIOLOGY, ETC.**—**Abbott, C. E.**—Methods of orientation in dragonfly larvae. [5] 33: 124-126. **Barnes, T. C.**—Kinesthetic sense of insects. [7] 24: 824-826. **Bito, S.**—The influence of food upon the nutrition of insects. (Japanese, resume in English.) [Bul. Sci. Kjusu

Imp. Univ., Japanujo] 4: 489-498, ill. **Braun, F.**—Beiträge zur biologie und atmungsphysiologie der *Argyroneta aquatica*. [89] 62: 175-262, ill. **Eltringham, H.**—On some peculiarities of the abdominal structure in certain male Trichoptera. [36] 69: 539-544, ill. **Eltringham, H.**—On the structure of the compound eye of *Aleurodes brassicae*. [36] 69: 431-435, ill. **Friederichs, H. F.**—Die funktionen der Ocellen bei den Lepidopteren. [18] 25: 326-332, ill. **Green, T. L.**—The anatomy and histology of the alimentary canal in the common wasp (*Vespa vulgaris*). [93] 1931: 1041-1066, ill. **Griswold, G. H.**—On the length of the adult life in the webbing clothes moth, *Tineola biselliella*. [7] 24: 761-764, ill. **Hamilton, M. A.**—The morphology of the water-scorpion. [93] 1931: 1067-1136, ill. **Hilton, W. A.**—Nervous system and sense organs. Pseudoscorpionida. [13] 23: 67-75, ill. **Holloway, J. K.**—Temperature as a factor in the activity and development of the Chinese strain of *Tiphia popilliavora* in New Jersey and Pennsylvania. [6] 39: 555-564, ill. **Klyver, F. D.**—Preliminary note on paedogenesis in a cecidomyiid. [55] 8: 9-10. **Mangelsdorf, A. J.**—Color and sex in the Indian walking stick, *Dixippus morosus*. [5] 33: 151-155. **Maulik, S.**—On the structure of larvae of Hispine beetles. [93] 1931: 1137-1162, ill. **McGovran, E. R.**—A method of measuring tracheal ventilation in insects and some results obtained with grasshoppers. [7] 24: 751-761. **Paterson, N. F.**—The bionomics and comparative morphology of the early stages of certain Chrysomelidae (Phytophaga). [93] 1931: 879-949, ill. **Salem, H. H.**—Some observations on the structure of the mouth parts and fore-intestine of the fourth stage larva of *Aedes (Stegomyia) fasciata*. [An. Trop. Med. Parasit., Liverpool] 25: 393-419, ill. **Semichon, L.**—Modifications précoces des réserves, avant la métamorphose chez un Hyménoptère: *Dasypoda plumipes*. [77] 108: 1140-1141. **Tanaka & Hino.**—Variations of tactile papillae and sensory hairs of the larval antennae of *Bombyx mori*. (Japanese, resume in English.) [Bul. Sci. Kjusu Imp. Univ., Japanujo] 4: 570-580, ill. **Thorpe, W. H.**—Experiments upon respiration in the larvae of certain parasitic hymenoptera. [Pro. R. Soc., London] 109: 450-471, ill. **Yeager, J. F.**—Observations on crop and gizzard movements in the cockroach, *Periplaneta fuliginosa*. [7] 24: 739-745.

..ARACHNIDA AND MYRIOPODA.—\*Chamberlin, J. C.—A synoptic revision of the generic classification of the

Chelonethid family Cheliferidae. [4] 63: 289-294. **Hoffmann, C. C.**—Los Scorpiones de Mexico. Part 1. [An. Inst. Biol., Mexico] 2: 291-409, ill. \***McGregor, E. A.**—A new spinning mite attacking raspberry in Michigan. [10] 33: 193-194, ill.

**THE SMALLER ORDERS OF INSECTS.**—\***Hilton, W. A.**—Paupoda from Alaska and the Yukon. [4] 63: 280-284. \***Hood, J. D.**—Notes on New York Thysanoptera, with descriptions of new genera and species. (S). [19] 26: 151-168, ill. \***Klyver, F. D.**—New records and two new species of Chermidae from British Columbia and Washington, with biological notes. [55] 8: 11-17, ill. **Light, S. F.**—The termites of Nevada. [55] 8: 5-9. \***McDunnough, J.**—New North American Caeninae with notes (Ephemeroptera). [4] 63: 254-268, ill. \***Mosely, M. E.**—Some new Trichoptera from Africa and British Guiana. [36] 69: 545-551, ill. \***Navás, R. P. L.**—Decadas de insectos nuevos. (S). [Rev. Acad. Cien., Madrid] 26: 60-118, ill. \***Smith, R. C.**—The Neuroptera of Haiti, West Indies. [7] 24: 798-823, ill. **Tillyard, R. J.**—Kansas permian insects. Part 15. The order Plecoptera. [16] 23: 97-134, ill., cont. **Traver, J. R.**—Mayflies of North Carolina. [Jour. E. Mitchell Sc. Soc.] 47: 85-161, ill. **Watson, J. R.**—A collection of Thysanoptera from western Oklahoma. [Biol. Surv. Univ. Oklahoma] 3: 339-345, ill.

**ORTHOPTERA.**—**Beamer, R. H.**—The giant walking-stick (*Megaphasma dentricus*) found in Kansas. [103] 5: 28. **Fulton, B. B.**—North Carolina's singing Orthoptera. [Jour. E. Mitchell Sc. Soc.] 47: 55-69. \***Hebard, M.**—Die ausbeute der deutschen Chaco Expedition 1925-26.—Orthoptera. [56] 10: 257-285, ill.

**HEMIPTERA.**—\***Barber, H. G.**—A new *Oncerotractelus* from Cuba (*Reduviidae*). [19] 26: 185-186. \***Beamer, R. H.**—Some *Erythroneura* (grape leaf hoppers) of the *Maculata* group (*Cicadellidae*). [4] 63: 268-270, cont. **Bibby, F. F.**—Coccoids collected on wild plants in semi-arid regions of Texas and Mexico. [6] 39: 587-591, ill. **Bibby, F. F.**—Coccoids collected on wild plants in semi-arid regions of Texas and Mexico. [19] 26: 189-194. \***Drake & Harris.**—Further notes on the genus *Rhagovelia*. *Veliidae*. [55] 6: 33-35. **Essig, E. O.**—The negro scale in California. [55] 6: 36. **Essig, E. O.**—Note on the redwood scale. [55] 6: 48. \***Evans, J. H.**—A preliminary revision of the Ambush bugs of North America (*Phyma-*

tidae). [7] 24: 711-738, ill. **Evans, J. W.**—Notes on the biology and morphology of the Eurymelinae (Cicadelloidea). [Pro. Linn. Soc. N. S. W.] 56: 210-226, ill. \***Gillette & Palmer.**—The aphidae of Colorado. [7] 24: 827-934, ill. **Goding, F. W.**—Synonymical notes on Membracidae. II. [7] 24: 935-936, ill. \***Harris, H. M.**—Nabidae from the state of Paraná. [An. Mus. Zool. Polonici] 9: 179-185. \***Knight, H. H.**—Three new species of Cyrtorhinus from North America (Miridae). [19] 26: 171-173. \***Knight, H. H.**—Descriptions of four new species of Eustictus (Miridae). [5] 33: 121-123. \***Lawson, P. B.**—The genus *Alapus* (Cicadellidae). [103] 5: 29-31. \***Mendes, L. O. T.**—Uma nova especie do genero *Eucalymnatus* (Coccidae). (S). [Revista Ent.] 1: 395-400. **Myers, J. G.**—Heteroptera in ocean drift. [5] 33: 110-115. **Osborn, H.**—Early work and workers in American Hemipterology. [7] 24: 679-685. **Pickles, A.**—A description of *Tomaspis bodkini*, (Cercopidae) from British Guiana. [Stylops] 1: 14-15, ill. **de la Torre-Bueno, J. R.**—Biting bugs. [19] 26: 176.

**LEPIDOPTERA.**—\***Bell, E. L.**—Descriptions of new Hesperidae from Trinidad, B. W. I., and South America. [6] 39: 523-529, ill. **Cockayne, E. A.**—A structural character of the larval cuticle and its possible bearing on the classification of the Noctuidae. [21] 43: 182-184. **Cockerell, T. D. A.**—*Melemaea magdalena*. [5] 33: 170. **Cottle, J. E.**—Where some rare butterflies fly. [55] 8: 1-4. \***Draudt, M.**—Ein neuer schmetterling aus Peru. [°17] 49: 1-3, ill. \***Ferreira d'Almeida, R.**—Bemerkungen über einige schmetterlinge aus Brasilien. [14] 45: 232-235, ill. **Fryer, J. C. F.**—Lepidoptera at sea. [8] 67: 279-280. \***Heinrich, C.**—A new pine moth from Connecticut. [10] 33: 196-197. **Hemming, A. F.**—New material regarding the dates of the plates of the Papiliones in Jacob Hübner's "Sammlung Europäischer Schmetterlinge", with notes on the synonymy and type localities of certain species described therein. [36] 69: 493-504. **Hemming, A. F.**—Notes on the date of issue of the parts of Volume I of W. H. Edwards' Butterflies of North America and on the plates by Wiest in that work subsequently rejected by the author. [Pro. Ent. Soc. London] 6: 42-44. **Issiki, S. T.**—On the morphology and systematics of Micropterygidae (Homoneura) of Japan and Formosa, with some considerations on the Australian, European, and North American forms. [93] 1931: 999-1039, ill. **Janse, A. J. T.**—A contribution towards the study

of the genera of the *Epipaschiinae* (Pyrilidae). [36] 69: 439-492, ill. **Jordan, K.**—Botl. sexes of *Papilio aristor* from San Domingo. [Pro. Ent. Soc. London] 6: 62. **Kaye, W. J.**—Additions and corrections to the author's "Butterflies of Jamaica (1926)". [36] 69: 531-537, ill. **Knobel, L.**—*Argynnis diana* as observed about Hope, Arkansas. [19] 26: 184. **Kremky, J.**—Neotropische lepidopteren aus der unterfamilie *Pericopsinae* (Arctiidae) in der sammlung des Polnischen Zoologischen Staatsmuseums. [An. Mus. Zool. Polonici] 9: 167-178, ill. **\*Michael, O.**—Neue oder wenig bekannte *Agrias*aberrationen vom Amazonas. [14] 45: 262-263, cont. **\*Rawson, G. W.**—The addition of a new skipper, *Adopaea lineola* to the list of U. S. Lepidoptera. [6] 39: 503-506. **\*Röber, J.**—Ueber einige falter. (S). [18] 25: 337-338, ill. **Rogers, W. P.**—Notes on *Eurymus eurytheme*. [19] 26: 188.

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**SPECIAL NOTICES.**—Juan Fernandez Islands, Natural History of III, Zool. Pt. IV, p. 461-638, Upsala. Papers on Coleoptera; Curculionidae, Anthribidae, Carabidae, Cleridae, Scarabaeidae-Aphodiinae. By Aurivillius, Andrews, Schenkling, Schmidt. **Plecoptera** Nymphs of America (North of Mexico) by Peter W. Claassen [Thomas Say Foundation] III, 199 pp. ill., 1931. This work is companionable to the "Monograph of the Plecoptera or Stone Flies of America North of Mexico," published by the Thomas Say Foundation in 1925. A sketch of Dr. **Hermann August Hagen**, occupying one and one-third columns, by L. O. H[oward], appeared in Volume VIII of the *Dictionary of American Biography*, issued Jan. 29, 1932. The *Dictionary* is published under the auspices of the American Council of Learned Societies by Charles Scribner's Sons, New York.



APRIL, 1932

# ENTOMOLOGICAL NEWS

Vol. XLIII

No. 4



JOHN HENRY COMSTOCK, 1849-1931.  
Portrait of 1884.

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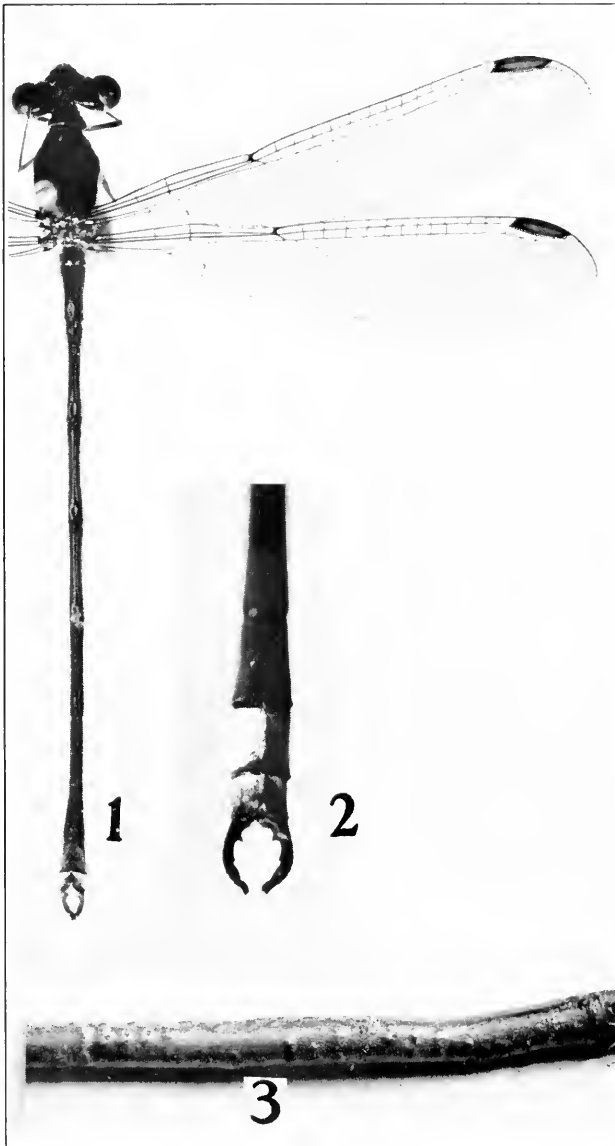
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ARCHILESTES IN KENTUCKY.—H. GARMAN

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## **The Genus *Archilestes* in Kentucky (Odonata : Agrionidae).**

By H. GARMAN, Lexington, Kentucky.

(Plates II, III and IV.)

On August 16, 1929, while the writer was pushing his way through a thicket along a small rocky brook which empties about a mile away into the Kentucky River he saw a large damsel fly move quickly before him and disappear among foliage a short distance away. It had the appearance of an exceptionally large *Lestes*, of which genus we have several species in Kentucky, and was followed and netted, but after transferring it to a cyanide bottle no more was thought of it until my return to Lexington, about twenty miles distant, when examination showed it to have the venation of the western *Archilestes*. I returned to the spot where it was captured two days later hoping to find others and from time to time during the remainder of the season again visited the place, with the result that on most occasions additional specimens were taken, mostly males at first, though the one first encountered was a large female. As the season advanced both sexes were collected, some of them mated, until at the end of the season twenty-eight specimens were in my possession the last one captured October 19 after some rather cool days and nights.

The little stream along which *Archilestes* was collected cuts into bed rock in many places, the water dropping over small ledges in the upper part of its course, but as it nears Kentucky River these increase in height to eight or ten feet. During the summer the stream is much reduced in size and the water may dry up completely in a large part of its bed, but in seasons of average rainfall pools of water remain below the larger falls. From one of these I took with a dip-net, August 19, 1929, nine specimens of a strong swimming nymph, a more vigorous swimmer than any damsel fly I had hitherto collected, and brought

them home alive where they were isolated in glass tumblers for rearing. It was thought that they would prove to be the young of the *Archilestes* collected, an impression that was justified later by the emergence of adults in the tumblers. Five adults were thus obtained, several of the nymphs having been put in preservative after examination to make sure of perfect specimens and two dying.

The record of captures of adults in the field during the season is as follows:

August 16, one female.

August 19, one teneral male, dislodged, shortly after it had shed the nymphal skin, from among grass in the margin of a pool.

August 30, two finely colored males.

September 2, one male, another seen but escaped.

October 8, six captured, two pairs and two unmated males.

October 11, fourteen fine specimens taken, four mated pairs, one unmated female, five unmated males.

October 19, four captured, one pair and two unmated males.

The emergence of adults (all males) from nymphs kept in tumblers was as follows:

First out morning of August 21.

Second out at noon, August 21

Third out August 24.

Fourth out August 25.

Fifth out August 27.

#### THE HABIT OF THE KENTUCKY ARCHILESTES.

The habit of the adult insect of seeking cover at once when it is aware of an intruder and its adroitness in concealing itself after it dashes among foliage rendered it difficult to capture in the early part of its season. Males sometimes emerged from their hiding places and came to a pool when I stood perfectly still for some minutes, and could then be captured with little trouble, but, if the first stroke with the net was not successful, they made off and no thrashing about the region where they disappeared resulted in starting them again. Most of the adults were captured when I was thus standing, or moving slowly and quietly along the stream, with net ready to strike

whenever one appeared. The suddenness and completeness with which they concealed themselves is illustrated by an example that emerged from a nymph kept in my study. On the removal of the cloth cover of the tumbler in which it was confined as a nymph it darted out into the room and though it was followed quickly, vanished under or behind a bookcase, table, or chair, and was not discovered until an hour or so later when it came out of its own accord and passed to a window in an effort to get out-of-doors.

The nymphs, also, behaved very differently from the rather sluggish young of other damselflies. Those captured were obtained from one pool on one occasion among some partly submerged grass when with a rather large dip-net a sudden sweeping movement through the grass brought out all of those captured. Repeated attempts afterward failed to capture another specimen. Like the nymphs of the western *A. californica*, as noted by Kennedy,\* these young appear to have dashed away and concealed themselves, perhaps in the mud of the bottom, for the water was clear and they were never observed swimming about. When confined in tumblers half full of water there was little opportunity to show their capacity to swim. They were well grown when captured and though given fresh water containing small crustaceans and dipterous larvae, showed little disposition to take food. To provide means of clinging when they were ready to emerge, cotton cord was suspended in the water and led up to the edge of the tumblers under a cloth cover. The adults were always found hanging by their feet to this cover.

Search was made for evidence of oviposition when it was realized that I was dealing with *Archilestes*, especially in willows, some of which grew at the edge of a pool, but the bark of this plant was not punctured. Scrubby elm at the edge of the same pool was, however, rough with the punctures, most of them of previous seasons. In October pairs of the insect were sometimes observed to alight on the elm, but egg laying was not observed. Living individuals captured when mated were confined in a celluloid cylinder on elm twigs of a tree at

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\* Proc. U. S. Nat. Mus., Vol. 49, pp. 259-269.

my residence, but their struggle to escape was incessant and no eggs were laid. Later, twigs with fresh eggs were confined over water for some months. None hatched, so that the early history of the nymph in Kentucky remains to be studied.

#### THE RELATIONSHIP OF THE KENTUCKY ARCHILESTES.

The writer assumes for the present that the insects collected here represent *Archilestes grandis*. The finding of the insect so far out of the known range of this western species led me at first to suspect that I might be dealing with a new species. With this idea in mind advantage of a trip east was taken in the winter of 1929 to examine specimens of the western insect in the collection of the Philadelphia Academy of Natural Science.\* I could not then find in the Academy material anything that would exclude my specimens. The Kentucky insect is evidently not *A. californica*.

I am adding a few notes on fresh material collected here with the impression that most of the published descriptions were made from dried specimens.

*Coloration of adults.* The Kentucky *Archilestes* is a strikingly handsome insect when alive, but more because of the delicacy than the brightness of its colors, though it has a share of each. Some of its most characteristic colors are lost after death and perhaps this explains why my specimens did not agree with descriptions published by Hagen, Calvert and others. The dorsal side of the body is in general bronze brown, but much of the head is of a fine robin's egg blue dorsally; the thoracic mass (meso and metathorax) has on each side a bright yellow longitudinal stripe followed ventrally by another somewhat less conspicuous one, the latter sometimes merging partly with the pale yellow color ventral to it. The abdomen is bronzy dorsally, with the distal somites of the male pruinose, or nearly white as one sees the insect flying in sunlight. An appearance of cross bands is apparent when the abdomen is observed from the side and in ventral views, a rather wide fuscous marginal region being apparent on the posterior parts of the somites. The wings are hyaline in old specimens, but freshly emerged individuals show a marked brown smokiness.

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\* Through the courtesy of Dr. Calvert and Mr. Cresson.



The large eyes are of a soft gray blue color, beautiful because of a silken sheen and play of color with change of position.

Keeping emerged specimens confined for some days failed to develop these bright colors. Published descriptions of *A. grandis* (Hagen, Synopsis, and Dr. Calvert, Biologia Centrali-Americana) do not mention the life colors and thus afford no means of comparison with western and southern material. The dried cabinet specimens examined at the Philadelphia Academy in December, 1929, gave but little more information as to coloration.\*

*Structure and Size of Adults.* In structure, Kentucky specimens agree closely with such descriptions and figures as have been examined. But the point of origin of vein  $M_2$  is quite constant in Kentucky specimens, the sector coming from the distal third of the first cell outside of the nodus, though in a very few cases starting nearer the nodus. In this respect they agree with published figures of the wing of *A. grandis*, but Dr. Calvert's observations on material from the West and Southwest imply more variation in the origin of this vein. He says the nodal sector in no case arises more than 1 and  $2/3$  cells from the nodus and that in males from Cuernavaca, and Guadalajara it begins in less than one cell beyond, and in one wing examined at the nodus itself.

While size within limits is a useful feature for the recognition of species of the group it can not be depended on when the material studied is obtained from one locality. Dr. Calvert calls attention to a considerable range in size of *A. grandis* from its western habitat, but in Kentucky specimens I find the range not great and the average size less than Dr. Needham\* represents for *A. grandis*. In no case has an individual been collected here as large as the species is represented in this author's handbook. Some loss in size is, of course, to be expected with the drying of specimens, but measurements given below were made from fresh material taken at random, collected at different dates of the 1929 season.

\* Tillyard's method of preserving the life colors was not seen by me until too late to give it a trial (See his "Biology of Dragonflies", p. 356).

\* Handbook, where the species is represented as having a length of 62<sup>mm.</sup> and a wing expanse of 82<sup>mm.</sup>

Seven Kentucky males gave an average length of 53.08<sup>mm.</sup> and an average alar expanse of 67.78<sup>mm.</sup> the range being, length 47 to 61<sup>mm.</sup> and wing expanse, 61 to 75<sup>mm.</sup>

Five Kentucky females gave an average length of 48.3<sup>mm.</sup> and a range of 37.7<sup>mm.</sup> to 53.00<sup>mm.</sup>, with an average wing expanse of 75.40<sup>mm.</sup> ranging from 71.70 to 78.8<sup>mm.</sup>

The dimensions of reared males averaged less than those of individuals maturing under natural conditions, the length averaging 50<sup>mm.</sup> and wing expanse 64.2<sup>mm.</sup>

Dr. Hagen's measurements (Neuroptera of North America, p. 66) apply well to my material. He gives the length 59-50<sup>mm.</sup> and wing expanse 72-66<sup>mm.</sup> with a habitat, Mexico, Colombia, Venezuela. Since he wrote, the distribution of the insect has been found to be more extended, recent writers noting it as occurring from Washington to Lower California and Texas.

After my own observations were written I received, in 1930, from Philip Garman of New Haven, a pair collected in Oklahoma (1929) which vary much like those noted by Dr. Calvert. The male measures 54<sup>mm.</sup> in length, the wing expanse is 68<sup>mm.</sup> Vein  $M_2$  arises a trifle outside of the first cell beyond the nodus on the two right wings; on the anterior left front wing it arises from the boundary between the first and second cells outside of the nodus and on the left posterior wing from the outer fourth of the first cell beyond the nodus. The superior straight yellow stripe of the thoracic mass is conspicuous, and the labrum has some appearance of having been blue, as in Kentucky examples. The female from Oklahoma measures 47.7<sup>mm.</sup> long; the wing expanse, 72<sup>mm.</sup>  $M_2$  arises just beyond the first cell outside of the nodus in both right wings and from the outer fifth of the first cell on both left wings.

*The Nymphs.* The notes following were made on one of the individuals collected August 19 in Kentucky. Antennae long and tapering, the two basal segments thickest, the rest thread-like. Compound eyes large, globose. Legs long and strong. Wing pads slender and thick, with rounded tips. Abdominal somites with a ridge along each side, 4 to 9 inclusive terminating in a small spine. Somite 10 with a median dorsal carina and two spines at the dorsal edge posteriorly and other

smaller ones along the edge elsewhere. Dorsum of thorax brown, the sides of the meso-metathoracic mass with a couple of curved brown marks on a pallid ground. Gills with two ill-defined bands, one at the posterior end of the proximal third, the other beginning near the middle and fading out toward the distal end of the gill. Legs brown, lined with fuscous, the tips of femora and tibiae fuscous. Labium largely pallid, the appendages indefinitely varied with fuscous. Length, 35<sup>mm.</sup>; antennae 6<sup>mm.</sup>; wing pads 6.4<sup>mm.</sup>; abdomen, 18<sup>mm.</sup>; gills 9.7<sup>mm.</sup>

Examples of the nymph of *A. grandis* from the West have not been examined. Kennedy's figure (Proc. U. S. Nat. Mus., loc. cit.) of the labium of *A. californica* shows the anterior

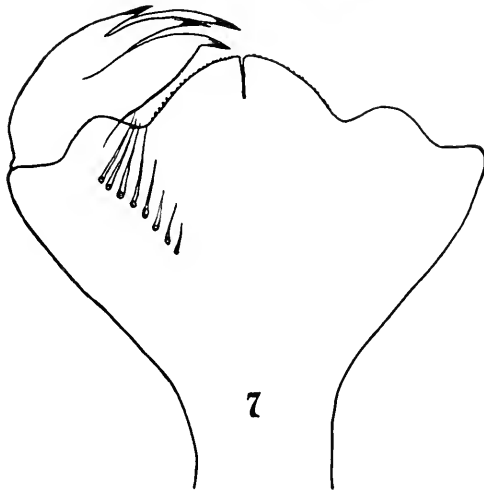


Fig. 7. Distal end of labium of nymph showing rounder anterior edge. Setae of palpus omitted purposely.

margin between the palpi straighter than it is in Kentucky material, where a pronounced forward convexity of the outline is apparent between the palpi.

*Note.*—Since my observations on *Archilestes* were written I have had the privilege, through the kindness of Professor P. P. Calvert, of examining specimens of both nymph and adult of *Archilestes* from Costa Rica. The nymph agrees closely with those collected in Kentucky. Adults, of which

several have been examined, show some of the variations mentioned by Professor Calvert in one of his papers. A pair of these from San Jose, C. R., and according to the label, from M. Valerio, F—6—28, shows the most striking departures from the Kentucky type, in which the sector  $M_2$  almost invariably arises from the first cell beyond (outside) the nodus. In the male from Costa Rica it starts *before the middle of the second cell beyond the nodus* on the left front wing; a little *outside the first cell beyond the nodus* on the hind wing of this side. On the right wings of this male it emerges at the *outer end of the first cell beyond the nodus*. In the female of this pair the sector arises *just within the middle of the fourth cell beyond the nodus* of the left front wing; on the left hind wing, *outside the middle of the third cell beyond*. On each of the right wings  $M_2$  arises from the *third cell beyond the nodus*.

#### EXPLANATION OF PLATES II, III AND IV.

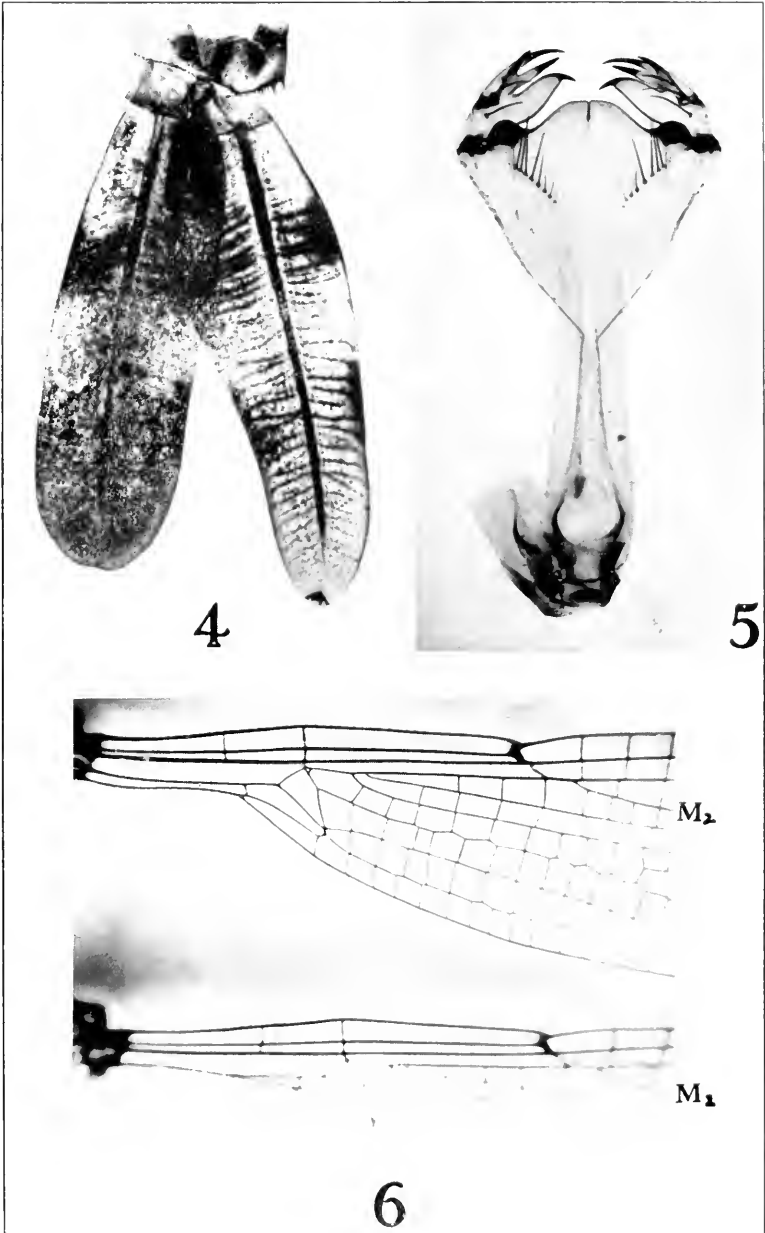
- Fig. 1. Male *Archilestes* from Kentucky.  
 Fig. 2. Showing claspers enlarged.  
 Fig. 3. Elm twig showing punctures made by female.  
 Fig. 4. Two of the gills of a nymph (Photographed by Philip Garman).  
 Fig. 5. Labium of nymph (Photographed by Philip Garman).  
 Fig. 6. Two wings enlarged to show origin of  $M_2$  as seen in Kentucky specimens.  
 Fig. 8. Upper part of brook about which *Archilestes* was collected.  
 Fig. 9. Pool from which nymphs were taken.  
 Fig. 10. Fall with pool about which specimens were taken, near Kentucky River.

### The Chrysomelinae of Nebraska (Coleop.: Chrysomelidae.)<sup>1</sup>

By EUGENE F. POWELL, University of Nebraska, Lincoln, Neb.

The purpose of this study has been to list the leaf-beetles of the subfamily Chrysomelinae of Nebraska, and to obtain notes on their abundance and on their seasonal and geographic distribution within the state. The material in the collection of the

<sup>1</sup> Studies from the Department of Zoology, The University of Nebraska, No. 171.



ARCHILESTES IN KENTUCKY.—H. GARMAN.





ARCHILESTES IN KENTUCKY.—H. GARMAN.





Department of Entomology of the University of Nebraska was studied, and was supplemented by specimens taken by the writer during the years 1924 to 1931. The nomenclature is that of Leng's "Catalogue of the Coleoptera of North America, North of Mexico." The Nebraska fauna includes seven of the fourteen genera listed by Leng, and these genera are represented by twenty-three species, two of which are represented by both the typical form and one variety each and four of which are each represented by one variety only. Several specimens were sent to Mr. Charles F. A. Schaeffer of the Division of Entomology, Brooklyn Museum, for verification of identifications by the writer, who wishes to acknowledge this valuable assistance given by an authority on this group. These verified species are designated by an (S) following the name. The writer also wishes to express his appreciation of the assistance given to him by Professors R. H. Wolcott, M. H. Swenk and D. B. Whelan, and Mr. Raymond Roberts, of the University of Nebraska.

*LABIDOMERA CLIVICOLLIS* var. *ROGERSI* Leconte. Taken in the eastern portion of the state, but not in abundance. Collected at Maskell, West Point, Cedar Bluffs and Lincoln. April 16 to October 7, most commonly in July. Fourteen males and twelve females. The six specimens taken in April and May were all males. One male specimen taken near Lincoln, October 7, was hibernating under an old board.

*LEPTINOTARSA DECEMLINEATA* (Say). Known to be abundant and generally distributed throughout the state. Specimens studied were taken at Omaha, South Sioux City, Waverly, Lincoln, Columbus, Chambers, Western, Fairmont and Mitchell. April 20 to August, most abundant in June and July. Fifty-six males and sixty-one females. Feeding on potato (*Solanum tuberosum*) and sand bur or buffalo bur (*Solanum rostratum*).

*ZYGOGRAMMA EXCLAMATIONIS* (Fabricius). Rather abundant over most of the state. Collected at Lincoln, West Point, Columbus, Marquette, Neligh, Clearwater, Cherry County sandhills, Cambridge, McCook, Hitchcock County, Haigler, Ogallala, Hay Springs, Pine Ridge in Dawes County, Glen, Warbonnet Canyon in Sioux County, Monroe Canyon in Sioux County, Mitchell, Morrill and Henry. June 20 to September 5, most commonly in June. Forty-eight males and fifty-nine females. Taken from potato (*Solanum tuberosum*), white clover (*Melilotus alba*), prairie sunflower (*Helianthus petiolaris*), and alfalfa (*Medicago sativa*).

*Z. CONJUNCTA* Rogers. (S). Scarce, and found only in the extreme northwestern portion of the state. One female specimen taken at Harrison, July 17.

*Z. CONJUNCTA* var. *PALLIDA* Bland. (S). Scarce, and taken only in the extreme western part of the state. One female specimen taken at Henry, July 12.

*Z. SUTURALIS* var. *CASTA* Rogers. (S). Fairly abundant throughout most of the state. Taken at Maskell, Lincoln, Fairmont, Valentine, Cherry County sandhills, Halsey, Hay Springs, Pine Ridge in Dawes County and Mitchell. April 15 to September, most abundant in June and July. Eighteen male and nineteen female specimens. One female specimen found under a log in a woods, April 19.

*Z. DISRUPTA* Rogers. (S). Scarce; taken only in the southwestern and western portions of the state. Collected at Haigler, Imperial and Scottsbluff. June 25 to August 14. One male and two females. Male specimen taken from alfalfa (*Medicago sativa*) at Scottsbluff, June 25.

*CALLIGRAPHA LUNATA* var. *HYBRIDA* (Say). (S). Scarce; found in the northeast and northwest of the state. Taken at South Sioux City, West Point, Pine Ridge in Dawes County and Warbonnet Canyon in Sioux County. June to July 21. Seven males and four females.

*C. SIMILIS* Rogers. Abundant through the eastern two-thirds of the state. Taken at Omaha, South Sioux City, Maskell, Lincoln, Malcolm, Fairmont, Clay Center, Hoppe's Well in Wheeler County, Springview, Halsey and Cherry County sandhills. January 19 to August 27; most abundant in June, July and August. Fifty-five males and forty-four females. One male specimen collected in hibernation, January 19. One female taken at an electric light in May. The greater number of the specimens were taken by the writer in swampy situations.

*C. PRAECELSIS* Rogers. Scarce; taken only in the eastern part of the state. Collected at South Bend, West Point, Lincoln, Malcolm and Bennett. June 28 to September 21. Three male and six female specimens. Two females were collected by the writer in moist situations along small streams. Blatchley (Coleoptera of Indiana, 1910) reports this species taken in Indiana from white top in timothy meadows.

*C. ELEGANS* (Olivier). Rather abundant over most of the northern half of the state. Taken at Omaha, West Point, Ewing, Holt County, Hoppe's Well in Wheeler County, Springview, Cherry County sandhills, Halsey, Mitchell and Glen. June 16 to August 19; most abundant in July. Twenty-four male and twenty-four female specimens. Taken by the writer

by sweeping vegetation in quite moist situations. Reported from Indiana (Blatchley, 1910) as taken from "thorough-wort and goldenrod in moist situations."

*C. SCALARIS* Leconte. (S). Abundant at scattered points in the east, south and northwest portions of the state. Collected at Tilden, Hardy, Cowles, Hastings, Chambers, Oxford, McCook and Warbonnet Canyon in Sioux County. April 11 to September 4, most commonly in July and August. Thirty-two males and fifty-seven females, of which five males and five females were reared by the writer from eggs deposited at Lincoln by specimens from Cowles. Females apparently more abundant than males in August. Feed on American elm (*Ulmus americana*) and rock elm (*Ulmus racemosa*). Reported by Blatchley (1910) in Indiana from linden also. Reported as injuring elms at Chadron, Dawes County, August 10, 1914. In 1929 there was a destructive outbreak of this species on the elms in Adams, Nuckolls, Webster and Furnas Counties, and in 1930 in Fillmore, Thayer, Clay and Nuckolls Counties. Specimens were sent in to the Department of Entomology during the summer of 1929 (June 21 to October 14) from Hastings, Hardy and Oxford, and in the summer of 1930 (June 3 to July 29) from Shickley, Sutton, Clay Center, Byron, Superior, Bostwick and Cowles.

*C. PHILADELPHICA* (Linnaeus). Abundant in the extreme northwest of the state. Taken at Pine Ridges in Dawes County, and Monroe Canyon, Warbonnet Canyon and elsewhere in Sioux County. July to August 17, mostly taken in August. Nine male and thirteen female specimens.

*C. AMELIA* var. *CONFLUENS* Schaeffer. (S). This variety, as determined by Schaeffer, is represented by eleven male and six female specimens from West Point, Cuming County, May 20 to June, mostly taken in May, and one specimen labeled simply "Neb."

*C. MULTIPUNCTATA* (Say). (S). Usually rather scarce, and occurring in the eastern and northern portions of the state. Taken at Blair, West Point and Springview. On July 14, 1930, however, specimens were sent in from Omaha, Douglas County, with a statement that these beetles were present in great abundance and were stripping the willows (*Salix* sp.) near that place. June 18 to July 13, most commonly in July. Three males and six females. One male specimen taken at Springview "under bridge on damp ground." Seven specimens were collected at Blair feeding on the foliage of willow (*Salix* sp.). Reported from Indiana (Blatchley, 1910) from thorn and red haw.

*C. BIGSBYANA* (Kirby). (S). Abundant through most of the state. Taken at Omaha, Blair, South Sioux City, West Point, Cedar Bluffs, Wahoo, Lincoln, Western, Fairmont, Genoa, Hoppe's Well in Wheeler County, Ewing, Springview, Dewey Lake Township in Cherry County, Halsey, Haigler, Thedford, Lewellen and Morrill. May to September, mostly taken in August. One hundred seventy-six male and one hundred fifty-six female specimens. Feeds on foliage of willow (*Salix* sp.). Also reported from poplar (*Populus* sp.) in Indiana (Blatchley, 1910).

*CHRYSOMELA FLAVOMARGINATA* Say. Abundant in the northwest portion of the state. Taken at Lincoln, Pine Ridge in Dawes County, and Monroe Canyon and Warbonnet Canyon in Sioux County. June and July, most commonly in July. Forty-eight males and fifty-nine females. Two male specimens only from Lincoln.

*C. BASILARIS* Say. (S). Scarce. Two specimens from Sioux County. No dates on the labels. One male and one female specimen.

*C. AURIPENNIS* Say. Rather scarce at scattered points in the state. Collected at South Bend, Lincoln, West Point, Neligh, Sidney, Harrison and Monroe Canyon in Sioux County. May to August 18. Nine male and nine female specimens.

*GASTROIDEA POLYGONI* (Linnaeus). Scarce. Taken at West Point and Lincoln. April and May. Two males and three females.

*G. DISSIMILIS* (Say). (S). Rather scarce, and taken at widely separated points. Collected at Lincoln, Fairmont and Mitchell. March 30 to July, mostly taken in April, May and June. Twenty-four male and twenty-six female specimens. Taken on gum weed (*Grindelia squarrosa*).

*LINA INTERRUPTA* Fabricius. Abundant and widely distributed through the state. Collected at Rulo, Nebraska City, Plattsmouth, Child's Point, Omaha, South Bend, Ashland, South Sioux City, Maskell, West Point, Lincoln, Beatrice, Wymore, Western, Hastings, Neligh, Clearwater, Springview, Valentine, Cherry County sandhills, Dewey Lake Township in Cherry County, Brady's Island, Pine Ridge in Dawes County, Monroe Canyon and Warbonnet Canyon in Sioux County and Mitchell. March 26 to August 12, most commonly in June and July. Ninety-six males and ninety-four females. Taken from white clover (*Melilotus alba*) and also on damp ground.

*L. INTERRUPTA* var. *QUADRIMACULATA* Schaeffer. (S). Rather scarce, but found in the southeast, north, northwest and west portions of the state. Taken at Rulo, Western, Valentine,

Dewey Lake Township in Cherry County, Cherry County sandhills, New Helena, Pine Ridge in Dawes County, Warbonnet Canyon in Sioux County, and Mitchell. June and July. Twelve male and nine female specimens.

*L. TREMULAE* (Fabricius). (S). Scarce, only three specimens in the collection of the Department of Entomology. Taken at Lincoln. June. Two males and one female.

*L. SCRIPTA* (Fabricius). Abundant throughout most of the state. Taken at Rulo, Omaha, Louisville, Maskell, Cedar Bluffs, Lincoln, Roca, Fairmont, Western, Neligh, Holt County, Bassett, Cherry County sandhills, Pine Ridge in Dawes County, Monroe Canyon and Warbonnet in Sioux County, and Mitchell. April 17 to August 10, most commonly in July. Seventy male and sixty-two female specimens. Taken from willow (*Salix humilis*).

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### The Migration and Breeding of *Dione vanillae* in Missouri (Lepid.: Nymphalidae).

By HAROLD O'BYRNE, Webster Groves, Missouri.

The occurrence of *Dione vanillae* Linn. in Missouri is so infrequent that the species can hardly be called a Missouri insect. Yet at times it appears in the vicinity of St. Louis in considerable numbers, local records showing that 1911, 1921, and 1931 were "*vanillae* years." As few were seen by collectors in this locality in any of the intervening years, each of these occasions must represent a new influx of individuals from the south. Randolph\* has recorded similar occurrences of this species near Pittsburg, Kansas.

The mating and ovipositing of *vanillae* in Missouri apparently have never been observed nor have its early stages been found. But recently a group of Girl Scouts succeeded where entomologists had failed; they found a number of larvae in various stages on a cultivated Passion-flower in St. Louis, about October 1, 1931. The youngsters obtained several pupae, and on October 15, 1931, a female butterfly emerged; during the next three weeks others of both sexes emerged. This event demonstrated that the species breeds in this locality, and that

\* Randolph, V. On the seasonal migrations of *Dione vanillae* in Kansas. Ann. Ent. Soc. Amer., xx (2), 242-244, 1927.

conditions are suitable for its development. The winter season, however, is probably not suitable for the survival of the species until spring, as the butterflies are never seen in the spring or early summer. All local records are dated August, September, October and early November.

It seems improbable that Missouri occurrences of this insect consist of solitary individuals that have strayed from their proper habitat. The records are too numerous for that. In 1931, specimens were captured or seen in St. Louis and in such widespread localities in St. Louis County as Webster Groves, Ranken, and Allenton. Various collectors report having seen from one up to four or five on nearly every collecting trip in August and September. Such a sudden appearance of large numbers of a species seldom seen here is evidently due to the arrival of an extensive wave of migration from the south.

Comparatively little study has been made of migration in this species, although many suggestions have been offered concerning the factors involved in the migration of other species, and of butterflies in general. One of these is that migration is forced by overcrowding, with consequent exhaustion of the larval food. Observations on the abundance of *vanillae* in the south in the years of northward flight would settle this point. It may be that there is a tendency in the butterflies to wander or spread as far as they can find favorable conditions. This would explain the occurrence of this species in the north in favorable years, but the question is: what are the conditions that make some years favorable? The summers of 1930 and 1931 did not appear to present such dissimilar conditions as to urge a great many of the butterflies to fly hundreds of miles northward in 1931, but none at all to do so in 1930.

As to the relation of these migrating individuals to the remainder of the species, it is probable that they are a total loss; there is no record of any southward migration from any place this far north, and they seem unable to endure the winter. It is possible, of course, that further study will disclose a return flight. Williams\* cites two instances of northward

\* Williams, C. B. The Migration of Butterflies. Edinburgh, 1930.

autumn flight of this species in Argentine, observed by Hayward, and one southward in Florida, observed by Johnson. In the light of existing records, however, it is most probable that the butterflies that fly to the north and their offspring all perish, and neither become established in their new home nor return to the south to rejoin the main body of their species.

### **A New Central American Proctolaboid Genus, *Tela* (Orthoptera, Acrididae, Cyrtacanthacrinae).**

By MORGAN HEBARD, Philadelphia, Pennsylvania.

In studying the Orthoptera of Mexico and making comparisons with material from adjacent regions we have discovered that Bruner, in the *Biologia*, has treated several species referable to the present group in a decidedly confusing manner. Material before us enables us to clear up most of this confusion and in so doing it has been found necessary to describe a new genus, one of the species there referable being also new.

#### ***Tela* new genus**

This genus is proposed to include the genotype *chlorosoma* here described, *Anniceris viridulus* Bruner and *Lcioscapheus annulicornis* Bruner. It represents a remarkable combination of the characters found in the allied genera, for the general appearance, contour of vertex and head, proportions of caudal tarsal joints and male supra-anal plate are as in *Ampelophilus* Hebard, the prosternum as in *Dellia* Stal, but the ovipositor valves as in *Lcioscapheus* Bruner.

Size medium, form moderately robust (not as graceful and with shorter limbs than in *Ampelophilus*). Fastigium prominent, narrow, slightly impressed, weakly declivent, with a definite carina at its transverse apex. Frontal costa subsiding at median ocellus, deplanate with a few minute impressed punctulae. Face moderately retreating, impresso-punctate, with carinae very weak but subocular sulcus very decided. Pronotum with cephalic margin slightly produced, with small, faint bi-convexities mesad; weak median carina best indicated cephalad and caudad, transverse sulci very decided; surface impresso-punctate particularly on metazona; caudal margin of disk broadly convex. Tegmina and wings considerably reduced, incapable of flight. Male genitalia of the general type found in *Ampelophilus*. Ovipositor valves represented by slender un-

armed fingers. Prosternum low, conical. Caudal femora with genicular lobes sharply acute-angulate produced in male, broader in female. Caudal tibiae with six (normal, or seven) external spines, lacking an apical spine. Caudal tarsi with joints elongate, second distinctly shorter and third distinctly longer than metatarsus.

**Tela chlorosoma** new species

1908. *Annicris viridulus* Bruner, in part, Biol. Cent.-Amer., Orth., I, p. 269, pl. III, 17 and 17a. [♀ (not ♂); Teapa, Tabasco, Mexico.]

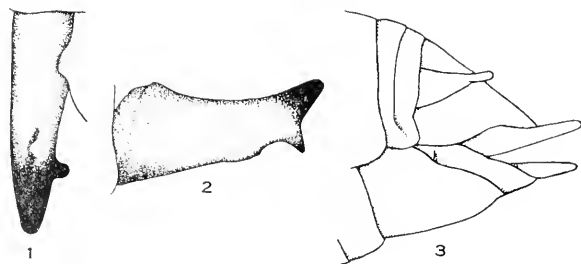


Fig. 1. Dorsal view of male cercus. Type. Lancetilla, Honduras.

Fig. 2. Lateral external view of same.

Fig. 3. Lateral view of apex of female abdomen. Allotype. Lancetilla, Honduras.

This species is readily distinguished from *viridulus* (Bruner) by the annulate antennae, pinkish genicular areas of the caudal femora, shorter tegmina and lack of black marking, the apex of the male abdomen in particular being pale.

Type: ♂; Lancetilla, near Tela, Atlantida, HONDURAS. September 7, 1930. (J. A. G. Rehn; from vine-covered weed tangle in opening in second-growth scrub.) [Acad. Nat. Sci. Phila., Type No. 5511.]

Size medium and form moderately compact for the group. Eyes large and prominent, separated by a very narrow interval. Tegmina slightly longer than combined length of head and pronotum. Supra-anal plate trigono-shield-shaped, a very small rounded projection proximad on each side, surface medio-longitudinally sulcate proximad and with a decided convex carina distad. Cerci curving gradually upward, with a decided sub-apical ventral tooth, the margin before this concave, and a decidedly smaller rounded tooth opposite that mesad on internal surface. Subgenital plate elevated to a sharply rounded apex, with a fine medio-longitudinal carina dorso-distad and the free



dorsal margin carinate. Cephalic coxae unarmed. Caudal femora not elongate (just as in *Ampelophilus*).

*Allotype*: ♀; same data as type. [Hebard Cln.]

Size decidedly larger, form decidedly more robust. Ovipositor valves unarmed slender fingers, the dorsal very faintly curved dorsad, the ventral straight.

General coloration rich biscay green, meso-caudal portion of occiput and a narrow post-ocular bar very slightly darker (light elm green) continued along the dorsal margins of the pronotal lateral lobes, but very inconspicuous. Abdomen slightly more yellowish; becoming paler distad in male, dull yellow ocher, with apices of cerci black; apex tinged with tawny in female. Fastigium and proximal antennal joints greenish yellow, the antennae thence black with very narrow annuli and apex broadly yellow ocher. Eyes rich hairs russet. Tegmina with narrow costal margins hyaline. Wings weakly infuscated. Mouthparts, ventral surface and cephalic and median limbs yellow ocher, the latter strongly tinged with green except proximad. Caudal femora rich biscay green; ventral and internal surfaces, a pre-genicular annulus and genicular lobes dull yellow ocher, the genicular areas tawny (this, except under the microscope, giving a pinkish brown effect. Caudal tibiae briefly dull yellow ocher proximad, then biscay green with dorsal surface distad darkened and in two females there definitely blackish.

Two female paratypes agree closely with the allotype and the measurements of a third smaller paratypic female follow those of the allotype. Length of body ♂ 15, ♀ 21 to 18 (estimated for normal position); length of pronotum ♂ 3.3, ♀ 4.8 to 4.2; total caudal width of pronotum ♂ 2.9, ♀ 4.7 to 4.2; exposed length of tegmen ♂ 5.7, ♀ 7.7 to 6.8; width of tegmen ♂ 2.3, ♀ 3.7 to 3.3; length of caudal femur ♂ 9.2, ♀ 12.1 to 11.2 mm.

Four females and a large immature female were taken in the same kind of environment in which the type was found at Lancetilla from August 24 to September 7.

We believe from examination of the specimens in the British Museum that the female from Teapa, Tabasco, recorded as *Anniceris viridulus* by Bruner, represents this species. The male so described, having been designated as type, must be recognized as *viridulus* and represents a very distinct species, apparently belonging to the present genus. That Institution

also has a male from Guatemala which we believe represents *chlorosoma*.

TELA ANNULICORNIS (Bruner)

1908. *Leioscapheus annulicornis* Bruner, Biol. Cent. Amer., Orth., I, p. 268. [♀; San Isidro, Guatemala, at 1600 feet.]

The type lacked caudal limbs and Bruner apparently placed the species in *Leioscapheus* wholly on the degree of development of the organs of flight shown.

Cacao, Trece Aguas, Alta Vera Paz, Guatemala, (Schwarz and Barber), 2 ♀, [U.S.N.M. and Hebard Cln.]

Though apparently closely related to the preceding, the present insect is more robust, with browns instead of greens the general coloration and dark markings much more definite, eye distinctly shorter, face less strongly impresso-punctuate and caudal margin of pronotum slightly more truncate.

In the best Cacao female (apparently considerably discolored, the other is very badly discolored) the general coloration is reddish brown, the antennae and caudal femora marked exactly as in *chlorosoma*. The wings are very strongly infumate. The caudal tibiae are extensively black dorso-distad. The abdomen has dark lateral margins and a medio-longitudinal line, the subgenital plate black proximad with two bands narrowing but extending to its caudal margin. The postocular lines are very narrow but darker than in *chlorosoma* and continued across the pronotum cause the narrow hyaline costal margin of the tegmina to be also very dark.

Length of body 18.5 (estimated for abdomen in normal position) and 21.7, length of pronotum 3.8 and 4.7, total caudal width of pronotum 3.8 and 4.9, length of tegmen 7.5 and 9.8, width of tegmen 3 and 3.4, length of caudal femur 11.7 and 12.2 mm.

Bruner's female from Purula, Alta Vera Paz, Guatemala, which he recorded as *Anniceris nigrinervis* in 1908, at the British Museum, does not represent that species and may be much nearer to the present genus. It is distinguished by the smooth pronotum, black bordered ovipositor valves, abdomen distad with several black vittae, antennae not annulate, tegmina 8.25 mm. in length and second tarsal joint equal to the first in length. Series from Guatemala are awaited with interest to determine the number of species of *Tela* which there occur.

## **A New Method of Studying the Wing Veins of the Mayflies and Some Results Therefrom (Ephemera).**

By HERMAN T. SPIETH, Indiana University, Bloomington,  
Indiana.

The wing of a mayfly as in other insects consists essentially of a saccular out-pocketing of the body wall, into which during the immature stages tracheae, blood vessels, and nerves penetrate. In the adult, this sac becomes flattened, greatly extended, and very thin, and veins are laid down. The mayfly wing is characterized (1) by the concave-convex placement of the wing veins, i.e., concave (or "down") and convex (or "up") veins alternating regularly with each other, and (2) by the triadic type of branching, i.e., whenever a vein forks there is always an interpolated vein of opposite position between the two branches. Thus a concave vein will fork into two concave branches; the interpolated vein is convex; and the regular alternation of convex and concave veins is preserved.

By soaking an adult wing in a 10-15% caustic soda solution for 24 to 48 hours, the connections between the two sides of the wing are broken and the wing separates into its component dorsal and ventral parts. The two surfaces can be cut apart at the margins and mounted on a slide for study.

The striking feature to be noted on a wing which has been treated thus is that all the convex veins belong to the dorsal surface of the wing and the concave veins to the ventral surface of the wing. The cross veins belong principally to the dorsal surface. Only at the base, where they join the concave veins which are on the ventral surface, is a stump of the cross vein to be found, while on the dorsal surface the cross veins are always complete and vigorously developed. The single exception to this condition is in the area between the costal edge of the wing and the sub-costal vein. Here the cross veins are better developed on the ventral wing surface, or at least developed equally on both surfaces of the wing. It is important to note that veinlets at the edge of the wings are always restricted to the dorsal surface.

Comstock and Needham in *Wings of Insects*<sup>1</sup> published a nomenclature which homologized the mayfly wing venation with that of other orders. Morgan<sup>2</sup> (1912) interpreted the

median and radial sector in the same manner as Comstock and Needham had interpreted them in Odonata. Tillyard<sup>3</sup> (1922) reworked the whole subject in correlation with his well known work on the veins of the Odonata. Lameere<sup>4</sup> (1922), dealing with the Paleodictyoptera, Odonata and Ephemera, advanced the hypothesis that in the ancestors of these groups the medial and cubital veins each presented a configuration similar to that of the radial and its branch the radial sector, i.e., a convex (radial) followed by a concave (radial sector). He terms these the anterior median (convex), posterior median (concave), anterior cubital (convex), and posterior cubital (concave). He also extended this hypothesis to the anal veins. In living mayflies he contended that anterior medial and anterior cubital were lacking. Martynov<sup>5</sup> (1922, published 1924) holds a view similar to that of Lameere but considered only the anterior median to have been lost.

Study of the two separated wing parts shows clearly that the vein Miss Morgan interpreted as Rs is not the radial sector but that the radial sector is in reality the concave vein just behind R.

According to Lameere's hypothesis it would be necessary, in order to maintain the regular alternation of convex and concave veins, which is invariably the condition found in the mayflies, that the posterior median had changed from a concave vein to a convex vein.

The loss of the anterior median, as hypothesized by Martynov, would necessitate all concave veins posterior to the radial sector to have changed to convex veins and vice versa.

Such changes as these would necessitate the "jumping" of a convex vein from the dorsal surface to the ventral wing surface and vice versa. Study of the separated wing parts shows that in no case is there any indication that any vein has ever changed from the dorsal to the ventral surface of the wing. Thus we are safe in assuming that the mayfly possesses a complete and archaic set of costal, radial, medial, and cubital veins, i.e., an anterior convex vein followed by a posterior concave member.

Tillyard<sup>6</sup> (1926), influenced by Lameere's hypothesis, modified his earlier nomenclature and to avoid confusion I have followed his system.

It is hoped that this method of study can be used by workers in other groups. For a fuller discussion of the Ephemerid wing veins, the reader is referred to my forthcoming paper on the *Phylogeny of Some Mayfly Genera*.

LITERATURE CITED.

1. COMSTOCK, J. H., and J. G. NEEDHAM. 1898. The wings of insects. *Amer. Nat.* 33:117-126.
2. MORGAN, A. H. 1912. Homologies in the wing-veins of mayflies. *Ann. Ent. Soc. of Am.* 5:89-106, 5 pl.
3. TILLYARD, R. J. 1922. The wing-venation of the order Plectoptera. *Jour. Linn. Soc.* 24:61; 25:477.
4. LAMEERE, A. 1922. Sur la nervation alaire des insects. *Bul. Class. des Sci. Acad. Roy. Belgique* 1922:38-149. (Translation in *Psyche* 30:123-132.)
5. MARTYNOV, A. V. 1922. The interpretation of the wing venation and tracheation of the Odonata and Agnatha. *Rev. Russe Ent.*, 18(4):145-174. (Translation in *Psyche* 37:245-281.)
6. TILLYARD, R. J. 1926. *Insects of Australia and New Zealand*. Sydney.

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**Fifth International Congress of Entomology.**

**Paris, 16-23 July, 1932.**

[Following is a translation of the official announcement in French.]

President: DR. PAUL MARCHAL, Member of the Institute, Professor at the National Agronomic Institute. Vice-Presidents: E. RABAUD, Professor at the Sorbonne, Paris; DR. J. VILLENEUVE, Rambouillet; P. DE PAYERIMHOFF, Conservator of Waters and Forests, Alger.

The Fourth International Congress of Entomology, at Ithaca, New York, in August, 1928, accepting the invitation which was given to it by the Entomological Society of France, unanimously decided that the fifth meeting should be held at Paris in 1932, at the same date as that of the Centenary of the Society. Dr. Paul Marchal has been elected President of the Fifth International Congress of Entomology.

We therefore invite very cordially all Entomologists to take part in the forthcoming Congress at Paris. We beg them also, with insistence, to honor the Entomological Society of France by their presence at the celebration of its Centenary.

DR. P. MARCHAL, President of the Congress.

DR. R. JEANNEL, President of the Entomological Society of France.

Executive Committee: Dr. K. Jordan, Permanent Secretary,

Tring, England. Dr. H. Eltringham, Stroud, England. Dr. R. Jeannel, Paris, France. Dr. W. Horn, Berlin, Germany. Dr. Y. Sjöstedt, Stockholm, Sweden. Dr. O. A. Johannsen, Ithaca, New York, U. S. America.

French Committee of Organization: Honorary members, E. L. Bouvier, H. W. Brolemann, J. de Joannis, J. Sainte-Claire Deville. Vice-Presidents of the Committee, F. Picard, E. Roubaud. Representatives of the Entomological Society of France, L. Chopard, R. Peschet, C. Dumont. Representatives of the French Society of Apiculture, G. Jaubert, E. Mamville, M. Sevalle. Representatives of the Commissions, on Organization, P. Vayssiere (lodgings), A. Magdelaine (meeting places), P. Marié (excursions), L. Lecharles. General Secretary of the Congress, Dr. R. Jeannel, 45 bis, rue de Buffon, Paris (5e).

Communications of general interest, accompanied as much as possible by photographic or cinematographic projections, will be made at a number of general sessions in the mornings.

The afternoons will preferably be reserved for meetings of the sections, divided as follows: 1. General Entomology; 2. Morphology, Physiology, Development; 3. Ecology, Biogeography; 4. Agricultural Entomology; 5. Medical and Veterinary Entomology; 6. Forest Entomology; 7. Apiculture (9th International Congress of Apiculture and Annual Meeting of the Apis Club); 8. Sericulture; 9. Nomenclature.

Communications may be made in French, English, German, Italian or Spanish. Each speaker is strongly requested to send a brief resumé of his communication in advance. This resumé will be printed and distributed before the meeting, which will greatly facilitate discussion.

All correspondence relating to communications presented to the Congress should be addressed to Dr. R. Jeannel, Muséum national d'Histoire naturelle, 45 bis, rue de Buffon, Paris (5e).

#### Provisional Program.

Centenary of the Entomological Society of France.

Saturday, July 16th. Afternoon. Formal session for the Centenary under the presidency of a member of the Government. Discourses. Addresses by Foreign Delegates. Concert. 8 P. M., Banquet to the official delegates of Universities and foreign Entomological Societies.

Sunday, July 17th, morning. Visit to the tomb of Latreille, first honorary president of the Entomological Society of France.

#### Fifth International Congress of Entomology.

Friday, July 15, Saturday, July 16, and Sunday, July 17. General Secretary's office open at the National Agronomic Institute, 16 rue Claude Bernard, Paris (5e), for the registration of members, distribution of badges and of invitations.

Monday, July 18, 10 A. M. Formal opening of the Congress under the presidency of a member of the Government. General session. 2 P. M., section meetings. 8 P. M., Theatrical soirée.

Tuesday, July 19. 10 A. M., General Session. 2 P. M., Section meetings. 5 P. M., Visit to the National Museum of Natural History. 8 P. M., Reception at the City Hall, Paris.

Wednesday, July 20. 9 A. M., Excursion to the Forest of Fontainebleau.

Thursday, July 21. 10 A. M., General Session. 2 P. M., Section meetings. 8 P. M., Banquet.

Friday, July 22. 10 A. M. Section meetings. 2 P. M., Excursion to Versailles and in the valley of Chevreuse.

Saturday, July 23. 10 A. M. Section meetings. 3 P. M. Closing session.

Sunday, July 24. Departure for an excursion of several days in the Pyrenees.

During the entire duration of the Congress, autocar excursions will be arranged each day, enabling the members to visit Paris and its surroundings agreeably.

The meetings and the office of the secretary will be in the quarters of the National Agronomic Institute, 16 rue Claude Bernard, Paris. Members of the Congress and their families can have their mail sent to this address. They will find there, on their arrival, all useful information on lodgings, program of the Congress, invitations to celebrations and excursions. The Secretary's office will place at their disposition a post-office, a travel bureau and an information bureau where interpreters will be at their disposition to guide them in visiting Paris. Tea will be served each day at 5 P. M. in the parlors of the Congress at the Agronomic Institute.

Everyone registered for the Congress will receive invitations for the celebration of the Centenary of the Entomological Society of France.

*Lodgings.* Tariffs of the principal hotels will be sent with a forthcoming circular. We can reserve rooms at an average price of 25 francs per room with one bed for one person, and of 40 francs per room with a large bed or with two beds. Students' rooms can be hired in University City at 10 francs per room with one bed.

The restaurants of Paris are of very diverse categories. They can be found at 7 francs per meal (fixed price, drinks and coffee included) up. But it is advisable to reckon that a simple but very satisfactory meal will cost from 12 to 20 francs.

Requests for information concerning lodgings should be addressed to the General Secretary or directly to M. P. Vayssière, Institut National Agronomique, 19, rue Claude-Bernard, Paris (5e), France.

## Entomological Literature

COMPILED BY LAURA S. MACKAY UNDER THE SUPERVISION OF  
E. T. CRESSON, JR.

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 figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the list of Periodicals and Serials published in our January and June issues. This list may be secured from the publisher of ENTOMOLOGICAL NEWS for 10c. The number of, or annual volume, and in some cases the part, part, &c. the latter within ( ) follows; then the pagination follows the colon :

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

\*Papers containing new forms or names have an \* preceding the author's name.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

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.

⚡ Note the change in the method of citing the bibliographical references, as explained above.

*Papers published in the Entomological News are not listed.*

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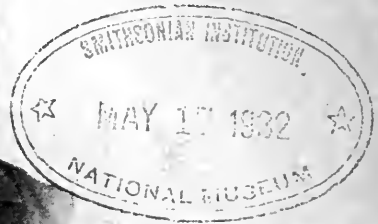
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No. 5



JOHN HENRY COMSTOCK, 1849-1931.  
Portrait of 1884.

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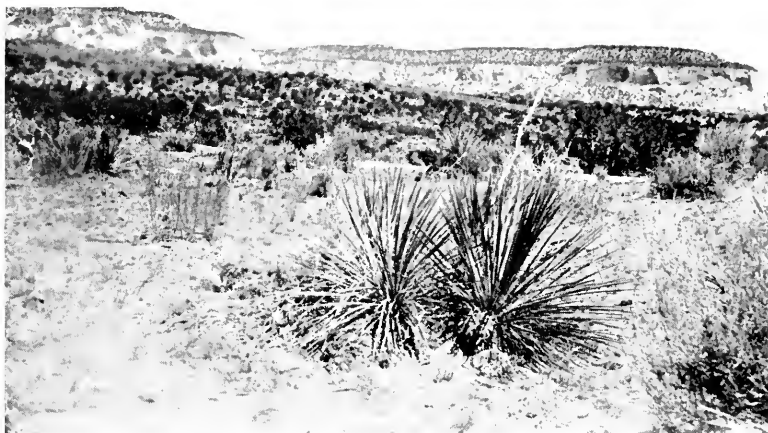
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Stated Meetings of The American Entomological Society will be held at 7.30 o'clock P. M., on the fourth Thursday of each month, excepting June, July, August, November and December, and on the third Thursday of November and December.

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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ANT, POGONOMYRMEX CALIFORNICUS.—COLE.



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## Notes on the Ant *Pogonomyrmex californicus*, Buckley (Hym.: Formicidae).

By A. C. COLE, JR., Ohio State University.

(Plate V.)

*Pogonomyrmex californicus*<sup>1</sup> is one of the most interesting species of the genus to which the well-known Occident ant (*P. occidentalis* Cr.<sup>2</sup>) belongs. Its habits are somewhat different from those of *occidentalis* yet the close relationship between the two species is distinctly noticeable.

### DISTRIBUTION AND HABITAT.

*Pogonomyrmex californicus* is one of the more common ants of the southwestern desert states, especially California and Arizona. Wheeler<sup>3</sup> reports it from California, Texas, and Grand Canyon, Arizona; Miss Helen Green<sup>4</sup> from southern California; and the writer from the vicinity of Mojave and Needles, California, and Cameron, Arizona.

The ant nests exclusively, as far as is known, in sandy or pebbly soil of deserts. This accounts for its abundance in the Mojave and Painted Deserts of California and Arizona. Apparently it has never been found to construct nests on the "baked" areas<sup>5</sup> of deserts for it is probably unable to excavate the hard soil.<sup>6</sup>

<sup>1</sup> A description of this species is given by W. M. WHEELER, New agricultural ants from Texas. *Psyche*, IX (1902), 391.

<sup>2</sup> See MCCOOK, H. C., The Honey Ants of the Garden of the Gods, and the Occident Ants of the American Plains. J. B. Lippincott & Co., Philadelphia, 1882.

<sup>3</sup> WHEELER, W. M., Ants; their structure, development and behavior. Columbia Univ. Press, New York, 1926, p. 566. Also, IDEM, New agricultural ants from Texas. *Psyche*, IX (1902), 393, and, IDEM, The ants of the Grand Canyon. *Bull. Amer. Mus. Nat. Hist.*, XXII (1906), 333.

<sup>4</sup> GREEN, HELEN E., Preliminary study of the ants of Southern California. *Jour. Ent. and Zool.*, XXIII (1931), 25.

<sup>5</sup> These "baked" areas are bare flats which do not support vegetation. In the Mojave Desert they are seasonal lakes which have dried up.

<sup>6</sup> WHEELER, W. M., Ants; (1926), 190.

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Wheeler<sup>7</sup> states that *californicus* is the most abundant and characteristic ant of the "warm desert zone" of the Grand Canyon which extends from the Angel Plateau to the banks of the Colorado River at the bottom of the canyon. The altitude, moisture and temperature of this lower zone are similar to those of the habitats of the ant in the desert south of the canyon.

In the typical habitats of the ant there is very little moisture and shade and an abundance of sunlight and high temperatures. The wind blows quite steadily over the Mojave Desert which greatly hastens evaporation. Shantz and Piemeisel<sup>8</sup> record the mean temperature of Mojave, California as 62.7 degrees over a period of 35 years and of Needles, California as 84.4 degrees for the mean maximum and 57.6 degrees for the mean minimum over a period of 23 years. The annual precipitation for Mojave is recorded as 4.86 inches over a period of 38 years and for Needles, 4.26 inches over a period of 28 years.

The following vegetation is typical of the desert areas occupied by nests of *californicus*: (Fig. 1).

*Atriplex polycarpa* (Torr.) S. Wats.  
*Covillea glutinosa* (Engelm.) Rydb.  
*Opuntia* spp.  
*Yucca mohavensis* Sarg.  
*Phacelia* sp.  
*Festuca octoflora* Walt  
*Parosela spinosa* (Gray) Heller  
*Franseria dumosa* A. Gray  
*Sarcobatus vermiculatus* (Hook.) Torr.  
*Aristida* sp.

#### THE FORMICARIES.

The nests, or formicaries, of *P. californicus* are often mere holes in the sand<sup>9</sup> with sand sometimes piled on one side. Wheeler<sup>10</sup> states that their nests are "low, flat craters from 6 inches to a foot in diameter with elegantly rounded slopes and slanting, usually somewhat eccentric entrances." This type of

<sup>7</sup> IDEM, The ants of the Grand Canyon. (See footnote <sup>3</sup>.)

<sup>8</sup> SHANTZ, H. L., and PIEMEISEL, R. L., Indicator significance of the natural vegetation of the southwestern desert region. Jour. Agr. Res., XXVIII (1924), 780 & 783.

<sup>9</sup> WHEELER, W. M., Psyche, IX (1902), 393.

<sup>10</sup> IDEM, Bull. Amer. Mus. Nat. Hist., XXII (1906), 341.

nest is shown in Figure 2. The writer has found both types of fornicaries and he is inclined to believe that the mound type is more characteristic of the Mojave Desert region.

The incipient mounds of *californicus* are small and fan-shaped and in their immature stages resemble those of *P. occidentalis* in the semi-desert regions. Wheeler<sup>11</sup> states that the de-lated queens construct the incipient mounds in pure sand "which is also the substance in which the adult colonies are found."

The size of the colonies varies from one to a few hundred individuals.<sup>12</sup> Apparently they never approach the numerical strength of colonies of *P. occidentalis*. The workers make no attempt to clear away vegetation surrounding the nest.<sup>13</sup>

#### HARVESTING ACTIVITIES OF THE ANT.

Perhaps the outstanding activity of these ants is the harvesting of seeds from plants in areas adjoining the colonies. Apparently three of the chief seeds harvested are those of *Phacelia* sp., *Aristida* sp. and *Sarcobatus vermiculatus*. The writer found these seeds in the chambers of most of the nests opened and the mounds were commonly surrounded with bracts of these and other seeds.

Harvesting activity in the Mojave Desert seems to be confined to the early morning and late evening hours. Many of the ants even work at night. During the heat of the day I found the entrances of all nests of *californicus* closed with sand or pebbles. When nests were opened under these conditions the ants were from one to a few feet below the surface where the soil temperature was noticeably lower.

#### EXPLANATION OF PLATE V.

Fig. 1.—A section of the Mojave Desert, California. The two plants in the foreground are *Yucca mohaveensis* Sarg. while a greater part of the vegetation in the background is composed of *Covillea glutinosa* (Engelm.) Rydb. Original.

Fig. 2.—A mound of *Pogonomyrmex californicus* Buckley on the eastern edge of the Mojave Desert, near Needles, California. The periphery of the mound is covered with husks from harvested seeds. The handkerchief serves to illustrate the relative size of the mound. Original.

<sup>11</sup> IDEM, *Ants*, (1926), 190.

<sup>12</sup> *Ibid.*, p. 284.

<sup>13</sup> *Op. cit.*

### **A New Species of *Phaleria* from the Gulf Coast of Alabama (Coleop.: Tenebrionidae).**

By FRANK E. BLAISDELL, Sr., Stanford Medical School and California Academy of Sciences, San Francisco, California.

The species belonging to the Tenebrionid genus *Phaleria* Latr., inhabit the sea-beaches of both the Atlantic and Pacific Coasts. The species described below is a new and interesting addition to those already known:

#### ***Phaleria lodingi*, new species.**

Form oval, depressed, narrowing very moderately anteriorly and posteriorly to appear slightly subfusiform, about twice as long as wide. Color pale testaceous, except eyes and tips of mandibles which are black, head sometimes suffused with piceous. Pubescence minute, extremely sparse and inconspicuous. Surface microscopically reticulo-granulate, luster dull and the integuments thin and subdiaphanous.

Head about as wide as long, scarcely as wide as the pronotal apex, widest across the eyes, canthi not in the least prominent; sides before the eyes very feebly arcuate and convergent anteriorly, slightly and broadly sinuate at the oblique sutures, the latter feebly indicated and blackish; epistomal apex slightly arcuato-truncate, angles narrowly rounded; frons scarcely convex, extremely feebly and broadly impressed from side to side before the eyes, frontal suture obsolete, finely, very sparsely punctate, punctures more distinct than elsewhere. Labrum short and transverse, apex feebly arcuate, more strongly so laterally, sparsely and obsoletely punctate. Eyes large, transverse, moderately prominent and convex, rather coarsely faceted, emarginate at the anterior canthi, narrowly separated beneath. Antennae short, equal to the length of the pronotum at middle, not quite attaining the posterior third; joints two to five inclusive quite equal in width, second a little longer than wide, third obconical and about twice as long as wide, fourth and fifth subequal and about as long as wide; joints six to eleven inclusive incrassate, forming a six-jointed moderately compressed club; joints seven to ten equal in length and width, transversely oval, sixth slightly smaller, eleventh as long as wide, subovate, feebly narrowed apically, apex arcuate, equal to the tenth in width.

Pronotum at base about twice as wide as long and twice as wide as the head, transverse; apex evenly, not deeply, broadly emarginate between the obtuse angles; sides convergent from base to apex and feebly arcuate; base broadly arcuate and three-fourths wider than the apex, angles nearly rectangular and narrowly rounded; disk feebly and evenly convex, sparsely and

obsoletely punctulate, basal impressions feeble and punctiform to slightly elongate.

Elytra widest at middle, a little more than three times as long as the pronotum, a third longer than wide; sides broadly arcuate and continuing the line of the pronotal sides, obtusely rounded at apex, sutural angles obliquely rounded; base adapted to but not wider than the pronotal base, broadly and arcuately emarginate, humeri not in the least prominent or tumid; disk evenly and very moderately convex, with striae of small, feeble and unimpressed punctures that become obsolete in apical third, where the striae are stronger, slightly impressed and the intervals feebly convex, best observed under oblique illumination, interstitial spaces quite impunctulate. Scutellum small, equilaterally triangular and impunctate.

Under surface of the body glabrous and for the most part obsoletely punctulate; metasternum and abdomen very sparsely and feebly punctulate, punctules slightly larger on the fifth ventral segment; second and third segments subequal in length, fourth a little shorter. Prosternal process horizontal, smooth, obtusely narrowed apically and vertical posteriorly. Prosternum with a small, more or less distinct, shallow rounded pit at middle a short distance from the base of the process, at times evanescent.

Legs slender, femora not in the least inflated, flattened, protibiae moderately broadly and gradually dilated apically, triangulo-clavate in outline and briefly arcuate at base; meso- and metatibiae straight, widening but slightly toward apex; protarsi short and slightly stout, joints one to four subequal in length and width, the terminal quite equal in length to the preceding four; meso- and metatarsi long and slender, the latter about eight-ninths as long as their tibia. Abdominal segments differing in length in the sexes.

*Male*: A little narrower, fourth abdominal segment four-fifths as long as the third and two-thirds as long as the second.

*Female*: Broader. Fourth segment one-half the length of the second and about three-fifths as long as the third.

Measurements: (Types) Length 5-5.5 mm.; width 2.3-2.8 mm.

*Holotype*, male, No. 2954, and *allotype*, female, No. 2955, in the author's collection, Museum of the California Academy of Sciences. Collected by H. P. Löding, on the Gulf Beach at Mobile, ALABAMA. I take much pleasure in naming it after Mr. Löding.

Fourteen specimens studied, ten of which are *paratypes* distributed as follows: Four in each of the Author's, U. S.

National Museum and Mr. Löding's collections; two in that of Henry Dietrich of Lucedale, Mississippi.

The habitat of the species appears to be local as Mr. Löding states that he has taken it in but one place and always under or in the vicinity of dead fish.

*Lodingi* is more closely related to *gracilipes* Casey than to any other species. Specimens have been very carefully compared with the type of *gracilipes* by Drs. Buchanan and Chapin of the National Museum.

Dr. Buchanan states concerning *gracilipes* Casey: "It is a little shorter and relatively narrower, is darker brown, more shiny and less distinctly alutaceous than *lodingi*; the punctulation of pronotum, elytral intervals and venter is a little heavier. Regarding *lodingi* the paler color, more strongly developed alutaceous surface texture, duller luster and feebler punctulation may be in part due to immaturity. In *lodingi* the prosternum in front of coxae has a small pit or large puncture which is lacking in *gracilipes*. The prothorax of *lodingi* is a little broader relative to the length, and has sides slightly less arcuate than in *gracilipes*."

Dr. Chapin remarks: "I am not certain whether I would call the two the same species. There is a difference in locality that may or may not be significant. Löding tells me that he finds these at but one place; that would indicate that the species is rather narrowly limited. So much for the side that the two are not the same. Against this, we have only the single type specimen of Casey's species. There is no way to tell how much his species varies. Perhaps they are the same—I really doubt it."

According to Col. Casey's remarks *gracilipes* is very narrow, smallest and by far the most slender species with elongate metasternum, allied only to *debilis* Lec. The type of *gracilipes* measures 4.5 mm. in length and 1.9 mm. in width, and was collected by Mr. W. Julich in Texas, (supposedly on the sea beach, although not so stated).

In closing Mr. Löding says that "the pale color of *lodingi* is not due to immaturity, as all of the specimens that he has collected have been of the same color." It belongs to the group of species in which the margins of the thorax and elytra are not fimbriate.

## The Relation of the Size of the Cell to the Sex of the Wasp in *Odynerus foraminatus* Sauss. (Hymenopt.: Vespidae).

By PHIL RAU, Kirkwood, Missouri.

This wasp<sup>1</sup> nests in hollow twigs and ready-made burrows. The discovery of one of these nests at just the right time enabled me to make the following notes.

The nest was in a hollow twig ten inches long, and the opening was plugged with mud. There was a  $1\frac{1}{2}$  inch vestibule near the plug, but this was merely an exaggeration of the double wall usually found between the cells. These spaces,<sup>2</sup> in my opinion, serve as insulation from the extreme weather changes for the immature insect, although Roubaud thinks they serve to confuse the parasites. This twig was one which had been hollowed out by some other insect and served nicely the purposes of the present occupants. It was one of about fifty tied together in a bundle and hung out-of-doors, vertically, just for the purpose of luring such insects as these to kindly use them in my own back yard and thus save me a trip afield.

The cells placed in the tube from the bottom up were measured and the sex of the occupant determined when they became mature.<sup>3</sup> It is interesting to note that only the two bottom

No. from Bottom	Size of Cell, Inches	Sex	Condition	Size of Air-space Above
1	1	♀	Pupa face pigmented	$\frac{1}{4}$
2	$\frac{3}{4}$	♀	Fully pigmented, and wings in early stage of inflation	$\frac{1}{8}$
3	$\frac{3}{8}$	♂	Completely developed adult	$\frac{1}{4}$
4	$\frac{1}{2}$	♂	Completely developed adult	$\frac{1}{4}$
5	$\frac{1}{2}$	♂	Completely developed adult	$\frac{1}{4}$
6	$\frac{3}{8}$	♂	Completely developed adult	$\frac{3}{8}$
7	$\frac{1}{2}$	♂	Dead small larva	$\frac{3}{8}$
8	$\frac{3}{8}$	♂	Pupa pigmented, no wing inflation	$\frac{1}{4}$
9	$\frac{1}{2}$	♂	Younger; only slightly pigmented	$\frac{7}{16}$
10	$\frac{1}{2}$	♂	Very white	$\frac{3}{16}$

The space between the last cell-plug and the outside plug (the vestibule) was  $1\frac{1}{2}$  inches in length.

<sup>1</sup> Identified by Dr. Grace Sandhouse.

<sup>2</sup> The air spaces varied in size from  $\frac{1}{8}$  inch to  $\frac{7}{16}$  inch (see table).

<sup>3</sup> The technique was carefully to split the tube, and cover the occupied portion with strips of celluloid or cellophane, secured by adhesive tape.

cells contained females and were from  $\frac{3}{4}$  to 1 inch in length, while all of the upper eight cells contained males and were only  $\frac{3}{8}$  to  $\frac{1}{2}$  inch in length.

This nest was taken and examined on July 29, 1930, and shows an interesting state of affairs in regard to development and emergence. Even though the eggs of the females had been the first deposited, they were in a more backward state of development than the males in the four cells above them. The males in cells 3, 4, 5 and 6 were fully developed and ready to emerge, and were undoubtedly waiting for the inmate in cell 7 to make way for their emergence by getting out itself. But unfortunately, the occupant in cell 7 had died, and since this one had failed to open its portion of the channel, all below it were imprisoned.

The reason for slower development in the females than in the males as shown by the first six cells is a physiological one as well as biological. The females, even though the eggs had been deposited first, were not the first to be ready to emerge. This was probably due to the larger size to which they must grow, plus the maturation of the ova; the males, being smaller, had less tissue to build and therefore matured in less time. From the behavioristic point of view, the males needed to be on hand early to fly forth and find females of other colonies.

While the males in cells 3, 4, 5 and 6 were adult and waiting to flee when the twig was cut, it does not necessarily mean that all of them had become adult simultaneously. It probably means that they became adult one by one in direct relation to the time when the eggs had been deposited, and merely waited quietly for the younger brothers between them and the door to become mature and break down the walls. In cells 8, 9 and 10, containing male pupae in various stages of development, the uppermost and youngest was a very white pupa, the next slightly pigmented, while the one below was wholly pigmented and very mummy-like; which indicates that they develop in order of oviposition.

Does the entire line wait for the youngest wasp to become



adult and start the emerging procession? Also when one such accident occurs as a dead wasp in the middle of the line, does the catastrophe of entombment result? Or are they capable of modifying their usual behavior to suit the needs of an emergency?

In order to test the method of emergence in this case, the two portions of the twig were put together with adhesive tape and placed in an upright position in a dark box. Two days later I discovered that the two lowermost wasps had attained adulthood and they along with males in cells 3 and 4, had bitten a hole through the center of each double plug and in the doorway, and had escaped to the floor of the box. It seems clear that the imprisoned wasps did not wait for the young males above them to clear the way, but probably the females below them, when they became full-grown, took the initiative and the males followed. This seems more likely, because the females are larger and have more powerful jaws. They, on whose energy the race depended, wasted no time in loafing, but worked upward and onward, bringing freedom to those who should have opened the way for them. The females alone were physically fit and physically capable to bite through the several walls.

It is surprising that in this abnormal process of liberation none of the infants in the upper rooms were disturbed or pushed to the bottom. They kept their places in each cell, and even though these adults crowded past them, none were injured, and all eventually reached maturity.

Of course the facts are interesting in themselves, and especially the fact that the large cells contained females and the small cells males, but it adds nothing in answer to the vexing problems of whether the mother knew something about the sex of each egg, and provided food and space according to the occupancy of one or the other sex. It seems almost too much to grant them sufficient foresight to do that sort of thing, but twenty years in the field with these insects have taught me to expect the unexpected, and not to be surprised at new wonders as they crop up from day to day.

**List of the Aquatic Beetles Taken in Presque Isle, State Park, Lake Erie, Penna.\* (Coleop.: Dytiscidae, Haliplidae, Hydrophilidae, Gyridae).**

By JOHN T. GAMBLE, Thiel College, Greenville, Pennsylvania.

Presque Isle State Park, located on a peninsula extending into Lake Erie at Erie, Pennsylvania, is one of the most unique ecological situations to be found in the United States. The peninsula is a compound, recurved sand-spit which,<sup>1</sup> as its name implies, is almost insular in its aspects. Due to constant changes in its topography it presents a remarkable series of aquatic habitats. These consist of series of ponds and marshes, separated by forest and sand dune areas, ranging along its entire length in a more or less chronological sequence. The ponds near the neck of the peninsula are several hundred years old and from these, extending toward the outer extremity of the sand-pit, there is a succession of ponds of various ages, sizes and shapes terminating in recently formed beach pools.

While engaged in field studies on the peninsula at the University of Pittsburgh Lake Laboratory the writer was impressed by the abundance of the aquatic beetles in the various ponds, which seemed to present almost every type of still water situation. From 1926 to 1931 a concentrated effort was made to determine the species of aquatic Coleoptera to be found on the peninsula and also to ascertain, as far as possible, the various factors involved in the distribution of these species in the numerous ponds.<sup>2</sup> The latter studies were made as a contribution to a general study of the life and distribution of animals on the peninsula by the Zoology staff<sup>3</sup> at the Lake Laboratory.

After completing the survey of species the writer was so impressed by the number of genera and species from such a restricted area, that he made a comparative study of species

\* Contribution from the University of Pittsburgh Lake Laboratory.

<sup>1</sup>JENNINGS, O. E. "A botanical survey of Presque Isle, Erie County, Pennsylvania." *Ann. Car. Mus.*, Vol. V, Nos. 2 and 3, 1909.

<sup>2</sup>GAMBLE, J. T. "Studies on the ecology and distribution of aquatic beetles of Presque Isle, Lake Erie, Pennsylvania". *Proc. Penna. Acad. Science*, Vol. V, 1931.

<sup>3</sup>WILLIAMS, S. H. "Preliminary report on the animal ecology of Presque Isle, Lake Erie, Pennsylvania." *Loc. cit.*

abundance with lists from nearby states. A list of the species of aquatic coleoptera collected on Presque Isle and a table showing the relative abundance of genera and species as compared with New York and Indiana, is as follows:

- DYTISCIDAE
- |  |  |
|--|--|
| 1. <i>Hydrocanthus iricolor</i> Say        | 49. <i>Dytiscus harrisi</i> Kirby                |
| 2. <i>Laccophilus maculosus</i> (Germ.)    | 50. " <i>fasciventris</i> Say                    |
| 3. " <i>proximus</i> Say                   | 51. " <i>hybridus</i> Aube                       |
| 4. " <i>undatus</i> Aube                   | 52. " <i>verticalis</i> Say                      |
| 5. <i>Hydrovatus pustulatus</i> Melsh.     | 53. <i>Cybister fimbriolatus</i> (Say)           |
| 6. <i>Desmopachria convexa</i> (Aube)      | HALIPLIDAE                                       |
| 7. <i>Bidessus affinis</i> (Say)           | 54. <i>Peltodytes duodecimpunctatus</i><br>(Say) |
| 8. " <i>flavicollis</i> Lec.               | 55. " <i>muticus</i> Lec.                        |
| 9. " <i>granarius</i> (Aube)               | 56. <i>Haliplus borealis</i> Lec.                |
| 10. " <i>pulicarius</i> (Aube)             | 57. " <i>fasciatus</i> Aube                      |
| 11. " <i>suburbanus</i> Fall               | 58. " <i>immaculicollis</i> Harr.                |
| 12. <i>Coclabius dispar</i> Lec.           | 59. " <i>triopsis</i> Say                        |
| 13. " <i>impressopunctatus</i><br>(Schall) | HYDROPHILIDAE                                    |
| 14. " <i>nubilus</i> Lec.                  | 60. <i>Helophorus linearis</i> Lec.              |
| 15. " <i>turbidus</i> Lec.                 | 61. " <i>lineatus</i> Say                        |
| 16. " <i>inaequalis</i> (Fab.)             | 62. " <i>nitidulus</i> Lec.                      |
| 17. " <i>laccophilinus</i> (Lec.)          | 63. <i>Hydrochus inaequalis</i> Lec.             |
| 18. <i>Hydrophorus dichrous</i> Melsh.     | 64. <i>Sphaeridium scarabacoides</i> L.          |
| 19. " <i>niger</i> Say                     | 65. <i>Cercyon pygmaeus</i> Illig.               |
| 20. " <i>clypealis</i> Sharp               | 66. " <i>tristis</i> Illig.                      |
| 21. " <i>consimilis</i> Lec.               | 67. <i>Paracymus subcupreus</i> Say              |
| 22. " <i>undulatus</i> Say                 | 68. <i>Hydrobius fuscipes</i> L.                 |
| 23. " <i>melshimeri</i> Fall               | 69. " <i>melaenus</i> Germ.                      |
| 24. " <i>striola</i> Gyllenhal             | 70. <i>Anacaena infuscata</i> Motsch.            |
| 25. <i>Celina angustata</i> Aube           | 71. <i>Enochrus cinctus</i> Say                  |
| 26. <i>Copelatus glyphicus</i> (Say)       | 72. " <i>hamiltoni</i> Horn                      |
| 27. <i>Agabetes acuductus</i> (Harr.)      | 73. " <i>ochraceus</i> Melsh.                    |
| 28. <i>Agabus aeneolus</i> Crotch          | 74. " <i>perplexus</i> Lec.                      |
| 29. " <i>confinis</i> Gyll.                | 75. <i>Helocombus bifidus</i> Lec.               |
| 30. " <i>punctatus</i> Melsh.              | 76. <i>Chaetarthria pallida</i> Lec.             |
| 31. " <i>semivittatus</i> Lec.             | 77. <i>Tropisternus glaber</i> Lec.              |
| 32. " <i>seriatus</i> (Say)                | 78. " <i>lateralis</i> F.                        |
| 33. " <i>scapularis</i> Mannh.             | 79. " <i>mixtus</i> Lec.                         |
| 34. <i>Ilybius biguttulus</i> (Germ.)      | 80. <i>Hydrophilus obtusatus</i> Say             |
| 35. " <i>confusus</i> Aube                 | 81. <i>Hydrous triangularis</i> Say              |
| 36. " <i>ignarus</i> Lec.                  | 82. <i>Berosus peregrinus</i> Herbst             |
| 37. " <i>oblitus</i> Sharp                 | 83. " <i>striatus</i> Say                        |
| 38. <i>Matus bicarinatus</i> (Say)         | GYRINIDAE  |
| 39. <i>Coptotomus interrogatus</i> (Fab.)  | 84. <i>Dineutes assimilis</i> Kirby              |
| 40. <i>Rhantus binotatus</i> Harr.         | 85. " <i>emarginatus</i> Say                     |
| 41. " <i>bistriatus</i> (Bergst.)          | 86. " <i>horni</i> Roberts                       |
| 42. " <i>flavogriseus</i> Crotch           | 87. <i>Gyrinus aeneolus</i> Lec.                 |
| 43. <i>Colymbetes sculptilis</i> Harr.     | 88. " <i>limbatus</i> Say                        |
| 44. <i>Hydaticus piceus</i> Lec.           | 89. " <i>minutus</i> F.                          |
| 45. <i>Graphoderes cinereus</i> L.         | 90. " <i>pectoralis</i> Lec.                     |
| 46. <i>Thermonectes basilaris</i> (Harris) | 91. " <i>piceolus</i> Blatch.                    |
| 47. <i>Acilius semisulcatus</i> Aube       |  |
| 48. " <i>mediatus</i> (Say)                |  |

Comparison of the aquatic coleopterous fauna of Presque Isle with that of the states of Indiana and New York.

	Dytiscidae		Hydrophilidae		Haliplidae		Gyrinidae	
	Gen.	Spec.	Gen.	Spec.	Gen.	Spec.	Gen.	Spec.
Presque Isle <sup>1</sup>	22	53	14	24	2	6	2	8
Indiana <sup>2</sup>	24	70	20	54	2	10	2	15
New York <sup>3</sup>	26	129	25	88	2	17	2	31

Both the Indiana and New York lists include pond, stream and terrestrial representatives of the various groups, while the Presque Isle list (with 2 or 3 exceptions) includes only pond forms.

### Some Old Letters.

By H. T. FERNALD, Orlando, Florida.

#### I. The Ways of a Wasp (Hym.: Sphecidae).

.....Pa., Sept. 3, 1898.

Dear .....

I have recently had an experience in which I am sure you will be interested and am therefore writing you somewhat at length about it.

Before I really begin, let me say that in order to make certain actions which I shall describe, stand out more clearly, I shall also explain them in such terms as would hold, I think, if it were a person concerned rather than a wasp. But I do not thereby commit myself even for a moment to the position that these explanations would hold for the wasp. In fact, who can with any certainty account for the actions of a wasp? We explain such actions in terms of our own mentality but they may be totally different, from the standpoint of the wasp.

A few days ago, early in the afternoon, I was walking along a path near my house when I saw, almost at my feet on the walk, a small digger wasp dragging along a caterpillar which either was or closely resembled that of a nearly full-grown cabbage butterfly. The walk, which was about five feet wide, was made of soft coal ashes (cinders) and while somewhat trodden down was nevertheless rather rough and loose, partic-

<sup>1</sup> From preceding list.

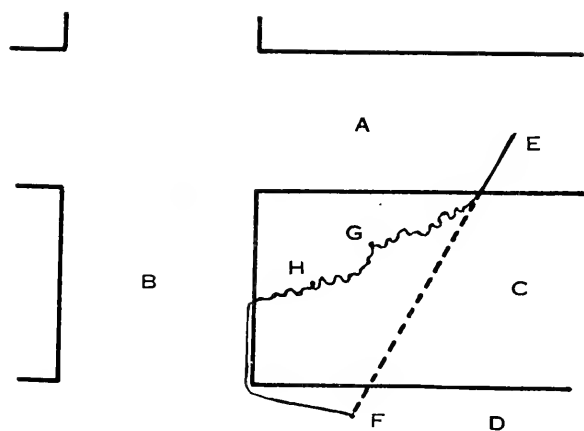
<sup>2</sup> From Blatchley, "Coleoptera of Indiana."

<sup>3</sup> From Leonard, "Insects of New York."

ularly toward its sides, which made the dragging rather hard for the wasp which was only about three-quarters of an inch long, and which later proved to be *Ammophila urnaria* (Dahlb.).\*

The wasp, when first seen, was astride the body of the caterpillar, dragging it along in the manner so delightfully described recently by the Peckhams in their book with which I know you are familiar.

After a time the insect seemed to tire of this method, for it let go of the caterpillar and, grasping its head, backed off dragging the caterpillar after it. This proving unsatisfactory or tiresome, however, it shortly resumed its first position.



A, Walk; B, Cross Walk; C, Grass; D, Road; E, Where wasp was first seen; F, Hole; G, H, Where the wasp climbed up the grass; EF, Direct line to hole; EGHF, Approximate path of wasp.

The path of the wasp was obliquely across the walk, at the side of which was a grass strip about seven feet wide, separating the walk from a carriage road also made of cinders, well packed by passing wheels except for about two feet near the grass, where, as this part was little used, it was quite loose. A few feet beyond the wasp a cross walk ran from the main one on which the wasp was, to this road. It was evident that if the wasp maintained the direction she was taking across the

\* Now *Sphex arvensis* (Dahlb.).

walk she would enter the grass and reach the road before coming to the cross walk.

Forgetful of everything else I watched that wasp, as she tugged and strained, dragging her burden along and finally entered the grass. Here, however, difficulties unforeseen appeared. The grass stems were quite close together and about four inches high, the lawnmower not having been over that place for some time. Under these conditions the wasp was dragging her burden through what, to her, was a dense forest, with the trees growing close together, to add to the difficulty of her task. No wonder then, that her path, at first as straight as could be expected under the circumstances, became more winding as she dragged the caterpillar between the grass stems seeking for the easiest way and finally led in quite a different direction from that first taken. That she seemingly realized this may be why she let go of the caterpillar and climbed to the top of a grass stem (I almost wrote it—tree). Here her head could be seen turning slowly from side to side for about a minute. Then she descended, grasped the caterpillar and started off, this time practically on her course again.

But the same difficulties as before were present. She was still less than half way across the strip of grass and after a time she again began to stray. To overcome this difficulty the same method as before was adopted. Another grass stem was climbed and from its top the wasp again viewed the scenery!

At this point in her wanderings the wasp had strayed so far from her original direction that she was nearer to the cross walk than to the road which she seemed to have been heading for, and if human interpretation of her next acts may be accepted, she decided that the best thing to do would be get out of the grass. Accordingly she went down and picked up the caterpillar, but this time, instead of resuming her original direction, she headed for the nearest clear place, the cross walk, and after some effort reached it about a foot from where it joined the road. Dragging, half carrying the caterpillar, she hurried along the side of the walk close to the grass, turned the corner and went along the road toward where her original line of march would have brought her, and about a foot out from the

grass. Arrived at the line of her original march she laid down the caterpillar and began hunting over an area eight or ten inches in diameter. Then spying a small, thin piece of slate evidently from the roof of a recently constructed building near by, she went to it, pushed it to one side, and beneath it was a hole! She had reached her goal.

And now to dispose of her prey. Pulling the caterpillar near the mouth of the hole the wasp now placed her antennae in the opening, pressing them against its sides; then withdrawing them, placed them on opposite sides of the caterpillar, after which she repeated the process. The human intellect would assume she was measuring to see if the caterpillar was too large for the hole. What the wasp thought, who can tell? Her next act was to step astride the caterpillar, pick it up and start down the hole. But here a difficulty appeared: the hole was large enough for the caterpillar or for the wasp, but not for the two together. After a brief struggle the wasp backed out of the hole—she did get her head part way in—and for a third time repeated her seemingly measuring movements with her antennae. Then followed a pause. Would she enlarge the hole; give it up altogether; or what would happen? After a few moments of absolute quiet she drew the head of the caterpillar close to the hole, which she then entered herself. Reappearing a moment later, heading outward, she reached out, grasped the caterpillar and backed down out of sight, dragging the caterpillar after her.

At this point I became fearful that the wasp might escape and so when it came out about a minute later it found itself in a cyanide bottle. I therefore lost any opportunity of seeing what would happen afterward such as the process of filling the hole, the possible pounding down of the earth with a stone, or the various actions chronicled by different observers.

The hole was between three and four inches deep, sloping obliquely downward, slightly greater in diameter in its lower third, and here I found the caterpillar with an egg attached to its side at about the fourth segment behind the head.

How to account for the remarkable actions of this wasp is a problem unless the fact that it (and probably several gen-

erations preceding) lived on a college campus be considered. If its mental activities were in some way affected by the intellectual atmosphere present there, an explanation, perhaps, is found!

I shall not publish this account at present for I feel sure it would not be believed. I do feel confident, though, that observations during the next quarter-century will bring to light such remarkable actions by wasps that by that time this description of my observations will be much more acceptable than now.

Yours sincerely,

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### Notes on Some New York Odonata.

By J. DOUGLAS HOOD, University of Rochester, Rochester,  
New York.

The dragonfly is worthy game, whether sought with the net, the camera, or, as advocated by a recent contributor to one of our leading sporting magazines, with the rifle loaded with shot cartridges.\* As an adjunct to the fly-rod, the insect-net has been in New York for several years my constant companion, and pleasant days on Adirondack streams have owed much of their pleasure (and frequently most of their profit!) to the net rather than the rod. A few of the observations made at such times and others, together with certain distributional records which have seemed worth while, form the contents of this paper.

*CALOPTERYX AMATA* Hagen. This strong-flying dragonfly, recorded in New York only from Franklin and Essex counties, is common along the Little River near Oswegatchie, N. Y., where it seems to frequent the mouths of the numerous cold spring-runs. It is more wary than its congener *C. maculata*, and consequently much more difficult to capture. Its flight is more direct and not as fluttering, and when hawking along the stream margins it may frequently be mistaken for a gomphine. Specimens have been collected from June 17 to July 27.

The male in courting frequently flutters poised in front of

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\* Burton, Lester A., "A Shootin' Yarn", *Field and Stream*, 1932, No. 9, p. 46 (Dec., 1931).



the seemingly disinterested female, usually alight on an alder leaf over the water, for a full thirty seconds, moving only a few inches away during the entire period.

*LESTES INAEQUALIS* Walsh. In the New York state list of insects,\* Needham records this species from Staten Island only, where it was taken in June and July by William T. Davis.

About Rochester it is not uncommon in certain years. In 1929 it was frequently encountered at Sodus Bay (Wayne Co.), where in the previous year only its congener *vigilar* was taken. In 1928 it appeared to be the commonest large *Lestes* at Long Pond (Monroe Co.). The dates of capture range from June 19 to July 19.

*ENALLAGMA ANTENNATUM* (Say). This is one of the dominant species along the old and abandoned Erie Canal at Wayneport, N. Y. Specimens were taken in numbers July 25. It is one of our rarer *Enallagmas* having been recorded in the State only from St. Lawrence, Essex, and Tompkins counties.

*OPHIOGOMPHUS CAROLUS* Needham. My experience with this species in the field is not at all in agreement with that of Needham, who says (Bull. 47, N. Y. State Mus., p. 439; 1901), "Few imagos have been taken at large, and, indeed, they are rarely met with"; and also (Can. Ent., 29: 183; 1897), "It was easy to collect the nymphs by hundreds in April, and in May the banks of the waters they frequented were fairly covered with exuviae. Yet, outside of my breeding cages I saw but one live imago, notwithstanding I was doing much collecting at all times and in all places considered favorable. Where were they?"

Along Willseyville Creek and Six-mile Creek, in Tompkins County, this was the commonest dragon-fly in June, 1926. In the riffles it was the exception to find an unoccupied boulder; and frequently a larger boulder would serve as a resting and reconnoitering station for two or three individuals. Long series of males (and one female) were taken in the period between June 16 and June 28.

The answer to Needham's question is that after emergence

\* Leonard, M. D., *et al.* "A List of the Insects of New York, with a List of the Spiders and Certain other Allied Groups", Mem. 101, Cornell Univ. Agr. Exp. Sta.; 1928.

this dragonfly, probably like all others, leaves the vicinity of the body of water in which the nymphal life was passed and remains away until the wings and integument are fully hardened and until sexual maturity brings them back to the water for the purpose of mating and egg-laying. Did dragonflies not habitually do this, the competition for food would be extreme, especially where many thousands emerge along each few hundred feet of shore line.

The emergence of our dragonflies from the warming waters begins in the spring with *Anax junius* and *Ischnura verticalis*, the first forms to be seen on the wing in this latitude. The transformation of the numerous species is continued throughout the summer, until August and September bring out from the water the last of the aeshnas and sympetrams. In this orderly cycle, many cordulines follow most of the Zygoptera and the libellulines precede the large aeshnas. The number produced is astonishing. From each foot of shore line in suitable bodies of water many dozens of individuals take wing. One year Mr. E. A. Maynard, one of my colleagues, found at Conesus Lake, on each of two successive nights, an average emergence of five *Epicordulia princeps* to each linear foot of shore; and yet this species is never abundant over the water, and is only one of nearly a score of species to complete its transformation among the rushes and flag which border most of the lake. Did every individual of all the species remain in the vicinity of its nymphal home, there would scarcely be flying room for them, and of food almost nothing at all.

*Ophiogomphus carolus* emerges in May, according to Needham, and several weeks apparently elapse before its return in sufficient numbers to be noticeable.

It is a beautiful insect, with the ground color of matured males bright grass-green, and the spots on abdominal tergites 7-10 and the terminal appendages yellow. The median spots on the basal tergites are decidedly greenish. Reared individuals never attain this full coloration, which is much brighter than that described by Needham.

*OPHIOGOMPHUS RUPINSULENSIS* (Walsh). Recorded in the state from Tompkins, Schoharie, and Sullivan counties, this has been taken at Lakeville (on Conesus Lake), June 3, 1928

(1 ♂, just emerged), by E. A. Maynard; and at Cranberry Lake, on the Oswegatchie River, Aug. 4, 1926 (1 ♀), by the writer. I have seen it also at Oswegatchie, on the Little River, resting on inaccessible boulders in midstream.

*LANTHUS ALBISTYLUS* (Hagen). Early in August, this is easily the commonest dragonfly along the Oswegatchie River, a mile or so below Cranberry Lake where the water comes over a log chute. In the state it has been recorded only from the "Ramapo Mts., close to [New Jersey] state line."

*BOYERIA GRAFIANA* Williamson. The state list of insects records this species from Herkimer, Greene, and Orange counties. I have taken it at Oswegatchie, along the Little River, August 28 and 29, 1930 (2 ♂ ♂).

*HELOCORDULIA UHLERI* (Selys). Frequents the shady nooks between large boulders and beneath trees along the margin of the Little River, near Oswegatchie, N. Y., in late June and early July, flying throughout the day. Though it explores the shade rather deliberately, I have found it difficult to capture, apparently because it flies close to the water's surface. Three specimens only were taken in two days of watchfulness (July 2 and 6, 1931).

*CORDULIA SHURTLEFFI* Scudder. Two males were taken at Mud Pond, on the Lloyd-Cornell Reservation near McLean, in Tompkins Co., N. Y., July 14 and 26, 1926, and the species is thus an addition to the list known from that area. This, too, is the only record for Tompkins Co., I believe.

*SOMATOCHLORA ELONGATA* (Scudder). One male of this species was taken on the Oswegatchie River near Oswegatchie, N. Y., August 3, 1926. In the state it has heretofore been recorded only from Ithaca.

*SOMATOCHLORA TENEBROSA* (Say). This is an abundant dragonfly in Bergen Swamp, Genesee Co., during at least the latter half of July. Both sexes have been taken in numbers.

*SOMATOCHLORA WALSHII* (Scudder). This is likewise common in Bergen Swamp, Genesee Co., where specimens of both sexes have been taken July 17 and 25. From Oswegatchie, St. Lawrence Co., I have one male taken August 3, 1926.

*SOMATOCHLORA WILLIAMSONI* Walker. Needham records this in the state list from Saranac Inn (Franklin Co.) and Fair

Haven, on Lake Ontario (Cayuga Co.). I have it from Sodus Bay (Wayne Co.), September 10 (1 ♂) and September 11 (1 ♀), 1925; from Adirondack Lodge (Essex Co.), August 5, 1926 (5 ♂), where it is common about Clear Lake (sometimes called Heart Lake); from Cranberry Lake (St. Lawrence Co.), August 4, 1926 (1 ♂); and from Rochester (Monroe Co.), July 31, 1928 (1 ♂), Grace L. Murray.

*NANNOTHEMIS BELLA* (Uhler). This, our smallest dragonfly, is very abundant in Bergen Swamp, Genesee Co., where, however, it apparently confines itself to a small area of marl near the middle of the swamp. The water is there only a few inches deep. Males fly actively on inconspicuous wings, looking like animated patches of bluish down; while the females are more likely to be found resting quietly on the low grass about the water's edge. Dozens were taken between June 25 and September 2, by Richard C. Hart, Grace L. Murray, and myself.

E. B. Williamson says in a recent letter, "I've seen it alive only a few times—always in Indiana."

In New York, Needham records it in the state list from Mt. Marcy (the highest peak of the Adirondacks, in Essex Co.), from New York City, and from Staten and Long Islands.

*SYMPETRUM CORRUPTUM* (Hagen). New York records of this species are confined to Rochester, Buffalo, and Staten Island. I have one male taken at Ithaca, July 8, 1926.

*SYMPETRUM COSTIFERUM* (Hagen). In 1926 this species was abundant at Ithaca, around the ponds on the fish-hatchery grounds, where it had formerly never been found. Quite evidently it is new to that region, as Dr. Needham and his classes could not possibly have overlooked it. At the Lloyd-Cornell Reservation, near McLean, N. Y., I also took one male August 30, 1925. Davis has taken the species frequently on Long Island; but in other parts of the state it appears to be rarer, having been recorded only from Franklin and Erie counties.

*SYMPETRUM DANAE* (Sulzer). This species has not previously been recorded from New York State. At Bergen Swamp (Genesee Co.) I took one male on August 25, 1930, flying over the marl beds, which are located deep in the swamp. Careful search on later visits proved fruitless, however.

## A Method of Preparing Grasshoppers for Pinned Specimens (Orthop.: Acrididae).

By HEBER C. DONOHUE, Bureau of Entomology,  
U. S. Department of Agriculture.

Many Acrididae, particularly gravid females, are of such large size that to make satisfactory pinned specimens the internal organs must be either removed and replaced, or treated to prevent collapse of the body walls and ultimate decay.

Two methods are commonly employed. The specimen may be slit ventrad the length of the abdomen, the entire body contents removed, and the cavity stuffed with cotton. Likewise, it may be injected *in toto* with melted paraffin while held submerged in a bath of warm water.

The writer has employed both of these methods with unsatisfactory results. Stuffed specimens offer favorable conditions for entrance and breeding of museum pests. Furthermore, the abdominal walls of specimens so prepared are thin and papery and are easily torn and shattered.

With the paraffin-injection method, besides the inconvenience of manipulating a syringe containing hot paraffin, injected specimens are so heavy that they slip on their pins, become readily dislodged and broken, and are a constant danger to other materials pinned in the same case.

The method finally adopted embodies parts of each process and gives excellent results.

The first eight abdominal sterna are slit mediad, and the entire thoracic and abdominal contents are removed with a pair of curved forceps. At this stage the specimen is pinned. Next a bit of absorbent cotton is rolled and carefully moulded to fit the entire body cavity, and is inserted, first cephalad into the cervix and thorax, then caudad to the tip of the abdomen. The final step consists of painting melted paraffin over the cotton exposed at the slit by means of a fine camel's-hair brush. The paraffin, rapidly absorbed by the cotton, forms a light, solid core. As the paraffin begins to solidify, the edges of the

incision may be pressed together and given an additional light coat of paraffin externally to seal the cut.

The result is a light, firm specimen showing no body openings for the admittance of museum pests and resistant to such invaders should they gain entrance by other means. Such specimens are easily and quickly prepared, retain their normal shape indefinitely, and pin well in cases.

The grade of paraffin to use must be determined by the maximum temperature to which the specimens will be exposed. In regions of extreme summer heat a paraffin of higher melting point must be used than in cooler regions.

In addition to Acrididae, the writer has employed this method to a slight extent for Tettigoniidae and the tarantula *Eurypelma californica* Auss., with highly satisfactory results. Its application should be equally successful for the preparation of all large, soft-bodied arthropods.

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#### Notes On a Few Night-flying Butterflies (Lepid.: Nymphalidae, Hesperiiidae)

In looking over my field notes and specimens, I find the following records which may be of interest to those collecting data on the night flight of diurnals.

*Vanessa atalanta* Linn.—Taken at Richmond Hill, Long Island, New York, July 16, 1915, at night, at sugar.

*Vanessa atalanta* Linn.—Taken at State College, Pennsylvania, on July 24, 1930, in a light trap.

*Vanessa cardui* Linn.—Perfect specimen taken at State College, Pennsylvania, August 22, 1931, in a light trap.

*Thorybes bathyllus* S & A—Taken at Clemson College, South Carolina, between July 10-15 in a light trap operated by Mr. Cartwright. Specimen was sent to me for identification with other light trap captures.

I believe that when butterflies do fly at night they are more often stimulated by light than by baits.—HARRISON M. TIETZ, Dept. Zoology, Pennsylvania State College, State College, Pennsylvania.

## Entomological Literature

COMPILED BY LAURA S. MACKEY UNDER THE SUPERVISION OF  
E. T. CRESSON, JR.

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 figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the list of Periodicals and Serials published in our January and June issues. This list may be secured from the publisher of ENTOMOLOGICAL NEWS for 10c. The number of, or annual volume, and in some cases the part, heft, &c. the latter within ( ) follows; then the pagination follows the colon :

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

\*Papers containing new forms or names have an \* preceding the author's name.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

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.

‡Note the change in the method of citing the bibliographical references, as explained above.

*Papers published in the Entomological News are not listed.*

**GENERAL.—Brues & Melander.**—Classification of Insects. [Bull. Mus. Comp. Zool. Harvard Coll.] 73: 672 pp., ill. **Carr, W. H.**—Adventures with trailside insects. [15] 195-206, ill. **DeLong, D. M.**—Some problems encountered in the estimation of insect populations by the sweeping method. [7] 25: 13-17. **Hamlin, J. C.**—An inquiry into the stability and restriction of feeding habits of certain cactus insects. [7] 25: 89-120, ill. **Larson & Hinman.**—A list of insects collected in moss and lichens on oak trees near Corvallis, Oregon. [10] 34: 43-44. **Lutz, F. E.**—Our ignorance concerning insects. [4] 64: 25-29, cont. **Maheux, G.**—Le mecanisme des epidemies d'insectes. [98] 59: 59-72, ill. **McAtee, W. L.**—Effectiveness in nature of the so-called protective adaptations in the animal kingdom, chiefly as illustrated by the food habits of Nearctic birds. [Smiths. Miscell. Coll.] 85: 201 pp. **Poulton, E. B.**—A hundred years of evolution. [Rep. Brit. Assoc. Advance. Sci.] 1931: 71-95, ill. **Scheerpeltz, O.**—Insekten in schnee und eis. [Der Naturf., Berlin] 8: 414-421, with plate. **Tavares, J. S.**—In Memoriam. [Brotéria] 1: 9-34. **Turner, H. J.**—Nomenclature. [21] 44: 40. **Van Duzee, E. P.**—The new entomological laboratory of the California Academy of Sciences. [55] 8: 97-101, ill. **Van Duzee, E. P.**—Numbering types. [55] 8: 101. **Weiss, H. B.**—John Pointer's collection of insects. [6] 40: 95-97.

- ANATOMY, PHYSIOLOGY, ETC.**—**Abbott, C. E.**—The proboscis response of insects, with special reference to blowflies. [7] 25: 241-244. **Dean, R. W.**—The alimentary canal of the apple maggot. *Rhagoletis pomonella* (Trypetidae). [7] 25: 210-223, ill. **deCoursey, R. M.**—The feeding habits of the first instar larvae of the cluster fly. [68] 75: 287. **Dickman, A.**—Studies on the intestinal flora of termites with reference to their ability to digest cellulose. [92] 61: 85-92. **Hering, M.**—Die bewegliche bursa copulatrix bei *Enrycus cressida*. [46] 24: 576-581, ill. **Heymons & von Lengerken.**—Studien über die lebenserscheinungen der Silphini. [46] 24: 259-287, ill. **Hosselet, C.**—Contribution a l'etude du Chondriome chez les insectes (Culicidae et Phryganidae). [Arch. Zool. Exp. et Gen., Paris] 72: 273 pp., ill. **Köhler, W.**—Die entwicklung der flügel bei der mehlmotte *Ephestia kühniella*, mit besonderer berücksichtigung des zeichnungsmusters. [46] 24: 582-681, ill. **Marcu, O.**—Beiträge zur kenntnis der stridulationsorgane der Curculioniden-gattungen *Rhinoscapha*, *Homalonotus* und *Dionychus*. [34] 97: 109-111, ill. **Merker, E.**—Die sichtbarkeit ultravioletten lichtes. [88] 20: 41-49, ill. **Metcalf, M. E.**—The structure and development of the reproductive system in the Coleoptera with notes on its homologies. [53] 75: 49-129, ill. **Misra, A. B.**—On the internal anatomy of the male lac insect, *Lacifer lacca* (Coccidae). [93] 1931: 1359-1381, ill. **Shull, A. F.**—An internal but non-genetic character affecting wing production in response to light in an aphid. [90] 66: 180-183. **Sprung, F.**—Die flügeldecken der Carabidae. [46] 24: 435-490, ill. **Strasburger, M.**—Bau, funktion und variabilität des darmtractus von *Drosophila melanogaster*. [94] 140: 539-649, ill. **Sweetman, H. L.**—The effects of temperature and moisture on the distribution of the Mexican bean beetle, *Epilachna corrupta*. [7] 25: 224-240, ill. **Thomas, M.**—L'instinct et la psychologie des Guêpes prédatrices. [33] 71: 255-285. **Urban, F.**—Der lauf der entflügelten honigbiene (*Apis mellifica*) zum licht und der einfluss von eingriffen an receptoren, centralnervensystem und effectoren. [94] 140-355, ill. **Verlaine, L.**—L'instinct et l'intelligence chez les Orthoptères. L'autotomie psychique ou volontaire chez les Phasmides (*Dixippus morosus*). [Mem. Soc. R. Sci. Liège] 16: (18), 1-47. **Welsh, J. H.**—Specific influence of the host on the light responses of parasitic water mites. [92] 61: 497-499. **Whitehead, W.**



E.—The morphology of the head-capsule of some coleopterous larvae. [Canadian Jour. Res.] 6: 227-252, ill. **Whiting, P. W.**—Diploid male parts in gynandromorphs of *Habrobracon*. [92] 61: 478-484, ill. **Wigglesworth, V. B.**—On the function of the so-called "Rectal glands" of insects. [53] 75: 131-150, ill.

**ARACHNIDA AND MYRIOPODA.**—\***Chamberlin, J. C.**—On some false scorpions of the superfamily Cheiridoidea (Chelonethida). [55] 8: 137-144. **Chickering, A. M.**—Notes and studies on Arachnida. Araneae from the Douglas Lake Region, Michigan. [Pap. Michigan Acad. Sci. Arts & Letters] 15: 349-355. \***Finnegan, S.**—On a new species of mite of the family Heterozetionidae parasitic on a snake. (S). [93] 1931: 1349-1357, ill. **Jacot, A. P.**—Moss mites. [Bull. Boston Soc. Nat. Hist.] No. 63: 17-22, ill. **Kästner, A.**—Ueber die gliederung der Solifugae. [46] 24: 342-358, ill. **Petrunkévitch, A.**—Collecting *Hypochilus*. [6] 40: 19-23.

**THE SMALLER ORDER OF INSECTS.**—\***Hood, J. D.**—A new thrips from Plummer's Island, Maryland. [10] 34: 37-40, ill. **Münchburg, P.**—Beiträge zur kenntnis der biologie der Odonatenfamilie der Gomphidae. [46] 24: 704-735, ill. **Neave, F.**—The mayflies of Lake Winnipeg. [Canadian Field Nat.] 46: 54-55.

**HEMIPTERA.**—\***Gillette & Palmer.**—Six new aphids from Colorado. [7] 25: 136-151, ill. \***Gould, G. E.**—The *Rhagovelia* of the Western Hemisphere, with notes on world distribution (Veliidae). [Sci. Bull.] 32: 5-61, ill. **Jaczewski, T.**—Die Corixiden (Corixidae) des Zoologischen Staatsinstituts und Zoologischen Museums in Hamburg. [Arch. f. Hydrobiol.] 23: 507-519, ill. **Kemper, H.**—Beiträge zur biologie der bettwanzen (*Cimex lectularius*). [46] 24: 491-518, ill. **McAtee & Malloch.**—Notes on the genera of *Isometopinae* (Heteroptera). [Stylops] 1: 62-70, ill. \***Schroeder, H. O.**—The genus *Rheumatobates* and notes on the male genitalia of some Gerridae (Gerridae). [Sci. Bull.] 32: 63-99, ill.

**LEPIDOPTERA.**—**Bandermann, F.**—Sehr auffallend gezeichnete Pieridenformen aus halleschen puppen. [18] 25: 495-496, ill. \***Clarke, J. F.**—New Microlepidoptera from the Pacific Coast: (Gelechiidae). [4] 64: 63-69, ill. \***Eaton, T. H., Jr.**—A review of some genera of *Hesperinae*. (*Hes-*

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**SPECIAL NOTICES.**—A systematic catalogue of Formosan Coleoptera. By Y. Miwa. [Rept. 55, Dept. Agric. Gov. Res. Inst., Formosa]. 359 pp., incl. index. In English except preface, with bibliography and bibliographical reference and synonymy of the species.

DIE RÜBENFLIEGE (*PEGOMYIA HYOSCYAMI* Pz.). Von Dr. H. BREMER und Dr. O. KAUFMANN. Heft 7 of Monographien zum Pflanzenschutz. Julius Springer, Berlin, 1931. Price, R. M. 12. 100 pp., 32 fig. and charts. A very comprehensive booklet on the turnip-fly, giving in a very orderly and concise

manner what is known about this serious pest, with constant reference to the copious bibliography. The taxonomic history of the fly is briefly indicated in a rather extensive list of its synonyms and host plants. The authors then launch into its biology, successively taking up the embryological development, the effect of temperature on the habits of the larva and pupa, entering with considerable detail into the habits of the larval, pupal and adult stages and their sensitiveness to various influences. The important parasites and diseases of the several stages are mentioned, and their fluctuation during the severe epidemics of this pest in Europe. Finally its control through cultural methods, biologically and by direct chemical treatment is reviewed. Although really a review of the taxonomic, morphological, biological and economic literature of this pest, the whole is presented in such an orderly and concise manner, that it should prove a very valuable handbook to truck farmers, specializing in cabbage, beet and turnip culture.—E. T. CRESSON, JR.

## OBITUARY.

### Death of Mr. J. J. Joicey.

EDITOR, ENTOMOLOGICAL NEWS:

I much regret to inform you of the unexpected death of Mr. J. J. JOICEY at his Witley residence on March 10th. The work of the Hill Museum, Witley, Surrey, England, has in consequence to cease.

G. TALBOT.

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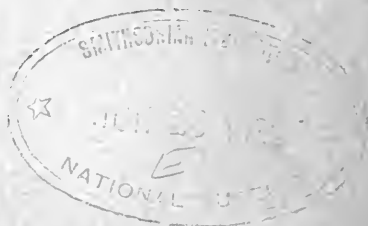
DR. REGINALD HEBER HOWE died on January 28, 1932, as we learn from an obituary notice by Charles W. Johnson, accompanied by a portrait of Dr. Howe, in the *Bulletin of the Boston Society of Natural History*, No. 63, April, 1932. He was born in Quincy, Massachusetts, April 10, 1875, graduated from the Lawrence Scientific School of Harvard University in 1901, obtained a doctorate from the Sorbonne, Paris, in 1912, was connected with the Middlesex School, Concord, Massachusetts, until 1920, and head master of the Belmont Hill School from 1923 to his death. He published upon birds, lichens and dragonflies of New England, his papers on the last named group including a *Manual* of both adults and larvae and appearing in parts as a *Memoir of the Thoreau Museum of Natural History* (1917-1927). His collection of Odonata was given to the Boston Society of Natural History in 1930.

JUNE, 1932

# ENTOMOLOGICAL NEWS

Vol. XLIII

No. 6



JOHN HENRY COMSTOCK, 1849-1931.  
Portrait of 1884.

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ENT NEWS, VOL XLIII, PLATE VI.

HENRY LORENZ VIERECK.



# ENTOMOLOGICAL NEWS

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No 6

## Henry Lorenz Viereck.

1881-1931.

(Portrait, Plate VI.)

As we reach middle age most of us find back in the pages of memory some picture of boyhood days, which, perhaps more sharply as the years go on, stands forth with all the glamor of youth still fresh upon it. Such memories become treasures of the mind, and those who figured in them are, as the years roll on, inseparable parts of our lives, even though they have passed from our midst.

The most vivid impressions of my early years are of a little group of boys banded together through a kindred interest in nature, and of these Henry Lorenz Viereck was easily the most unusual figure.

The Wagner Free Institute of Science, in the northwestern part of Philadelphia, furnished in its then Museum Curator, Charles W. Johnson, a man who could interest boys in nature and hold that interest through the kaleidoscopic changes of youth. To know him as we did was to respect and love him, for unbounded patience, good temper, keen enthusiasm, kindly help and inspiring generosity. That he subsequently removed from Philadelphia, and in the environment of Boston became a national figure in entomology, has never caused us to feel other than that we were the original group of "Johnson's boys."

Our little association rejoiced in a formal and pretentious name, the "Aristotle Society," and its existence extended over a period of many years after the departure of its original benefactor to his duties at the Boston Society of Natural History, and also after some of its original members were deeply engaged in entomological investigations of their own.

Of the original coterie three subsequently became professional entomologists,—Charles T. Greene, the dipterist, now at the United States National Museum, Viereck and the writer,

Viereck was generally the leader in planning field rambles, in exploring out-of-the-way nooks and corners, in trying new methods, and experimenting along new lines. From my first acquaintance with him, when we were both about twelve years of age, he possessed the inquisitive spirit of the investigator, which with a tireless body and general obliviousness to discomforts, made him an ideal companion for long collecting rambles in winter cold as well as summer heat.

Our interests were broad—insects first, but also birds, mollusks and reptiles. Viereck owned a small caliber rifle which, with shot cartridges, supplied material for developing bird skinning technique. The vicinity of Philadelphia was well combed by our little band for some of the rarer local mollusks, and salamander hunts frequently added to the small private collections which all true boy collectors acquire. On one occasion a full-sized torpid snapping turtle was fished from a small park pond and transported alive in a satchel to its doom as a specimen. "High" game birds, bought in the market with the pennies of the group, were skinned and, at Viereck's suggestion, prepared with the noses of the operators immunized by clips made of his sisters' hair-pins. With cheerful generosity and unfailing good humor Viereck was always the one to offer more of labor or boyhood's slender funds to carry out some project. The crusader spirit was always strong in him, in his scientific studies and in his personal attitude toward social and political problems of the day. Compromise with wrong or injustice was unthinkable to him, and in after life his strong convictions and demands for what he considered fair dealing more than once caused him to shift the scene of his activities. While a blithesomeness which his old associates will never forget was one of his chief possessions, tragedy stalked through his life, loved ones were taken from him with startling suddenness, and when at last the final curtain swiftly dropped, our old friend went as he had lived—the entomologist at work with his beloved bees.

Henry Lorenz Viereck was born in Philadelphia, March 28, 1881, the son of John August and Wilhelmine Magdalena

(née Krauter) Viereck. His father was born in Zierenburg, near Cassel, Germany, and emigrated to America in 1856. His paternal grandfather had been a republican in his native land, a "man of '48," and Henry's father brought to his adopted country a strong love of liberty and representative government. A recent arrival in a land torn by the horror of internal strife, the elder Viereck served in the Union Army for nearly the entire period of the Civil War, and was wounded at the second battle of Bull Run.

Henry's mother, a native of Lautenbach, near Stuttgart, came to America in 1863. His parents were married in 1864, and Henry was the youngest of five children, three sons and two daughters.

An intense patriot the younger Viereck enlisted when under age during the Spanish-American War, and almost succumbed to typhoid fever contracted at Chickamauga, Georgia. The personal knowledge then gained of camp and community sanitary shortcomings served him in good stead in after years. When he was little more than convalescent his mother died quite suddenly, and but a few years later his kindly, white-bearded father, beloved by all the son's boyhood friends, was killed by an express train at Lehigh Gap, Pennsylvania.

During these years of Viereck's life, and of his boy associates as well, Lehigh Gap was a favorite spot. Here on the slopes of the Blue Ridge, in the farm of a "Pennsylvania Dutch" friend of his family, they made their headquarters, scouring the mountain slopes and river bottom for specimens. Many happy days were spent there by parties of the Aristotelians, chiefly between 1897 and 1903.

Viereck's early education was in the Philadelphia public schools, from which he passed to Brown's Preparatory School, but did not complete his full course. In 1900 he was appointed a Jessup Fund Student at the Academy of Natural Sciences of Philadelphia, and thus enabled to spend priceless hours of study with the Cresson types of Hymenoptera, on which order his entomological interest had already centered. Several years later, feeling the need for a profession of more financial prom-

ise than entomology, he turned toward medicine, and several years were spent in its study at Jefferson Medical College, Philadelphia, but the call of entomology was so strong he did not complete his course, although later (1905-7) he served as assistant in the pathological laboratory of the Medico-Chirurgical College, and at the same time added to his medical education.

While a Jessup Student some months were occupied with field work in New Mexico with the writer, a fellow student, gathering collections of general zoological and botanical character for the Academy. The habit of long hours of work in the laboratory, the ability to completely devote himself to any task in which his intense nature was at that time absorbed, stood him in good stead there, and the collections of insects there made largely by him, attest the enthusiasm which in early life made him a capable collector and a prolific writer. At that early day his preferences for the ichneumon-flies and the bees were already evident, and plans were then made for a monograph of the bee genus *Andrena*, which remained through the rest of his life the one contribution he wished to complete, and toward which a number of his published papers were preliminary, but the final study never appeared.

The years 1903 and 1905 to 1907 were quite thoroughly occupied with medical school duties, yet studies prepared in large part or at least outlined during his Jessup Student days at the Academy, issued regularly from his pen. His service at the Connecticut Agricultural Experiment Station in the years 1904 and 1905 also provided the opportunity for more research. From 1903 to 1907 twenty contributions appeared. Of these his study of the mutillid genus *Odontophotopsis* is perhaps the best known and most useful. A study of the Philanthidae of New Mexico, prepared with Professor Cockerell, and a synopsis of the bees of the northwestern states and adjacent Canada, on which collaborated Professors Cockerell, Titus and Swenk and J. C. Crawford, evidenced the very live character of Viereck's interest in Hymenoptera during these years so largely taken up with other duties. He once told me his hours of sleep at that time averaged daily not more than six, and this amount

he considered sufficient for a healthy person of his years. Certainly hard study and little sleep was his consistent schedule during most of the "twenties" of his life.

Of a highly nervous temperament, restive under official requirements or regulations, an idealist and enthusiast, Viereck, after definitely deciding upon a career as an entomologist, sometimes severed his connections with one organization and associated himself with another for reasons which would not have influenced most individuals. In consequence we find that during his nearly thirty years of entomological productivity, he was attached successively to a number of institutions or departments.

In the summer of 1903 he was associated with Dr. John B. Smith in his mosquito control work in New Jersey, and much of 1903 to 1905, when attached to the Connecticut Agricultural Experiment Station, under Dr. Britton, was occupied with similar duties, while in 1906 the Pennsylvania Department of Health placed him in charge of a reconnaissance survey of the same type. It was during his work at New Haven the foundation was laid for his later manual of the Hymenoptera of Connecticut. On the staff of the Pennsylvania Department of Zoology from 1907 to 1908, in 1909 Viereck was attached to the United States Bureau of Entomology and stationed at the National Museum, where during the following three years the most important part of his work on the Ichneunonoidea was carried out. At the outbreak of the World's War he was in Sicily as an entomological explorer for the California State Horticultural Commission, working on citrus fruit scale parasites, but the entry of Italy into the war brought this to an end. In 1916 he was appointed on the staff of the Biological Survey of the United States Department of Agriculture and continued there until 1923, when he became assistant entomologist on the Entomological Branch of the Canadian Department of Agriculture.

In 1926 Viereck returned to Philadelphia, spending some months at the Academy in surroundings reminiscent of his younger days, later removing to Irvington, New Jersey, where he lived for some years with his sister, Mrs. Edward Poeter, to

whom I am indebted for certain information herein contained. In September, 1931, an opportunity presented itself for entomological field work in Ohio. On October 8, 1931, while walking along a road at Loudenville, Ohio, engaged in collecting, he was struck and killed by a hit-run motorist.

In 1918, in Washington, Viereck married Ida Adele (née Pearce) Davis, a widow, and a happy home life was abruptly terminated by her sudden death from pneumonia the next year. The loss of his brilliant and attractive wife was a staggering blow, and in later years he often referred feelingly to the companionship which had been so abruptly terminated.

In 1922 he visited the Santa Marta district of Columbia, as the guest of Mr. and Mrs. Orlando L. Flye, old friends and coffee planters of that region, whose home has been visited by a number of their many naturalist friends. Here he made his first personal acquaintance with tropical insect life. One of Viereck's most valued friendships was with Charles Grafly, the distinguished Philadelphia sculptor, who was Viereck's host many times at his New England summer home, and for years association with the Grafly family was one of Viereck's pleasantest memories. Grafly modelled a head of his younger friend, which cast in bronze was shown at one of the annual exhibitions of the Pennsylvania Academy of the Fine Arts. It seems one of the strange twists of fate that these two men, long friends, should both come to their deaths through the recklessness and criminal irresponsibility of hit-run automobile drivers.

The first entomological contribution from Viereck's pen appeared in 1901 in the Transactions of the American Entomological Society, i.e., "New Species of the Subfamily Pseiniinae." Between that time and 1928 his entomological contributions, all on Hymenoptera, numbered ninety-two, in addition to which he virtually prepared the Hymenoptera portion of Professor Smith's 1910 edition of the "Insects of New Jersey." His studies were chiefly upon bees and the ichneumon-flies, although he described a number of species and studied a number of genera belonging to the social and solitary wasps. The bee studies centered chiefly about the Andrenidae, and fourteen of

his publications relate solely to members of this family. As an illustration of the amount of work accomplished preliminary to his projected, but unfortunately never completed, monograph of the North American members of the family, in the classic Hymenoptera of Connecticut alone sixteen species of the genus *Andrena* are credited to Viereck, while in a prodrome of the Canadian species of the same family, which appeared in 1924, he described four new genera and twenty-four new species. His studies of other bees were distributed over a number of genera, and his acquaintance with these insects—truly his first loves entomologically—was broad and comprehensive, backed by field experience under varying conditions over much of the United States.

In the ichneumon-flies Viereck's studies were largely of the post-pioneer type, taking the work of the true pioneers, strengthening its fundamentals, correcting evident errors and misconceptions, constructing upon their foundations and passing on to the next generation of workers a great amount of detailed study, type comparisons and laboriously assembled bibliographic work for the more final analyses of successors. In all fields of science we find this type of student—necessary, hard-working, yet by the very nature of their knowledge lacking the tools for more than temporary completion of the projects to which they set themselves. What these "road-makers" save those who come after them, in coordination, in comparison, in clearing away obstructions, is often not fully appreciated by those who follow.

Viereck's outstanding reference contribution in the Ichneumonoidea is his "Type Species of the Genera of Ichneumon-flies," published in 1914 as a Bulletin (No. 83) of the United States National Museum, and through this work alone his name will always be familiar to workers on that superfamily. In this the type species of over two thousand genera were worked out from the evidence of previous literature, or there fixed. During his service on the staff of the Bureau of Entomology Viereck was almost continuously engaged in studying the great collections of parasitic material received from all parts of the world. Twenty-four of his papers deal entirely with ichneu-

mon-flies, and in these and other studies about three hundred species, over eighty genera and two families of the superfamily were described.

The most important single contribution to entomology which, conceived by Viereck, was largely written by him, and to the editing of which he gave untold hours over a number of years, was the eight hundred and twenty-four page Hymenoptera volume of the "Guide to the Insects of Connecticut."<sup>1</sup> Only those who knew him well can realize how much of his life and energy was devoted to this work, which stands to-day the "only one general manual . . . to discriminate between genera and species," as Dr. J. Chester Bradley terms it in his prefatory remarks in the Hymenoptera section of the recent New York State list of insects.

While the types of a large part of the species described by Viereck are in the United States National Museum and other institutions scattered over the United States and Canada, the Academy of Natural Sciences of Philadelphia alone has two hundred and ninety of his species represented by single types, as well as numerous others by paratypic material. A count of the species credited to him in the Hymenoptera of Connecticut gives a total of one hundred and eighty-eight, of which one hundred and twenty-five, as well as six genera and subgenera, were first described by him in that study. His personal collection of Hymenoptera, library and card indices were presented to the Academy some few years before his death.

Those of us who were Viereck's companions in early years cannot but feel that he carried on the historic association of Philadelphia with research in the Hymenoptera, and that we can add his name to the brilliant company of his fellow townsmen Say, Cresson, Blake, McCook and Fox. In his passing science lost a devoted worker, and the narrowing circle of boyhood associates mourn the departure of a beloved member.

JAMES A. G. REHN.

<sup>1</sup> Guide to the Insects of Connecticut. Part III. The Hymenoptera or Wasp-like Insects of Connecticut. By Henry Lorenz Viereck, with the collaboration of Alexander Dyer MacGillivray, Charles Thomas Brues, William Morton Wheeler and Sievert Allen Rohwer. 1916. 824 pp., 10 pls. (Bull. No. 22, Connecticut State Geological and Natural History Survey.)



## The Diseases of Elateridae (Coleoptera.<sup>1</sup>)

By C. A. THOMAS, Pennsylvania State College.

In recent papers<sup>2</sup> the writer has discussed the parasites and the predators which are enemies of click beetles and their larvae. This paper is a summary of our present knowledge concerning the few species of bacteria and fungi which have been recorded as having caused injury to these insects.

The diseases of Elateridae, especially of their larvae, the wireworms, are widespread, but because of the subterranean habits of these larvae and the quite rapid progress of these diseases under favorable conditions, resulting in practically complete disintegration of the insect's body, comparatively few diseased wireworms are found in the field.

On the other hand, diseases often cause great losses among artificially reared wireworms, spreading rapidly and sometimes destroying whole series in a short time. Confinement, favorable temperature and humidity conditions, and the almost unavoidable transfer of spores from one culture to another during the frequent examinations, all aid in spreading and propagating these diseases. In the field, it is probable that the most favorable conditions for the successful transfer, inoculation and growth of these diseases are only occasionally or periodically present. A complete study of such conditions would be necessary before it would be possible to make any recommendations for the artificial dissemination of the diseases in the field.

The diseases are here discussed as bacterial and fungous. The writer has found no references to any protozoan, filterable virus or nuclear disease which has been found attacking any stage of these insects.

### BACTERIAL DISEASES.

Under artificial rearing conditions wireworms are frequently found to be entirely black over the whole body, and soft and

<sup>1</sup> Publication authorized by the Director of the Pennsylvania Agricultural Experiment Station as Technical Paper No. 555.

<sup>2</sup> ENT. NEWS, XL, 287, Nov., 1929. ENT. NEWS, XLII, 137, 158, 1931.

flabby, or to show irregular spots scattered over the body, appearing dark under the chitin.

It is possible that these spots are due to bacteria, although practically nothing is known of their true cause. Dr. G. F. White, U. S. Bureau of Entomology, could not find bacteria in such spots in diseased wireworms sent to him. The writer has occasionally seen such spots develop on wireworms where they were bitten by predatory wireworms living in the same cultures.

Graf (1914) reported on a red bacterium which invaded his cultures of *Limonius californicus* larvae and caused considerable loss among the young wireworms. Newly diseased larvae showed a reddish discoloration in the anterior portion of the body. Under the microscope the head and thorax appeared to contain small, bright red, oil-like globules. The following day the infected larva would be deep blood red all over its body, and so putrid that it would fall to pieces when picked up. This disease spread very rapidly among the younger larvae, but mature larvae exposed to it were never affected. On agar the bacteria formed rich blood red colonies. Graf did not give the name of this organism, nor any further characters.

Wade and St. George (1923) found larvae of false wireworms (*Elcodes suturalis* Say) infested with similar reddish brown spots on the body segments, and noted that Swenk (1909) and McColloch (1919) had experienced the same trouble when rearing other Tenebrionid larvae. They presumed that the disease was caused by bacteria, although apparently no further studies were made of it.

Masaitas (1929) found an unnamed bacterial infection which killed a considerable number of *Sclatosomus* larvae in the insectary, but was less effective in the field. This disease appeared to be associated with the occurrence of Tyroglyphid mites on the larvae, and may have entered through the punctures made by these mites. *Agriotes* larvae, which were not infested by the mites, remained immune to the disease.

#### FUNGOUS DISEASES.

Several species of fungi attack wireworms under artificial rearing conditions. These may spread rapidly and sometimes

destroy whole series of cultures. They seem to be more common and active under warm humid conditions. The writer has never found them so abundant in the field that they constituted an effective check upon the wireworms, although they might become effective under warm humid conditions.

Class PHYCOMYCETES, Family Entomophthoraceae.

The wireworm disease most frequently mentioned in the literature is the Green Muscardine Fungus, *Mctarrhizium anisopliac* (Metchn.) Sorokin, known also as the White Grub Fungus. This fungus first causes the wireworm to become somewhat rigid, although it can still move its legs, but is soon incapable of locomotion. White, cotton-like, mycelial threads then appear at the leg joints and on the thinner membranes between the body segments. This mycelium spreads until it may envelop the whole body. The interior of the larva is now filled with whitish mycelial threads extending the length of the body. Within a few days the tips of the external white mycelia begin to exhibit small gray-green masses of spores, which gradually increase in abundance until the whole insect is encrusted with a greenish covering. These spores are thrown off and may infect nearby larvae, if conditions are favorable. The larva is usually dead by the time the white mycelium has appeared on the intersegmental membranes. This fungus also attacks the eggs, pupae and adults of Elaterids.

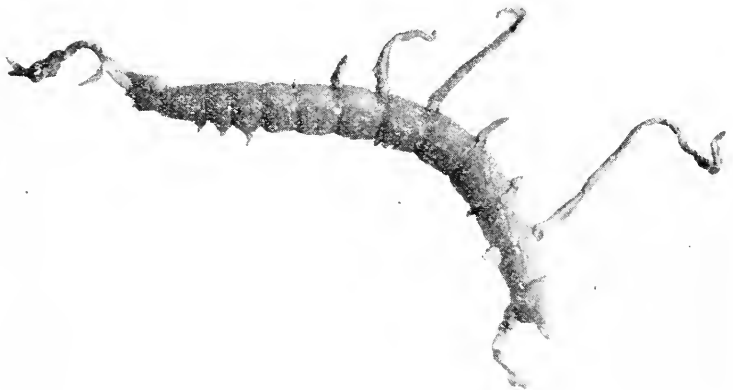
*Mctarrhizium anisopliac* is cosmopolitan and attacks many species of insects. Its occurrence upon Elaterids and their larvae has been noted by Comstock and Slingerland (1891), Forbes (1892), Pettit (1895), Hyslop (1915), Johnston (1918), Stevenson (1918), and others. Hyslop tried introduction of this fungus against *Melanotus* larvae in a field at Nisbet, Lycoming County, Pa., in 1913, but no notable results were obtained in this experiment. Pettit, in the above paper and in correspondence, stated that many *Agriotes mancus* Say larvae in his cultures were killed by *Mct. anisopliac*, variety *americana*, which he said was distinct from the typical *anisopliac*. The *americana* spores were lighter green. Johnston (1918)

thought, however, that the variations in color and size of the spores depended upon the host or the medium, being different physiological races rather than true varieties.

*Entomophthora carpentieri* Girard was found by Picard (1914) to attack adults of *Agriotes* and *Elatер* species in France. Gorham (1924) noted a fungus of the genus *Tarichium* as attacking pupae and young adults of *Agriotes mancus* Say, in Canada.

#### Class ASCOMYCETES.

Fungi of the genus *Cordyceps* (Hypocreaceae), which attack Lepidopterous larvae, are also occasionally found infesting wireworms, although this condition is by no means common in the field. Forbes (1892) found an *Asaphes* larva in Illinois infested by a fungus closely resembling *Cordyceps*. Girard (1895) recorded *Cordyceps hunti* n. sp. attacking wireworms



*Phelctes agonus* Say larva affected with a species of *Cordyceps*.

in Trinidad. The accompanying figure shows a *Phelctes agonus* Say larva collected by the writer in southeastern Pennsylvania in April, 1926. This specimen is infested with the sterile form of a *Cordyceps*, which is possibly *C. stylophora*, according to Professor Roland Thaxter, Harvard University. In this, the only specimen of *Cordyceps* that the writer has ever

seen in the field, the fungus has completely filled the interior of the larva and has grown out through the head and intersegmental membranes.

Hyslop (1915) cited a note by Webster which told of an *Agriotes* larva from Nova Scotia which had been killed by a fungus. This was determined by Dr. Flora Patterson as *Penicillium anisopliac* Viull. (Aspergillaceae).

Arnaud (1927), after a series of experiments, decided that *Agriotes* larvae are very resistant, and perhaps even immune to infection by *Beauveria bassiana* (Mucedinaceae) and several related fungi. Rambousek (1929) stated that attempts to infect *Agriotes ustulatus* larvae with *B. bassiana* were unsuccessful.

#### Class HYPHOMYCETES.

Fungi of the genus *Isaria* (Stillbaceae) also occasionally injure wireworms. Rymer-Roberts (1919) found some of these larvae apparently parasitised by an *Isaria* species, and Ford (1917), and the Ministry of Agriculture and Fisheries leaflet 10 (1918) noted the same, but stated that under normal conditions it is not an effective check. According to Gorham (1924) the pupae and young adults of *Agriotes mancus* Say are attacked by a fungus which he provisionally identified as *Isaria anisopliac*, var. *americana*.<sup>3</sup>

Le Mout (1922) described experiments in which cultures of *Isaria densa*, *I. destructor*, *I. farinosa*, and *Sporotrichium globuliferum* Speg. (Moniliaceae) were mixed with sand or soil and spread on an infested field before tilling, in the hope of destroying larvae of *Elatер scgetis*. No results were recorded.

Mail (1930) stated that a few wireworms in his laboratory died of a disease identified as *Oospora destructor* (Metch.) Delacr. (Moniliaceae) and that healthy larvae brought in contact with the diseased were also attacked and killed. Adults in the oviposition cages were also killed.

#### Undetermined Fungi.

Graf (1914) found adults of *Limoniус californicus* Mannh. attacked by a fungous disease which worked well in the labor-

<sup>3</sup> Is *Isaria anisopliac* var. *americana* the same fungus which was noted above as *Metarrhizium anisopliac* var. *americana*?

atory, but less than 0.1% were affected in the field. Pupae were also killed by fungi in the laboratory. None were affected in the field, where it would spread very slowly, since the soil moisture is low during the period of the pupal stage.

Conradi and Eagerton (1914) noted that *Horistonotus uhleri* eggs were frequently attacked in the laboratory by an unidentified mold.

Strickland (1927) stated "We have found no indication of fungous or bacterial diseases of *Ludius acripennis* Kby. in Alberta." Hawkins (1928) said: "Certain seasons are more favorable to fungus growth than others, and this may account for years of relative scarcity. Wheat wireworms in high ground were unaffected; those in wet places were killed." Baudys (1922) found that fungi attack many wireworms, especially after flooding.

#### BIBLIOGRAPHY OF WIREWORM DISEASES.

- ARNAUD, M. 1927. Ann. Epiphytes, XIII, pp. 1-30, Paris, Jan.-Feb., 1927.
- BAUDYS, E. 1922. Flugbl. tschech. Sektion mähr Landeskulturrates in Brünn.
- COMSTOCK, J. H., and SLINGERLAND, M. V. 1891. Bul. 33, Cornell Univ. Agric. Expt. Sta.
- CONRADI, A. F., and EAGERTON, H. C. 1914. S. Carolina Agric. Expt. Sta., Bul. 180, Clemson College, S. C.
- FORD, G. H. 1917. Ann. Appl. Biol., London, III, Nos. 2 and 3.
- FORBES, S. A. 1892. 18th Report State Ent. of Illinois, 1891-1892.
- GIRARD, A. 1895. Ann. Soc. Ent. France, Bul. des Seances, p. CLXXXI.
- GRAF, J. E. 1914. Bul. 123, Bur. Entomology, U. S. Dept. Agric., p. 47.
- GORHAM, R. P. 1924. Proc. Acadian Ent. Soc. 1923, p. 69, Truro, Nova Scotia.
- HART, C. A. 1891. Insect Life, vol. III, p. 246.
- HAWKINS, J. H. 1928. Bul. 343, Maine Agric. Expt. Sta., Orono.
- HYSLOP, J. A. 1915. Bul. 156, Professional Paper, U. S. Dept. Agric., p. 29.
- JOHNSTON, J. R. 1918. Mem. Soc. Cubana Hist. Nat., "Felipe Poey", Havana, III. Nos. 2 and 3, 1917-1918, pp. 61-82.

- LEMOULT, L. 1922. Comptes Rendus Acad. Agric. de France, VIII, p. 596.
- MAIL, G. A. 1930. Journ. Agric. Research, XLI, p. 590.
- MASAITAS, A. I. 1929. Izv. sibirsk. kraev. Stantz. Zashch. Rast., No. 3 (6), pp. 1-41, Tomsk. (Rev. Appl. Ent. A, XVIII, 49.)
- MCCOLLOCH, J. W. 1919. Journ. Econ. Ent., XII, p. 191.
- Ministry of Agric. and Fisheries 1918. Leaflet 10, London.
- PETTIT, R. H. 1895. Bul. 97, Cornell Agric. Expt. Station.
- PICARD, F. 1914. Bul. Soc. Etude Vulg. Zool. Agric., Bordeaux, XIII, Nos. 1-4.
- RAMBOUSEK, F. 1929. Z. Zuckerind. Czechoslov. Republic, liv (XI), No. 20, p. 197, Prague.
- RYMER-ROBERTS, A. W. 1919. Ann. Appl. Biol., Cambridge, VI, p. 134.
- STEVENSON, J. A. 1918. Journ. Dept. Agric. Porto Rico, II, No. 1, Rio Piedras.
- STRICKLAND, E. H. 1927. Research Bul. 2, College Agric., Univ. of Alberta, Edmonton.
- SWENK, M. H. 1909. Journ. Econ. Ent., II, p. 332-338.
- WADE, J. S., and ST. GEORGE, R. A. 1923. Journ. Agric. Research, XXVI, p. 561.

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### **A New Moth from Peru (Lepid.: Syssphingidae, antea Saturniidae).**

By W. SCHAUS, United States National Museum,  
Washington, D. C.

*Loxolomia johnsoni*, new species.

*Male*.—Head black; vertex with some white scales; hairs at base of antenna rufous; collar grayish crossed by a semilunar drab stripe finely edged with black. Thorax black and benzo brown with some white hairs; tegulae drab gray; metathorax with some drab gray and cinnamon mottling. Abdomen above, black on basal four segments with whitish dorsal points, otherwise vinaceous fawn suffused with burnt sienna on anal segment; a lateral wavy black fascia, with double whitish points on segments; venter white with some irregular black lines near base. Legs mostly sudan brown. Fore wing: Costal margin broadly white with hair brown striae; cell also below and beyond to subterminal line dark grayish brown with fine long fuscous striae; a fuscous oval line at base below cell filled in with sayal and snuff brown, also a few white scales, and followed at inner margin by a large fuscous oblong patch, out-

wardly edged with white; a fuscous medial line outangled on costa well inbent to median vein; a black streak on discocellular with an incurved black line from it, outangled at vein 2, then wavily bent down to inner margin. A remote postmedial thick black line inwardly oblique and outangled at vein 7, then very fine benzo brown and deeply dentate to vein 5. Subterminal line double, remote from apex on costa, well incurved to below vein 7 and again to below vein 6, the distal thicker portion black, outangled on vein 7, more so between veins 6 and 7 and again below vein 6, the proximal portion fine, below vein 6 closer to margin, deeply dentate, fuscous on the chaetura drab termen to inner margin; the terminal space below apex enclosed by the subterminal line cinnamon drab with dark striae and vague dark shades. Hind wing: Basal third black, triangular, crossed by an antemedial outcurved brownish drab shade; medial space broadly white, irrorated with drab, outwardly edged by a lunular dentate black line followed by a broad drab shade with fuscous irrorations; termen broadly fuscous irrorated with black. Fore wing below very similar to above, without the dark patch on inner margin. Hind wing below white with drab striae to postmedial dentate line; a thick curved black discal line; postmedial line broadly followed by drab, becoming white towards costa, irrorated with dark striae; termen as on fore wing, inwardly edged by a lunular dentate black line partly double. Expanse.—165 mm.

Habitat: PERU. *Type* in collection of Mr. Frank Johnson.

This species is allied to *L. serpentina* Maassen but very different in shape. The fore wing is narrower and more produced at apex, the termen more oblique. The hind wing is also narrower, the termen evenly rounded and slightly crenulate.

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**Wanted: Material for Study of the Genus *Argia* (Odon.: Agrionidae).**

The collection of dragonflies in the Museum of Zoology, University of Michigan, contains long series of the genus *Argia* representing collections accumulated over a quarter of a century, about 10,000 specimens. Support has been obtained for a revisional study of the genus and I should like to study other available *Argias*. Material loaned me will be returned intact to the owner at the completion of the study.

E. B. WILLIAMSON,

Research Associate, Division of Insects.



### An Additional Annotated List of the Ants of Mississippi (Hym.: Formicidae).\*

M. R. SMITH, State College, Mississippi.

In a previous article (Ent. News, Vol. 42 pp. 16-24, 1931) 20 species of ants were recorded for Mississippi. This article lists 9 additional species, making a total of 135 for the state.

It is not only to be noted that all of the species given here fall within the sub-family *Myrmicinae* but furthermore that the majority of them belong to the genus *Strumigenys*. Of the 16 species recorded for North America in my recent revisionary paper, (Annals Ent. Soc. Amer., Vol. 24, pp. 686-710, 1931), approximately 63 per cent have been taken in Mississippi.

An especially interesting record is that of *Myrmica punctiventris pinctorum*, the second species of *Myrmica* to be recorded for the state, which is at this time represented in our collection by a single specimen.

127. *STRUMIGENYS* (C.) *MEMBRANIFERA* subsp. *SIMILLIMA* Emery. Avera (H. Dietrich and E. Lott), Waynesboro (G. L. Bond), West Point (M. R. Smith and E. E. Byrd), Belzoni (G. W. Haug), Columbus and Greenwood (J. W. Ward).

This exceedingly small (1.5 mm.) but very distinct species is recorded in the United States for the first time, having been previously known only from the Virgin Islands. It is one of the most common species of *Strumigenys* in Mississippi. Colonies are usually found in the soil beneath objects lying on the surface, but in one instance a colony was found in the woodwork of an old, deserted house.

The ant can readily be distinguished by the following characters: (1) the very distinct rectangular shape of its head anteriorly; (2) the very angular antennal scapes; (3) the strongly marginate prothorax; and (4) the almost complete absence of scale-like hairs on the body except for the presence of two short, erect, club-like hairs on the vertex of the head.

128. *STRUMIGENYS* (C.) *ANGULATA* M. R. Smith. Louis-

\* A contribution from the Mississippi Agricultural Experiment Station.

ville (M. R. Smith). This is one of our largest species of *Strumigenys* (2-2.5 mm.). At the present time *Strumigenys angulata* is represented in our collections by 14 specimens, all of which were collected from a rotten log in a rather dense woodland thicket.

The species is most likely to be mistaken for *Strumigenys pergandei* Emery, which it closely resembles. From this species it can be distinguished by the characters here listed: (1) the very rectangular head anteriorly; (2) the shorter, more robust, and more angular antennal scapes; and (3) the differently toothed mandibles.

129. STRUMIGENYS (S.) LOUISIANAE subsp. LATICEPHALA M. R. Smith. Longview (M. R. Smith), Louisville (M. R. Smith), West Point (E. E. Byrd), Ripley (S. W. Simmons), Landon, Mississippi (G. W. Haug), and Decatur, Alabama (W. S. Creighton).

This subspecies is one of the most common *Strumigenys* in the state. Colonies have been observed which contained as many as 120 workers. Nests are usually constructed in the soil beneath objects lying on the surface. Winged males have been taken at dates ranging from June 20 to July 10.

This subspecies is distinguished from *Louisianae* by the following differences: (1) its larger size (2.5 mm.); (2) its relatively broader head, the occipital lobes of which are more angular; and (3) its darker color.

— STRUMIGENYS (C.) CLYPEATA var. LAEVINANSIS M. R. Smith. Louisville (M. R. Smith). This species was recorded in my previous paper in the Entomological News as No. 115 under the name of *Strumigenys clypeata* var. *pilinasis* Forel. After comparing our specimens with type specimens of *Strumigenys clypeata pilinasis*, I have been able to note the following differences: (1) The size is smaller (1.8 mm.); (2) the head is relatively more slender in proportion to its length; (3) the clypeus is not only more narrowly oval anteriorly but is also more depressed dorsally; (4) the clypeus and frontal area are decidedly more shining; and (5) the pilosity of the head is sparser, longer, and apparently more slender.

The three workers representing this variety were collected in the same type of habitat as were the *Strumigenys angulata*.

130. STRUMIGENYS (C.) DIETRICH M. R. Smith. Lucedale (H. Dietrich). This very striking species is represented in our collections by 7 workers, all of which were collected from beneath the bark of logs and stumps.

*Strumigenys dietrichi* is more apt to be mistaken for *Strumigenys ornata* than any other species of the genus. Although it does bear a strong resemblance to *ornata*, the following differences can be noted: (1) The anterior border of its clypeus is not only narrower but also more sharply angulate; and (2) the erect hairs are not so greatly enlarged apically.

131. STRUMIGENYS (C.) CLYPEATA Roger. Lucedale (H. Dietrich). Our collection contains only 1 individual of this species, a wingless queen, which was presumably taken from a rotten log or stump. It is probable that the ant is more common in the state than it appears to be, especially in view of the fact that Louisiana is the type locality. The characters which distinguish this species are: (1) its clypeus, which is scarcely longer than broad and which forms a broadly oval curve anteriorly; (2) the distinctive type of pilosity of the clypeus, which is represented by short, appressed, squamiform hairs; and (3) the dorso-ventrally flattened mandibles with a row of coarse irregular teeth on their border.

132. STRUMIGENYS (C.) SCULPTURATA M. R. Smith. Aberdeen (M. R. Smith), Ripley (S. W. Simmons). This species might easily be confused with *Strumigenys pulchella*, which it closely resembles in superficial appearance. Like *pulchella* it also nests beneath the bark of rotten logs and stumps, as well as in the ground beneath objects lying on the surface.

From *pulchella* this ant can be distinguished by the differences here enumerated: (1) its more robust head, the width of which is greater in proportion to the length; (2) the more rugulose or tuberculate sculpturing of the head; (3) its shorter and more robust type of mandibles; and (4) the decidedly truncate shape of the anterior border of the clypeus.

133. LEPTOTHORAX TEXANUS Wheeler. Louisville (M. R.

Smith), Ripley (S. W. Simmons). A small colony was found nesting in sandy loam soil on a hillside thicket near Louisville.

The species, which varies in size from 2.25-2.75 mm., can perhaps be recognized by the characters here given: (1) the 12-segmented antennae; (2) the absence of meso-epinotal constriction on the thorax; (3) the short, erect, white, clavate hairs on the body; (4) the reticulate-rugose sculpturing of the head, thorax, petiole, and post-petiole; and (5) the generally dark brown or black color, with slightly lighter appendages.

134. *APHAENOGASTER TENNESSEENSIS* Mayr. New Augusta (H. Dietrich). Strange to say this species is represented in our collections by only two specimens, both of which are wingless queens. These specimens were sent in for determination without any special remarks concerning their habitat.

The queen of *Aphaenogaster tennesseensis* differs so distinctly from the worker that Mayr described a queen unassociated with the workers as a different species. He called the species *A. laevis* because of the unusually smooth and shining surface of the body, which is dark red in color. In addition to the above characters the queen possesses very large, flattened epinotal spines. Wheeler regards this ant as a temporary parasite on other ground-nesting Aphaenogasters of the *fulva* group. *A. tennesseensis* is typically a wood-nesting type of ant.

135. *MYRMICA PUNCTIVENTRIS* subsp. *PINETORUM* Wheeler. Starkville, (M. R. Smith). A single worker was excavated from the soil of a woodland strip near Starkville. The ant was found in close proximity to the nest of *Lasius (A.) interjectus* Mayr, which was located in the soil at the base of a rotten stump.

As the specific name indicates, the gaster of this species is very coarsely punctate at the base, a character which at once distinguishes it from other closely related species of North American *Myrmica*. The subspecies is separated from the species by: (1) its lighter color; (2) its smaller size; (3) its less heavily sculptured body; and (4) the epinotal spines which are not only shorter than with the species but are also deflected apically.

### Inscribing Author's "Extras".

The sending out of extras is a well established entomological custom.<sup>1</sup> It is encouraged by the various journals and much help and good fellowship follows as a reward. Authors generally take pride in their contributions whether they are of any special value or not and such papers are rarely distributed indiscriminately. As a matter of fact too few are mailed out in many instances, regardless of numbers retained as request copies or to serve other purposes.

#### Compliments of the Author

To Dr. W. J. Holland,  
Pittsburgh, Pa.

It was the habit of early writers to sign their own names in one way or another on pamphlets going to friends, but that style of the personal autograph is passing and nowadays most extras simply bear a stamped, "Author's Compliments" or "With the compliments of the Author". For a number of years I have found it practical to inscribe pamphlets as depicted above. By so doing the recipient can always identify his property and there can never be any future doubt as to whom the author's original belonged to, though it be passed on from party to party. In reviewing papers of senior authors, information as to former ownership would be of great value in many special cases where question of dates and authenticity of marginal notations remain a problem. Therefore, by all means inscribe your extras.<sup>2</sup> It's a simple courtesy which your prudent colleagues will find advantageous and not in the least indecorous.—J. D. GUNDER, Pasadena, Calif.

<sup>1</sup> Called "extras" by this publication and others for the first 25 copies usually received free and reprints when more copies are wanted, representing additional runs or cost to the printer. Called separates by *Psyche* and reprints by several other journals.

<sup>2</sup> Not that it matters much, but unsigned pamphlets may be mistaken for "bookseller's separates" (more correctly termed—"bookseller's excerpts" by Mr. J. R. de la Torre-Bueno in the December, 1931, Bulletin of the Brooklyn Entomological Society). These are cut-out articles from serials, dolled-up to imitate author's extras and sold by certain American and European book dealers MORE EXTENSIVELY THAN IS THOUGHT. See p. 257, Ent. News, November, 1931. If commercialism and short-sightedness prevail, the shortage of serials by 1982 will be just as much felt, if not more so, than those of the 1890 era are now. The propaganda and comments of authors should be along the line of conservation and, by the way, don't you think it's poor policy or advertising, as the case may be, if ultieriors or personals creep into replies?

### Some Old Letters.

By H. T. FERNALD, Orlando, Florida.

#### II. An Attractant for the Monarch Butterfly. (Lep.: Danaidae.)

———, Mass., Nov. 7, 1903.

Dear ——:

For nearly ten years I have been making certain observations which may interest you, both because they concern one of our most common butterflies, and because they show how two seemingly unrelated subjects may prove to have a connection after all.

As you well know, the salary of a teacher is very small. To live on it and raise a family means the closest economy and any way by which expenses and particularly luxuries may be reduced is welcome. So, when a friend informed me (and others) that he had found a brand of Pittsburg stogy which "wasn't half bad" we at once adopted it for our use because of its low cost.

Shortly afterward, while smoking one of these "cigars" one day, I noticed a Monarch butterfly (*Danaus archippus* Fab.) coming up wind toward me. Its actions were as though it was trailing something, for while its general flight was in my direction, it flew obliquely from side to side much as a vessel does in sailing against the wind. It soon passed by me but almost immediately, after a few brief changes of direction, floated down the wind a short distance, then turned and repeated its former actions. This happened half a dozen times before it was disturbed and flew off.

Similar actions on the part of these butterflies were observed more than twenty-five times during that summer and those following. It was only while smoking these stogies that it happened: never at any other time. In one case it happened while I was in the upper part of New York City, out of doors, not far from Grant's Tomb. I spoke to a number of my friends who smoked these stogies, about the odd actions of the butterfly and several reported later that they had noticed the same thing while they were smoking.

A few years later I moved here and found that the butterfly acted in the same way in Massachusetts as it did in Pennsylvania and New York in response to the smoke of that partic-

ular brand of stogy. After a time, though, finding it difficult to obtain that brand, I gave it up and since then I have failed absolutely to induce a Monarch butterfly to show the slightest interest, either in me or in anything I might be smoking.

I feel sure that something in the smoke from that particular brand of stogy was an attractant to the butterfly and am now wondering what the particular "dope" was which was used by the manufacturers of that brand.

And so a low salary led to the discovery of a butterfly attractant!

Yours sincerely,

### III. A Case of Mimicry.

(*Calopteron reticulatum* var. *apicale* Lec. (Coleop.; Lycidae) and *Lycomorpha pholus* Dru. (Lep.: Syntomidae).

—, Mass., Sept. 20, 1904.

Dear —:

Last August 4th was a beautiful day and as I had no appointments early in the afternoon I decided to go to "The Notch" four or five miles south of here, collecting. I find quite a little of interest there as the Holyoke Range seems to be, to some extent, a northern boundary limit for some insects and a southern limit for others and thus collecting on the North side brings some species seldom or never taken on the South side, and vice versa.

This time, though, my attention was attracted to some insects flying around and crawling over the leaves of a bush on the southern slope of the mountain. Catching some, I discovered that a part of them were the Syntomid moth, *Lycomorpha pholus* Dru., while others were beetles which I later identified as the Lycid, *Calopteron reticulatum* var. *apicale* Lec.

In flight it was almost impossible to distinguish the two species as their form and color are almost identical, and when crawling, the wings are held in similar positions.

I collected quite a number of specimens of each and returned to my office, intending to mount them. On my arrival there, however, I found that I must go away at once, so I put them into the hands of a student with instructions to pin them all and to spread the moths.

A week or so later when this material was returned to me I was much amused to note that among the spread specimens

**List of the Titles of Periodicals and Serials Referred to by  
Numbers in Entomological Literature  
in Entomological News.**

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1. Transactions of The American Entomological Society. Philadelphia.
2. Entomologische Blätter, red. v. H. Eckstein etc. Berlin.
3. Annals of the Carnegie Museum. Pittsburgh, Pa.
4. Canadian Entomologist. London, Canada.
5. Psyche, A Journal of Entomology. Boston, Mass.
6. Journal of the New York Entomological Society. New York.
7. Annals of the Entomological Society of America. Columbus, Ohio.
8. Entomologists' Monthly Magazine. London.
9. The Entomologist. London.
10. Proceedings of the Ent. Soc. of Washington. Washington, D. C.
11. Deutsche entomologische Zeitschrift. Berlin.
12. Journal of Economic Entomology, Geneva, N. Y.
13. Journal of Entomology and Zoology. Claremont, Cal.
14. Entomologische Zeitschrift. Frankfurt a. M., Germany.
15. Natural History, American Museum of Natural History. New York.
16. American Journal of Science. New Haven, Conn.
17. Entomologische Rundschau. Stuttgart, Germany.
18. Internationale entomologische Zeitschrift. Guben, Germany.
19. Bulletin of the Brooklyn Entomological Society. Brooklyn, N. Y.
20. Societas entomologica. Stuttgart, Germany.
21. The Entomologists' Record and Journal of Variation. London.
22. Bulletin of Entomological Research. London.
23. Bollettino del Laboratorio di Zoologia generale e agraria della  
R. Scuola superiore d'Agricoltura in Portici. Italy.
24. Annales de la société entomologique de France. Paris.
25. Bulletin de la société entomologique de France. Paris.
26. Entomologischer Anzeiger, hersg. Adolf Hoffmann. Wien, Austria.
27. Bollettino della Società Entomologica. Genova, Italy.
28. Ent. Tidskrift utgifen af Ent. Föreningen i Stockholm. Sweden.
29. Annual Report of the Ent. Society of Ontario. Toronto, Canada.
30. The Maine Naturalist. Thornaston, Maine.
31. Nature. London.
32. Boletim do Museu Nacional do Rio de Janeiro. Brazil.
33. Bull. et Annales de la Société entomologique de Belgique. Bruxelles.
34. Zoologischer Anzeiger, hrsq. v. E. Korschelt. Leipzig.
35. The Annals of Applied Biology. Cambridge, England.
36. Transactions of the Entomological Society of London. England.
37. Proceedings of the Hawaiian Entomological Society. Honolulu.
38. Bull. of the Southern California Academy of Sciences. Los Angeles.
39. The Florida Entomologist. Gainesville, Fla.
40. American Museum Novitates. New York.
41. Mitteilungen der schweiz. ent. Gesellschaft. Schaffhausen, Switzerland.
42. The Journal of Experimental Zoology. Philadelphia.
43. Ohio Journal of Sciences. Columbus, Ohio.
44. Revista chilena de historia natural. Valparaiso, Chile.
45. Zeitschrift für wissenschaftliche Insektenbiologie. Berlin.
46. Zeitschrift für Morphologie und Ökologie der Tiere. Berlin.
47. Journal of Agricultural Research. Washington, D. C.
48. Wiener entomologische Zeitung. Wien, Austria.
49. Entomologische Mitteilungen. Berlin.
50. Proceedings of the U. S. National Museum. Washington, D. C.
51. Notulae entomologicae, ed. Soc. ent. Helsingfors. Helsingfors, Finland.
52. Archiv für Naturgeschichte, hrsq. v. E. Strand. Berlin.



53. Quarterly Journal of Microscopical Science. London.
54. Annales de Parasitologie Humaine et Comparée. Paris.
55. Pan-Pacific Entomologist. San Francisco, Cal.
56. "Konowia". Zeit. für systematische Insektenkunde. Wien, Austria.
57. La Feuille des Naturalistes. Paris.
58. Entomologische Berichten. Nederlandsche ent. Ver. Amsterdam.
59. Encyclopédie entomologique, ed. P. Lechevalier. Paris.
60. Stettiner entomologische Zeitung. Stettin, Germany.
61. Proceedings of the California Academy of Sciences. San Francisco.
62. Bulletin of the American Museum of Natural History. New York.
63. Deutsche entomologische Zeitschrift "Iris". Berlin.
64. Zeitschrift des österr. entomologen-Vereines. Wien.
65. Zeitschrift für angewandte Entomologie, hrsg. K. Escherich. Berlin.
66. Report of the Proceedings of the Entomological Meeting. Pusa, India.
67. University of California Publications, Entomology. Berkeley, Cal.
68. Science. New York.
69. Comptes rendus hebdom. des séances de l'Académie des sciences. Paris.
70. Entomologica Americana, Brooklyn Entomological Society. Brooklyn.
71. Novitates Zoologicae. Tring, England.
72. Revue russe d'Entomologie. Leningrad, USSR.
73. Quarterly Review of Biology. Baltimore, Maryland.
74. Šborník entomolog. národního musea v Praze. Prague, Czechoslovakia.
75. Annals and Magazine of Natural History. London.
76. The Scientific Monthly. New York.
77. Comptes rendus heb. des séances et mémo. de la soc. de biologie. Paris.
78. Bulletin Biologique de la France et de la Belgique. Paris.
79. Koleopterologische Rundschau. Wien.
80. Lepidopterologische Rundschau, hrsg. Adolf Hoffmann. Wien.
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82. Bulletin, Division of the Natural History Survey. Urbana, Illinois.
83. Arkiv för zoologie, K. Svenska Vetenskapsakademien i. Stockholm.
84. Ecology. Brooklyn.
85. Genetics. Princeton, New Jersey.
86. Zoologica, New York Zoological Society. New York.
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88. Die Naturwissenschaften, hrsg. A. Berliner. Berlin.
89. Zoologische Jahrbücher, hrsg. v. Spengel. Jena, Germany.
90. The American Naturalist. Garrison-on-Hudson, New York.
91. Journal of the Washington Academy of Sciences. Washington, D. C.
92. Biological Bulletin. Wood's Hole, Massachusetts.
93. Proceedings of the Zoological Society of London. England.
94. Zeitschrift für wissenschaftliche Zoologie. Leipzig.
95. Proceedings of the Biological Soc. of Washington, Washington, D. C.
96. La Cellule. Liège, Belgium.
97. Biologisches Zentralblatt. Leipzig.
98. Le Naturaliste Canadien. Cap Rouge, Chicoutimi, Quebec.
99. Mélanges exotico-entomologiques, Par Maurice Pic. Moulins, France.
100. Bulletin Intern., Académie Polonaise des Sci. et des Lett. Cracovie, Poland.
101. Tijdschrift voor entomologie, Nederlandsche Entomol. Ver., Amsterdam.
102. Entomologiske Meddelelser, Entomologisk Forening, Copenhagen.
103. Journal of the Kansas Entomological Society, Lawrence, Kansas.
104. Revista de la Sociedad entomologica Argentina, Buenos Aires.
105. Revista Entomologia, São Paulo, Brazil.
106. Anales Sociedad Científica Argentina, Buenos Aires.

were several of the beetles, and among the moths several had only been pinned! Following this up by questions, I learned that the student supposed he had spread all the moths and only pinned all the beetles. As he had worked on insects considerably for over a year, one of two conclusions seems obvious: either the resemblance of the two species is extremely great, or the student was not giving much attention to what he was doing. Knowing the two species as you do, I leave you to draw your own conclusions as to which is correct.

But how did it happen that the beetle and the moth were flying actively about and crawling over the same plant at about two o'clock in the afternoon unless there is the factor of mimicry involved? I have never chanced to run across anything written about mimicry in these insects but the generic name of the moth—*Lycomorpha*—is at least suggestive that their similarity has been noticed.\*

Yours sincerely,

## Entomological Literature

COMPILED BY LAURA S. MACKEY UNDER THE SUPERVISION OF  
E. T. CRESSON, JR.

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 figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the list of Periodicals and Serials published in our January and June issues. This list may be secured from the publisher of ENTOMOLOGICAL NEWS for 10c. The number of, or annual volume, and in some cases the part, left, &c. the latter within ( ) follows; then the pagination follows the colon :

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

\*Papers containing new forms or names have an \* preceding the author's name.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

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.

⚡ Note the change in the method of citing the bibliographical references, as explained above.

*Papers published in the Entomological News are not listed.*

**GENERAL.**—Barrett, R. E.—An annotated list of the insects and arachnids affecting the various species of walnuts or members of the genus *Juglans*. [67] 5: 275-309.  
Eltringham, H.—[Entomology and its bearing on human

[\*Poulton & Marshall's paper on the Bionomics of South African Insects (Trans. Ent. Soc. London, 1902, pt. iii) has a section and a plate (xviii) on mimicry in the "group with Lycoid markings."—Ed.]

progress.]. [Pro. Ent. Soc. London] 6: 109-123. **Griffin, F. J.**—On the dates of publication and contents of the parts of Westwood (J. O.). Introduction to the Modern Classification of Insects, 1838-1840. [Pro. Ent. Soc. London] 6: 83-84. **Gunder, J. D.**—Kow-towing to the general zoologist. [19] 27: 62, ill. **Headlee, T. J.**—Further studies of the effects of electromagnetic waves on insects. [12] 25: 276-288, ill. **Heikertinger, F.**—Wie beschafft sich der Spezialist die nötige Literatur? [79] 18: 21-35. **Hermes, W. B.**—Insect parasitology. [12] 25: 222-232. **Hobby, B. M.**—Local abundance as a factor governing prey-selection by predacious insects. [Pro. Ent. Soc. London] 6: 87. **Leeson, H. S.**—Methods of rearing and maintaining large stocks of fleas and mosquitos for experimental purposes. [22] 23: 25-31, ill. **Longfield, C.**—Attacks by birds on migrating butterflies observed at Panama by Miss Cynthia Longfield. [Pro. Ent. Soc. London] 6: 90-91. **Poulton, E. B.**—Doubts about the frequency of bird-attacks upon butterflies, and about the qualities believed to be advertised by warning colours. [Pro. Ent. Soc. London] 6: 90. **Ris, F.**—Obituary. By O. Schneider-Orelli. [Act. Soc. Helvétique Sci. Nat.] 1931: 396-407, ill. **Shelford, V. E.**—Basic principles of the classification of communities and habitats and the use of terms. [84] 13: 105-120, ill. **Storer, T. I.**—What is a publication? [68] 75: 486-487. **Wallace, W. G.**—Observations, nearly eighty years old, on pompilid wasps and spiders in California. [Pro. Ent. Soc. London] 6: 71-73.

**ANATOMY, PHYSIOLOGY, ETC.**—**Bulger, J. W.**—Additions to our knowledge of the toxicity of stomach poisons to insects. [12] 25: 261-268, ill. **Clayton, D. E.**—A comparative study of the non-nervous elements in the nervous systems of invertebrates. [13] 24: 3-22, ill. **Cole, A. C.**—Use of the quadrat in studying the plant-cutting activities of the ant, *Pogonomyrmex occidentalis*. [84] 13: 213-214, ill. **Crampton, G. C.**—A phylogenetic study of the head capsule in certain orthopteroid, psocoid, hemipteroid and holometabolous insects. [19] 27: 19-49, ill. **Fife, J. M.**—A method of artificially feeding the sugar-beet leafhopper. [68] 75: 465-466, ill. **Green, T. L.**—Function of the spiracles of insects. [31] 129: 582. **Hockenyos & Lilly.**—Toxicity studies by hypodermic injection of *Celerio lineata* larvae. [12] 25: 253-261, ill. **Hood & Hook.**—Tergo-sternal muscles in the Thysanoptera. [19] 27: 1-6, ill. **Park, T.**—Studies in population physiology: the relation of numbers to initial population growth in the flour beetle *Tribolium*

confusum. [84] 13: 172-181, ill. **Rivnay, E.**—Studies in tropisms of the bed bug *Cimex lectularius*. [Parasitology] 24: 121-136, ill. **Rühle, H.**—Das larvale tracheensystem von *Drosophila melanogaster* und seine variabilität. [94] 141: 159-245, ill. **Theodor, O.**—On the structure of the buccal cavity pharynx and spermatheca in South American *Phlebotomus*. [22] 23: 17-23, ill. **Tillyard, R. J.**—The wing-venation of the order Isoptera. [Proc. Linnean Soc. N. S. Wales] 56: 371-390, ill. **Verlaine, L.**—L'instinct et l'intelligence chez les Hyménoptères. [33] 72: 89-97.

**ARACHNIDA AND MYRIOPODA.**—\***Beier, M.**—Pseudoscorpionidea I. Subord. Chthoniinea et Neobisiinea. [Das Tierreich] Lief. 57: 258 pp., ill. **Stewart, M. A.**—Dispersal of the sticktight flea of hens (*Echidnophaga gallinacea*). [12] 25: 164-167.

**THE SMALLER ORDERS OF INSECTS.**—**Jordan, K.**—Die aus der arktischen Zone bekannten flöhe. [Fauna Arctica] 6: 117-118. \***McDunnough, J.**—Further notes on the Ephemeroptera of the north shore of the Gulf of St. Lawrence. [4] 64: 78-81. **Neave, F.**—A study of the May Flies (*Hexagenia*) of Lake Winnipeg. [Contrib. Canadian Biol. & Fish.] 7: 177-201, ill. \***Silvestri, F.**—Descrizione di un nuovo genere ecitofilo di Lepismidae (*Thysanura*). [Rev. Ent. Sao Paulo] 2: 133-138, ill.

**ORTHOPTERA.**—**Menozi, C.**—Contributo alla conoscenza dei Dermatteri del Brasile. [Rev. Ent. São Paulo] 2: 150-168. \***Rehn, J. A. G.**—New or little known neotropical Blattidae. [1] 58: 103-137, ill.

**HEMIPTERA.**—\***Beamer, R. H.**—Some *Erythroneura* (grape leaf hoppers) of the *Maculata* group. (*Cicadellidae*). [4] 64: 82-88, cont. **Hoffmann, C. H.**—The biology of three North American species of *Mesovelia* (*Mesoveliidae*). [4] 64: 88-95, cont. **Myers, J. G.**—Observations on the family *Termitaphididae* (*Heteroptera*) with the description of a new species from Jamaica. [75] 9: 366-372, ill. **de la Torre Bueno, J. R.**—*Murgantia histrionica* in Mississippi; and comment on the incompleteness of catalogues and faunal lists. [19] 27: 18.

**LEPIDOPTERA.**—**Bratley, H. E.**—The Oleander caterpillar, *Syntomeida epilais*. [39] 15: 57-64, ill. \***Ferreira d'Almeida, R.**—Etude sur le genre *Terias*. [25] 37: 44-47, ill. (S). \***Hoffmann, F.**—Eine neue Hesperide. [17] 49: 77-79. (S). **Huntington, E. I.**—A list of the *Rhopalocera* of

Barro Colorado Island, Canal Zone, Panama. [62] 63: 191-230. **de Joannis, J.**—Deux rectifications concernant des Lépidoptères. (Galleriidae et Crambidae). [25] 37: 54-57. **\*Meyrick, E.**—Exotic Microlepidoptera. 4: 193-224. (S).

**DIPTERA.**—**\*Aldrich, J. M.**—Records of dipterous insects of the family Tachinidae reared by the late George Dimmock, with description of one new species and notes on the genus *Anetia*. [50] 80, Art. 20: 8 pp. **Aldrich, J. M.**—Collecting flies in the Gaspé Peninsula of eastern Quebec. [Explor. & Field-Work Smiths. Inst.] 1931: 83-86, ill. **Dinulescu, G.**—Recherches sur la biologie des Gastrophiles. [An. Sci. Nat. Zool., Paris] 15: 183 pp., ill. **\*Edwards, F. W.**—New Brazilian Mycetophilidae. [Rev. Ent., São Paulo] 138-149, ill. **Hoffmann, C. C.**—Anopheles pseudopunctipennis y su relacion con el paludismo en la Republica Mexicana. [Rev. Mexicana de Biologia] 12: 33-42. **Krober, O.**—Bemerkungen über die systematik der neotropischen Tabaniden, nebst bestimmungstabelle der subfamilien und gattungen. [Rev. Ent., São Paulo] 2: 185-202, ill. **Metcalf, C. L.**—Black flies and other biting flies of the Adirondacks. [N. Y. State Mus. Bull.] Bull. 289: 5-58, ill. **Paramonow, S. J.**—Beiträge zur monographie der gattungen Cytherea, Anastoechus etc. Bombyliidae. [Trav. Mus. Zool. Acad. Sci. Ukraine] No. 9: 355-481. **Rogers, J. S.**—On the biology of *Limonia* (*Dicranomyia*) *floridana*. [39] 15: 65-70, ill. **Tate, P.**—The larval instars of *Orthopodomyia pulchripalpis* (Nematocera). [Parasitology] 24: 111-120, ill. **\*Van Duzee, M. C.**—New species of Dolichopodidae from North America and Cuba, with notes on known species. [40] 521: 14 pp., ill.

**COLEOPTERA.**—**\*Blaisdell, F. E.**—Studies in the tenebrionid tribe Scaurini a monographic revision of the Eulabes. [1] 58: 35-101, ill. **Bruch, C.**—Metamorfosis de *Entimus nobilis* (Curculionidae). [Rev. Ent., São Paulo] 2: 179-185, ill. **Buchanan, L. L.**—The parsley and carrot weevil, *Listronotus latiusculus*. [19] 27: 7-8. **Gebhardt, A. V.**—Zur Eidonomie der Buprestiden. [79] 18: 1-20, ill. **Leng, C. W.**—Böving and Craighead's larvae of Coleoptera. [Review] [19] 27: 56-58. **Marshall, G.**—Notes on the Hylobiinae (Curc.). [75] 9: 341-355, ill. **\*Melzer, J.**—Vinte especies novas de Cerambycideos neotropicos, principalmente do Brasil. [Rev. Ent. São Paulo] 2: 216-238, ill. **Schaeffer, C.**—*Serica brunnea*. [19] 27: 50. **Siepmann, C. G.**—*Omosita discoidea* (Nitidulidae). [19] 27: 49-50. **\*Van**

**Dyke, E. C.**—Miscellaneous studies in the Elateridae and related families of Coleoptera. [Pro. Calif. Acad. Sci.] 20: 291-465.

**HYMENOPTERA.**—**Bequaert, J.**—[Appendix to paper by Cockerell]. **Cockerell, T. D. A.**—Bees (Apoidea) collected at Chichenitzá, Yucatan, by the Harvard Expeditions of 1929-1930. [19] 27: 9-17. \***Donisthorpe, H.**—A new species of *Camponotus* (Formicidae) from Colombia. [Stylops] 1: 88-89. **Hoffmann, C. H.**—Hymenopterous parasites from the eggs of Aquatic and semi-aquatic insects. [103] 5: 33-37. **Olmedo, I. H.**—*Ei Tenthredinido Neodiprion vallicola* plaga de los pinos en el Estado de Michoacán, Mexico. [Rev. Ent., São Paulo] 2: 168-175, ill. **Rau, P.**—The courtship dance and sleeping habits of *Scolia dubia*. [19] 27: 59-62. \***Richards, O. W.**—A note on the genus *Microstigmus*, with the description of a new species. [75] 9: 372-377. (S). **Thorpe, W. H.**—The primary larvae of three Ophionine ichneumonids, parasitic on Rhyacionia. [Parasitology] 24: 107-110, ill. **Wheeler, W. M.**—Some attractions of the field study of ants. [76] 397-402, ill. \***Wilkinson, D. S.**—Three new Braconids. (S). [Stylops] 1: 85-88.

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#### Special Note.

Among the many contributions to entomological science, which make for chaos rather than order and leave the field a farrago for some careful constructive worker, with much labor, to clear away before beginning his building, may be mentioned "Die neotropischen Chloropiden," by Oswald Duda (*Folia Zool. et Hydrobiol.*, II, p. 46-128, 1930). A very involved work and difficult to interpret, with many violations of acknowledged rules of nomenclature, especially some of those recently suggested for enforcement but always followed by serious workers. This work is in the form of keys, and in such manner a new sub-family name is proposed, many new names for genera (23), some without any citation or indication of the type, some without an included species.

Works of this nature should not be accepted for publication by any progressive scientific medium, and should be ignored by all serious entomologists and considered nonexistent by the entomological world. We cannot hope that the zoological world will take any steps to so treat such barriers to the advancement of science. The botanists are to be envied for their stand regarding the legitimate establishment of genera and species.

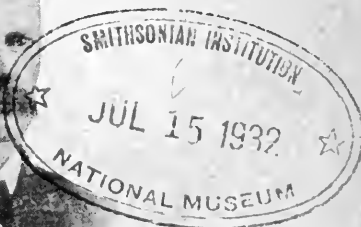
E. T. CRESSON, JR.

JULY, 1932

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JOHN HENRY COMSTOCK, 1849-1931.  
Portrait of 1884.

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# MACROLEPIDOPTERA

**S**PECIES— . . . . . SPECIES  
*A prime group of individuals reproducing their own in kind.*

**R**ACE—(Subspecies & "variety" being synonymous.) . . . . . RACE  
*A digressing near-by group or a separate far-away group of individuals reproducing their own in kind which are constantly similar to, yet consistently atypical of, a predetermined group.*

**F**ORMS { LOCAL FORM— . . . . . F. LOC.  
*A cognate form whose congenial habitat or metropolis is considered restricted to segregated localities within the range of a species or race and generally contiguous to them; i. e. altitude or confined desert forms.*  
 FORM—(or general form) . . . . . F  
*A form occurring quite generally and commonly throughout the range of a species or race. This term is much abused, new names being given on slight differences usually "representing ordinary variance or usual variance occurring within the range of a typical series and understood by the original author."*  
 SEASONAL FORM— . . . . . F. VERN. or F. AEST.  
*Forms occurring within a species or race only at certain periods of the year.*  
 SEXUAL FORMS— . . . . . ♂ F. & ♀ F.  
*Forms belonging to one sex only.*

*Deviating, cognate individuals or group of individuals, bred continually or at cyclic periods within a species or within a race, and which we, as a rule, practically counterparts of one another.*

**T**RANSITION FORM— . . . . . TR. F.  
*Recurrent individuals within a species or within a race which by change of color or by change of pattern graduate with persistent characteristic similarity from parental type to definitely limited variation away from parental type. These may be classified for name retention as follows:*

- |                    |   |
|--------------------|---|
| Change of color—   | { melanism—to black<br>chromatism—to follow color sequence<br>albinism—to white<br>pellucidism—lacking color, or to indescence                  |
| Change of pattern— | { immaculism—lacking design<br>albfusism—white design radiation<br>chromatifusism—color design radiation<br>melanifusism—black design radiation |

**H**YBRID— . . . . . HYBRID  
*Progeny which have the combined essential characteristics of parents each unlike in specific character relation.*

**U**NNAMABLE or SYNONYMOUS FORMS— . . . . . SYNONYM  
*Hermaphrodites, mosaics, dwarfs and giants, rubbed specimens, chrysalis burns, pigmental fluid misplacements, venation malformations, wing shape distortions with resulting pattern changes, scaleless, monstrosities, degreasing or killing color changes, fades, inverted wings, parasitic wing punctures and all so-called freaks, aberrations, mutants, illforms, malforms, deforms and sports.*

*Names given to specimens which vary from normal in an abnormal way due to the above listed lepidopterist afflictions fall into the synonymy and have no classification rating by rank in check lists or catalogues.*

## CLASSIFICATION

( GUNDER )

# ENTOMOLOGICAL NEWS

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## Macrolepidoptera: Species and Lower Concepts.

By J. D. GUNDER, Pasadena, California.

(Plate VII.)

In former times makers of Lepidoptera check lists simply recorded names one after the other, for the most part at random, because practically everything was described either as a new species or as a new "variety" of some species and the procedure of classification and cataloging was easy. Present day listers face a more precise and difficult nomenclature and one which involves showing of the inter-related concepts. By inter-related concepts, I mean those categories known as races, various forms, transition forms and possibly hybrids. These classificatory divisions, like the rungs on the evolutionary ladder, are units for names, each of which requires and is entitled to a potential position in tabulation which should be as *approximately natural and convenient*<sup>1</sup> as our present knowledge and scheme of printing permits. Our modern check lists, therefore, are a great improvement over the older and more simple lists which were not built on any definite evolutionary standard and there is every reason to believe that future lists will register an even greater accuracy in this respect. To improve future lists taxonomists must study the question of concepts; they must understand their scope, unitize their meaning and know when to employ them to best advantage. There must not be too many concepts, nor too many phrases used to express the same concept; also concepts must not be illogically used, that is, strung together in illogical formation. I will refer to this just a little farther on. If a concept attempts to cover too great a range, it demoralizes its meaning and defeats its purpose; not only that, but it corrupts its value when used again for neighboring names. Of course a minority of new names

<sup>1</sup>Note last sentence in statement by Capt. N. D. Riley of London on page 271 of the November, 1927, ENTOMOLOGICAL NEWS.

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cannot be definitely placed immediately or at the time of proposal or for a considerable time after; however, this trouble is mostly to be encountered among the forms and transition forms, so it is in these groups that authors will have to watch most carefully the value of their classification ratings. I have noticed that during the last decade authors are beginning to take more care of their new names and are beginning to realize that the burden of correct check listing is not to be left wholly to the discretion and secondhand judgment of the lister. It was easy in bygone days for an author just to call a thing something-new, like "variety nov." or "ab. nov.", etc., and then let the lister worry as to how it should be placed. Those were indeed the good old days when one took a chance without thought of classification or neighboring names, but that slipshod era is rapidly passing and more and more must the namer shoulder some responsibility when naming for the true position in classification of his new assemblage, which means that naming is being put on a more scientific basis with the result that there will be less synonymy.

A discussion of classification does some good if only to familiarize others as to the more correct usage of terms lower than species. A common error, made by even some of our entomological professors, is the misuse of the terms race and form *when a racial meaning* is in mind. For example, it is incorrect to say, "This form occurs in western America", but the sentence should read, "This race occurs in western America". Remember that a form comes of, is found with, or is an immediate part of either a race or a species, while a race is an independent portion, a unit by itself, much as is a species, except that it is considered less mature. At the bottom of page 183, in the June, 1929, issue of the ENTOMOLOGICAL NEWS, in an article entitled, "What Constitutes a Good Original Description", I referred to an example showing indiscriminate use of the term form. Anyone interested should look up the December, 1928, issue of the *Journal of the New York Entomological Society* and see the paper entitled, "Variations in *Junonia lavinia*" by Dr. Wm. T. M. Forbes. The word form appears 82 times designating various groups.

The classification chart (Plate VII) accompanying this article is similar to the one printed in the November, 1927, issue of the ENTOMOLOGICAL NEWS. Only a few slight changes have been made. The definitions are short and in some cases partially borrowed from longer ones. A short definition rarely overshoots an opinion and is less likely to complicate an issue. Only useable classification terms, as generally understood in America, are included and with one exception, no mention is made of British and Continental conceptions which seem to vary according to the countries. Illogical formation or arrays of terms suggested by misinstructed authors may lead some to anticipate a chance for multinomials, but there is absolutely no danger of phylogeny overbalancing nomenclature, if the subject is understood and handled rightly. Picking at random from names given to North American butterflies, among the many similar and longest combinations definitely possible, the following one happens to be the first on my own check list, *Papilio philenor hirsuta inghami* Gun., (genus *Papilio*, species *philenor*, race *hirsuta*, tr.f. *inghami* Gun.). That is not exactly a brain-breaker, as on the whole, the use of the quadrinomial is well established. Longer nomials are unnecessary and I have never used or advocated any of greater length. Longer names would be absurd, especially in the light of present nomenclature. What troubles taxonomists, or leads them astray, if at all, is standing "the continual strain of association with such horrors" in multinomials as appear in the writings of student undergraduates being "trained" in Lepidoptera at Cornell University. (See 3rd paragraph, p. 324, December, 1930, ENTOMOLOGICAL NEWS; an article by A. B. Klots of Cornell University, now Dr. A. B. Klots of Rochester, N. Y.). For example, the stupid octonomial, suggested therein as possible: *Claudius (Megaclaudius) crosbyi occidentalis f.loc. pasadencensis f.aest. megacephlus f.♀ inimicus tr.f. absurdus* Jones. To begin with, there is no such thing as a tr.f. of a f.♀ (keep that point in mind) and it's a mistaken combination, check list or otherwise, which attempts to show a straight f.♀ of a f.aest. Further, a f.loc. would probably revert to a racial standing if names

were found to be borne of it. To illustrate a similar, but not hypothetical, angle of possible misconception, we COULD NOT say of ab. *rothkei* Reiff. that we have an ab. of *Eurymus philodice*, f. ♀ *alba* Stkr., reading *Eurymus philodice alba rothkei* Reiff.; but WE COULD say we have an ab. *rothkei* Reiff. of *Eurymus philodice* Godt., reading *Eurymus philodice rothkei* Reiff. Crediting any tenable system of classification, my own (as suggested), or any other, with such unachievable accomplishments is a boomerang for a student-author and doubtful instruction on the part of his taxonomic professor.

#### THE TERM SPECIES.

Among the definitions on the accompanying chart, I would call attention to the use of the word PRIME in species. They say that anyone is foolish to try to define species. That may be so, but my use of the word prime in this instance only tries to straddle our more or less artificial situation by covering priority as to man's discovery and as to oldness by natural descent. There is no one who doubts that our priority arrangement takes an unfair advantage over the natural situation; however, we will have to struggle along for many years before a complete change of system can be worked out. Personally, I would advocate, for the time being, the "forgetting of the Law" when it comes to the "form morn." names. We only have a few isolated cases now and will have less as authors appreciate concept values. I would like to hear from Mr. F. H. Benjamin of Washington upon this subject. Shall it be priority within concepts only?

#### THE TERM RACE.

The word PREDETERMINED in the definition of race throws the responsibility of determination on to the species where it naturally rests. Sometimes it is asked whether the term *race*, within itself, is a sufficient classification unit, as there are so-called "geographical races" and biological races. All butterfly races are geographical; that is understood when the word race is used alone, so geographical is a superfluous adjective. Likewise are the words climatic and altitudinal superfluous when

similarly used. In the same locality within a species or within a race we have "climatical forms", better expressed as seasonal forms, but these are not races by any means. In original descriptions the word race is used alone with new, no further superlative being needed. It is a sufficient classification unit. Butterflies have no biological races. A few examples have been cited among the moths (Dr. W. H. Thorppe in *Annals of Applied Biology*, Vol. XVIII, No. 3, Aug., 1931). These would still be check-listed as races, I imagine, without the need of an explanatory prefix.

In several articles in the past I have made complaint against the use in original description of the archaic term "variety", as var. nov. and otherwise. Some authors continue its use because they think that all zoological terms, (as well as names), should be in Latin, or of Latin derivation, and some authors think that because others use it, they should continue its employment as well, but the mere use of a term does not enhance its quality. The word race is a very much better designation to use in its place with new; *i.e.* new race. "Variety" is so indefinite and does not mean the same thing to all entomological workers or even to workers in the same Order and it usually has to be accompanied by some explanation. What I mean by explanation is this: for example, three new moths recently described as new varieties or "n. var." by Dr. McDunnough on page 39 of the February, 1932, issue of the *Canadian Entomologist*. As a headline for his article he is forced to say, or rather must think it best to say, that they are "Some undescribed RACES". He uses the term race there in the headline to explain "n. var." found just below in his description proper; but why use a term like "variety" which must need explanation all the time? Why not use the word "race" and be properly understood to begin with? If one of those moth descriptions were ever copied out separately from the original text, as they often are for one reason or other, and his headline should happen to be overlooked, as it is apt to be, then McDunnough's "n. var." would be an open question. Mr. Foster H. Benjamin once told me that when he saw the words "var. nov." in original

description, he was never quite sure as to whether the author meant a race, anyone of the forms, or an "aberration". It has been used many times to mean any of these categories and still is, unfortunately. "Variety" certainly is a poor word at any rate and finds slim companionship in critical classification, being too general and being more or less of an admittance, when used by some authors, of their inability at determination. They employ "variety" when they don't know just what other concept to use, but that is no excuse, if they know their insects and are in a position to describe comparatively at all. I sink the term "subspecies" in preference to "race" for fewer serious reasons and I shed a tear in its behalf. Of course "subspecies" has always been more equivalent in meaning to "race," than "variety" ever was. Some will say that "subspecies" is a good old Washingtonian word and as such, should be kept, like the name Studebaker is on fine carriages. They are quite right; it is a good old word and we still see a few fine carriages, especially in more select rural districts. I surrender to those time-worn arguments and I doff my hat to those venerable four-in-hands as they go trotting by. Shame on those new fangled horseless-carriages!

#### THE TERM LOCAL FORM.

Dr. J. McDunnough, of Ottawa, uses the category "altitude form" occasionally; *Argynnis rhodope minor* McD., for example, and possibly *Euphydryas chalcedona perdiccas paradoxo* McD. It would seem to be a processive or connective step lower than race in his opinion, or at least not equivalent, otherwise he would employ the word "race" instead. This "altitude form" of his is the same as is meant and defined under local form in my chart, but "local form" seems to me to be a more conformable and explanatory designation, especially as it covers opposite or reversed conditions, *e.g.*, confined desert colonies, etc., and can be understood to include self-sustained units which connect races or species and races as well. Personally, I believe there is little taxonomic consolation to be felt by the use of the "local form" designation in present boreal



American lists, seeing that original description data are available and that such group names can be almost as well understood when placed as straight races. I have never utilized the category myself and include it simply for the convenience of others who, like Dr. McDunnough and Mr. Benjamin, seem to more fully appreciate its value as an intermediate necessity. British and Continental authors refer to the term quite often and I do not see why American authors should not adopt it in the interest of uniformity and thereby help stabilize concepts in this particular classificatory division. In the future, should we find the "home metropolis" of some species to be in Asia, and have a Canadian race as well, then we can connect its "exerge" into Mexico, for example, by the term "local form"; however, in my opinion, with world check lists scarce and with our present knowledge of lineage based mostly on guess-work, a division of this character and meaning will have to bide its time. With regard to the general misunderstanding, misinterpretation and often misuse of well-known classificatory terms, would it not be well for the International Rules of Zoological Nomenclature to eventually set forth some "Recommendations" upon the subject? (See plate IX, page 63, of the February, 1932, issue of the *Bulletin of the Brooklyn Entomological Society*, etc.).

(To be continued).

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### **On Preparing Grasshoppers (Orthop.: Acrididae).**

By JAMES A. G. REHN, Philadelphia.

I have read with considerable interest the article by Mr. Heber C. Donohoe in the May issue of ENTOMOLOGICAL NEWS entitled, "A Method of Preparing Grasshoppers for Pinned Specimens." Having had over thirty years' experience in both field and laboratory preparation of such material, perhaps a few comments *apropos* of Mr. Donohoe's article, as drawn from my own work, may not be out of place.

Mr. Donohoe is convinced that "stuffed" specimens as such give "unsatisfactory results," and that the abdominal opening unless sealed with paraffin furnishes "favorable conditions for entrance and breeding of museum pests." He also feels "the

abdominal walls of specimens so prepared (i. e. stuffed) are thin and papery and are easily torn and shattered."

To most of us who have had much museum experience with grasshoppers subject to infestation, it is hardly necessary to point out that the abdominal slit is only *one* of the many points of attack. The compound eyes, the prosternum, the coxal areas of all the limbs, the meso- and metapleura and beneath the wings at their bases are equally vulnerable. For a collection tight containers and quarantine are, and always will remain, the real safeguards. Many years ago Dr. Elliott Coues fittingly emphasized this in his proverbial "eternal vigilance is the price of a collection."

Mr. Donohoe directs the preparation to start as follows: "The first eight abdominal sterna are slit mediad." In so broadly opening up the abdomen, I can appreciate how one would have trouble with "papery" abdominal walls. With reasonable skill in the use of the "gutting" forceps it is almost never necessary in a grasshopper to slit more than the three proximal abdominal sterna. In virtually all preparatory technique simplicity and reliability are of paramount importance, combined with the outstanding requisite, *i. e.* proper preservation of the material in hand. After many miles on foot and a gruelling day of desert work I have stuffed as many as three hundred grasshoppers in an evening, by the light of a camp-fire and lantern, with my fingers numb from October cold, and even then a three segment slit was all that was necessary.

With the shorter slit, which leaves intact the often important surface structure of the distal half of the abdomen, the thorax is cleared first, the specimen then turned in the fingers, the *straight* forceps reinserted, and then the abdomen is similarly eviscerated. The smaller of those specimens which need evisceration require no stuffing at all, the abdominal walls possessing sufficient resiliency to return to their true form with a tease or so of the forceps. The larger specimens require only a light stuffing with chopped cotton, gently worked in, so as not to disturb any coloring layers lining the chitin, and merely enough in bulk to keep the walls from collapsing.

Mr. Hebard and I have collected considerably over one hundred thousand Orthoptera in temperate and tropical America, and the simple process in use has proved fully satisfactory. In the case of brilliant green material we also use immersion in a low percentage formaldehyde solution to fix the greens, but such "dipped" specimens must be absolutely dry before packing, as otherwise the formaldehyde will continue working and the color be hopelessly ruined. In using this method, however, the strength of the solution, the length of the immersion and the method of drying vary according to the individual specimen. Although a considerable number may be moving through the dip at the same time, individual treatment is required for the best results, and no set rules can be given, as experience is the sole guide. The results of proper handling, however, are excellent and the greens will be perfectly preserved. We have in the Academy of Natural Sciences many specimens prepared in this way as much as eighteen years ago, when we were first introduced to the method by that veteran entomologist and old friend William T. Davis. These specimens are still as vividly green as they were in life.

The use of paraffin, either as an injection or as an infiltration, would be impractical under most field conditions, and not at all advantageous where heat is applied to force drying or volatilize flake naphthaline to combat possible mold, as frequently must be done under humid tropical conditions. It is often difficult for those accustomed only to laboratory methods to realize under what conditions material must be prepared in the field, particularly in humid tropical and extreme desert regions. In our field work Mr. Hebard and I have on several occasions prepared more than a thousand Orthoptera in a single night, and the specimens always came through in distinctly first-class condition. Methods for survey work of this character must be simple, efficient and easily applied. Simple stuffing, when done with reasonable skill, proper drying and packing in the field, and skilled preparations in the laboratory will produce results equal to those of much more complicated technique. The time saved in the field is vitally needed for those invaluable notes which all too frequently are never written on the spot.

## The Red and Black Cherry Aphid in Massachusetts (Homop.: Aphidae).

By FORREST W. MILLER, Zoology Department, University of  
Pittsburgh.

The red and black cherry aphid, *Aphis feminea* (Hottes), was first reported as occurring on the wild black cherry *Prunus serotina*, in Maine by Patch (1914) who ascribed to it the name of *Aphis tuberculata*. This name, however, was pre-occupied as explained by Hottes (1930) who proposes the name used here. A second announcement of the occurrence of this species was given by Quaintance and Baker (1920) who stated that it had been found in very small numbers in the District of Columbia. A third and most recent account of the occurrence of the species was given by Hottes (1931) who reports it from Illinois.

During the summer of 1930 the writer collected this species in the region of Woods Hole, Massachusetts. The host was *Prunus serotina* as was reported in all previous cases. The forms were first noted on June 16th and observations were made until September 12th. During the entire month of June and the first week of July the species was restricted to one host plant of the wild black cherry but later a few alate females appeared and these migrated to a second tree about twenty feet distant and started a colony there. Feeding was entirely upon the stem. During the latter part of August the aphids were accompanied by ants, the species of which was undetermined.

At no time during the entire period of observation did the number increase so rapidly as to cause overcrowding. Throughout the entire summer the species was restricted to the two wild cherry trees mentioned above. That the species is not very common is evidenced by the fact that it has been found and reported but four times and further, where it is found it is apparently restricted to a very small locus. Hottes (1931) offers some possible explanation for this fact. The small trees upon which the Woods Hole species was collected were located very close to a tree and shrub nursery. It is very likely that the form was brought to this region upon one of these trees or shrubs. The following is a detailed description of the different forms collected at Woods Hole, Massachusetts, during the summer.

## ALATE VIVIPAROUS FEMALE.

*Size and general body color:* Average length from the vertex to tip of anal plate, 1.57. Head, thorax, legs, cornicles and antennae are black. Abdomen a deep red with five lateral black spots. Forewing with stigma brown, veins light brown, region in the vicinity of the base of the wing a deeper brown. Beak very dark brown to black.

*Head and appendages:* Average width of head across eyes, .47. Antennal segments with lengths as follows: II—.079 to .081, average .08; III—.360 to .368 average .364; IV—.302 to .314 average .308; V—.168 to .172 average .170; VI—.097 to .099 average .098 plus .320 to .326 average .324. Secondary sensoria numbering 18 to 22 on the third segment, 11 to 15 on the fourth, and four to five on the fifth segment. Primary sensoria on the sixth segment surrounded by small marginal sensoria. Antenna imbricated and with few hairs. Beak extending to the end of the mesothoracic coxae.

*Thorax and appendages:* Prothorax with a pair of large lateral tubercles. The second fork of media slightly closer to the margin of the wing than to the first fork.

*Abdomen:* Large lateral tubercles located on segments 2, 3, 4, 5, and 7. Cornicles straight averaging .28 in length with a flange at the apex, and imbricated. Cauda averaging .08 in length, not constricted, and with from four to five pairs of lateral hairs, the terminal pairs incurved.

## APTEROUS VIVIPAROUS FEMALE.

*Size and general body color:* Average length from vertex to tip of anal plate, 1.9. Head, thorax, and abdomen of a light red color and covered with a white powdery wax secretion. First two antennal segments concolorous with head; third to sixth segments darker. Legs of deeper red than the body. Beak same as in alate female.

*Head and appendages:* Average width of head across eyes, .47. Antennal segments with lengths as follows: II—.07 to .10 average .094; III—.25 to .27, average .26; IV—.24 to .26, average .25; V—.24 to .25 average .24; VI—.10 to .13 average .11 plus .28 to .30 average .29. Secondary sensoria absent, imbricated, and bearing a few fine hairs. Beak extending to the middle of the prothoracic coxae.

*Thorax and appendages:* A pair of lateral tubercles on the prothorax.

*Abdomen:* Abdominal tubercles located on segments 2, 3, 4, 5 and 7. Cornicles averaging .37 in length and shaped as in the alate viviparous female. Cauda averaging .09 in length and with four to five pairs of lateral hairs.

## LITERATURE CITED.

- PATCH, E. M. 1914. Maine aphids of the rose family. Maine Agr. Exp. Sta. Bull. 233, p. 254-280.
- QUAINTANCE, A. L., and BAKER, A. C. 1920. Control of aphids injurious to orchard fruits, currant, gooseberry, and grape. Farm. Bull. 1128, p. 1-48.
- HOTTES, F. C. 1930. Aphid Homonyms. Proc. Wash. Bio. Soc. 43, p. 179-84.
- . 1931. Plant lice or aphidae of Illinois. Nat'l Hist. Survey Bull. 19:3, p. 193.

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**Additional Host Plants of *Grapholitha conversana*  
Wlsm. in the North Pacific Region (Lepidoptera:  
Olethreutidae).**

By L. P. ROCKWOOD and T. R. CHAMBERLIN, U. S. Bureau of Entomology, Forest Grove, Oregon.

Rockwood and Zimmerman (Jour. Agr. Research, Vol. 43, No. 1, pp. 57-65, 1931) have recorded biological and descriptive notes on this western clover seed caterpillar. They found the larvae of this species commonly on the native clover *Trifolium involucreatum* Ort. and rarely on red clover, *T. pratense* L., on the Oregon seacoast. Since the preparation of this article the writers have made additional observations on *G. conversana* in the quite different environment of the intermountain region.

In June, 1930, the writers made an effort to collect this species near Lord Walsingham's type locality, "Camp Watson," in what is now Wheeler County, Oregon. A variety of *T. involucreatum* was found growing there but this was not infested and no moths were collected. It is possible that close grazing, in the past, may have eliminated the seed caterpillar in this locality. Proceeding to Grangeville, Idaho, an attempt was then made to ascertain if it was this species which was reported (i.e., footnote, p. 62) to have damaged alsike clover in 1929.

On the farm of Mr. Ben Baker near Harpster, Idaho County, Idaho, a few heads of alsike clover that were infested with seed caterpillars were found after a considerable search. Mr. Baker stated that these were the same insects that caused appreciable damage to his alsike clover seed crop in 1929. However, after

assisting in the search, he said that they were much scarcer than they had been in the previous year. The writers inquired if he had observed any native clover near his fields. Mr. Baker then stated that there had originally been some but that it had been killed out by cultivation. He directed us to his son's place 5 miles southwest (towards Grangeville), where there was considerable native clover in a natural meadow. Here were found two species of native clover, *Trifolium douglasii* House and *T. plumosum* (?) Dougl. The flower heads of *T. douglasii*, which were of about the size and color of red clover heads, were found to be heavily infested with seed caterpillars. None of these were found on the white heads of the hairy *T. plumosum* (?).

A large series of moths of *Grapholitha conversana* Wlsm. (det. by Carl Heinrich) were reared from the heads of *T. douglasii* in the period from April 1 to April 7, 1931. These averaged larger in size than those previously reared from *T. involucratum* on the Oregon coast. Thirteen specimens of the same species were reared also from alsike clover heads, which had been collected on Mr. Baker's farm near Harpster.

A few days after leaving Grangeville, the writers examined *T. douglasii* and *T. plumosum* (?) in a meadow near La Grande, Union County, Oregon, but no seed caterpillars were found here. In June, 1931, the writers examined *T. involucratum* in a wet meadow near Paisley, Lake County, Oregon, and found that the flower heads were well infested with a seed caterpillar which is doubtless this species.

These records give us a new locality, north-central Idaho, for *Grapholitha conversana* and two new host-plant records, *Trifolium douglasii* House and alsike clover, *T. hybridum* L. There is evidence of a wide but discontinuous distribution west of the Rocky Mountains. The rearings from Idaho material indicate the same one-generation life cycle as was earlier found for the Oregon coast region. This seed caterpillar already shows a tendency to adapt itself to red and alsike clovers and it may become a pest of considerable importance, especially to growers of alsike clover seed, in some of the clover seed districts west of the Rocky Mountains.

## Records of Louisiana Butterflies (Lepidoptera: Rhopalocera).

By ROBERT W. MONTGOMERY, Poseyville, Indiana.

In 1925 B. E. Montgomery captured a number of butterflies in the vicinity of Tallulah, Louisiana. These have been given to the writer and the records are presented in this paper.

### PAPILIONIDAE.

1. *PAPILIO POLYXENES* Fab. Tallulah, July 25, August 16.

### PIERIDAE.

2. *PIERIS PROTODICE* Bdv.-Lec. Tallulah, June 26; 7 miles southeast of Tallulah, July 25.
3. *CATOPSILIA EUBULE* L. Bear Lake, Madison Parish, July 18; seven miles southeast of Tallulah, July 25; Tallulah, August 16.
4. *COLIAS EURYTHEME* Bdv. Tallulah, June 26.
5. *TERIAS NICIPPE* Cram. Tallulah, July 2, 25, 27; Bear Lake, Madison Parish, July 18.
6. *TERIAS LISA* Bdv.-Lec. Bear Lake, Madison Parish, July 18; Tallulah, July 25, August 2, 27; Roadside, Madison Parish, July 23.

### NYMPHALIDAE.

7. *DIONE VANILLAE* Hbn. Tallulah, August 5.
8. *EUPTOIETA CLAUDIA* Cram. Tallulah, July 27, 28, August 1.
9. *PHYCIODES THAROS* Drury. Tallulah, June 26, July 27, August 1, 5; Bear Lake, Madison Parish, July 18.
10. *CYNTHIA HUNTERA* Fab. 7 miles southeast of Tallulah, July 25.
11. *BASILARCHIA ARCHIPPUS* Cram. Lake Bruin, Tensas Parish, July 26, August 8.
12. *ANAEA ANDRIA* Scud. Madison Parish, July 23. Ovipositing on goatweed.

### LIBYTHEIDAE.

13. *LIBYTHEA BACHMANI* Kirt. Bear Lake, Madison Parish, July 18; small stream in woodland, 7 miles southwest of Tallulah, August 10.

### LYCAENIDAE.

14. *STRYMON CECROPS* Fab. Woodland, Tallulah, June 21, July 25.
15. *EVERES COMYNTAS* Godt. Tallulah, June 26.



**Three New Species of Dolichopodidae from North America and Cuba, with Notes on *Diaphorus leucostola* Loew and its Allies (Diptera).**

By M. C. VAN DUZEE, Buffalo, New York.

***Condylostylus nigritiba* new species.**

♂: Length 5 mm. Face wide, narrowed below, blue, more green on the sides, suture near its middle, lower part with thick white pollen, which extends more thinly to a little above the antennae, face very obtusely pointed on lower edge; front shining blue; palpi and proboscis black; antennae black, bristles on lower side of second joint longer than antenna, third joint nearly round; arista dorsal, as long as head height; beard rather short, white.

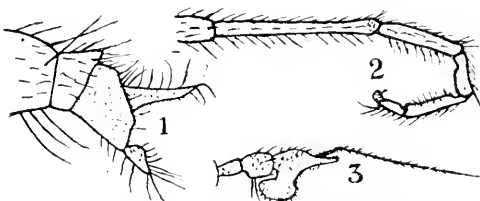


Fig. 1, *Condylostylus nigritiba* new species, hypopygium of male.

Fig. 2, *Mesorhaga ornatipes* new species, fore tarsus of male.

Fig. 3, *Diaphorus leucostola* Loew, antenna of male.

Thorax green, dorsum with white pollen along the front and bronze reflections on anterior half, blue on posterior part; scutellum blue with two pair of large bristles. Abdomen shining green with black incisures, which cover more than half of the segments towards tip of abdomen and become coppery, sides and venter of anterior half with rather short, white hair; hypopygium (fig. 1) small, black, its outer appendages black, finger-like, as long as hypopygium, with rather long hair on outer side and at tip.

Coxae and femora green; anterior coxae with long, white hair and two slender black bristles; tips of fore and middle femora yellow, all femora with white hair below, which is as long as width of femora; fore and middle tibiae yellow, former with three or four bristles on lower posterior edge, these are slender and nearly as long as second joint of fore tarsi; middle tibiae with extreme tip blackened; hind tibiae and all tarsi wholly black; fore basitarsi with three bristles below, the one at apical

fourth about as long as those on fore tibiae, the one at basal fourth very short; second joint of fore tarsi with a row of spine-like hairs below, which are as long as diameter of joint and continued on next joint, where they are much shorter: joints of fore tarsi as 72-30-22-16-8; of middle ones as 77-30-21-11-7; of posterior pair as 69-32-19-13-9. Calypters and their cilia black; knobs of halteres wholly yellow, petiole black.

Wings grayish with the usual two blackish cross-bands united along the costa as far back as third vein, beginning well beyond tip of first vein and extending to half way between tips of second and third veins, basal band quite wide and ending abruptly at fifth vein, apical band equally wide and ending a little back of fourth vein, hyaline space between them of the same width as the bands; fork of fourth vein at a little less than a right angle with basal part of fourth vein, upper bend but little rounded, last part running nearly straight to wing margin near tip of third vein, which bends backward at tip; last section of fifth vein nearly straight and scarcely reaches wing margin; fourth vein from cross-vein to fork as 54, from fork to wing margin 30; cross-vein as 38, last section of fifth vein 31.

♀ : Differs from male in having fore coxae, all femora and tibiae yellow, knees of hind legs black; apical fourth of hind tibiae black, shading into the yellow above; white hair on fore coxae short; bristles on second joint of antennae not longer than antenna; fore tarsi yellowish on basal half, bristles on first joint shorter; fore tibiae with very short bristles; femora with very short pale hair below; abdomen blue posteriorly or wholly green, shining, with scarcely any white hair at base below; color of head and thorax and the wing characters as in the male.

Described from three male and two females, taken by S. C. Bruner, at Santiago de los Vegas, CUBA. *Type* in the author's collection.

This species is related to *similis* Aldrich, from Mexico, but differs in having the hind tibiae wholly black.

Mr. Bruner reports this species as abundant everywhere around Santiago.

### **Mesorhaga ornatipes** new species.

♂ : Length 3 mm. Face green, but wholly opaque with white pollen when viewed obliquely; front shining green, with one

black bristle at outer third near middle and four white bristle-like hairs on each side near vertex, oceller tubercule with a pair of black, rather short, straight bristles and several delicate white hairs; palpi and proboscis yellow with white hair; antennae black, bristles on second joint white, about as long as third joint; third joint round, brownish, arista dorsal, nearly bare, black; orbital cilia and rather scanty beard white.

Thorax and scutellum shining green, pleurae with a little white pollen; bristles of thorax black, acrostichal bristles rather long, in two irregular rows; five dorso-central bristles; abdomen green with bronze and reddish coppery reflections, dorsum with minute white hairs; sides of first segment with long white hair; hypopygium and its appendages black, outer lamellae not very wide, but nearly as long as hypopygium, a little enlarged at base.

Coxae black or greenish with white hair, fore coxae yellow at tip; all femora and tibiae pale yellow with their hairs partly black; extreme tip of hind tibiae black; all femora with long white hair below, those on middle femora in two rows, the posterior row short, anterior row with some of the hairs longer than width of femora; middle tibiae with a very small bristle above near basal third; all tarsi blackened from tip of first joint; fore tarsi (fig. 2) with bristles below on second joint, third joint shorter than fourth with little spines below; hind tarsi with last two joints a little widened and flattened; length of fore tibiae as 57, joints of fore tarsi as 36-17-8-12-5; middle pair as 49-18-11-9-6; joints of posterior pair as 33-28-16-10-6; last two joints as 4 wide. Calypters white with black edge and long white cilia; knobs of halteres yellow.

Wings nearly hyaline; last section of fourth vein not as abruptly bent as in some species, the bend rounded; fourth vein from cross-vein to bend as 23, from bend to tip 62, cross-vein 23, last section of fifth vein 29; third vein nearly straight; fifth vein straight with an angle at cross-vein, its last section straight but running downward to hind margin of wing.

Described from two males, taken by S. C. Bruner and V. L. Beule, June 6, 1930, at Manacas Station, F. E. A. de Clara, Cuba. *Holotype* in the author's collection.

This is much like *juvenda* Becker, Paraguay, but in that the hind tarsi are as thick as tibiae, with last two joints widened; fore coxae black only at base. The Georgia female he places with the pair from Paraguay is more likely to be this species, the females of the two species must be very nearly alike.

## DIAPHORUS LEUCOSTOLA Loew and allied species.

Among the North American *Diaphorus* there is a group having the third antennal joint more or less like that of *leucostola* Loew (fig. 3), that is with a point projecting from the upper apical corner, the front wide, nearly as wide as the face, color of body and size about alike in all. These are separated by the color of the legs and feet, size of pulvilli and bristles at tip of abdomen, and length and color of palpi. The seven forms may be separated by the following key:

- 1 Second antennal joint cutting into third on its upper part, that is the lower basal corner of third joint extending more or less basally beyond apical end of second joint. .3  
Second antennal joint not cutting into base of third at all. .2
- 2 Hind tibiae wholly black, (Idaho; Nevada; Colorado),  
*aldrichi* Van Duzee  
(Montana) . . . . . *albifacies* Parent.  
Hind tibiae largely yellow. (Pennsylvania),  
*similis* Van Duzee.
- 3 Hind tibiae yellowish brown; second antennal joint cutting into third but little, about as long as wide, (California),  
*occidentalis* V. D.  
Hind tibiae brownish black; second antennal joint cutting half, or more than half its length into third, longer than wide, (Ontario) . . . . . *quadratus* Van Duzee.  
Hind tibiae yellow, sometimes with a black tip; second antennal joint cutting deeply into base of third. . . . . 4
- 4 Dorsum of thorax with a median coppery vitta, (Virginia),  
*vittatus* Van Duzee  
Thorax without a vitta, (*leucostoma* Loew) . . . . . 5
- 5 Hind tibiae wholly yellow, hind tarsi yellow at base. (North America; Guatemala). . . . . *leucostoma* Loew.  
Hind tibiae blackish brown at tip, hind tarsi wholly black, (North America),  
*leucostoma* variety *infuscatus* Van Duzee

I find no difference between *albifacies* Parent, 1929, and *aldrichi* Van Duzee, 1915.

**Argyra (Leucostola) basalis** new species.

♂ : Length 5 mm. Face narrow, face and front wholly silvery white pollinose; palpi nearly round, yellow; proboscis black; antennae black, first joint bare above, third joint scarcely twice as long as first two taken together, its tip rounded; arista nearly twice as long as the antenna, in-

served just above the tip of third antennal joint; posterior orbits with a few black cilia above and delicate white cilia on lower third.

Dorsum of thorax bright shining green with thin white pollen along the front, and thick silvery white pollen on the side in front of the wings; pleura black with rather thin white pollen, its posterior edge infuscated; scutellum with one pair of rather small marginal bristles. First three abdominal segments yellow with only the extreme apical margins a little blackish, fourth segment dark yellow with basal half blackish, last two segments black; last three segments thickly covered with silvery white pollen; hairs of abdomen black. Hypopygium black with yellow appendages, which are formed about as in *involuta* Van Duzee (fig. 31, pl. i, Proceedings of the U. S. National Museum, Vol. 66, Article 23), except that the outer lamellae are more triangular.

Coxae, femora, tibiae and fore and middle tarsi wholly pale yellow, except the tarsi which are slightly brownish towards tip, hind tarsi brown; anterior surface of fore tarsi with a few delicate, yellowish white hairs and two large and three small black bristles, one of the large bristles is near the middle of outer edge, all other bristles are near tip; fore and hind femora with delicate yellow hairs below, those on anterior pair nearly as long as width of femora, those on posterior pair shorter; joints of hind tarsi as 37-37-25-17-9. Calypters yellow with the tip broadly black, their cilia yellow; halteres pale yellow.

Wings grayish; third vein bent backward towards tip; last section of fourth vein only slightly bent before its middle, nearly parallel with third vein, its tip just back of the apex of wing; last section of fifth vein as 55, cross-vein as 19.

Described from one male taken by the author, June 24, 1923, at Little Valley, New York. *Holotype* in the author's collection.

This would run in the table of species of *Leucostola* in the Proceedings of the U. S. National Museum, Vol. 66, Article 23, page 6, to *flavicoxa* Van Duzee, but in that species the hind tibiae are brownish yellow, only the extreme base being yellow, fore coxae with one or two blackish bristles, the hypopygial appendages are of very different form and the abdomen also of different color.

**Paraherminia—New Genus for the European  
"Herminia" *derivalis* Hbn. (Lepid.: Noctuidae).**

A. GLENN RICHARDS, JR., Entomology Dept., Cornell Univ.,  
Ithaca, New York.

The following generic name is proposed at this time because I would like to refer to it in another paper where it would be inconvenient to describe it. The genotype of *Herminia* Latreille is *tentacularia* Linnaeus, a form which is closely related to, but not congeneric with, *derivalis* Hübner.

**Paraherminia** gen. nov.

Frons smooth with a slight tuft. Palpi oblique; second segment long and straight, third short and pointed. Antennae of male ciliated and bristled, without a knot-like swelling. Fore-tibia of male unmodified. Body, wings and tibia smoothly scaled. Tympanic hood greatly reduced, almost membranous, and slightly postspiracular.

*Genotype: N. derivalis* Hübner.

Differs from *Herminia* in that the antennae lack the knot-like swelling, and that the hood is slightly postspiracular instead of prespiracular. Probably the most striking differences are in the accessory tympanal structures, especially the hood. These will be treated in detail in a subsequent paper. *Derivalis* Hbn. is a peculiar species, and seems to represent a connecting link between the Hypeninae and the Herminiinae.

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**Incubation of Bark Bug Eggs. (Hemiptera: Aradidae.)**

In 1926 it was observed that several hundred Flat bugs or Bark bugs, of the species *Neuroctenus pseudonymus*, were feeding upon the juices of decay under the bark of a dead oak tree in a woods east of Lake Dallas Dam, Lake Dallas, Texas. Eggs, nymphs of all instars and adults were present.

The eggs were laid in triangular masses of from ten to fifty, side by side and end to end shingle-like, within the channels cut in the wood and bark by wood-boring insects. They were 1 mm. long, white, elliptical, and flattened as the bugs, and did not change color nor shape during the incubation period.

It was noted that after the female had laid the eggs and

departed, another adult (the sex was not determined, probably the male) crawled astride the group and remained there immobile until they hatched. The incubation of the eggs observed extended over a period of at least two weeks.

Pieces of bark bearing the insects and eggs were removed and placed with the inner sides out in a well-lighted room. All the insects, but that astride the eggs, migrated to the darkened side.

Upon hatching, the little nymphs, of the size and color of the eggs, climbed on top of the empty and collapsed egg shells and remained under the guardian for two days. Then the adult left the colony which then broke up.

There were two distinct forms of adults present. Both were about eight millimeters long. One type was black except for the iridescence of the wing membranes. The other form was a yellow-brown or tan with the connexiva a dark brown. It was the darker form that brooded the eggs.

H. ELLIOTT McCLURE, Urbana, Illinois.

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#### Four New Dragonfly Records for the United States. (Odonata.)

In cataloging recent accessions to the Odonata collection in the Insect Division of the Museum of Zoology, University of Michigan, I found specimens representing the following four species which have not been recorded for the United States.

*ARGIA BARRETTI* Calvert. Llano River, Junction, Kimble Co., Texas: 1 ♂, November 5, 1929, E. B. Williamson. The type male collected at Linares in Nuevo Leon, Mexico (Coll. P. P. Calvert) was the only one known until Mr. Williamson took the species in Texas. Dr. Calvert has compared the two specimens and confirms the identification of the Texas male.

*ARGIA OENEA* Hagen. Nogales, Arizona (16 mi. n.w., on the Quebrada Sonoita in Santa Cruz Co.): 1 ♂, September 23, 1923, J. H. Williamson. Santa Catalina Mountains, Cañada del Oro, Pima Co., Arizona: 1 ♂, August 4, 1930, L. K. Gloyd. The northernmost Mexican locality from which the species has been reported is near Santa Ana in Chihuahua.

*AESHNA DUGESI* Calvert. Davis Mountains, Limpia Cañon (Granger's Ranch), Jeff Davis Co., Texas: 9 ♂ 1 ♀, July 5, 1930; 4 ♂ 1 ♀, June 25, 1931, L. K. Gloyd. This species is recorded by Dr. Calvert in the *Biologia Centrali-Americana* (p. 185) from "Mexico [1 ♂], Guanajuato [Dr. A. Dugès: 1 ♂]

(U.S.N.M.). There is also one male collected by Mr. J. H. Williamson at Los Parres, Baja California, on October 7, 1923, in the collection of the Museum of Zoology. These sixteen males and two females are the only known specimens.

*WILLIAMSONIA FLETCHERI* Williamson. Manistique, Michigan: 1 ♂, June 5, 1929, W. W. Newcomb. All previous records have been for Ontario, Canada.

LEONORA K. GLOYD, University of Michigan, Ann Arbor, Michigan.

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## Entomological Literature

COMPILED BY LAURA S. MACKEY UNDER THE SUPERVISION OF  
E. T. CRESSON, JR.

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 figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the list of Periodicals and Serials published in our January and June issues. This list may be secured from the publisher of ENTOMOLOGICAL NEWS for 10c. The number of, or annual volume, and in some cases the part, nest, &c. the latter within ( ) follows; then the pagination follows the colon :

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

\*Papers containing new forms or names have an \* preceding the author's name.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

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.

⚡ Note the change in the method of citing the bibliographical references, as explained above.

*Papers published in the Entomological News are not listed.*

**GENERAL.**—Bethune, C. J. S.—Obituary notice. [4] 64: 97-98, ill. Debauche, H.—Methode rapide de préparation des génitalia. [Lambillionea] 1932: 99-101. Faggioli, D.—Nuovo apparecchio per soffiare le piccole larve di insetti. [Bol. Lab. Ent. Bologna] 4: 18. Heikertinger, F.—(See under Coleoptera). Pearse, A. S.—Environment and heredity. [76] 1932: 541-544. Sherman, J. D.—The "First Series A of the Bulletin of the Brooklyn Entomological Society Volumes I-VII: 1878-1885. [19] 27: 102-106. Tillyard, R. J.—Origin of insects from Crustacea. [31] 129: 828-829, ill.



**ANATOMY, PHYSIOLOGY, ETC.**—**Andresen, E.**—Veränderungen des kaaninchenauges unter der giftwirkung der käfer *Epicauta* und *Mylabris*. [Zeit. Parasit.] 4: 387-394. **Bonet, F.**—Sobre la estructura del mesenteron y sus apéndices tubuliformes en los fásmidos. [Eos] 8: 93-114, ill. **Bridges, C. B.**—Apparatus and methods for *Drosophila* culture. [90] 66: 250-273, ill. **Craig, C. F.**—The possible chemotactic effect of the salivary secretions of certain insects upon microfilariae. [68] 75: 561-562. **Gäbler, H.**—Regenerationsvorgänge an Heteropterenfühlern. [34] 98: 275-280, ill. **Grandi, G.**—Contributi alla conoscenza biologica e morfologica degli Imenotteri melliferi e predatori. [Bol. Lab. Ent., Bologna] 4: 19-72, ill. **Grandi, G.**—La morfologia comparata di alcuni stati larvali di 20 Microlepidotteri minatori. [Bol. Lab. Ent. Bologna] 4: 223-338, ill. **Henriksen, K. L.**—The manner of moulting in Arthropoda. [51] 11: 103-127, ill. **Hirschler, M. J.**—Sur certains composants plasmatiques membranoux et granulaires dans les cellules sexuelles mâles chez les Lépidoptères. [69] 1682-1684, ill. **Hughes, A. W. M.**—Induced melanism in Lepidoptera. [Pro. R. Soc., London] 110, (B): 378-402, ill. **Larsen, O.**—Beiträge zur kenntnis des pterygopolymorphismus bei den wasserhemipteren. [Acta Univ. Lund] 27, (1): No. 8, 30 pp., ill. **Malouf, N. S. R.**—The morphology of the head of a "White Grub". [Bull. Soc. R. Ent. Egypte] 1932: 66-87, ill. **Maziarski, M. S.**—Sur le tissu musculaire des insectes. IV. Les éléments contractiles dans les couches musculaires de l'intestin moyen des Coléoptères. [Bull. Int. Acad. Polonaise Sci. et Lett.] 1931: 425-445, ill. **Roberts, E. F.**—The clinical application of blow-fly larvae. [76] 1932: 531-536. **Strebel, O.**—Beiträge zur biologie, ökologie und physiologie einheimischer collemboen. [46] 25: 31-153, ill. **Werringloer, A.**—Die sehorgane und sehzentren der Dorylinen nebst untersuchungen über die facettenaugen der Formiciden. [94] 141: 432-524, ill. **Začwilichowski, M. J.**—Ueber die innervierung und die sinnesorgane der flügel von insekten. II. Teil. [Bull. Int. Acad. Polonaise Sci. et Lett.] 1931: 391-424, ill. **Zarapkin & Timoféeff-Ressovsky.**—Einige gesetzmässigkeiten in der variabilität der fleckenform bei *Epilachna chrysomelina* (Coccinellidae). [88] 20: 384-387, ill. Eine graphische darstellungsmethode der abhängigkeit zwischen der variabilität zweier grössen. [97] 52: 138-147, ill.

**ARACHNIDA AND MYRIOPODA.**—\***Brolemann, H. W.**—Description d'un Myriapode nouveau de la Guyane française. [25] 37: 119-121, ill. **Hilton, W. A.**—Tartarid whip-scorpions of Southern California. [13] 24: 33-40, ill. **Verhoeff, K. W.**—Bronns Klas. Ordn. Tier-reichs. Bd. 5, (Lief. 12), pp. 1835-1962. Diplopoda, in part.

**THE SMALLER ORDERS OF INSECTS.**—\***Light, S. F.**—Contribution toward a revision of the American species of Amitermes. [67] 5: 355-414, ill. \***McGregor, E. A.**—The ubiquitous mite, a new species on citrus. [10] 34: 60-64, ill. \***Mills, H. B.**—Catalogue of the Protura. [19] 27: 125-130. \***Navas, R. P. L.**—Décadas de insectos nuevos. [Brotéria] 1: 62-73, ill. (S). **Stanford, J. S.**—Mallophaga from Utah birds and mammals. [4] 64: 112-113. **Williamson, E. B.**—Dragonflies collected in Missouri. [Occas. Pap. Mus. Zool.] 240: 40 pp.

**ORTHOPTERA.**—\***Borelli, A.**—Dermaptères nouveaux du Muséum zoologique de Hamburg. (S). [56] 11: 87-97, ill. **da Costa Lima, A.**—Notas sobre Phasmida. (S). [Rev. Ent., São Paulo] 2: 257-261, ill. **Criddle, N.**—The life-history of *Schistocerca lineata*. [4] 64: 98-102, ill. \***Hubbell, T. H.**—A revision of the puer-group of the North American genus *Melanoplus*, with remarks on the taxonomic value of the concealed male genitalia in the *Cyrtacanthacrinae* (Acrididae). [Univ. Michigan Mus. Zool.] Misc. Publ. 23: 64 pp., ill. \***Moreira, C.**—Dermapteros da coleção do Museu Paulista. [Rev. Ent. São Paulo] 2: 277-289, ill. (S).

**HEMIPTERA.**—**Autuori, M.**—Contribuição para o estudo biológico de *Eutriatoma flavidae*. [Rev. Ent., São Paulo] 2: 269-275, ill. **Barber, H. G.**—Two Palearctic Hemiptera in the Nearctic fauna (Pentatomidae: Nabidae). [10] 34: 65-66, ill. **da Costa Lima, A.**—Dois homopteros brasileiros pouco conhecidos. [Bol. Biol., Rio de Janeiro] 1932: 36-40, ill. \***Drake & Harris.**—A synopsis of the genus *Metrobates* (Gerridae). [3] 21: 83-88, ill. \***Drake & Harris.**—A survey of the species of *Trepobates* (Gerridae). [19] 27: 113-122, ill. **Gillett, J. D.**—Climbing organ on a reduviid bug. [9] 65: 123. \***Hempel, A.**—Descrição de vinte e duas espécies novas de Coccídeos. [Rev. Ent., São Paulo] 2: 310-339. (S). \***Jaczewski, T.**—Studies on Mexican Corixidae. [An. Mus. Zool. Polonici] 9: 187-230, ill. **Rivnay, E.**—The influence of relative humidity upon the rate of development of the bed bug *C. lectularius*. [Bull. Soc. R. Ent. Égypte] 1932: 13-16. \***Schmidt, E.**—Zwei neue Cicadellinen-gattungen und arten von Ecuador. [48] 49: 45-50, ill.

**LEPIDOPTERA.**—**Bischoff, H.**—Ueber einen bisher unbeachteten sexualcharakter der Parnassier. [Parnassiana] 2: 16-19, ill. **Comstock & Dammers.**—Early stages of *Melitaea leanira wrightii* and *Calephelis nemesis*. [38] 31: 9-15, ill. **Crumb, S. E.**—The more important climbing cutworms. [19] 37: 73-98, ill. **\*Forbes, W. T. M.**—Supplementary report on the Heterocera or moths of Porto Rico. [Jour. Dept. Agric. Porto Rico] 15: 339-394, ill. **Gaede, M.**—Lepidopterorum Catalogus. Pars 52. Aganaidae. 39 pp. **Griffin, E. J.**—A note on Haworth's "Lepidoptera Britannica" etc., 1803-1828. [75] 9: 531-532. **Hewer, H. R.**—Studies in *Zygaena*. Part I (A) The female genitalia; (B) the male genitalia. [93] 1932: 33-75, ill. **\*Jørgensen, P.**—Lepidopterologisches aus Südamerika. [63] 1932: 37-48, cont. **Learned, E. T.**—*Eriopyga contrahens* in Red Pepper. [19] 27: 112. **\*McDunnough, J.**—Notes on Agrotid genera with descriptions of new species. [4] 64: 104-112, ill. **\*Niepelt, W.**—Eine neue *Castnia*-rasse. (S). [18] 26: 65, ill. **Sperry, G. H. & J. L.**—Notes on the larva of *Melitaea pola*. [38] 31: 8. **Stichel, H.**—Lepidopterorum Catalogus. Pars 51. Brassolidae. 115 pp. **Wille, J.**—*Margaronia quadristigmalis* (Pyralid.), ein grossschädling des olivenbaumes. [Rev. Ent., São Paulo] 2: 339-369, ill.

**DIPTERA.**—**\*Barnes, H. F.**—Notes on Cecidomyiidae. (S). [75] 9: 475-484. **\*Borgmeier, T.**—Revisão do genero *ecitophilo Xanionotum*, com a descrição de duas especies novas (Phoridae). [Rev. Ent., São Paulo] 2: 369-380, ill. (S). **Bradley, G. H.**—Some factors associated with the breeding of *Anopheles* mosquitoes. [47] 44: 381-399, ill. **\*da Costa Lima, A.**—Sobre os phlebotomos americanos (Psychodidae). [Mem. Inst. Oswaldo Cruz] 26: 15-70, ill. **Curran, C. H.**—New North American Diptera, with notes on others. [40] 526: 13 pp., ill. **\*Curran, C. H.**—New American Diptera. [40] No. 534: 15 pp. **\*Dickinson & Alexander.**—The crane-flies of Wisconsin with a description of a new species. [Bull. Pub. Mus., Milwaukee] 8: 142-266, ill. **Fischer, C. R.**—Nota taxonomica e biologica sobre *Anastrepha grandis* (Trypetidae). [Rev. Ent., São Paulo] 2: 302-310, ill. **\*Hall, D. G.**—Canadian Sarcophagidae. [4] 64: 102-103, ill. **Hendel, F.**—Nochmals Meigens "Nouvelle Classification des mouches à deux ailes", Paris 1800. [34] 98: 182-187. **\*Hendel, F.**—Kritische und synonymische bemerkungen über Dipteren. [Verh. Zool.-Bot. Gesel., Wien] 81: 4-19. **\*Hendel, F.**—Die ausbeute der deutschen

Chaco-Expedition 1925-26.-Diptera. Sciomyzidae, Lauxaniidae, Tanypezidae, Lonchaeidae, Tylidae, Drosophilidae, Milichiidae. [56] 11: 98-110, cont. \***Kröber, O.**—Die Tabaniden-subfamilie Bellardiinae der neotropischen region. [Rev. Ent., São Paulo] 2: 289-302, ill. \***Macfie, J. W. S.**—Some new or little-known Ceratopogonidae. (S). [75] 9: 485-499, ill. **Malloch, J. R.**—Notes on exotic Diptera. [Stylops] 1: 112-120, ill. \***Martini, E.**—Chagasia fajardoi var. stigmopteryx, nov. var. (Culicidae). (S). [Rev. Ent., São Paulo] 2: 276-277.

**COLEOPTERA.**—**Bequaert, J.**—Paederus signaticornis, the cause of vesicular dermatitis in Guatemala (Staphylinidae) [19] 27: 107-112. \***Bierig, A.**—A new species of Polyphemus from Brazil (Staphylinidae). [Rev. Ent., São Paulo] 261-264, ill. \***de Breuning, M. E.**—Cinq nouvelles formes de Carabini. (S). [Bull. Mus. Nat. Hist. Nat., Paris] 3: 620-623. **Davis, W. T.**—A coccinellid beetle new to the fauna of New York State. [19] 27: 101. **Heikertinger, F.**—Die Coccinelliden, ihr "Ekelblut", ihre wartracht und ihre feinde. [97] 52: 65-102, ill. \***Hustache, M. A.**—Nouveaux Zygopini de la Guyane Française. [Bul. Mus. Nat. Hist. Nat., Paris] 3: 608-610. \***Musgrave, P. N.**—Notes on Helmidæ taken in the Tennessee Great Smoky Mountains, with description of a new species. [10] 34: 78-81, ill. **Pic, M.**—A propos de Longicornes. [L'Exchange] Hors-texte No. 448: 4 pp. \***Thèry, M. A.**—Deux Conognatha nouveaux de Colombie (Buprestidae). [Bull. Mus. Nat. Hist. Nat., Paris] 4: 171-173, ill. \***Valentine, J. M.**—A classification of the genus Pseudanopthalmus (Carabidae) with descriptions of new species and notes on distribution. [Jour. E. Mitchell Sci. Soc.] 47: 261-280, ill.

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## Doings of Societies

### Entomology at the Fourth Congress of the International Society of Sugar Cane Technologists in Porto Rico.

The fourth Congress of the International Society of Sugar Cane Technologists was held in San Juan, Porto Rico, March 1 to 16, 1932. The Section on Insect Pests of Sugar Cane was well attended. Among those present were the Chairman, C. E. Pemberton, Hawaiian Sugar Planters' Experiment Station; J. G. Myers, Imperial Institute of Entomology, Trinidad, B.W.I.; H. E. Box of Antigua, B.W.I.; and from Porto Rico: M. D. Leonard, G. N. Wolcott and F. Sein of the Insular Experiment Station; Julio Garcia Diaz and Rachel R. Dexter of the University of Porto Rico; Stuart T. Danforth of the College of Agriculture at Mayaguez; Wm. A. Hoffman of the School of Tropical Medicine; L. A. Catoni of the Insular Plant Quarantine Service; Richard Faxon and A. S. Mills of the U. S. Plant Quarantine and Control Administration and several visitors.

Twenty papers on various phases of sugar cane entomology from Java, Hawaii, Philippines, Louisiana, Cuba, Porto Rico, Antigua, Barbados and Peru were presented at four separate sessions. One session was almost entirely devoted to a discussion of the moth borer, *Diatraea saccharalis* Fab., giving special

emphasis to factors affecting its abundance and to methods of measuring the degree of infestation. A committee was appointed to attempt to standardize the latter. Another session was given to the general subject of biological control of sugar cane insects and to the preparation of a list of the sugar cane insects of the world and their natural enemies. A committee was appointed for the fulfillment of this project. Of particular interest was a paper on the food habits of an imported toad, *Bufo marinus* L., in Porto Rican cane fields. At the third session three important papers were read on the utilization of the egg-parasite, *Trichogramma minutum* Riley, by means of mass production for the control of the sugar cane moth borers. An illuminating inquiry into the merits of this method followed. The final session was held jointly with the Section on Diseases of Sugar Cane. This included a discussion of the relation of insects to certain sugar cane diseases, chiefly mosaic and root troubles. At this session was presented the report of the Committee on Protective Sugar Cane Quarantine which included a special discussion of a cane butterfly, *Calisto pulchella* Lathy, peculiar to Santo Domingo and Haiti.

The technical sessions were followed by an extended tour of the Island to visit the principal Centrals where the more important sugar cane insects were observed in the field.

The detailed "Proceedings" will be published in San Juan in the near future.

C. E. PEMBERTON, Entomologist, Hawaiian Sugar Planters' Association and M. D. LEONARD, Entomologist, Insular Experiment Station, Porto Rico.

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#### Ninth Rocky Mountain Conference of Entomologists.

The Ninth Rocky Mountain Conference of Entomologists will be held in Pingree Park, Colorado, August 15 to 20 inclusive. The Agricultural College Forestry Lodge will be made the headquarters and the plans so made that the entire family can enjoy the occasion. Anyone interested in details in regard to the meeting should get in touch with the Secretary, George M. List, Fort Collins, Colorado.

# ENTOMOLOGICAL NEWS

OCTOBER, 1932

Vol. XLIII

No. 8



JOHN HENRY COMSTOCK, 1849-1931.  
Portrait of 1884.

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ENT. NEWS. VOL. XLIII, PLATE VIII.

PROFESSOR DON JOSÉ FIDEL TRISTÁN

# ENTOMOLOGICAL NEWS

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OCTOBER, 1932

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## **Professor J. Fidel Tristán.**

(Portrait, Plate VIII.)

Professor don José Fidel Tristán, Director of the National Museum at San José, Costa Rica, died in that city on Saturday, January 23, 1932. He was the son of Fidel Tristán Céspedes and Praxedis Fernandez Acuña. His father was one of the first who established at his plantation of Cinco Esquinas (Five Corners) the preparation of coffee by machinery imported from Europe and he was a large exporter of this "golden grain" to European and South American markets. Having undertaken the construction of a cartroad over the central Cordillera to Carrillo, the original terminus of the Costa Rican railway, he lost heavily in the venture, so that his family had to contend with adversity.

José Fidel, born September 6, 1874, was the second child of eleven who survived to reach majority. In his early years he built water and wind mills, collected stones, stamps, insects and plants. In 1886 he entered the Normal and Model School of San José where he came under the instruction of Paul Biolley. Biolley was one of a group of young Swiss, which included Henry Pittier, Gustave Michaud and Jean Rudin, who had been invited by the Government of Costa Rica to assist in the educational development of the country. Biolley became well known in Europe and America for his natural history collections. He died in 1908 and a brief sketch of his life appeared in the NEWS for October, 1908, page 394-395. Tristán's father had sought to launch his son in a commercial career, but the natural disposition of the boy was toward scientific studies which led to his graduation as one of the first bachelors of the Liceo of Costa Rica in 1894. He learned the rudiments of meteorology from Pedro Reitz in the Instituto Físico-Geográfico, founded April 7, 1888, under the direction of Prof. Pittier, and he served as entomologist at the Museo Nacional.

The government of Chile having offered that of Costa Rica the opportunity for a group of young men to study in the Pedagogical Institute of Santiago, Tristán made application for an assignment in the fields of physics and chemistry. He received an appointment and with four other young compatriots spent nearly three years (March 1897-January 1900) in study in the southern republic, where he became acquainted with Dr. R. A. Phillippi, Director of the Museum at Santiago, Federico Phillippi, subsequently Director, and the entomologist Filiberto Germain.

In May, 1900, he became professor of physics and chemistry in the Liceo at San José, where he introduced German equipment into the laboratories, and, later in the same year, was named professor of zoology and mineralogy in the School of Pharmacy. In 1903 he was made Professor of Physics and Chemistry in the Superior College for Young Women, and in 1904 the duties of Subdirector of the same institution were added. In 1908, on the retirement of Miss Marian LeCapellain from the directorship, Tristán succeeded to this position, which he held until 1922. In 1912 he added his old professorship of physics and chemistry at the Liceo to his tasks and became Director of the Liceo when he left the Superior College. Finally, having resigned from the Liceo, he became Director of the National Museum, March 8, 1930.

On January 15, 1911, Tristán married Ester Castro Meléndez, who with three sons, Luis, Oscar and Marco Fidel, survive him.

The preceding sketch is greatly abbreviated from a two page article "Homenaje en memoria del Profesor Tristán" which appeared in *La Prensa Libre* of San José for February 2, 1932.

The writer made the personal acquaintance of Prof. Tristán on May 5, 1909, at the Young Women's College at San José, and on May 16th we took our first entomological trip together—from San José to the Rio Tiribi and the farm house of La Verbena. It was followed by others—to the Laguna de Ochomogo, Turrialba, Turrúcares, Surubres and, greatest of all, to the province of Guanacaste for thirty days. He spoke and wrote English fluently, a great boon to one whose Spanish was, as he truly said, "muy poquito". He was extremely kind

and helpful in every way, an entertaining talker, and to him, as stated in a volume which records our joint experiences in Costa Rica, "more than to any other one person do we owe much of our success".\* When the great earthquake of May 4, 1910, demolished Cartago, our Costa Rican headquarters, he sought us on the following day among the ruins of the city.

We maintained a correspondence for more than twenty years after that catastrophe and his letters mention the excursions which he made to various parts of Costa Rica to collect material illustrating the natural history of his native land—to Oricuajo and El Roble, not far from Puntarenas, in July, 1911, and December, 1913, respectively, to the peninsula of Nicoya in January, 1912, to Santo Domingo in the Peninsula of Osa in May, 1913, and the volcano Rincón de la Vieja in April, and again in June, 1922. Still earlier, in 1908, he visited Santa Maria Dota. Frequent trips were made to various places in and near Irazú, to obtain material and observations for a monograph on that volcano to which he devoted much labor for many years but which, we believe, has never been published. It is to be hoped that its publication will not be indefinitely postponed.

In 1923 and 1927 on entomological trips to Costa Rica, our colleague Mr. Rehn had the pleasure and profit of accompanying Tristán on two trips to the cloud forest of La Palma, in the saddle of the Central Cordillera between Irazú and Barba (August 31 to September 2, 1923, and July 28 to 31, 1927), to Oricuajo, on the Pacific side (August 31 to September 3, 1927), as well on a number of short excursions in the vicinity of San José.

From these various expeditions he sent entomological material to Doctors Borelli, Silvestri, Grandi and Bezzi in Italy, Orthoptera to Mr. Rehn, Odonata to the writer, and, doubtless, other insects to various specialists. He stimulated his own students in San José to entomological interests. He wrote (February 26, 1911): "Mr. Clodomiro Picado, a young man who was studying natural history in Paris, is now here preparing his theme to get the D.Sc. I suggested to him the study of the Fauna of the Bromelia", which eventuated in the extensive memoir: *Les Broméliacées Epiphytes considérées comme milieu biologique*.†

Tristán had many plans for work not a few of which were frustrated by his teaching and administrative duties. A pas-

\* *A Year of Costa Rican Natural History*, page 29.

† Bull. Sci. France et Belg. (7) xlvii: 215-360, 19 pls., 54 text figs. Paris, 1913. See the NEWS for Feb. 1914, pp. 87-88.

sage in his letter just quoted: "Every day I lament not to have time to devote to natural history studies", has a familiar ring. His earliest paper in entomology appears to be his report on the work done in this department of the Museo Nacional in 1895-96, published as an *Informe* of the Museum in 1896. It gives lists of Coleoptera, Hemiptera, Orthoptera, Hymenoptera, Neuroptera and Lepidoptera. Similar is his *Insectos de Costa Rica pequeña coleccion arreglada*, issued by the Museum in 1897. In 1901 he had an article on a case of Entomophily—pollination of *Asclepias curassavica* by the butterfly *Anartia fatima*, in the *Boletín* of the *Instituto Físico Geográfico*, volume 1, pp. 318-322, with one plate. In collaboration with Prof. Gustave Michaud he published a paper *Probable Perception of Invisible Light by Some Animal Species* in the *Scientific American* for January 15, 1916 (page 81 etc.), illustrated by photographs of butterflies under a weak yellow screen, in ultra-violet and in infra-red light. They suggested that the visual apparatus of these insects is perhaps sensitive to the ultra-violet reflected by flowers allowing them to "select, among flowers, those best adapted to their digestive organs", as well as "to favor the union of sexes or to protect those butterflies which feed on ultra-violet flowers". The *NEWS* for October 1929 (page 273) contains a brief note by him on *A Swarm of Dragonflies in Costa Rica*.

Tristán published more on volcanos and earthquakes than on insects and his studies of Irazú, Poás and Rincón de la Vieja are among the most recent which we possess on these mountains. A fine series of photographs taken by him accompanies an interesting and popular article *Costa Rica—Volcan's Smithy* by H. Pittier in the *National Geographic Magazine* for June, 1910, and he had a part in the preparation of ex-President Don Cleto Gonzalez Viquez's *Temblores, Terremotos, Inundaciones y Erupciones Volcánicas en Costa Rica, 1608-1910* (1910).

His long-time interest in physics doubtless led him into studies on ultra-violet light, in cooperation with Prof. Gustave Michaud, some of which were published in the *Scientific American* and in the *Archives des Sciences physiques et naturelles* of Geneva, 1913-1915.

His influence on the development of science in Costa Rica was undoubtedly great and it is saddening to realize that his departure, at the early age of fifty-eight, has brought his personal contact to an end. But the impulses which he started and furthered will surely continue to animate those who knew and loved him.

P. P. CALVERT.

## **On Apterism and Subapterism in the Blattinae (Orthoptera : Blattidae).**

By JAMES A. G. REHN, Academy of Natural Sciences of  
Philadelphia.

The cockroaches of the subfamily Blattinae comprise an extensive representation of species distributed over the tropical and subtropical parts of the world, with certain of them, which are domiciliary or household pests, liable to occur almost anywhere except in the arctic and antarctic regions. The opening up of remote parts of the world is soon followed by the penetration of these latter unwanted and unloved travellers, of which the native homes are still in doubt. Within this subfamily, which contains nearly two score of genera, we find all degrees of size development in the organs of flight, ranging from fully developed in both sexes to completely absent in the same. The intermediate conditions are similarly well represented in both sexes, or flight organs are reduced in the female alone.

The extent and degree of differentiation in alar development in the Blattinae influenced the well-known French orthopterist, Dr. Lucien Chopard, some years ago, to tabulate the genera of the subfamily under divisions expressive of the degree of development and sexual association of the organs of flight, and from these tabulations to conclude that the three categories employed exhibited certain geographic correlations. This work was published under the title: "La distribution géographique des 'Blattinae' apteres ou subapteres."<sup>1</sup>

Having had some experience with the subfamily in question, several years ago I read Dr. Chopard's paper with much interest, and at that time jotted down certain points which seemed at variance with the impression left by the tabulations. Recently having reread the paper and rechecked my hasty notes, it seemed desirable, in view of the possibility that Dr. Chopard's summary might be accepted as unquestioned, to amplify and publish my impressions on the subject.

<sup>1</sup> Compt. Rend. Assoc. Franç. Adv. Sci., 1924 (Liège), pp. 975-977, (1925).

On the basis of alar development Chopard divided the genera comprising the subfamily into three categories, as follows:

1. Genera with tegmina and wings well developed in the two sexes.
2. Genera with tegmina and wings very short or absent in the female alone.
3. Genera with tegmina and wings very short or absent in the two sexes.

Following this classification the genera then considered were arranged under the respective sections, nine in the first, seven in the second and thirteen in the third.

All of the genera in the first section, Chopard states, are African or Indo-Australian, except the Neotropical *Pelmatosilpha*. Of those in the second section the majority are African, several Indo-Malayan and Australian and one (*Blatta*) cosmopolitan, but probably of African or Indo-Malayan origin. The third section is dominated by Australian genera, over eighty per cent. of the total in the section being from the Antipodes, another, *Stylopyga* (as there used equalling *Neostylopyga* of Shelford and present workers), is circumtropically established,<sup>2</sup> while the single genus *Eurycotis* Stål is given as American.

Unfortunately Chopard did not consider the genus *Lamproblatta* Hebard, described some few years prior to the date of his writing,<sup>3</sup> for placed in the tabulation it would have been the first completely apterous Neotropical genus. The relative position of *Lamproblatta* in such a tabulation, and the degree to which the genera *Pelmatosilpha* and *Eurycotis* form with it a cohesive American complex, vitiating to a considerable degree the soundness of Dr. Chopard's classification, are responsible for the present remarks.

The genus *Pelmatosilpha* Dohrn, placed in category one by Chopard, is entirely Neotropical in distribution, and comprises a series of closely related species possessing tegmina and wings

<sup>2</sup>In the American tropics the genotypic species (*N. rhombifolia*) is known from but a few areas: in Africa it is more generally present on the coast, while in the Malayan region it is widely distributed, and probably the genus originated there.

<sup>3</sup>Trans. Amer. Ent. Soc., XLV, p. 108, (1919).



in both sexes, ranging in the various entities from fully developed to reduced quadrate tegmina and vestigial, non-functional wings. The same genus passes without marked distinction into *Eurycotis* Stål,<sup>4</sup> which was placed by Chopard in his category three. In the last-mentioned genus we have a considerable series of species—seventeen in the West Indies<sup>5</sup> and southeastern United States alone—in which the tegmina range from reduced and transversely subquadrate, attingent mesad, to lateral, slip-like structures, with the wings vestigial in the former and absent in the latter. The genus *Eurycotis* is distributed from the southern United States, Mexico and the West Indies south to at least Ecuador and eastern Brazil. Carrying alar reduction to its logical conclusion in the same complex of the subfamily is the genus *Lamproblatta* Hebard, representing an opposite extreme from *Pelmatosilpha*, and in which tegmina and wings are completely absent in the adult condition of both sexes. This similarly Neotropical genus ranges from the Canal Zone, Panama, to central Matto Grosso, Brazil, east to Trinidad.

The genera *Pelmatosilpha*, *Eurycotis* and *Lamproblatta* represent sections of a complex embracing not less than forty-one described and valid species, and in which combined assemblage we find, uniformly in both sexes, every shade of alar development from appendages fully formed and reaching to the apex of the abdomen (certain *Pelmatosilpha*), to the complete absence of all organs of flight (all seven species of *Lamproblatta*<sup>6</sup>). In Cuba alone we find twelve species of the genus *Eurycotis*, including forms with short, transversely truncate tegmina with attingent sutural margins, as well as others with these organs lateral and slip-like. The wings correspondingly are vestigial to absent.

From the above it is evident that the influences which operate for tegminal and alar reduction, at least in this complex of the subfamily, are not regional, and also, broadly speaking, that

<sup>4</sup> For discussion of the relationship of these genera see Rehn and Hebard, Bull. Amer. Mus. Nat. Hist., LIV, p. 147, (1927).

<sup>5</sup> For a study of the majority of the West Indian species see Rehn and Hebard, Idem., pp. 154-187.

<sup>6</sup> See Rehn, Trans. Amer. Ent. Soc., LVI, pp. 27-38, (1930).

no geographic correlation of alar development exists in this particular assemblage. While our distributional information for these genera is still "spotty," it is sufficient to show conclusively the degree of variability in alar development in the Cuban species of *Eurycotis*, the presence of all three genera in or in the immediate vicinity of the Canal Zone, Panama, and also in eastern Ecuador, as well as at least two of the genera in Trinidad, Costa Rica and upper Amazonia. When our knowledge of the Blattidae of these latter areas is relatively as full as that of the Canal Zone species, we probably shall find all three genera present. Apparently the factors which operate to produce the respective conditions must be looked for in directions other than geographic. I have personally collected all three genera and, speaking broadly, their habits are similar—secretive and in daylight negatively phototropic, utilizing many types of chinks and crannies for hiding, such as under bark, palm frond bases, the dead adherent stubs of the same, in hanging dead leaves, under rotting vegetable matter, beneath stones and fallen logs. It is not known whether the fully alate *Pclmotosilphas* use their wings to escape, nor have I any knowledge of their being attracted to light at night.

Apropos of the Old World genera of the subfamily listed by Chopard, there can be little question as to the really close relationship of *Periplaneta* Burmeister and the African genus *Pseudodcropleltis* Krauss, even though the latter shows pronounced sexual dimorphism in other features as well as the degree of development of the alar appendages. The common origin of these two genera can hardly be questioned, even though they would fall into separate categories of Chopard's tabulation (i.e. *Periplaneta* in number one, *Pseudodcropleltis* in number three). Again the recently erected genus *Blattina* Hebard<sup>7</sup> is very close to *Blatta*, in which its genotype had been placed, yet the former possesses an equal degree of alar development in the two sexes, while the latter exhibits a marked sexual difference in tegminal structure and wing presence. On the other hand *Ncostylopyga* Shelford (= *Stylopyga* as used

<sup>7</sup> Proc. Acad. Nat. Sci., Phila., LXXXI, p. 84, (1929).

by Chopard) is an exceedingly close relative of *Blatta*, but has the tegmina in both sexes reduced to lateral slips while the wings are absent.

The East African genus *Cartoblatta* Shelford was placed by Chopard in the category (one) having the tegmina and wings well developed in the two sexes. The male possesses fully developed tegmina and wings, but the female has the tegmina reduced and quadrate and the wings vestigial—in fact both no more developed than in a number of species of *Eurycotis*, which was placed in category three.

To summarize, the factors producing brachypterism or subapterism in the Blattinae, as in the subfamilies Pseudomopinae, Ectobiinae and Epilamprinae of the Blattidae, cannot be considered geographic per se, although environmental and other influences, such as altitude and possibly humidity or aridity under special conditions, appear to be or have been motivating causes. Elsewhere I have recently demonstrated<sup>3</sup> the correlation of altitude with relative brachypterism in the normally fully alate African *Ectobius africanus*, and it is strongly suggested in a number of cases which have yet to be given critical study. Chopard has called attention to the high percentage of apterous or subapterous genera of Blattinae in Australia, and suggests this degree of specialization as a response to desert conditions. Brachypterism or even complete apterism in the female sex is marked in desert cockroaches, generally correlated with fully alate males, often of nocturnal habits. This tendency is probably as marked in the Old World as it is in the Sonoran deserts of the southwestern United States and adjacent Mexico. However, the percentage of brachypterism and subapterism to be found among the Blattidae of the humid rain-forest areas of tropical America refutes any attempt to make a purely geographic or zonal correlation of apterism or brachypterism. The Blattidae of tropical regions are no different from other groups of animal life in that the large, striking and obvious are first made known, while the subapterous and brachypterous, usually secretive species generally require for their discovery the more detailed explorations of trained field workers. Tropical regions

<sup>3</sup> Proc. Acad. Nat. Sci., Phila., LXXXIII, pp. 346-353, (1931).

which are now fairly well known orthopterologically, such as the West Indies and parts of Central America, show a far larger percentage of subapterous and brachypterous blattids than is known from countries less carefully studied.

Macropterism is clearly the primitive condition in the Blattidae, as affirmed by paleontological and an increasing amount of phylogenetic data. Chopard has left no doubt regarding his support of this very evident conclusion. Brachypterism and apterism in the cockroaches are evidently responses to influences which under given conditions, environmental or what-not, inhibit or at least limit the success of fully alate types. These conditions are much less fundamental than was believed to be true by the past generation of workers. So far we have made but a beginning in solving the involved phylogenetic history of existing Blattidae, but this general conclusion gains added support with each definite addition to our knowledge of these animals.

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#### Bookseller's Separates.

In a statement (ENT. NEWS 43: 258) made to call attention to the difference between "author's separates and bookseller's separates", it is said that cut-out articles are *not* genuine separates.

The cut-out articles are the more reliable separates. The Canadian Entomologist has sent out pages of the journal as separates. Separates of my paper "Localities of insects collected by Robertson", Psyche 35: 61, contain the errors, "*wellesleyana* and *novae, angliac*" instead of "*wellesleyana* and *novae-angliac*", as in the original. The separate is an erroneous copy of the published article.—CHARLES ROBERTSON, Carlinville, Illinois.

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#### Insect Racketeers.

Our attention having been called to advertisements holding out great hopes of making large sums of money by collecting and selling insects, particularly butterflies, it seems almost obligatory to warn persons attracted by such advertisements that very few realize such hopes. No one should enter into any engagement to supply insects to parties about whom they know nothing without first learning from reliable sources something of their honesty and business standing.—EDITOR.

## On the Activity of Butterflies at Night (Lepid.: Rhopalocera).

By HAROLD O'BYRNE, Webster Groves, Missouri.

That butterflies are lovers of the sunshine and are inactive at night is an accepted fact; most students agree that they spend the night in a state physiologically similar to the sleep of vertebrates. It is to be expected, therefore, that efforts to arouse butterflies to activity at night, even in brightly lighted places, are foredoomed to failure. Comparatively few attempts to determine this have been made. The purpose of the observations described below was to test this expectation; the results obtained confirm my belief that sleeping butterflies would be hard to awaken, and also show that after being disturbed, they seek the darkest spots available, where they resume their interrupted rest.

The observations were made during the summer of 1931, in a brightly-lighted electric power station in St. Louis, Missouri. The butterflies observed (other than two exceptional individuals later noted) entered the building in the daytime, were trapped, and finally came to rest near closed windows through which they had vainly tried to escape. The nights when observations were made were all clear, and followed warm, sunny days when butterflies were generally active. Temperature indoors, due to machinery in operation, was in the neighborhood of 95 degrees, Fahrenheit; and was somewhat higher than temperature on the outside. The time used is Central Standard in all cases.

*PHYCIODES THAROS* DRU. One was found on a window sill at 11 P. M. A gentle push caused it to flap its wings a few times. Later, while being carried by the wings to another place, it began to kick its legs; when released, it fluttered a little and then became motionless. Pushing it repeatedly caused a short flight each time. The second individual, found on the floor at 11 P. M., was picked up by the wings and thrown into the air. It flew rapidly upward and disappeared in the shadows that hid the ceiling. A few seconds later it descended to the floor, remaining motionless for at least half an hour. The third speci-

men, observed at 8 P. M., was disturbed twice by pushing; a short flight resulted each time.

*POLYGONIA INTERROGATIONIS UMBROSA* Lint. A female found resting on a window frame at 1 A. M. was not disturbed by the heavy jar of a ladder placed against the window. After being picked up by the wings, nearly a minute elapsed before it began to move its legs. It was released on my open hand, where it did not move, except to take hold with its feet. When prodded, it opened and closed its wings several times and then flew about ten feet. Its wings opened and closed slowly for several minutes; then it flew again and hid in the shadows some fifty feet overhead.

*VANESSA ATLANTA* Linn. A female was resting on a window frame at 11 P. M. The jar of a heavy ladder allowed to fall against the frame failed to arouse the butterfly. Another female, first seen at 1 A. M., was resting on the outside of a window. It, too, was difficult to arouse; closing the window failed to disturb it. When picked up and then released in the air inside of the building, it flew to the floor and walked slowly into a nearby shadow, where it remained motionless until pushed. This time, it flew up to a girder about forty feet above, and came to rest in the glare of a bright light. In this individual we have an attraction to the light that was not observed in the others. Furthermore, it must have been attracted to the light originally, for it was found on the outside of the lighted window.

*PIERIS RAPAE* Linn. A male and a female were found resting on window frames at 7:30 P. M. Three attempts to arouse the male by pushing resulted in as many flights of a few feet each. When thrown out through an open window, it flew to the ground and stayed in the spot where it alighted. The female was not disturbed until about 10 P. M. After being pushed, it flew to a height of about 20 feet, circled about, and alighted on the floor. A second push caused it to fly about eight feet, coming to rest in the darkness of a shadow. Disturbed a third time, it flew high and disappeared in the ceiling shadows, where it stayed.

*EUREMA LISA* Bdv. & Lec. A female was found on the wall

at about 1 A. M. Repeated efforts to arouse it were futile; only short flights resulted.

*PAPILIO CRESPIHONTES* Cram. A male was seen resting on the outside of a window at 11 P. M. When dislodged with an insect net, immediate activity began; it struggled violently in the net, in great contrast to the behavior of all the butterflies mentioned before. Like the second *I. atalanta* observed, it must have come to the window after dark, in response to the lights within.

The important fact gleaned from these observations is the difficulty of arousing butterflies from their nocturnal stupor; my efforts to provoke them to sustained flight were generally unsuccessful, a result that I had anticipated. This confirms the observations of Rau and Rau, '16, who also found butterflies hard to arouse from sleep. The high temperature in the building shows that the sluggishness displayed by the butterflies was not an effect of cool night air, such as would have complicated the observations had they been made out-of-doors. On the contrary, any effect that temperature could have had upon their behavior would have urged them to become active. Hayward, '30, has suggested that observed instances of butterflies flying at night are probably due to their having been disturbed from their rest by passing animals. Some such instances can be so explained, but the foregoing observations show that such behavior is unusual. The facts clearly indicate that the periods of activity and of rest in butterflies are so strongly fixed, psychologically and physiologically, that the simulating of day conditions by artificial light does not influence them to day activity. However, the data show that for at least two individuals there was a reversal of this behavior, where response was to artificial light. It would be interesting to find what conditions influence such exceptional behavior.

#### LITERATURE CITED.

- HAYWARD, K. J. 1930. The night flight of diurnal butterflies. *Ent. News*, xli: 258-261.  
RAU, P., and RAU, N. 1916. The sleep of insects; an ecological study. *Ann. Ent. Soc. Amer.*, 9: 227-274.

## **The Rhopalocerous Lepidoptera of Scott County, Kansas.**

By VIRGIL F. CALKINS, Scott City, Kans.

### INTRODUCTION.

The main reason for preparing this list of the butterflies of Scott County, Kansas, is because of the interest expressed in the species local to this region by various entomologists with whom I have been in correspondence.

So far as I know, I believe not very much has ever been written about the butterflies of the State of Kansas—certainly not the western part of the State. Hence, a description of the region about which this list is written will be of interest.

Scott County is situated in the center of the extreme western part of the state, about sixty miles from the Colorado line. It is about twenty-four miles wide by thirty miles in length, and has an area of 720 square miles. The elevation of Scott City is 2,970 feet above sea level. The whole state lies within what is termed the Great Plains Region, the western half consisting of broad, level prairie, being devoid of trees in general, except along the shallow prairie streams.

In the northern part of Scott County, in the vicinity of Beaver Creek—a small tributary of the Smoky Hill River, one encounters the hilly district—otherwise known as the “bad lands” of western Kansas. It consists of cuts, ravines and canyons of shale, sand and limestone, the formations being rugged and fantastic in form, some with flat-topped mounds and long rocky ridges many of which are of a shelving and rounded contour. Beginning at the summits of these hilly districts, which are numerous, and continuous in various parts of the west, and north-western, parts of the state, is the level prairie. In the northern part of Scott County, a portion of this type of country has been set aside by the state as the Scott County State Park, which is one of the favored collecting places. Various species of cacti and yuccae flourish here, the general appearance suggesting that of semi-arid desert country.

Inasmuch as the whole of the western part of the state is level prairie, a list of the butterflies of Scott County would necessarily be representative of this part of the state.

As far as my knowledge goes, there are no other collectors



of lepidoptera in the entire western part of the state of Kansas.

I trust that this list will therefore have value for the entomologist who has an interest in the lepidoptera of this region.

#### Family PAPILIONIDAE.

*PAPILIO POLYXENES* Fabr. The Eastern Swallowtail. The common black Swallowtail which ranges over practically all of the eastern half of the United States. Abundant, and very easily reared.

*P. BAIRDI BRUCEI* Edw. Bruce's Butterfly. A decidedly rare insect this far east; two specimens have been taken only, in the month of June. One example had one of the tails missing but both specimens were in very fresh condition.

*P. CRESPIONTES* Cram. The Giant Swallowtail. This, also, is an uncommon insect to be taken locally. All specimens that have been taken were badly worn and torn, indicating that they had come from a distance. Some half dozen specimens have been captured only one of which was respectable enough for collection purposes.

*P. GLAUCUS* L. The Tiger Swallowtail. This beautiful *Papilio*, according to its distribution records, should be fairly plentiful in this region. On the contrary it is somewhat scarce. The male sex is usually most prevalent and the species appears to be most common, whenever found, just as the cherry and apple trees burst into bloom. Yellow females are not common, and when taken, represent the first brood of the year.

*P. DAUNUS* Bdv. Two-tailed Swallowtail. The two-tailed Swallowtail is a very interesting capture indeed, for this locality. While far from being common, the writer usually takes a few each year. This species is, as a rule, peculiar to the Rocky Mountain region, or at most, the valleys and foot hills of mountainous ranges. Hence, its appearance this far east on the prairie regions of Kansas is very interesting. A fact concerning *Papilio daunus* not usually known is that it is double-brooded in this region. The imagoes emerging from over-wintering chrysalids are somewhat small and dwarfed, and the summer examples are giants, the females measuring four and one-half to five inches.

*P. TROILUS* L. Spice Bush Swallowtail. Extremely rare. But two specimens have ever been taken.

## Family PIERIDAE.

PIERIS OCCIDENTALIS Reak. The Western White. While *occidentalis* is a common insect of the more western states, it is highly doubtful if, as a species, it is generally taken in Kansas. Two examples, a male and a female, have been taken by the writer, and were identified as *occidentalis* by Dr. Dyar.

P. PROTODICE Bdv. & Lec. The Common White, the Checkered White. This is a quite common butterfly some seasons and apparently scarce during others. The best way to obtain perfect specimens for collection is to rear them on mustards. The majority of them taken at large have wing punctures due to parasitization. It is triple-brooded in this region. It can usually be taken at any time during the collecting season, but most commonly during the early fall.

P. PROTODICE VERNALIS Edw. The Vernal White. The spring form of the above species is only found in numbers enough to assure the propagation of the species. Very many of the abundant larvae encountered in the fall are victims of parasites and are consequently destroyed, making the spring form *vernalis* less common.

P. RAPAE L. The Cabbage Butterfly. An extremely common butterfly. Plentiful at all times throughout the collecting season. Stray specimens that have emerged during the latter part of February and the first days of March have been observed. It appears commonly in April.

NATHALIS IOLE Bdv. Dwarf Yellow. A common little yellow butterfly. Stray specimens can be taken at various intervals during the spring. It begins to appear more commonly during the latter part of July, and by September, it is abundant where it frequents the ditches along the roadsides flying up and down in regular streams in twos and threes. The writer has reared specimens on Bush Marigold, Cosmos and other allied plants.

ZEGRIS OLYMPIA Edw. Olympian Marble-wing. A single male specimen of this very desirable species was taken on the outskirts of the city early in April, 1932, by Wilson Finkenshinder and kindly presented to me. Unknown in this locality except for this one specimen.

CATOPSIS EUBULE L. Cloudless Sulphur. Not always common, but it can usually be taken in September. Very swift on

the wing, scarcely taking the time to stop on any sort of flowers for a sip of nectar unless they be of a deep-tubed variety. Nasturtiums and morning glories are to its liking. The females frequent legumes, especially bean patches, and occasionally deposit eggs.

C. EUBULE PALLIDA Ckll. The Pallid Sulphur. The white form of the female of *cubule* is more commonly taken than regular yellow forms. Even the narrow band of brown on the outer margins of the primaries is somewhat bleached and pale.

CATOPSILIA PHILEA L. Red-barred Sulphur. An excellent female specimen of this magnificent species was recorded in August of 1932.

C. AGARITHE Bdv. The Large Orange Sulphur. A few years ago a single male of this species was taken, and also one or two females, the latter being in very poor condition. A rare capture.

C. STATIRA Cram. Statira Sulphur. An interesting capture for this region. Thought to have been observed previously, no actual specimens were taken until 1931. Males are confused with *cubule* when on the wing, but females are recognizable by the narrow border of dark brown along the margins of the primaries which is broader and more regular than that of *cubule*. Very rare.

KRICOXONIA LYSIDE Godt. Godart's Sulphur. Until 1931, about a half dozen individual specimens were all that had ever been captured in this locality. These specimens were taken in the early spring fluttering around apple trees which were in full bloom. During the summer of 1931, the species was apparently common in some places and could usually be found about Alfalfa fields, although perfect examples were hard to obtain. Many forms, or varieties, were indicated by the captured specimens. Females were most common. Whether the insect will be taken in any numbers during 1932 remains to be seen. It would seem that a colony has got a footing in this locality.

ZERENE CAESONIA Stoll. Southern Dog's Head Butterfly. Not taken commonly, but observed every year, usually in August and September.

Z. CAESONIA ROSA McNeill. The Rosy Dog Head. Two specimens of this fall form of *caesonia* have been taken in late September.

*EURYMUS EURYTHEME* Bdv. Boisduval's Sulphur, Common Orange Sulphur. A very common butterfly, everywhere, on the plains of the west. Alfalfa fields are literally alive with the vivid yellow and orange of the teeming swarms of this beautiful butterfly.

*E. EURYTHEME ALBA* Stkr. Boisduval's White Sulphur Female. The white female, or albinic, form of the above species while not common like the regular form nevertheless is plentiful.

*E. EURYTHEME AMPHIDUSA* Bdv. The Flavid Sulphur. *Amphidusa*, the summer form, is abundant.

*E. EURYTHEME AMPHIDUSA ALBA* Stkr. This female form, considered by some, separate from typical albinic *curytheme*, also is fairly plentiful.

*E. EURYTHEME ERIPHYLE* Edw. The Eriphyle Sulphur. A yellow summer form of *curytheme* which is common.

*E. PHILODICE* Godt. The Eastern Sulphur, Puddle Butterfly. The "yeller" butterfly so frequently mentioned in poetry and literature is seldom taken this far west, and the few specimens that I believe to be true *philodice* have been taken in the early summer.

*EUREMA MEXICANA* Bdv. Mexican Yellow. The Mexican Yellow represents only an occasional visitor to this region. It was plentiful during one year, when over 100 specimens were collected. Since that time it has only been observed occasionally—usually in the fall. The species has a weak flight and is not all together easily captured, it becoming confused and disturbed, when it darts in a somewhat zig-zag fashion making it hard to place a net over it.

*E. NICIPPE* Cram. The Small Orange, Nicippe Yellow. Somewhat rare in this locality and hard to get in perfect condition. Most specimens have frayed wings or are otherwise imperfect.

*E. EUTERPE* Men. (Lisa Bdv. & Lec.) The Little Sulphur. Also an uncommon species and never taken in any numbers, in this locality.

#### Family DANAIIDAE.

*DANIAS PLEXIPPUS* L. The Monarch. An abundant butterfly, especially in the fall. Tattered examples are seen passing north in April.

D. BERENICE STRIGOSA Bates. Striated Queen. Not very common. The author has taken a dozen or more specimens, from the month of July onward until September. Both sexes have been taken, the female having been observed to oviposit on a species of the Milkweed family called Whorled Milkweed, locally.

(To be continued)

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### **Vespa crabro L. in Pennsylvania (Hymen.: Vespidae).**

It may be of interest to readers of ENTOMOLOGICAL NEWS that *Vespa crabro*, the European hornet, this large and pretty, but otherwise not at all pleasant insect, has doubtless taken a foothold in northeastern Pennsylvania. In the fall of 1931, in September and October, I collected a number of specimens in our garden, located at the outskirt of the city of Scranton in Lackawanna County, where they were nibbling on the bark of a big and rather old lilac bush. I collected the specimens on several sunny days, mostly in the afternoon, but did not lose much time in watching them, otherwise I could have collected many more specimens. I suppose, that they must have had their nest somewhere in the woodland adjoining our property of 3 acres.

According to Frank E. Lutz (Field Book of Insects, 1930), Comstock (Introduction to Entomology, 1925), and Howard (Insect Book, 1902), the species was accidentally introduced into this country a number of years ago and occurs only in the vicinity of New York City, Long Island, Connecticut and certain parts of New Jersey. The above mentioned catches show evidently that this insect is slowly spreading westward. I do not know, if it ever has been recorded from Pennsylvania before.

MAX ROTHIKE, Scranton, Pennsylvania.

The extension of *V. crabro* southward is shown by the following records. The collection of the Academy of Natural Sciences of Philadelphia contains two specimens from Philadelphia, one August, 1911, the other October 14, 1914, that of the University of Pennsylvania one from the campus May 31, 1932, and a male and female from Mapleshade, New Jersey, September 20, by Dr. R. G. Schmieder. Mr. E. T. Cresson, Jr., has seen a nest at Swarthmore, Pennsylvania, and knows of one at New Britain, Penna. Two specimens from Cheyney, Penna., are before me, October 10, 1929, by Mrs. A. S. Calvert, and September 5, 1931, by Mr. Joseph Derry.

EDITOR.

## Entomological Literature

COMPILED BY LAURA S. MACKEY UNDER THE SUPERVISION OF  
E. T. CRESSON, JR.

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 figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the list of Periodicals and Serials published in our January and June issues. This list may be secured from the publisher of ENTOMOLOGICAL NEWS for 10c. The number of, or annual volume, and in some cases the part, part, &c. the latter within ( ) follows; then the pagination follows the colon :

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

\*Papers containing new forms or names have an \* preceding the author's name.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

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.

*Note the change in the method of citing the bibliographical references, as explained above.*

*Papers published in the Entomological News are not listed.*

**GENERAL.**—**Carpenter, F. M.**—The lower permian insects of Kansas. Part 5. Psocoptera and additions to the Homoptera. [16] 24: 1-22, ill. **Felt, E. P.**—Shade trees threatened by insect pests. [76] 1932: 59-62. **Gunder, J. D.**—International nomenclature stew. [19] 27: 165-166, ill. **Imms, A. D.**—Origin of insects from Crustacea. [31] 130: 95. **Jacot, A. P.**—The status of the species and the genus. [90] 66: 346-364. **Janet, C.**—Obituary. By L. Berland. [24] 101: 157-164, ill. **Joy, N. H.**—What is the meaning of a pupa? [21] 44: 87-88. **Matthey, R.**—Les chromosomes et la systématique zoologique. [Rev. Suisse Zool.] 39: 229-237. **McClendon, J. F.**—Doodle-bugs and law-makers. [68] 76: 81-82. **Myers, J. G.**—The original habitat and hosts of three major sugar-cane pests of tropical America (Diatraea, Castnia and Tomaspis). [22] 23: 257-271, ill. **Peterson, A.**—Are economic entomologists becoming "Insecticide minded?" [6] 40: 159-165. **Smith, R. C.**—A summary of the population of injurious insects in Kansas for 1931. [103] 5: 65-92, ill. **Trouvelot, B.**—Recherches sur les parasites et prédateurs attaquant le Doryphore en Amérique du nord et envoi en France des premières colonies des espèces les plus actives. [An. Epiphyties, Paris] 17: 408-445, ill. **Wasmann, P. E.**—In Memoriam. By H. Schmitz. [101] 75: 1-57, ill.

**ANATOMY, PHYSIOLOGY, ETC.**—**Barnes & Kohn**—The effect of temperature on the leg posture and speed of

creeping in the ant *Lasius*. [92] 62: 306-312, ill. **Brug, S. L.**—Chitinisation of parasites in mosquitoes. [22] 23: 229-231, ill. **Burgess, E. D.**—A comparison of the alimentary canals of the active and hibernating adults of the Mexican bean beetle *Epilachna corrupta*. [43] 32: 249-261, ill. **Cameron, A. E.**—The rearing of *Haematopota pluvialis*, (Cleg. Tabanidae) under controlled experimental conditions. [31] 130: 94-95. **Carpenter, G. D. H.**—Resemblance of moths to bird-droppings. [Pro. Ent. Soc. London] 7: 22-23. **Carter, W.**—Studies of populations of *Pseudococcus brevipes* occurring on pineapple plants. [84] 13: 296-304, ill. **Currie, G. A.**—Oviposition stimuli of the burr-seed fly, *Euaresta aequalis* (Trypetidae). [22] 23: 191-193, ill. **Davidson, J.**—Resistance of the eggs of *Collembola* to drought conditions. [31] 129: 867, ill. **Dixey, F. A.**—The plume-scales of the Pierinae. [36] 80: 57-75, ill. **Eastham, L.**—Currents produced by the gills of mayfly nymphs. [31] 130: 58, ill. **Eltringham, H.**—On an extrusible glandular structure in the abdomen of *Mantispa styriaca*. [36] 80: 103-105, ill. **Fischer, E.**—Artbastarde von schmetterlingen und ihre F2-und rückkreuzungsgenerationen. [Vierteljahrsschrift d. Naturf. Ges. Zürich] 76: 214-303, ill. **v. Frankenberg, G.**—Mehrfachbildungen und verschmelzungen an den fühlern von *Melolontha*. [34] 99: 87-98, ill. **Fuller, C.**—The thorax and abdomen of winged termites. [Union So. Africa Dept. Agric.] Ent. Mem. No. 2: 49-78, ill. **Harrison, J. W. H.**—The recent development of melanism in the larvae of certain species of Lepidoptera with an account of its inheritance in *Selenia bilunaria*. [Pro. R. Soc., London] (B), 3: 188-200, ill. **Haupt, H.**—Die mundteile der Dryinidae. [34] 99: 1-18, ill. **Henson, H.**—The development of the alimentary canal in *Pieris brassicae* and the endodermal origin of the malpighian tubules of insects. [53] 75: 283-305, ill. **Hingston, R. W. G.**—Changes in the method of insect protection at successive periods of growth. [Pro. Ent. Soc. London] 7: 12-14. **Holdaway, F. G.**—An experimental study of the growth of populations of the "Flour Beetle" *Tribolium confusum*, as affected by atmospheric moisture. [Ecol. Monographs] 2: 261-304, ill. **Jordon, K.**—Calliper-like appendages in some American moths. [Pro. Ent. Soc. London] 7: 16. **Kaufmann, O.**—Einige bemerkungen über den einfluss von temperaturschwankungen auf die entwicklungsdauer und streuung bei insekten und seine graphische darstellung durch kettenlinie und hyperbel. [46] 25: 353-361, ill. **Learned, E. T.**—An occurrence of spiral segmentation in

*Apantesis nais* (Arct.). [6] 40: 167-180, ill. **LeCharles, L.**—Anomalies chez des Lépidoptères. [25] 37: 151-152, ill. **Leeson, H. S.**—The effect of temperature and humidity upon the survival of certain unfed rat fleas. [Parasitology] 24: 196-209, ill. **Parat & Wou-Tseng-Cheng.**—Nature et origine des constituants cytoplasmiques de la cellule sexuelle male de *Notonecta*. [77] 110: 543-546, ill. —**Schulze, P.**—Ueber das zustandekommen des zeichnungsmusters und der schmelzfärbung in der zeckengattung *Amblyomma* nebst bemerkungen über die gliederung des ixodidenkörpers. [46] 25: 508-533. **Seifert, B.**—Anatomie und biologie des Diplopoden *Strongylosoma pallipes*. [46] 25: 362-507, ill. **Steopoe, J.**—Etude sur le plasmosome et les chromosomes sexuels dans la spermatogenèse de *Nepa cinera* et *Naucoris cimicoides*. [Arch. Zool. Exp. et Gén., Paris] 72: 577-592, ill. **Tokunaga, M.**—Morphological and biological studies on a new marine chironomid fly, *Pontomyia pacifica*, from Japan. [Mem. Coll. Agric. Kyoto Imperial Univ.] 1932: 56 pp., ill. **Uvarov, B. P.**—Bioclimatograph, an improved method for analyzing bioclimatic relations of insects. [84] 13: 309-311, ill. **Wigglesworth, V. B.**—The function of the so-called rectal glands of insects. [Pro. Ent. Soc. London] 7: 18. **Yeager & Tauber**—Determination of total blood volume in the cockroach, *P. fuliginosa*, with special reference to method. [7] 25: 315-327.

**ARACHNIDA AND MYRIOPODA.**—\***Badcock, H. D.**—Arachnida from the Paraguayan Chaco. [Jour. Linn. Soc., London] 38: 1-48, ill. **Ewing, H. E.**—Notes on the taxonomy of three economic species of mites, including the description of a new species. [95] 45: 99-101. \***Mooser, H.**—*Ornithodoros nicollei* spec. nov. [An. Inst. Biol., Mexico] 3: 127-131, ill. (S).

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neo-tropical parasitic Hymenoptera. [36] 80: 121-136, ill.  
\*Pickles, A.—Notes on the natural enemies of the sugarcane froghopper (*Tomaspis saccharina*) in Trinidad, with descriptions of new species. [22] 23: 203-210, ill. Richards, O. W.—Leptofoenus, a synthetic hymenopteron. [Pro. Ent. Soc. London] 7: 5.

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A TEXTBOOK OF AGRICULTURAL ENTOMOLOGY by KENNETH M. SMITH, D.Sc., Ph.D., Entomologist to the Potato Virus Research Station, School of Agriculture, University of Cambridge. Cambridge, University Press, 1931. Pp. xiii, 285, frontispiece and 79 figures.—This volume, dealing with the insect pests of farm crops in Great Britain, is professedly modeled on John Curtis's *Farm Insects* of 1860 which, though "long out of date, remains the standard textbook on agricultural entomology in the British Isles." The Phytopathological Service, which includes both entomology and mycology, has divided England and Wales into twelve provinces, each with a collegiate advisory centre and this organization is briefly described. Methods of insect control and their application in farming practice are outlined and there is an interesting chapter (5 pages) on the effect of weather conditions on insect outbreaks. Ten chapters (233 pages) are devoted to those insects which are of agricultural importance, but excluding the pests of fruit, arranged by taxonomic orders. Under the phytophagous species, care is taken to list both the cultivated and the wild host plants. Evidently the author (page 1) would have preferred to illustrate a larger number of the insects described in the text than has been done, and the result would seem to necessitate the user of the book making reference to other works for such figures. Chapter XIV is concerned with insects and virus diseases of crops, a subject to which the author has given special attention. In Great Britain the aphid *Myzus persicae* can transmit no less than five virus diseases of the potato. A common solanaceous weed, the black nightshade, *Solanum nigrum*, is an almost symptomless carrier of one or more potato viruses, analogous to human typhoid or diphtheria carriers. *Myzus persicae*, which has fed on this nightshade, can infect healthy potatoes with the virulent virus. Appendices list crops and weeds by families giving symptoms of insect attacks and attacking insects. Selected bibliographies, including references to American literature, follow each chapter. There are three indices to this volume which, though chiefly of interest to residents of Britain, includes a number of species found also in North America.—P. P. CALVERT.

CLASSIFICATION OF INSECTS. A Key to the Known Families of Insects and Other Terrestrial Arthropods. By CHARLES T. BRUES, Associate Professor of Entomology, Harvard University, and A. L. MELANDER, Professor of Biology, College of the City of New York. Bulletin of the Museum of Comparative Zoology at Harvard College, Vol. LXXIII, 672 pp., 1121 figs. In paper covers \$5.50, in cloth \$6.50.—The *Key to the Families of North American Insects* of 1915 by the present authors (see the NEWS for May, 1915, pp. 233-234) has served in a general way as a model for the present and much more ambitious volume. The latter, as contrasted with the former, is world-wide, includes the other terrestrial arthropods, gives selected lists of literature under each order, suborder, or superfamily, and adds keys to larval forms under the Insecta in general, Odonata, Plectoptera, Plecoptera, Megaloptera, Trichoptera, Lepidoptera, Diptera and Hymenoptera (*not* Coleoptera). It goes more deeply into the classification than one might infer from the subtitle, first by restriction of the extent of the families and the consequent increase in their number, thus the Scarabaeidae of, let us say Blatchley's *Coleoptera of Indiana*, appear as nineteen families; second by often giving keys to subfamilies; and third by citing one or more genera, with their general distribution, of each family or subfamily. "The keys aim to reproduce as accurately as possible the most generally accepted system of classification of each group. They are necessarily to some extent heterogeneous as they represent the accumulated opinions and revisions of hundreds of workers during the course of many decades." The arrangement of the Hymenoptera, Diptera and to some extent of the Coleoptera represents, however, mainly the present authors' viewpoints. The authors "have attempted to correct all such errors of orthography" where "a few incorrectly formed family names have been used . . . sometimes over long periods." The glossary of special terms and the alphabetical index to genera and higher groups, features of the *Key* of 1915, have been retained, the latter of course enormously extended, occupying 53½ pages of three columns each. There is also a 3-page index of common names. It is questionable whether the figures, especially of the venation, are in all cases sufficiently labeled to enable the user to correctly interpret the keys without reference to more fully lettered illustrations elsewhere. Allusion is rightly made in the preface to "the tedious process of preparation," but the authors have produced a very useful handbook.—P. P. CALVERT.

FUNDAMENTALS OF INSECT LIFE. By C. L. METCALF, M.A., D.Sc., Professor of Entomology in the University of Illinois, and W. P. FLINT, Chief Entomologist, Illinois State Natural History Survey. McGraw-Hill Book Co., Inc., New York and London, 1932. Pp. xi, 581. 315 figs. \$4.00.—The first ten chapters of this book bear the same titles as do the first ten chapters of an excellent work by the same authors, *Destructive and Useful Insects* (1928), reviewed in the NEWS for January, 1929 (pages 29-31). They have been revised and a number of additional illustrations accompany them; the greatest change is in Chapter VIII, The Important Orders and Families of Insects, which is expanded from 59 to 182 pages. It is regrettable that in their treatment of the Diptera, the authors should have adhered to Osten Sacken's term *tegula* for what is almost universally known as the *squama*, especially since they use *tegula*, in connection with the Hymenoptera, in its common application, for an organ which is not homologous with the *squama*. The first ten chapters occupy 438 pages as against 297 in the earlier book. As in their earlier work, the authors consider the embryology of insects "too technical to attempt to cover here." Considering the scope and detail of the book in other respects, it is regrettable that at least an outline of embryonic development is not included. Knowledge thereof adds so much to understanding the structure of insects, as in every other group of animals. Of the remaining three chapters two deal with the biology and ecology of insects, the living and the physico-chemical environments respectively. The last (thirteenth) chapter is on insect behavior. While frequent references to literature are given in footnotes throughout the volume, there is a classified bibliography of five pages near the end; it is composed chiefly of textbooks, manuals and compilations and includes very few original memoirs. The index is of slightly more than 54 pages of small type. It is the last three chapters which positively differentiate this volume from its predecessor. Of them the authors say in their preface: "Neither of the authors makes any claim to special knowledge of the field of animal ecology. In compiling the latter chapters of the book they have therefore become greatly indebted to many works on general and special phases of ecology, from which they have drawn extensively." A perusal of these chapters will, we believe, suffice to prove that the authors have produced a very clear and readable account of the phenomena thus far known.—P. P. CALVERT.

GENERAL CATALOGUE OF THE HEMIPTERA. G. Horvath, General Editor. H. M. Parshley, Managing Editor. Fascicle IV FULGOROIDEA Part I TETTIGOMETRIDAE by Z. P. METCALF, D. Sc., North Carolina State College. Published by Smith College, Northampton, Mass., U. S. A. 1932. 69 pp. \$1.00.—“The plan is to issue the catalogue of each family of the Fulgoroidea, as recently defined by Muir, as a separate part of the general fascicle of the Fulgoroidea and then to issue a special part containing the bibliography and the index for the whole.” As eighteen families are recognized, fascicle IV will be extensive. Seventy species and twelve genera are attributed to the Tettigometridae, of which only one (monotypic) genus and species, *Nototettigometra bredini* Muir, occurs in the New World (Peru); the others are Palaearctic, Ethiopian and Oriental. Some new names for Old World varieties are proposed.—P. P. CALVERT.

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DICTIONARY OF AMERICAN BIOGRAPHY published under the auspices of American Council of Learned Societies by Charles Scribner's Sons, New York. Volume IX, June 20, 1932, contains, among others, a notice of George Henry Horn, the distinguished coleopterist, by L. O. H[oward], occupying a little more than one-half page.

Dr. Howard has also contributed a very interesting memoir of Stephen Alfred Forbes (1844-1930) to the BIOGRAPHICAL MEMOIRS OF THE U. S. NATIONAL ACADEMY OF SCIENCES, Vol. XV, Washington, 1932.

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JOBS FOR THE COLLEGE GRADUATE IN SCIENCE. By EDWARD J. V. K. MENGE, Ph.D., Sc.D., Director of the Dept. of Zoology, Marquette University. The Bruce Publishing Co., New York, Milwaukee, Chicago. 1932. Pp. viii, 175. \$2.00.—This little book aims to provide information which will assist the present generation of high school and college boys and girls and their parents in learning what possibilities are offered by the sciences and their applications when choosing a life-work. In the introduction emphasis is laid on the importance of acquiring a knowledge of fundamental laws and principles and the prospective student is warned against selecting the technical and applied sides of any subject to the exclusion of these. Entomology is considered (pages 122, 147, 155-157) as to the points of view from which it may be studied, the number of entomologists in the United States, their income, qualifications and training, available government positions, possibilities as consultants. The paragraph near the top of page 122 would seem to forget the good advice of the introduction in not holding out prospects of higher grades of work in this field.—P. P. CALVERT.

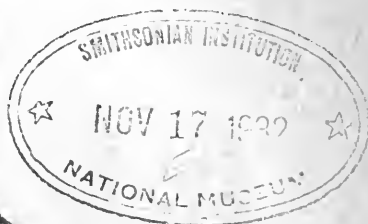
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# ENTOMOLOGICAL NEWS

**NOVEMBER, 1932**

Vol. XLIII

No. 9



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Portrait of 1884.

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# ENTOMOLOGICAL NEWS

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## The *Rhopaloceros* Lepidoptera of Scott County, Kansas.

By VIRGIL F. CALKINS, Scott City, Kans.

(Continued from page 215.)

### Family SATYRIDAE.

*CERCYONIS ALOPE* Fabr. Blue-eyed Grayling. The Grayling is only found sparingly over the county but is more plentiful in the northern part along the prairie stream known as Beaver Creek. It is subject to considerable variation.

*C. ALOPE TEXANA* Edw. Texan Grayling. This form during some seasons seems to be met with quite as commonly as the above. It is much lighter in color than *alope*, the spots being very large on the under surface of the wings, and the band a shade of ochre-yellow. Usually quite large in wing-expanse.

*C. ALOPE OLYMPUS* Edw. Olympus Grayling. This form is only taken during some years. Also has a wide wing-expanse.

*C. ALOPE BOOPIS* Behr. Boopis Grayling. This variety, strangely enough, is to be encountered in the same haunts as the Blue-eyed Grayling, but is not at all common.

### Family NYMPHALIDAE.

#### Subfamily HELICONIINAE.

*HELICONIUS CHARITHONIA* L. The Zebra Butterfly. This is perhaps the most interesting, and unusual, of all butterfly captures in this vicinity. Only one specimen has ever been taken in Scott County. Two days before its capture, a terrific wind and dust storm blew up from the southeast; when this abated two days later, the next morning the butterfly was seen fluttering about a species of locust which was very fragrant with bloom. The specimen was worn, indicating that it had been blown in in the wake of the storm. The author has taken other species of butterflies and moths not local to this region that owed their presence to wind storms which carried them from more southern regions.

*DIONE VANILLAE INCARNATA* Riley. Gulf Fritillary. Not a very common insect this far north, stray specimens having been taken from May to September, usually after wind storms from the south. It is interesting to note the effect of wind on the lepidoptera of this region. In the Great Plains Region of the middle-west, dust and wind storms are of quite frequent occurrence; in fact, much more common than rain storms. They usually blow up from the south, southeast, or southwest, and are, as a general rule, more common in early spring, but more terrific and destructive in August. Great clouds of very fine loessial dust, fanned by a brisk wind, haze the sky, sifting into homes and dwellings. Owing to the electrical effects of such storms, they are very destructive to tender vegetation and foliage, scalding and burning the leaves to a crisp. After such a storm of any intensity, which does not last more than two or three days in duration, insects of various orders may be taken in tattered condition, indicating the struggles they have had with the force that brought them northward.

#### Subfamily NYMPHALINAE.

*EUPTOIETA CLAUDIA* Cram. The Variegated Fritillary. A very common insect from early spring unto late fall. The author has observed the young larvae to feed on *Portulaca* and *Passion Vine*. In places where violets grow, in the southern part of the county, it is especially abundant.

*ARGYNNIS IDALIA* Dru. Regal Fritillary. Found occasionally in the northern part of the county along Beaver Creek. But one female has ever been taken. The insect is unusually large hereabouts.

*A. CYBELE* Fabr. The Great Spangled Fritillary. The Great Spangled Fritillary also is uncommon, being taken sparingly in the northern part of the county in the vicinity of Beaver Creek, where violets grow. Now and then, a stray specimen is noticed in town.

*PHYCIODES GORGONE* Hbn. (*ismeria* Bdv. & Lec.) *Ismeria* Crescent-spot. Common some years only, usually in the spring. In recent years few specimens have been noticed.

PHYCIODES NYCTEIS Dblidy. & Hew. Nycteis Crescent-spot. Known only by a battered female specimen taken during the summer of 1932. The species should be common, however.

PH. VESTA Edw. Vesta Crescent-spot. A very rare little *Phyciodes* in this region. Very few specimens have been taken, and, while rather fresh in appearance, it is probable that they were only strays blown in after dust storms. The insect also occurs in south central Kansas in the vicinity of Harper.

PH. THAROS Dru. Pearl Crescent. This very common little butterfly plays almost everywhere throughout the spring and summer, and is abundant in the fall.

PH. THAROS MARCIA Edw. Marcia Crescent. Merely the early spring form of the above. Common.

PH. PICTA Edw. Painted Crescent-spot. A very beautiful species of the Crescent-spot group which is taken only every few years. When it occurs, it is usually fairly plentiful. A very clean-cut little species, and it soon becomes worn.

ANTHANASSA (ERESIA) TEXANA Edw. The Texas Eresian, Texas Crescent. A non-local insect which is sometimes taken in the fall of the year.

CHLOSYNE (SYNCILOË) LACINIA Dru. Lacinia Butterfly. Another species which has strayed far from its regular range. Only one or two specimens have been taken.

MESTRA (CYSTINEURA) AMYMONÉ Men. The Texas Bagvein). A very much prized capture. The author secured a few specimens in August and September of 1931, and others have been noticed. The insect has a very peculiar method of flight.

POLYGONIA INTERROGATIONIS Fabr. Violet-tip Butterfly. Question Sign. Is found commonly almost everywhere.

P. INTERROGATIONIS FABRICII Edw. This form is also common, especially in September. By looking for a tree from which sap is oozing, one can usually gather a number of specimens of this fine butterfly. *B. interrogationis* is becoming a pest in some prairie regions where its larvae feed on Chinese Elms completely defoliating small trees.

P. COMMA Harris. The Comma Butterfly. Scarce, and seldom taken.

P. COMMA DRYAS Edw. This, as the above, is also scarce. An occasional specimen is sometimes picked up in late September or October.

P. PROGNE Cram. Currant Angle-wing. Very rare, but one specimen having been taken. Possibly a visitor from more northern localities.

AGLAIS ANTIOPA L. The Mourning Cloak. The handsome Mourning Cloak should be a rather common insect in prairie regions, but it is apparently not the case. Fresh specimens, from caterpillars having fed on Poplar, have been taken in the city. It is more common in the vicinity of the creek in the northern part of the county where willows are to be found.

VANESSA ATALANTA L. The Red Admiral. A very common insect where its food-plant is abundant.

V. VIRGINIENSIS Dru. (*huntera* Fabr.) Virginia Lady, Hunter's Butterfly. While not as common as the Red Admiral, it is plentiful.

V. CARDUI L. The Painted Lady, Thistle Butterfly. Abundant because of the widespread distribution of its food plant.

JUNONIA COENIA Hubn. Buckeye Butterfly. The pretty Buckeye is scarce in this region.

BASILARCHIA ARCHIPPUS Cram. (*dissipus* Godt.) The Viceroy. A few specimens of the Viceroy Butterfly are taken throughout the county, but it is more common along Beaver Creek where its food plant, Willow, is to be found.

CHLORIPPE CELTIS Bdv. & Lec. Hackberry Butterfly. Hackberry butterflies are not as common as they should be in a prairie region. Taken fairly commonly along the creek where hackberry trees are to be found.

CH. CELTIS ANTONIA Edw. Antonia Hackberry Butterfly. Rare. But few specimens have been taken. It flies in company with *celtis*.

CH. CELTIS MONTIS Edw. Mountain Emperor. This form of *celtis* represents, I believe, a wind-blown butterfly coming from the southwest. Only a small number of specimens have been taken.

CH. CLYTON Bdv. & Lec. Tawny Emperor. The Tawny Emperor also flies in company with the other Hackberry butterflies in the northern part of the county, but is not commonly taken.

ANAEA ANDRIA Scud. Goatweed Emperor, Goatweed Butterfly. The striking and beautiful Goatweed Butterfly is abundant in late fall. Very few specimens are ever noticed in the spring or summer save those which have hibernated. It begins to appear in September and flies until late October. The Goatweed Butterfly is a very interesting butterfly; one notices it sailing high in the sky, with outspread wings, floating something after the manner of a hawk, and when it happens to spy a bit of decayed fruit, or a garbage container, down it comes post haste and it has its favorite feast. Decayed water melon rinds are an excellent bait and the author has taken scores of specimens by using this fruit. The creatures become so absorbed in the sweet fruit that, by careful approach, very many of them may be taken. As many as eight or ten specimens have been captured simultaneously on one water melon rind.

A. MORRISONI Edw. Morrison's Goatweed. This unusual butterfly also represents a wind blown species in this locality. It flies with *andria* and but three or four individual specimens have been taken, and they in very poor condition. Very rare, and a possibility only after a southwestern wind.

#### Family LIBYTHEIDAE.

LIBYTHEA BACHMANNI Kirt. The Snout Butterfly. Not uncommon in favorable localities; where Hackberry trees grow it is fairly plentiful, but it seems to be a hard species to get in perfectly fresh condition. It is a very pugnacious little butterfly. Male specimens have been observed sitting on branches of twigs of small trees, and whenever any other butterfly passed by, out they would dart and give merry chase to the trespasser.

L. CARINENTA Cram. Carinenta Snout Butterfly. I have taken numerous specimens of the Snout Butterfly that is called by some authorities, *carinenta*, but upon which other authorities disagree. At any rate very light-colored specimens of the Snout Butterfly are not uncommon, whether they be a species, or merely a form or race of *bachmanni*.

L. CARINENTA LARVATA Stkr. Larvata Snout. A female specimen or two of the Snout Butterfly which has been called *larvata*, has been captured.

(To be continued.)

## Records of Tachinidae from Minnesota and Other States (Diptera).\*

By JOHN ALLEN ROWE.

Some time ago a large number of Tachinidae were sent to me by the University of Minnesota for identification. The following list includes locality records not only for Minnesota, but for other States based on specimens included in the collection.

In most cases, the species were represented by a generous series, specimens of which are in the collections of the University of Minnesota at Minneapolis, Minnesota, and the University of Utah at Salt Lake City, Utah.

*CISTOGASTER OCCIDUA* Walk. MINNESOTA: Washington County, July 8, 1910; Ramsey County, August 5, 1922 (A. Hertig); Ft. Snelling, August 3, 1923 (H. H. Knight). NEW YORK: Batavia, July 8, 1913 (H. H. Knight).

*GYMNOSOMA FULIGINOSA* Desv. MONTANA: Butte, August 4, 1921 (F. M. Sallee); Scot County, August 25, 1925 (A. A. Nichol). MINNESOTA: Marshall County, July 28, 1910; Ramsey County, July 13, 1910; Rock County, June 24, 1910; Chicago County, July 15, 1911; Anoka County, July 3, 1924 (C. E. Mickell). NORTH DAKOTA: Trail County, July 4, 1923 (A. A. Nichol).

*ELIOZETA FLAVA* Tns. MINNESOTA: Scot County, Dunes near Jordan, August 1, 1922 (W. E. Hoffman); Anoka County, Fridley Sand Dunes, August 8, 1922 (A. T. Hertig).

*ALOPHORA FUMOSA* Coq. NORTH DAKOTA: Trail County, August 4, 1923 (A. A. Nichol). MINNESOTA: Marshall County, July 28, 1910.

*TRICHOPODA CILIPES* Wied. FLORIDA: Orland, May 21, 1925 (O. C. McBride).

*T. PENNIPES* Fab. TEXAS: Eastland County, April 29, 1921 (Grace O. Wiley).

*MYIOPHASIA NIGRIFRONS* Tns. MINNESOTA: Taylors Falls August 5, 1925 (S. Kepperly); Norman County, August 28, 1923 (A. A. Nichol).

*CRYPTOMEIGENIA SIMPLEX* Curt. MINNESOTA: St. Anthony, June 2, 1921 (W. E. Hoffman); Newport, May 12, 1922 (C. E. Mickel); Etter, May 18, 1930 (Leslie Bergren).

*C. SP?* MINNESOTA: Hennepin County, poplar woods, May 25, 1922 (A. A. Nichol); North Branch, August 6, 1922 (W. E. Hoffman).

\* Contribution from the Zoological Laboratory of the University of Utah.

ADMONTIA RETINIAE Coq. MINNESOTA: St. Anthony Pk., Baptism Creek, Lake County (W. E. Hoffman).

CLAUSICELLA TARSALIS Coq. MINNESOTA: St. Paul, May 25, 1926 (S. Kepperley); St. Anthony Pk., September 6, 1921 (H. H. Knight).

POLIDEA AREOS Walk. MINNESOTA: Willow River, August 7, 1922 (W. E. Hoffman); Two Harbors, August 20, 1920 (H. H. Knight). NEW YORK: Batavia, September 8, 1914 (H. H. Knight). VIRGINIA: Ft. Humphreys, September 16, 1928 (C. E. Mickel).

LEUCOSTOMA ATRA Tns. MINNESOTA: Norman County, September 13, 1922 (A. A. Nichol). NEW YORK: Batavia, August 1, 1913 (H. H. Knight).

LINNAEMYIA COMPTA Fall. MINNESOTA: Lake City, July 7, 1921 (P. L. Keene); St. Anthony Pk., August, 1911; Breeding Cage No. 1012; Minneapolis, July 5, 1922 (H. Hertig); Clear River, July 16, 1925 (C. B. Philip). NEBRASKA: Lincoln, June 30, 1925 (C. E. Mickel).

L. HAEMORRHOIDALIS F. MINNESOTA: Warroad, July 16, 1925 (C. B. Philip).

EXORISTA RUSTICA Fall. MINNESOTA: North Branch, August 6, 1922 (W. E. Hoffman).

E. EUFITCHIAE Tns. MINNESOTA: Anoka County, Fridley Sand Dunes, July 21, 1922 (C. E. Mickel).

MASICERA XYLOTA Curr. MINNESOTA: St. Paul, near Fish Hatchery, July 24, 1922 (W. H. Hoffman); St. Anthony Pk., June 6, 1923 (H. H. Knight). MONTANA: Butte, August 4, 1921 (F. M. Sallee).

TACHINA ROBUSTA Tns. MINNESOTA: St. Anthony Pk., June 2, 1921 (W. E. Hoffman); Hennepin, poplar woods, May 25, 1922 (W. E. Hoffman); Ramsey County, University Farm, June 6, 1925 (C. B. Philip); Ft. Snelling, April 19, 1921 (R. N. Chapman). NEBRASKA: Halsey, September 1, 1924 (R. W. Dawson).

T. VARLATA Curr. MINNESOTA: Slayton, April 26, 1926 (C. E. Mickel); Etter, May 18, 1930 (Leslie Bergren); Hennepin County, May 21, 1925 (C. B. Philip). NEBRASKA: Halsey, April 11, 1925 (R. W. Dawson).

WINTHEMIA MILITARIS Walsh. MINNESOTA: Jordan, Sandarea, July 13, 1923 (A. T. Hertig); Breeding cage records probably of the University of Minnesota: Nos. 1419a, 1411B, 1471a, 1394B, 1411a.

W. sp. Many records from MASSACHUSETTS, NEW YORK, and MINNESOTA.

PARADIDYMA SINGULARIS Tns. KANSAS: 1922 (W. E. Hoffman). CALIFORNIA. MINNESOTA: Elkhorn Creek, Carlton County, August 18, 1920 (H. H. Knight); St. Paul, August

31, 1926 (S. Kepperley); Cramer, August 10, 1922 (H. E. Hoffman).

*GONIA CARINATA* Tot. COLORADO: Pingree Pk., August 17, 1926 (R. W. Dawson).

*G. EXUL* Will. NEBRASKA: Halsey, August 29, 1924 (R. W. Dawson).

*G. FRONTOSA* Say. Many localities.

*G. LONGIFORCEPS* Tot. NEBRASKA: Halsey, August 14, 1925 (R. W. Dawson). MINNESOTA: Anoka County, June 30, 1923 (H. H. Knight).

*G. SAGAX* Tns. MINNESOTA: Hennepin County, May 21, 1925 (C. B. Philip).

*CHAETOGAEDIA ANALIS* v. d. W. MINNESOTA: Norman County, September 13, 1922 (A. A. Nichol).

*PELETERIA CLARA* Curt. NEBRASKA: Halsey, September 3, 1924 (R. W. Dawson).

*P. CAMPESTRIS* Curt. COLORADO: Pingree Pk., August 7, 1922 (W. E. Hoffman). CALIFORNIA: Mondoe County (J. Hornton). TEXAS: El Paso County, July 7, 1921 (Grace O. Wiley).

*P. ITERANS* Walk. MINNESOTA: Ft. Snelling, Hennepin County, Anoka County, St. Anthony Pk., Norman County, Rock Creek, Chicago County, Holt County.

*P. sp?* Female. Many localities

*ARCHYTAS APICIFERA* Walk. MINNESOTA: St. Anthony, September 19, 1928; Hennepin County, August, 1926 (J. E. Hill); Clarkfield, August 16, 1930 (Leslie Bergren); Koochiching County, August 20, 1910; Lesueur County. NEW YORK: Batavia, July 31, 1913 (H. H. Knight); Portage, August 9, 1914 (H. H. Knight). NORTH DAKOTA: Trail County, August 4, 1923 (A. A. Nichol).

*A. ATERRIMA* Desv. MINNESOTA: Warroad, July 16, 1925 (C. B. Philip); Olmsted County, September 5, 1904 (C. N. Ainslie). Koochiching County, August 17, 1923 (A. A. Nichol); Lake City, July 7, 1921 (P. L. Keene). VIRGINIA: Ft. Humphreys, September 16, 1928 (C. E. Mickel). NEBRASKA: Halsey, August 15, 1925 (R. W. Dawson).

*A. FLORIDENSIS* Tns. MINNESOTA: Clear River, July 16, 1925 (C. B. Philip).

*A. NIVALIS* Curt. MINNESOTA: Easton, July 18, 1924 (C. E. Mickel); St. Anthony Pk.; Norman County, September 13, 1922 (A. A. Nichol); Faribault, June 20, 1922 (W. E. Hoffman); Anoka County, Moores Lake, August 3, 1924 (C. B. Philip).

*A. PILOSA* Drury. MINNESOTA: St. Paul, August 12, 1924 (R. W. Dawson); Minneapolis, June 29, 1930 (Leslie Bergren).



FABRICIELLA MONTANA Tbs. MINNESOTA: Tower City, August 27, 1920 (H. H. Knight); Itasca Pk., July 24, 1914; Cook County, July 20, 1926 (L. W. Orr); Salol, April 15, 1925 (C. B. Philip).

F. SPINOSA Tot. UTAH: Emery County, August 10, 1921 (Grace O. Wiley).

F. LATIANULUM Tot. OREGON: Corvallis, July 6, 1890.

F. ALGENS Wied. MINNESOTA: St. Louis County, August 27, 1910; Hennepin County, June 7, 1910; Baptism Creek, August 21, 1920 (H. H. Knight); Cramer, August 10, 1922 (W. K. Hoffman); Itasca Pk., July 20, 1914; Beltrami County, August 2, 1910; Clear River, July 17, 1925; Chicago County, July 15, 1911; Salol, April 15, 1925 (C. B. Philip). NEW YORK: Batavia, July 11, 1913 (H. H. Knight). OREGON: Corvallis, June 5, 1898. COLORADO: Pingree Pk., August 20, 1926 (R. W. Dawson).

EPALPUS SIGNIFER Walk. MINNESOTA: Hennepin County, May 21, 1925 (C. B. Philip).

HYSTRICIA ABRUPTA Wied. WASHINGTON: Seattle, July, 1922. MINNESOTA: Warroad, July 16, 1925 (C. B. Philip). PENNSYLVANIA: Allegheney, June 20, 1890.

PARADEJEANIA RUTILIOIDEA Jaen. CALIFORNIA: Wildwood Canyon, September 8, 1928 (M. Froiland).

JURINIA METALLICA Desv. VIRGINIA.

*Species Not Included in the Aldrich Catalogue of 1905:*

BUCENTES CRISTATA F. MINNESOTA: St. Paul, May 25, 1926 (S. Kepperley); Norman County, June 4, 1923 (A. A. Nichol); Hennepin County, May 27, 1922 (A. A. Nichol); Lake County, Caribou Creek, August 10, 1922 (W. E. Hoffman).

CYLINDROMYIA ARGENTIA Tbs. MINNESOTA: Anoka, Fridley Sand Dunes, June 30, 1922 (Hertig); Divide County, July 20, 1921 (F. M. Sailes); Owatonna, June 25, 1931 (P. L. Keene); Winona County, July 1, 1922 (H. H. Knight). NEW YORK: Batavia, July 13, 1914 (H. H. Knight). WYOMING: Norman. NEBRASKA: Halsey, August 31, 1924 (R. W. Dawson).

C. EUCHENOR Walk. MINNESOTA: Ft. Snelling, July 28, 1922 (A. A. Nichol); Lake City, July 6, 1921 (P. L. Keene); Norman County, June 29, 1922 (A. A. Nichol); St. Anthony Pk., July 9, 1921 (W. P. Hoffman). NORTH DAKOTA: Frail County, August 4, 1923 (A. A. Nichol). NEBRASKA: Halsey, August 29, 1924 (R. W. Dawson).

DORYPHOROPHAGA DORYPHORAE Riley. MINNESOTA: St. Anthony Pk., July 9, 1923 (H. H. Knight).

ERYCIA RUTILA Mg. NEBRASKA: Halsey, August 13, 1925 (R. W. Dawson).

*E. VARIFRONS?* MINNESOTA: Ramsey County, August 24, 1922 (Clayton Johnson). In too poor condition for determination.

*MERICIA AMPELUS* Walk. MINNESOTA: Norman County, November 22, 1923 (A. A. Nichol). COLORADO: Pingree Pk., August 20, 1926 (R. W. Dawson).

*PIROSINELLA FULVICORNIS* Coq. NEBRASKA: Halsey, August 30, 1924 (R. W. Dawson).

*SPATHIDEXIA DUNNINGI* Coq. NEBRASKA: Halsey, August 13, 1925 (R. W. Dawson).

*STEVENIOPSIS SINUATA* Tns. COLORADO: Pingree Pk., August 26, 1926 (R. W. Dawson).

*WAGNERIA VERNATA* West. MINNESOTA: Lesueur County, near fish hatchery, September 13, 1923; Grand Marais, August 13, 1922 (W. E. Hoffman).

*ZENILLIA FUTILIS* O. S. MINNESOTA: Norman County, August 5, 1923 (A. A. Nichol). NEBRASKA: Halsey, August 29, 1924 (R. W. Dawson). MONTANA: Missoula, summer, 1925 (Ray Knudson).

*Z. VALENS* Ald. MINNESOTA: Two Harbors, August 9, 1922 (H. H. Knight); St. Paul, June 12, 1926 (S. Kepperley); Minneapolis, July 5, 1922 (A. Hertig). NEBRASKA: Halsey, August 14, 1925 (R. W. Dawson).

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### ***Platycordulia xanthosoma* Williamson (Odonata: Corduliinae).**

By RALPH D. BIRD, University of Oklahoma, Norman, Okla.<sup>1</sup>

This dragonfly was first described by Williamson ('08) from two males taken by him on the Poteau River near Wistar, Oklahoma. The female remained unknown until 1919, when it was described by Kennedy<sup>2</sup> from two specimens, the type from Chautauqua Co., and a paratype from Miami Co., Kansas. These counties are both in the southeastern corner of the state. Since then a male was taken at Tuskahoma, Oklahoma, July 16, 1925, by A. I. Ortenburger, a male at Gore, Sequoyah County, Oklahoma, July 10, 1929, a male at Oil Springs, Johnston County, Oklahoma, April 29, 1929, by R. D. Bird, and a female and two males on Mountain Fork River near Broken Bow,

<sup>1</sup>Dept. of Zoology, Contribution No. 109.

<sup>2</sup>Kennedy, C. H. 1919. Studies in Kansas Insects: The Dragonflies of Kansas. Univ. of Kansas Biol. Series, Vol. XVIII, No. 1. Bull. No. 11, Dept. of Ent.

Oklahoma, by Earl Pritchard, June 12, 1930. These were the only records known to me until I found it in great numbers on Cunneo Tubby Creek, near Wilburton, Oklahoma, in June, 1931. The reason for the scarcity of this species in collections appears to be the fact that, unlike most Odonata, it is crepuscular. It undoubtedly occurs in similar habitats in Arkansas and Missouri.

Cunneo Tubby Creek in the section most abundantly inhabited by *xanthosoma* is a small sluggish stream with muddy bottom and heavily wooded banks. A few specimens were taken in shady places during the day, but these flew only when flushed and might otherwise have been overlooked. They did not appear in flight until the dusk of evening started to close. Then both sexes were present everywhere about the edges of the pools, usually flying at a height of 1 to 3 feet over the water close to shore. They followed more or less regular beats, frequently hovering in little bays, and except for the failing light were not at all difficult to capture. Occasionally two males would chase each other round and round in short circles, gradually getting higher and higher and then separate, but generally they were sociable and several would be seen flying close together. Some flew back and forth over willows bordering the stream where midges were swarming. Although careful watch was kept, no ovipositing females were seen. One tandem pair was observed on June 23. Many exuvæ were collected about the edges of the pool in the hopes of finding the yet unknown nymph but they proved to be mostly *Dromogomphus spinosus* which was also very common there.

On July 10, Mr. Wilton Fisher observed a female ovipositing at 6:30 p.m. She was near the ford on Cunneo Tubby Creek where I had seen such large numbers of this species. He says in his notes. "She was alone, hovering about 18 inches over a small quiet pool. She would dip down, tap the water with the tip of her abdomen, rise to the same height, move forward about two feet and repeat the operation. When she neared the bank she would fly back and work across the pool in a similar manner. She dipped 25-30 times before flying away. Later she returned and was captured."

## Macrolepidoptera: Species and Lower Concepts.

By J. D. GUNDER, Pasadena, California.

(Continued from page 175)

### THE TERM FORM.

The term "form" makes a very useful category and is often employed by listers to hold a seemingly doubtful name or a name which is little understood and which might otherwise be placed in the synonymy. Also this concept provides the first step or position above transition forms for groups which have been found to become numerous enough to "graduate". For example, tr.f. *sincepunctata* Comst. of *G. behri australis* Grin. This variation is sufficiently recurrent and should be listed as a form, as in recently discovered localities, it is as plentiful as typical. Another well-known example of a named form is *Aglais milberti subpallida* Ckll. which is found everywhere in the west, perhaps more abundantly in some regions, but everywhere as a matter of fact. Form is also a convenient term to designate examples which connect or show relationship between species and races or between races and races. Names have a real value in such instances whether the form connects extant or extinct species or divergent entities in process of formation. Some butterfly groups, more often certain tropical denizens, have a wider range of consistent variation within their kind than others. This wider range of specific character deviation seems indicative and can be noticed within any fairly long series, but sometimes authors are apt to pick out a specimen or two and consider that the seeming dissimilarity requires a name; however, such separations may mean little under a new title as the old title probably covered such fluctuations, the author, of course, not realizing the confines of the normal range. I use the word fluctuation in the sense that it indicates neither progressive nor retrogressive change in the species such as temperate zone transition forms obviously induce for their species. Take *Heliconius melpomene*, for example, or the eye colors of *Drosophila melanogaster*, it would do little good and be a present-day waste of space to have a lot of form names (that is what they would be) applied to these. I say "present

day" because if named just now without objective research possibilities being cited, such names would be offered simply for the sake of naming. Our *Junonia coenia* Hbn. has colored eye-spots and upper as well as under side shadings which vary, the eye-spot colors, for example, corresponding to the various similar ground colors which one finds on the under sides of the secondaries in different specimens, to wit: red, orange, yellow, blue, green, etc. Fortunately no one has applied color form names to these as yet, there being no particular research problem evolved for them warranting such application. In Europe many different names have often been given to a single variable species. Perhaps many of these "idle names", or at least a portion, can be saved under the term form; certainly that is the only hope for many of them.

Form is a term which indicates that the described variation occurs in both sexes. (We have the category of sexual forms, when needed, for those of either sex alone.) It would be an incongruity then to have a female form (f. ♀), for example, of a form (f.), as either would be of their parentage instead of each other. Likewise, it is impossible to have a transition form (tr.f.) of a female form (f. ♀) as stated on page 171 in the July installment of this article. Transition forms are not sex-limited; in other words the same melanifusism, for example, ample, occurs in both sexes, as well as in varying sexes of the same species or race as the case may be.

In the first section of this article (July number), on the lower half of page 170, I deplored the pernicious use of classification terms, especially those of form and race. If authors are "hard up" for expressive phrases to designate groups without involving themselves in classificatory discussions, it is suggested they make use of any of the following expressions; i.e., "This group—", "That colony—", "Those southern examples—", "My series from—", "Our specimens of—", "This regional group—", "That western distribution—", "This central American division—", "Those variations of—", etc. The use of these or similar grammatical combinations in plain or scientific text oft-times save distortion of definite terms in the minds of student readers and incidentally saves the author the

necessity of definite classification or of uncertain classification. We must try to preserve classification terms by conserving them. By giving a little thought to the matter, this is easy to do.

#### THE TERM SEASONAL FORM.

I believe there is no great necessity for more than two subdivisions in this section. Some seasonal forms are in reality little more than races in neighboring regions. In this connection the question of type locality is important and opens up a chance for further investigation. A named seasonal form should have the same, or nearly the same, type locality as its parental stock. Oft-times older authors disregarded this rule, especially when dealing with western United States material and hence brought on our present difficulties in categorical relationships. Future revisers will have to pay more rigid attention to type localities, rather than to asserted seasonal periods, if we are to improve certain strained classifications and lead the way out of a rather obvious congestion which exists at present. I refer to the *Ascia* as listed in the 1926 Diurnal Check List. In America we should not countenance the European tendency to name seasonal forms merely because they are seasonal forms. Names in this group should be based only on variation which is unquestionably divergent.

#### THE TERM SEXUAL FORM.

The listing of the white females or yellow females, as the case may be, of *Eurymus* under the term "ab." has been a big taxonomic mistake for many years. Of course only precedent has been followed by our cataloguers, but it has been a confusing source of error and the time is ripe for this much needed correction. All these *Eurymus* should come under the sexual forms with the sign—f. ♀. Note the location on the classification chart (Plate VII, July number) of the sexual forms, as being just above that of the Change of Color division in the transition forms; a logical and natural position which I hope is noted. In Change of Color transition forms both sexes always show the same color modification, so these female

*Eurymus*, representing only the one sex, cannot consistently come under that heading. Their males do not record color change. In other words, these female *Eurymus* are sex-limited as to color change and therefore are sexual forms in reality; whereas transition forms are not sex-limited, both sexes being equally capable. It is thoroughly advisable to have handy reference names applied to these sexual forms as there is so much future work to be accomplished relative to showing why certain species have white females commonly with few yellow females, while others have yellow females and few if any white representatives, etc. Where there is a recognized problem, there is always need of meritorious names and the *Eurymus*, including others, present an excellent, though far from the most important, example of this need.

Professional taxonomists of repute, who list lepidoptera continually, never suggest less naming because of "over-work", but always encourage more and better naming if for additional comprehension. It is only amateur taxonomists, reaching their point of inability, who betray their predicament by voicing the "over-worked", "over-burdened" and "swamped" idea. The psychology of such appeals is the attempted conversion of others to their own rather low level of perplexity. Fortunately for entomological pursuit, all of us do not care to regress, so we are not deceived by propaganda advising restoration of some old methods against a continued renaissance through newer standards of progress. The tendency to belittle naming has always been prevalent among a small though restricted group of entomologists schooled to dogged conservatism. Acquiescence in such a principle is taxonomically easy because it follows the path of least resistance. The attitude of these workers is often due directly to misapprehension through lack of study material, although it is sometimes due to an underestimation of modern research necessity. Those who complain about names of lower concepts should remember that consideration of lower concepts focuses attention and concentrates study on variation. By recognizing variation through varietal names and through tentative classification thereof, we aid in the determination of causes. The final analysis of cause would be retarded or be

made impossible if we did not sum up effect (which is through classification) in a simplified manner (which is by names). It seems that every so often it is necessary to remind a rising entomological generation of the reason for names, why they are advisable, why they are given, etc. I list a few of the more important reasons as follows:

*First.* Without names, effect would be lost in a maze of scattered and generalized literature without a "handle" to recognize it by or a "handle" to remember it by.

*Second.* Without names, illustrated literature of scientific nature would be under a great handicap for simplified explanation.

*Third.* Without names, the initiative of discovery and the "glory" thereof is destroyed for the amateur and typical collector and nine-tenths of new descriptions are based on their finds. (Many of my readers should appreciate this point.)

*Fourth.* Without names, definite description would be impossible, for writers never describe accurately except when naming; and lower concept names, more than others, are based on special, not ordinary, description.

*Fifth.* Without names, there would be no types and these ARE THE REAL basis of conception. Types, by the way, are the only units being really preserved to posterity. (See the valuable paper by C. E. Mickel in the June, 1930, issue of *Psyche*, entitled, "Descriptions plus Types vs. Descriptions alone".)

I might add that without names, entomological workers would not spend their time and money simply to "*collect variants . . . figure them and publish data on them . . . just for the geneticists*", as has been suggested. This is one of those truly hopeless and impracticable ideas which has appeared in print in connection with anti-naming propagandism. It is hard enough to get authors to illustrate their own types at time of original description when the incentive is strongest to do so, much less expect the general entomological public to collect and figure just for the geneticists. (See page 327, December, 1930, ENTOMOLOGICAL NEWS,

(To be continued.)



### A Good Butterfly Transition Form (Lepid.: Nymphalidae).

The question of the origin of aberrant forms of Lepidoptera is one that has come in for much discussion during the past few years, and much classificational ink has been spilled in attempts to clear the matter. Unfortunately, many good authorities feel, the nomenclature has been so muddled by the naming of so many "races", "transition forms", etc., ad nauseum, that the whole matter has become a bone of contention, until American Lepidopterists almost resemble two armed camps, and one wonders if the original question has not been lost sight of in the struggle.

I am rather a humble member of the army of those who derive pleasure from prying into the insect life surrounding us, and therefore my views may not be strictly scientific, being those of a field collector rather than of a trained student. However, erroneous as any opinion of mine may be, may I state that as I see the matter it is in this light:—Are these "transition forms" produced by environment, climatic changes, and circumstance, or are the factors for their production carried in the racial stock as Mendelian recessives, heritable and cropping out at intervals? The former view would indicate that many, many names now on check-lists should be treated as synonyms, inasmuch as a true "sport," the product of shifting whims of the elements, should not and cannot be included in any scientific attempt at classification.

However, I cannot incline to such a view, in many cases. Perhaps there are a good number of atypical specimens that cannot be treated in any other way, in fact my disgust of the tribe of "splitters" is just as profound as it is of anyone who has attempted to sail with the veering winds of recent nomenclatorial changes. But we know that many transition forms are valid and reoccurring, persisting in uniformity, even when taken from widely separated localities. How can such be explained, except in the light of Mendelian inheritance? And such forms should be treated as such, and given names to mark them off from the typical, should they not?

Here is a case in point, from my own collecting experience, one so clear-cut and unmistakable that I consider it worthy of record:—

During the season of 1929 I took two male specimens of *Euphydryas phaeton streckeri*, Elsw., in a swale near the Penobscot River, about a mile above Lincoln, Maine. In looks they matched *streckeri* as shown by Mr. J. D. Gander, on plate B, in the November, 1927, ENTOMOLOGICAL NEWS, being rather far advanced in melanifusism. Next year (1930) I took four

more of the same, the specimens being almost identical with those of the preceding year, and last summer (1931) I took another of them, and saw more, all being very similar in the amount of black.

Now, here are seven in a row, taken during three seasons, in a place no larger than an average dooryard. The reader may draw his own conclusions, but I shall believe the name *streckeri*, Elsw., well given, and from this experience shall believe that in this case the true explanation lies in the inheritance of recessive factors in the racial stock, and apparently the dark strain is well established in this particular colony.

L. P. GREY, Lincoln, Maine.

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### The Pigeon Hawk as an Odonatologist.

On September 13, 1930, I shot a pigeon hawk, *Falco columbarius columbarius* (identified by Oberholser), near Birtle, Manitoba. At the time the bird was flying over a wheat field, but there were several sloughs at no great distance, and dragonflies, *Sympetrum danae*, *S. costiferum*, and *Aeshna interrupta* were common.

I was surprised on examining the contents of the crop and stomach of the hawk to find its food consisted entirely of dragonflies. The following species were identified:

*Sympetrum danae* Sulzer: 7 females, 1 male.

*Sympetrum costiferum* Hagen: 1 female.

*Aeshna interrupta* Walker: 3 males.

The *Sympetrum*s had been swallowed whole, but the *Aeshna*s had the wings missing and had apparently been torn apart before being swallowed.

It would be interesting to know if other hawks feed on the larger Odonata at the times of their abundance.†

Another interesting observation on *Sympetrum costiferum* as a food of birds was made at Vernon, B. C., on August 12, 1931. This insect was emerging from a small marshy pond in large numbers and as the teneral fluttered feebly in the grass they were at once pounced upon by a kingbird and four cedar waxwings which were sitting on telephone wires close by.—RALPH D. BIRD, University of Oklahoma, Norman, Oklahoma.\*

\* Department of Zoology, Contribution No. 108.

† References to hawks feeding on Odonata in North and South America and Europe are summarized in Trans. Amer. Ent. Soc. XX: 205 (1893). Further records are given by R. Martin in Revue Française d'Ornithologie No. 12, April, 1910, No. 21, Jan., 1911, and No. 26, June, 1911.—Editor.]

## Entomological Literature

COMPILED BY LAURA S. MACKAY UNDER THE SUPERVISION OF  
E. T. CRESSON, JR.

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 figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the list of Periodicals and Serials published in our January and June issues. This list may be secured from the publisher of ENTOMOLOGICAL NEWS for 10c. The number of, or annual volume, and in some cases the part, part, &c. the latter within ( ) follows; then the pagination follows the colon :

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

\*Papers containing new forms or names have an \* preceding the author's name.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

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.

†Note the change in the method of citing the bibliographical references, as explained above.

*Papers published in the Entomological News are not listed.*

**GENERAL.**—Cockerell, T. D. A.—Collecting bees in the Belgian Congo. [15] 32: 399-407, ill. Eisentraut, M.—Biologische studien im bolivianischen Chaco. [Sitz. Gesell. Naturf. Freunde Berlin] 1931: 167-192. Forbes, W. T. M.—How old are the Lepidoptera. [90] 452-460. Fricke & Sizer.—Radiographs of insects. [31] 130: 436-437, ill. Johnson, Charles Willison.—Obituary by J. A. G. Rehn. [68] 76: 226-227. Oberholser, H. C.—American scientific organizations call for stability of rules of zoological nomenclature. [68] 76: 121. Pritchard, A. L.—Taxonomic and life history studies of the Ciscos of Lake Ontario. [Univ. Toronto Stud. Biol. Ser.] 41: 78 pp., ill. [Contains lists of insects found in stomachs of these fishes.] Pruthi, H. S.—Colonisation of the sea by insects. [31] 130: 312. Reich, P.—Durch banauentransporte eingeschleppte Arthropoden. [Mitt. Deut. Ent. Gesell.] 2: 146-149. Scheerpeltz, O.—Höhleninsekten und ihre erforschung. [Der Naturf., Berlin.] 9: 129-134. Scheerpeltz, O.—Eine neue Beleuchtungseinrichtung für Stereo-mikroskope vom Greenough-Typus. [Mitt. Deut. Ent. Gesell.] 3: 53-57, ill. da Silva Tavares, J.—Um novo caso de Trofobiose. [Bol. Acad. Cien. Lisboa] 3: 727-731. Stiles & Stanley.—Key-catalogue of parasites reported for Insectivora (Moles, Shrews, etc.) with their possible public health importance. [Nat. Inst. Health, Wash.] Bull. 159: 791-911. Strand, E.—Nochmals: Nomenklatur und ethik. Miscellanea nomenclatorica zoologica et palaeontologica. [Fol. Zool. Hydrob. Riga] 4: 103-133; 133-

147. **Thienemann, A.**—Die tierwelt der Nepenthes-kannen. [Archiv für Hydrobiol., Stuttgart] 11. (Suppl.): 1-54, ill.

**ANATOMY, PHYSIOLOGY, ETC.**—**Ahrens, W.**—Ueber die beziehungen zwischen Karyoplasma, Zytoplasma, Deutoplasma im reifenden Arthropodenei (nach untersuchungen an *Termes redemanni*). [Jenaische Zeit.] 67: 516-534, ill. **Boselli, F. B.**—Istinti materni del *Sehirus sexmaculatus* (Cydnidæ). [23] 26: 1-8, ill. **Brocher, F.**—Le mecanisme de la respiration et celui de la circulation du sang chez les insectes. [Arch. Zool. Exp. Gen.] 74: 25-32, ill. **Cockayne, E. A.**—A new explanation of the genetics of sex-limited inheritance in butterflies. [9] 65: 169-176. **Cowan, F. A.**—A study of fertility in the blowfly, *Phormia regina*. [43] 32: 389-392. **Drake, Tate & Harris.**—Preliminary experiments with aphids as vectors of yellow dwarf. [Iowa St. Coll. Jour. Sci.] 6: 347-355, ill. **Feuerborn, H. J.**—Die Psychodide *Maruina indica* sp. n. und ihre beziehung zu den Blepharoceriden. [Archiv für Hydrobiol., Stuttgart] 11. (Suppl.): 55-128, ill. **Franssen, C. J. H.**—Microscopische preparaten van chitineuze lichaamsdeelen van insecten. [Natuurhist. Maandblad] 21: 99-102. **Gillett and Wigglesworth.**—The climbing organ of an insect, *Rhodnius prolixus*. [Proc. R. Soc. Lond.] 111 (B): 364-376, ill. **Gösswald, K.**—Oekologische studien über die ameisenfauna des mittleren Maingebietes. [94] 142: 1-156. **Hiestand, W. A.**—Progressive paralysis of the nervous system of house flies by formaldehyde and anesthetics. [Pro. Indiana Acad. Sci.] 41: 433-437. **Hiestand, W. A.**—A comparison of the metabolic rates of various insects as determined by carbon dioxide output. [Pro. Indiana Acad. Sci.] 41: 441-444. **Himmer, A.**—Die temperaturverhältnisse bei den sozialen Hymenopteren. [Biol. Rev. & Biol. Pro. Cambridge Phil. Soc.] 7: 224-253, ill. **Jucci, C.**—Sulla presenza di batteriociti nel tessuto adiposo dei Termitidi. [Arch. Zool. Ital.] 16: 1422-1429. **Kaburaki & Kurihara.**—On the effect of light on the mating of the rice borer, *Chilo simplex*. [Pro. Imp. Acad., Tokyo] 8: 324-327, ill. **Koch, A.**—Ueber die symbiose von *Oryzaephilus surinamensis*. [Arch. Zool. Ital.] 16: 1430-1436. **Koch, C.**—Der nachweis des chitins in tierischen skeletsubstanzen. [46] 25: 730-756. **de Lerma, B.**—Osservazioni sui corpora allata del *Grillotalpa*. [Arch. Zool. Ital.] 17: 417-433, ill. **Lutz, F. E.**—Experiments with Orthoptera concerning diurnal rhythm. [40] 550, 24 pp., ill. **MacBride & Harrison.**—The inheritance of acquired characters. [31] 130: 128-129. **Marcu, O.**—Zur kenntnis stridulationsorgane der Hymenopterengattung *Mutilla*. [34] 100: 47-

48, ill. **Martini, E.**—Parasitismus in der zoologie. [Arch. Zool. Ital.] 16: 1299-1314. **Mellanby, K.**—The effect of atmospheric humidity on the metabolism of the fasting mealworm. [Proc. R. Soc. Lond.] 111 (B): 376-390. **Nowikoff, M.**—Ueber den bau der komplexaugen von *Periplaneta* (*Stylopyga*) *orientalis*. [Jenaische Zeit.] 67: 58-69, ill. **Patterson, J. T.**—A method for mounting specimens of *Drosophila* on microscopic slides. [68] 76: 258. **Ries, E.**—Die symbiose der Pediculiden und Mallophagen. [Arch. Zool. Ital.] 16: 1408-1421. **Saez, F. A.**—Variación numérica en correlación con la existencia de Cromosomas múltiples en "*Aleuas vitticollis*" (Acrididae). [Rev. Mus. La Plata] 33: 189-193, ill. **Scheffler, H.**—Beobachtungen und versuche zur ökologie der Trichopterenlarven. [94] 142: 157-190, ill. **Shull, A. F.**—Clonal differences and clonal changes in the aphid *Macrosiphum solanifolii*. [90] 66: 385-419. **Stammer, H. J.**—Die bakteriensymbiose der Donaciinen (Chrysomelidae). [Arch. Zool. Ital.] 16: 1397-1407. **Surber & Meehan.**—Lethal concentrations of Arsenic for certain aquatic organisms. [Trans. Am. Fish. Soc.] 1931: 225-239, ill. **Szalay, L.**—Missbildung bei einer Hydracarine. [34] 334-336; ill. **Tate and Vincent.**—Influence of light on the gorging of *Culex pipiens*. [31] 130: 366-367. **Thorpe, W. H.**—Petroleum bacteria and the nutrition of *Psilopa petrolei*. [31] 130: 437. **Uhlmann, E.**—Instinkt und entwicklung. Unter besonderer berücksichtigung des bauinstinkts der Trichopterenlarven. [Jenaische Zeit.] 67: 571-588, ill. **Unwin, E. E.**—On the structure of the respiratory organs of the terrestrial Isopoda. [Pap. & Pro. R. Soc. Tasmania] 1931: 37-104, ill. **Vayssière, M. P.**—Observations expérimentales sur le Criquet pèlerin (*Schistocerca gregaria*). [69] 195: 94-96. **Walczuch, A.**—Studien an eocidensymbionten. [46] 25: 623-729, ill. **Whiting & Anderson.**—Temperature and other factors concerned in male biparentalism in *Habrobracon*. [90] 66: 420-432. **Wladimirow & Smirnov.**—Experimente an wasserinsekten, die sich von Culicidenlarven ernähren. [34] 99: 192-206, ill. **Yeager, Shull & Farrar.**—On the coagulation of blood from the cockroach, *Periplaneta orientalis*, with special reference to blood smears. [Iowa St. Coll. Jour. Sci.] 6: 325-345, ill. **Zavrel, J.**—Praemandibeln einiger Dipterenlarven. [Arch. Zool. Ital.] 16: 1000-1004.

**ARACHNIDA AND MYRIOPODA.**—**Bequaert, J.**—On the ornate nymphs of the tick genus *Amblyomma* (Acarina: Ixodidae). [Z.f. Parasitenkunde] 4: 776-783, ill. **Elliott, F. R.**—Revision of and additions to the list of

Araneae (spiders) of Indiana. [Pro. Indiana Acad. Sci.] 41: 419-430. **Marshall, R.**—Preliminary list of the Hydracarina of Wisconsin. [Trans. Wisconsin Acad. Sci. A. & L.] 27: 339-356, ill. **Mello-Leitão**—Dois novos escorpiones do Brasil. [32] 7: 283-285. **Roewer, C. F.**—Bronns Klassen u. Ordn. Tier-reichs. Bd. 5, Abt. 4, Solifuga, Palpigrada, p. 1-160, ill. **\*Schenkel, E.**—Notizen über einige Scorpione und Solifugen. [Rev. Suisse Zool.] 39: 375-396. (S.) **\*Silvestri, F.**—A new and extraordinary genus of the diplopod family. Polydesmidae, from British Guiana. [40] 564: 12 pp., ill. **Worley, L. G.**—The spiders of Washington with special reference to those of the San Juan Islands. [Univ. Washington Pub. Biol.] 1: 63 pp.

**THE SMALLER ORDERS OF INSECTS.**—**Falkenhan, H.**—Biologische beobachtungen an Sminthurides aquaticus (Collembola). [94] 141: 525-580, ill. **\*Mills, H. B.**—New and rare North American Collembola. [Iowa St. Coll. Jour. Sci.] 6: 263-276, ill. **Montgomery, E.**—Records of Indiana dragonflies. VI, 1931. [Pro. Indiana Acad. Sci.] 41: 449-454. **Münchberg, P.**—Beiträge zur kenntnis der biologie der Libellenunterfamilie der Cordulinae. [Int. Rev. d. ges. Hydr. u. Hydr.] 27: 265-302, ill. **\*Navas, R. P. L.**—Decadas de insectos nuevos. 21. [Broteria] 108-119. (S.) **\*Snyder, T. E.**—Two new termites from Costa Rica. [10] 34: 98-100, ill. **\*Williamson, E. B.**—Two new species of Stylurus (Gomphinae). [Occ. Pap. Mus. Zool. Univ. Mich.] 1932, No. 247: 18 pp., ill.

**ORTHOPTERA.**—**Beall, G.**—The life history and behavior of the European earwig, *Forficula auricularia* in British Columbia. [Pro. Ent. Soc. Brit. Col.] 29: 28-43, ill. **Caudell, A. N.**—Description of the male of *Paratylotropidia beutenmuelleri*. [10] 34: 86-87, ill. **\*de Miranda Ribeiro, P.**—Os Dermapteros do Museu Nacional. [32] 7: 289-294, ill. (S.) **Sherman, F.**—Data on captures of the grasshopper *Paratylotropidia beutenmuelleri* (Acrididae). [10] 34: 85-86.

**HEMIPTERA.**—**\*DeLong, D. M.**—Further studies of the genus *Empoasca* (Cicadellidae). [43] 32: 393-401, ill. **Hase, A.**—Beobachtungen an venezolanischen Triatomaarten, sowie zur allgemeinen kenntnis der familie der Triatomidae (Heteropt.). [Z.f. Parasitenkunde] 4: 585-652, ill. **Jordan, K. H. C.**—Beitrag zur kenntnis der eier und larven von Aradiden. [89] 63: 281-299, ill. **Knowlton, G. F.**—Notes on Utah Hemiptera. [4] 64: 166-167. **Lindinger, L.**—Die synonymie von Walkers Cocciden.

[Mitt. Deut. Ent. Gesell.] 3: 26-27. \***Oman, P. W.**—Two new species of *Laevicephalus* from California. [10] 34: 90-92, ill. **Schmidt, E.**—Verzeichnis der von Herrn Kotzbauer in der umgebung von Rio de Janeiro-Nietheroy (Brasilien) gesammelten Homopteren. [60] 93: 55-57. \***Schmidt, E.**—Neue und bekannte zikadengattungen und arten der neuen. [60] 93: 35-54. \***Tissot, A. N.**—Six new aphids from Florida with description of the sexual forms of another species. [39] 16: 13 pp., ill. **Walley, G. S.**—A second report on Hemiptera from the north shore of the Gulf of St. Lawrence. [4] 64: 152-155.

**LEPIDOPTERA.**—**Aue, A. U. E.**—Handbuch für den praktischen Entomologen. Lepidoptera. Band IV. 168 pp. **Avinoff, A.**—Affinités zoogéographiques dans la faune des Rhopalocères de l'Amérique du Nord et la région paléarctique. [Compte Rendu Som. Séa. Soc. Biogéog.] 9:51. \***Bell, E. L.**—Hesperiidae (Rhopalocera) of the Koraima Duida Expeditions, with descriptions of new species. [40] 555: 16 pp., ill. \***Benjamin, F. H.**—A new genus and species of Phalaenidae from California. [38] 31: 27-29. New Phalaenidae from the southwestern part of the United States. [38] 31: 29-32. \***Busck, A.**—*Polyortha mollinediella* sp.n. [Bol. Biol., R.d. Janeiro] Fas. 21: 43-44, ill. **Comstock & Dammers.**—Metamorphoses of five California diurnals. [38] 31: 33-45, ill. \***Costa Lima, A.**—Um novo lepidoptero heterocero (*Pyrilidoidea*: Thyrididae). [Bol. Biol., R.d. Janeiro] Fas. 21: 53-57, ill. **Griffin, F. J.**—The true dates of publications of "Encyclopédie Entomologique, Série B. III. Lepidoptera, Vols. 1-3". [75] 10: 152. \***Hering, M.**—Bemerkungen zur gattung *Catagramma*. [Mitt. Deut. Ent. Gesell.] 3: 83-87, ill. \***Rothschild, L.**—On *Opsiphanes orgetorix* and *orgetorix magnalis*. [75] 10: 200. (S.) **Seitz, A.**—Erinnerungen an Sphingiden. [17] 49: 155-159. \***Stichel, H.**—Beiträge zur kenntnis der Riodinidenfauna Südamerikas. [11] 1929: 199-208. **Turner, H. J.**—The basis of the classification of the British plume moths (*Pterophorina*). [Pro. So. London Ent. & Nat. Hist. Soc.] 1931-32: 27-32, ill.

**DIPTERA.**—**Bequaert, J.**—The Nemestrinidae in the V. v. Röder Collection. [34] 100: 13-33, ill. \***Curran, C. H.**—New species of Trypanidae, with key to the North American genera. [40] 556: 19 pp., ill. \***Curran, C. H.**—New species of Calobatidae from British Guiana. [40] 559: 4 pp. \***Dettmer, H.**—Beschreibung einiger südamerikanischer arten der gattung *Nyalophora*. [Broteria] 28: 120-143, ill.

**Graham, K.**—Variations within the species of the nemestrinid fly *Rhyncocephalus sackeni*. [4] 64: 167-168. \***Hall, D. G.**—A new biting *Culicoides* from saltmarshes in the southeastern states. [10] 34: 88-89, ill. \***Hearle, E.**—The blackflies of British Columbia (*Simuliidae*). [Pro. Ent. Soc. Brit. Col.] 29: 5-19, ill. **Hicks, E. P.**—A simple apparatus for breeding fleas. [An. Trop. Med. Parasit.] 26: 147-148, ill. \***James, M. T.**—New *Stratiomyidae* in the American Museum of Natural History. [40] 571: 7 pp., ill. **Lopfs, H. de S.**—Sobre dois paratipos de Townsend do Museu Paulista. (*Sarcophagidae*). [Bol. Biol., R.d. Janeiro] Fas. 21: 45-52, ill. **Martelli, G. M.**—Note di biologia sulla "*Rhagoletis cerasi*" (*Trypaneidae*). [23] 26: 20-45. \***Parent, O.**—Especies nouvelles du genre *Sympycnus*. Provenant de l'Amérique du Sud et conservées au Museum de Dresde. [59] 6, (B): 41-70, ill. \***Philip, C. B.**—The *Tabanidae* (Horseflies) of Minnesota, with special reference to their biologies and taxonomy. [Univ. Minn. Agric. Exp. Sta.] 1931: 132 pp., ill. \***Séguy, E.**—Etudes sur les *Anthomyiides*. Un *Coenosia* nouveau de l'Amérique équatoriale. [59] 6, (B): 144, ill. **Spencer, G. J.**—Further notes on *Rhyncocephalus sackeni* (*Nemestrinidae*). [Pro. Ent. Soc. Brit. Col.] 29: 25-27. \***Van Duzee, M. C.**—New North and South American *Dolichopidae*, with notes on previously described species. [40] 569: 22 pp., ill. **Vignon, P.**—Nomenclature des veines de l'aile chez les Diptères. L'aile primitive des Diptères. [59] 6, (B): 133-142, 142-143, ill. \***Walley, G. S.**—A new species of *Forcipomyia* (*Chironomidae*). [4] 64: 165-166, ill.

**COLEOPTERA.**—**Bridwell, J. C.**—The subfamilies of the *Bruchidae*. [10] 34: 100-106. \***Bruch, C.**—Un género nuevo de histérico mirmecófilo. [Rev. Mus. La Plata] 33: 277-281, ill. (S). \***Chapin, E. A.**—*Strategus simson* and related West Indian species (*Scarabaeidae*). [91] 22: 449-456, ill. **Costa Lima, A.**—Sobre um aleochatineo ecitophilo (*Staphylinidae*). [Bol. Biol., R.d. Janeiro] Fas. 21: 58-59. **E. F.**—*Hypocephalus armatus*. (S.) [Natur & Mus. Frankfurt] 62: 93-95, ill. \***Fiedler, C.**—Die rüsslergattung *Macromerus* (*Cryptorrhynchini*). (*Curcul.*) [11] 1932: 36-88, ill. (S.) \***Hustache, A.**—Huit nouveaux Coléoptères (*Curculionidae*, *Zygopinae*) du British Museum. [75] 10: 201-208. (S.) \***Nevermann, F.**—Beitrag zur kenntnis der *Telephanus* (*Cucujidae*). [60] 93: 1-35, ill. **Twinn, C. R.**—The occurrence of the odd beetle and a brief note on other dermestid species in Canada. [4] 64: 163-165. \***Uhmann,**



**E.**—Beitrag zur kenntnis der Hispinen (Chrys.) [Mitt. Deut. Ent. Gesell.] 3: 36-38. **Weber, R. G.**—Some modifications of leg structure in the Hydrophilidae. [Pro. Indiana Acad. Sci.] 41: 483-494. **Zacher, F.**—Untersuchungen über die anatomie der geschlechtsorgane und die systematik der samenkäfer (Bruchidae). [Arch. Zool. Ital.] 16: 1005-1009.

**HYMENOPTERA.**—\***Alfken, J. D.**—Die drei kleinen chilenischen echten Halictus-Arten. (Apid.) [Mitt. Deut. Ent. Gesell.] 3: 18-21. **Balch & Simpson.**—A European sawfly (Diprion polytomum) attacking spruce in the Gaspe Peninsula, Que. [4] 64: 162-163. **Bruch, C.**—Notas biológicas y sistemáticas acerca de "Bruchomyrma acutidens". [Rev. Mus. La Plata] 33: 31-55, ill. (S.) \***Bruch, C.**—Descripción de un género y especie nueva de una Hormiga parásita (Formicidae). [Rev. Mus. La Plata] 33: 271-275, ill. (S.) **Buckell, E. R.**—A list of the ants of British Columbia. [Pro. Ent. Soc. Brit. Col.] 29: 22-25. \***Cockerell, T. D. A.**—Two new bees of the genus *Andrena* from Canada. [4] 64: 155-158. **Constantineau, M. J.**—Cas d'anomalie chez quelques especes d'ichneumonides. [Arch. Zool. Exp. Gen.] 74: 69-79, ill. **Costa Lima, A.**—A proposito da *Acropyga pickeli*. [Bol. Biol., R. d. Janeiro] Fas. 21: 65-69. \***Gallardo, A.**—Deux nouvelles espèces de "Pogonomyrmex" de la République Argentine (Formicides). [Rev. Mus. La Plata] 33: 185-188, ill. **Grant, K.**—Aquatic Hymenoptera. [Pro. So. Lond. Ent. & Nat. Hist. Soc.] 1931-32: 23-26, ill. **Hicks, C. H.**—Notes on *Sphex aberti*. [4] 64: 145-151. \***Mallach, N.**—Neue neotropische Cimbicinen. (Tenthred.). [11] 1929: 285-288, ill. **Menozi, C.**—Formiche del Nord America raccolte dal Prof. F. Silvestri. [23] 26: 310-312. \***Muesebeck, C. F. W.**—Revision of the Nearctic Ichneumon-flies belonging to the genus *Macrocentrus*. [50] 80, Art. 23: 55 pp. \***Rohwer & Middleton.**—Descriptions of five Nearctic sawflies of the tribe Hemichroini. [10] 34: 93-98, ill. \***Schwarz, H. F.**—The genus *Melipona*: the type genus of the Meliponidae or stingless bees. [62] 63: 231-460, ill.

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**SPECIAL NOTICES.**—**Krogerus, R.**—Ueber die ökologie und verbreitung der Arthropoden der triebsandgebiete an den Kusten Finnlands. [Acta Zool. Fennica] 12: 308 pp., ill. Ecological entomologists will probably find Rolf Krogerus' paper suggestive and useful.

## Doings of Societies.

### The Fifth International Congress of Entomology

Through scientific societies and their publications, as well as by letter to individuals, invitation was extended to the entomological world to attend the Fifth International Entomological Congress at Paris, July 16 to 23 of the present year (1932), and coincidentally the celebration (July 16) of the Centenary of the Entomological Society of France. American participation in these meetings was undoubtedly reduced by the prevailing economic conditions; in spite of which, however, 38 names were registered from the United States, representing 24 organizations and institutions. The total registration at the Congress was about 400, coming from 37 countries and their principal divisions, those more numerous being

France .....	118
Great Britain .....	51
United States .....	38
Switzerland .....	28
Italy .....	22
Germany .....	21
Austria .....	15
Belgium .....	15
Spain .....	12

The afternoon and evening of Saturday, July 16, were occupied in the celebration of the Centenary of the Entomological Society of France. In the afternoon, a most impressive audience crowded the Amphitheatre of the National Museum of Natural History. Presided over by the officers of the Society, places of honor were accorded distinguished guests, including the President of the French Republic and his Ministry, and official delegates to the Centenary and Congress. University gowns of various colors, the gorgeous uniforms of members of the French Institute, of the military guards and of a regimental band, gave a degree of color to the assemblage scarcely possible to any scientific meeting in America. Following brief addresses, the names of the various organizations officially represented were called in turn, these delegates arising in their places in response. Many of the foreign delegations brought with them elaborate addresses of congratulation, engrossed on vellum or parchment, officially sealed, some in book form, some in scrolls, some enclosed in metal cylinders; and all these, one by one, were deposited on a table before the officers of the Society, forming an impressive mound embodying the written felicitations of the scores of organizations represented.

In the evening, the French Society tendered the delegates and other guests an elaborate banquet at the Hotel Claridge. More than three hundred names were included in the official seating-list, the United States being represented at the table of honor by Dr. L. O. Howard. No formal speeches were made, but Professor Poulton of Oxford, in a few well-chosen words, voiced the appreciation of all the English-speaking guests for the lavish hospitality accorded.

The meetings of the Congress, beginning on Monday, July 18, and continuing until Saturday afternoon, July 23, were held in the various lecture-rooms of the Institute Agronomique, which also formed the starting-point for the delightful excursions planned for the entertainment of the Congress. Four general and twenty-three sectional meetings of the Congress were held, at which approximately 150 papers were read. Of these, something over 60% were in French, 20% in English, 12% in German, and smaller percentages in Italian and in Spanish. Eleven papers were contributed by entomologists from the United States. Many of the papers presented were of obviously great significance; but unavoidable brevity of time-allowance, the divergence of language, and the impossibility of attending coincident meetings, forbids any appraisal of their relative importance here, which must await their more satisfactory perusal in the published Transactions of the Congress.

Those attending the Congress will always remember the generous plans made for their entertainment by the French Society. These included a Sunday afternoon at Chantilly Castle and its forest; an all-day trip through Barbizon to Fontainebleau, with stops for collecting and exploration among the lichen-covered boulders and flowery slopes of the beautiful old forest; an afternoon at Versailles, returning through the forest-bordered valley of the Chevreuse; a reception by the municipality of Paris, in the gorgeously-decorated rooms of the Hotel de Ville; an evening banquet in the Zoological Gardens at Vincennes; assemblage in an old Roman amphitheatre for a group photograph.

At the concluding general session of the Congress, after spirited discussion, the time and place for the next Congress were fixed for Madrid, Spain, in the summer of 1935. For most of those attending the Congress, departure from Paris took place on Sunday morning, July 24, when those participating in the excursion to the Pyrenees (July 24 to 30) took train at the Gare d'Orsay for Lourdes and a strenuous but enjoyable week amid the beauty and historic interest of southern France.

FRANK M. JONES.

## OBITUARY.

The death of Sir RONALD ROSS, "whose discovery that the *Anopheles* mosquito carries the malaria parasite was responsible for controlling one of the world's most terrible scourges," occurred in London, September 16, 1932, and was widely announced in the daily press. He was born in India in 1857, studied medicine in London, entered the Indian Medical Service in 1881 and began the special study of malaria in 1892. Riley and Johannsen, in the first edition of their *Handbook of Medical Entomology* (page 191), have summarized his great discovery thus:

Laveran had early suggested that the role of carrier might be played by the mosquito, but Manson first clearly formulated the hypothesis, and it was largely due to his suggestions that Ross in India, undertook to solve the problem. With no knowledge of the form or of the appearance in this stage, or of the species of mosquito concerned, Ross spent almost two and a half years of the most arduous work in the search and finally in August, 1897, seventeen years after the discovery of the parasite in man, he obtained his first definite clue. In dissecting a "dappled-winged mosquito," "every cell was searched and to my intense disappointment nothing whatever was found, until I came to the insect's stomach. Here, however, just as I was about to abandon the examination, I saw a very delicate circular cell, apparently lying amongst the ordinary cells of the organ and scarcely distinguishable from them. On looking further another and another similar object presented itself. I now focused the lens carefully on one of these and found that it contained a few minute granules of some black substance, exactly like the pigment of the parasite of malaria. I counted altogether twelve of these cells in the insect."

His discoveries were announced in *Nature* for 1899 and 1900 and in the *Quarterly Journal of Microscopical Science* for the latter year, in his *Researches on Malaria* (Nobel Prize Medical Lecture 1902) 1904 and *Prevention of Malaria* New York, 1910.

The establishment of the Ross Institute and Hospital for Tropical Diseases, of which he was Director in Chief, his poems and novels, his dire want in the nineteen twenties, the foundation and completion by public subscription of a fund to care for him in his old age, have been told in the newspapers and popular magazines.

Title-page and Index to Volume XLIII will be issued with an early number of Volume XLIV.

Subscriptions for 1933 now Payable.

# ENTOMOLOGICAL NEWS

DECEMBER, 1932

Vol. XLIII

No. 10



JOHN HENRY COMSTOCK, 1849-1931.  
Portrait of 1884.

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# ENTOMOLOGICAL NEWS

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## **Fermenting Baits for Trapping Elateridae and Cerambycidae (Coleop.).**

By A. B. CHAMPLAIN and J. N. KNULL<sup>1</sup>

During the past five years the writers have made use of fermenting baits in liquid form for the capture of certain beetles in various parts of Pennsylvania. Elateridae and Cerambycidae were the two families of Coleoptera most desired although numerous other interesting insects, including other families of Coleoptera were represented in the catches. The methods used in trapping these insects and the records of some of the captures may be of interest to others.

Various grades of molasses or brown sugar mixed with water were the attractants used. One part of the better grades of molasses to ten parts of water seemed to give the best results for captures in the groups most desired. This mixture was contained in two quart agate ware pans or one gallon tin pails which were hung on the branches of trees about four to six feet from the ground. Some of these pails were placed near mountain tops, others on upper, middle and lower slopes of mountains, still others in bottom lands and valleys. All contributed a share in the catches, the species taken varying somewhat with the locality and elevation. The best catches were obtained when the bait receptacles were hung in openings or glades adjacent to wooded areas, especially if there were dead, dying or over-matured trees in the region.

Gallon pails allow less evaporation than the two quart pans. There is also less likelihood of pails spilling in the violent summer storms. However, the pans give better catches under proper climatic conditions, no doubt due to the fact that they have a greater evaporating surface.

The traps were generally visited twice a week and the insect

<sup>1</sup> Authors' names arranged alphabetically.

contents was removed, although Coleoptera might remain in the fermenting liquid for a week without deterioration, even in warm weather. Material removed from the traps was transferred, in the field, to vials containing 70% alcohol. In the laboratory, before pinning, the insects were washed in water to remove debris and dissolved bait substance and they were then in perfect condition for drying.

As pointed out by Frost and Dietrich<sup>2</sup> the liquid baits in the traps have three different stages of development; (1) a short period of alcoholic fermentation; (2) a period of acid fermentation and (3) a putrefaction period. Baits are attractants for Elateridae and Cerambycidae up to the third stage of their development. After this they draw scavengers such as Staphylinidae, Histeridae and Silphidae. When the putrefaction period is reached the writers discard the contents of the traps and add new material.

Undoubtedly many of the insects taken in these traps drop or fly accidentally into the liquid. It is quite evident, however, that many forms go to the traps to feed and are taken in this way. The writers are of the opinion that members of the Scarabaeidae, Elateridae, Nitidulidae and Cerambycidae are foremost among those attracted for feeding purposes. The fact that many males of a certain species are frequently taken in a trap while other receptacles in the same locality do not contain the species at all might be explained by the theory that a single female falling into the liquid thus drew to this particular trap numbers of the other sex. This incident has occurred in a number of cases.

As stated by Champlain and Kirk<sup>3</sup> many of the species taken in traps of this kind are seldom, if ever, collected in general field surveys even though intensive collecting is practiced. It is an excellent method of getting locality and emergence records of many species.

The following records of captures are from Clark's Valley, Rush Township, Dauphin County, unless otherwise stated:

<sup>2</sup>Frost, S. W., and Dietrich, Henry; *Ann. Ent. Soc. Amer.*, V. 22, p. 427, 1929.

<sup>3</sup>Champlain, A. B., and Kirk, H. B.; *ENT. NEWS*, V. 37, p. 288, 1926.



## ELATERIDAE.

- ADELOCERA OBTECTA Say, July 21; Laporte, August 6.  
 ADELOCERA DISCOIDEA Web., July 27.  
 ALAUS OCELLATUS L., numerous in July; five in one pan July 12.  
 MONOCREPIDIUS LIVIDUS DeG., numerous in July.  
 LIMONIUS QUERCINUS Say, numerous in June and July.  
 LIMONIUS BASILARIS Say, numerous in June and July.  
 LEPTOSCHENA DISCALCEATUS Say, September 7.  
 ATHOUS MACULICOLLIS Lec., numerous in July.  
 ATHOUS BRIGHTWELLI Kby., many specimens in July and August.  
 ATHOUS CUCULLATUS Say, July 26, August 10; Pond Bank, Franklin County, July 7.  
 LUDIUS PYRRHOS Hbst., numerous in July.  
 LUDIUS AETHIOPS Hbst., July 2.  
 LUDIUS TRIUNDULATUS Rand., Laporte, June 24.  
 LUDIUS HIEROGLYPHICUS Say, very plentiful in June, July and August.  
 HEMICREPIDIUS BILOBATUS Say, July 29.  
 HEMICREPIDIUS MEMNONIUS Hbst., July; Laporte, plentiful in July.  
 MELANACTES PICEUS DeG., numerous in July and August.  
 PARALLELOSTETHUS ATTENUATUS Say, numerous July and August.  
 NEOTRICHOPHORUS ABRUPTUS Say, July 7, 30; Laporte, plentiful in July and August.  
 DOLOPIUS LATERALIS Esch., plentiful in May and June.  
 SERICUS SILACEUS Say, plentiful in May and June.  
 AGRIOTES OBLONGICOLLIS Mel., plentiful in June.  
 ELATER PULLUS Germ., Laporte, July 29, August 6.  
 ELATER VITIOSUS Lec., Laporte, July 15.  
 ELATER VERTICINUS Beauv., numerous specimens in July.  
 ELATER SEMICINCTUS Rand., numerous specimens the latter part of July; Laporte, July 15.  
 ELATER RUBRICUS Say, plentiful in June.  
 ELATER COLLARIS Say, July 2.  
 ELATER MANIPULARIS Cand., August 3.  
 ELATER PEDALIS Germ., May 11; Laporte, July 17.  
 ELATER NIGRICANS Germ., numerous in July.  
 ELATER MIXTUS Hbst., Laporte, numerous in June.  
 MEGAPENTHES RUFILABRIS Germ., taken in numbers pan pails at Mont Alto in July by J. O. Pepper.  
 MELANOTUS COMMUNIS Gyll., numerous in June and July.  
 MELANOTUS FISSILIS Say, June, July and August; Laporte, very plentiful in July and August.

- MELANOTUS CORTICINUS Say, July 21.  
 MELANOTUS SAGITTARIUS Lec., Laporte, very plentiful in July.  
 MELANOTUS HYSLOPI Van Z., very plentiful in June and July.  
 MELANOTUS GLANDICOLOR Mel., Laporte, June 24.

## MELASIDAE.

- DROMAEOLUS CYLINDRICOLLIS Say, Pond Bank, July 11-20,  
 twelve specimens in one pail, none in adjacent traps.

## CERAMBYCIDAE.

- DEROBRACHUS BRUNNEUS Forst., numerous in July and August.  
 STROMATIUM PUBESCENS Hald., Inglenook, August 9.  
 EBURIA QUADRIGEMINATA Say, plentiful in July.  
 HYPERMALLUS VILLOSUS Fab., plentiful in July.  
 ELAPHIDION MUCRONATUM Say, very plentiful in August.  
 ANOPLIUM CINERASCENS Lec., Hummelstown, June 24, July 14.  
 PSEUDIBIDON UNICOLOR Rand., Hummelstown, June 9, July 31.  
 TOXOTUS CYLINDRICOLLIS Say, August 2; Inglenook, July 26,  
 five specimens.  
 GAUROTUS CYANIPENNIS Say, plentiful in July.  
 LEPTURA EMARGINATA Fab., numerous specimens in July and  
 August in Clark's Valley, Inglenook and Hummelstown.  
 LEPTURA LINEOLA Say, numerous in July.  
 ANOPLODERA OCTONOTATA Say, June 10.  
 ANOPLODERA NITENS Forst., several specimens in July.  
 ANOPLODERA PUBERA Say, June and July.  
 ANOPLODERA VITTATA Oliv., numerous in June and July.  
 ANOPLODERA RUBRICA Say, plentiful in June and July.  
 ANOPLODERA CANADENSIS Fab., Laporte, very plentiful in July.  
 ANOPLODERA MINNESOTANA Csy., Laporte, June 20.  
 ANOPLODERA PROXIMA Say, July 2, 24.  
 TYPOCERUS VELUTINA Oliv., plentiful in June and July.  
 STRANGALIA LUTEICORNIS Fab., June.  
 PHYSOCNEMUM BREVILINEUM Say, Hummelstown, June.  
 PHYMATODES VARIUS Fab., July 12.  
 CYLLENE ROBINIAE Forst., numerous specimens in August and  
 September.  
 XYLOTRECHUS COLONUS Fab., plentiful June and July.  
 XYLOTRECHUS ACERIS Fisher, July 2.  
 XYLOTRECHUS NITIDUS Horn, Chambersburg, June 6, 28, J. R.  
 Stear and J. A. Reeves. Three specimens of this rare  
 species were taken in bait pans.  
 NEOCLYTUS SCUTELLARIS Oliv., August 10.  
 NEOCLYTUS MUCRONATUS Fab., numerous in July.  
 NEOCLYTUS ACUMINATUS Fab., numerous in June and July.  
 ANTHOBOSCUS RURICOLA Oliv., July.

- CLYTANTHUS ALBOFASCIATUS Lap., June 10.  
 EUDERCES PICIPES Fab., many specimens June and July.  
 PURPURICENUS HUMERALIS Fab., very plentiful in the southern part of the state in June and July.  
 PURPURICENUS AXILLARIS Hald., numerous specimens in June and July in the southern part of the state.  
 MICROGOES OCLATUS Lec., Laporte, July 17, 30.  
 MICROGOES DEBILIS Lec., one specimen in June.

## CLERIDAE AND BUPRESTIDAE.

The following captures were probably due to adults falling into the traps accidentally:

- CYMATODERA BICOLOR Say, Inglenook, July 20.  
 CYMATODERA UNDULATA Say, Inglenook, July 20.  
 ENOCLERUS LILJEBLADI Wolc., Cold Springs, Adams County, September 6.  
 DICERCA PUGIONATA Germ., July 26.  
 CHRYSOBOTHRIS SENSIGNATA Say, July 20.  
 CHRYSOBOTHRIS VERDIGRIPENNIS Frost, September 7; Laporte, July 29.  
 ANTHAXIA QUERCATA Fab., July 26.

### The Rhopalocerous Lepidoptera of Scott County, Kansas.

By VIRGIL F. CALKINS, Scott City, Kans.

(Continued from page 229.)

Family LYCAENIDAE.

Subfamily Theclinae.

STRYMON MELINUS Hubn. Common Hair-streak. A fairly common, and the only Hair-streak, to be taken at almost any time that butterflies are on the wing. I have reared specimens, the larvae of which were feeding on alfalfa flower heads, attended by swarms of small black ants.

S. ACADICA Edw. The Acadian Hair-streak. But one specimen of this species has been taken in Scott County. It was captured on the State Park Grounds in the northern part of the county. An unusual capture.

Subfamily Chrysophaninae.

HEODES DIONE Scud. Dione Copper. Uncommon this far south; almost every year a few stray specimens are taken, usually in worn and faded condition.

H. THOË Bdv. & Lec. Bronze Copper. The Bronze Copper is a distinctly rare insect in this locality. But three or four examples have been recorded. Its food plant, Dock, is abundant in favorable localities, but the species is rare nevertheless.

H. HELLOIDES Bdv. Purplish Copper. One stray butterfly of the female sex is the only specimen ever recorded for this region. Extremely rare.

#### Subfamily Lycaeninae.

LEPTOTES MARINA Reak. Marine Blue. This beautiful little Blue is uncommon, but one is almost sure to take a few specimens each year. The food plant is Alfalfa.

BREPHIDIUM EXILIS Bdv. The Pigmy Blue. This interesting little species so often referred to as "the smallest butterfly" is a stray in this locality. Three specimens have been recorded in the last five years.

HEMIARGUS ISOLA Reak. Reakirt's Blue. Prior to the year 1928, no specimens of *isola* were ever taken. During the summer of 1928, *isola* was a new capture, and since that time it has been abundant, as a rule, every year. As many as two hundred specimens have been taken within three hours. Their favorite food plant is pin clover, and other clovers. A very pretty little Blue, and interesting because of its appearance for the first time in 1928.

EVERES COMYNTAS Godt. The Eastern Tailed Blue. While this species ought to be common, it is not. Occasional specimens are taken only.

PLEBEIUS MELISSA Edw. Orange-margined Blue. This beautiful Blue is abundant every year, but one has to be at hand when they first emerge to get good specimens. I have reared very many on alfalfa. This species is one that is always attended by ants in the larval stage. The slug-shaped caterpillar prefers the flower head of the alfalfa, and by the presence of countless small black ants, it is always suspected. It can be very easily reared in captivity by gathering the flower heads. The slugs, even when in captivity, are sure to be found by ants.

P. ACMON Dbdy. & Hew. Acmon Blue. Very rare. Very few specimens have been recorded.

LYCEANOPSIS PSEUDARGIOLUS Bdv. & Lec. The Spring Azure, the Common Blue. This is another species that should be common, but is not, here on the prairies. About a half dozen specimens have been collected. They were small, and dwarfed.

L. PSEUDARGIOLUS NEGLECTA-MAJOR Tutt. The Neglecta Blue. Also uncommon, being only a form of the above species.

#### Family HESPERIIDAE.

##### Subfamily Pyrrhopyginae.

EPARGYREUS TITYRUS Fabr. Silver-spotted Skipper. This big skipper is taken occasionally, but not commonly.

THORYBES DAUNUS Cram. (*bathyllus* A. & S.) The Southern Dusky-wing. An unusual capture for this locality.

PYRGUS TESSELLATA Scud. Tessellated Sipper, Checkered Skipper. Found abundantly over the county. It is especially common in the fall of the year. Larvae are partial to mallows, hollyhocks, etc.

GRAIS STIGMATICUS Mab. Stigmaticus Skipper. A very rare thing, here. On a hot August day, after a dust storm of a few days previously, a specimen was captured hovering over Zinnias. The same afternoon two more specimens were taken, they being in an almost unrecognizable state.

PHOLISORA CATULLUS Fabr. Sooty-wing. Abundant during the spring of the year, but not taken at any other time of the year.

THANAOS PERSIUS AFRANIUS Lint. Afranius Dusky-wing. But one specimen is known from this county. It appeared after a wind storm; having never seen anything like it, it was sent away for identification, and Dr. Dyar labeled it *Thanaos afranius* Lint.

TH. JUVENALIS Fabr. Juvenal's Dusky-wing. What few specimens that are taken occur early in the spring. Uncommon.

TH. HORATIUS Scud. & Burg. Horace's Dusky-wing. Only occasionally taken, the species also being found in early spring.

TH. PACUVIUS Lint. Pacuvius' Dusky-wing. But one specimen has ever been taken.

TH. FUNERALIS Scud. & Burg. The Funereal Dusky-wing. This handsome black skipper seems to represent another wind blown species. It is hard to get in perfect condition for this reason. While previously considered a prize, lately numerous examples have been taken and the species may now be listed as occurring regularly.

#### Subfamily Hesperinae.

COPAEODES AURANTIACA Hew. Hewitson's Skipper. Only one specimen of this conspicuous species has been taken, where it was sipping nectar from a marigold blossom. It represents a wind blown species—probably from Texas.

PAMPHILA UNCAS Edw. Uncas Skipper. A few specimens of this Hesperid are to be taken occasionally in the spring of the year, when they fly with *Atalopedes campestris*. Uncommon.

HYLEPHILA PHYLAEUS Dru. The Fiery Skipper. Very rare in this region.

POLITES CERNES Bdv. & Lec. (*Limochores taunus* Fabr.) Fawny-edged Skipper. Rare. Only an occasional specimen is taken.

ATALOPEDES CAMPESTRIS Bdv. Field Skipper. The most common Skipper to be found. In the fall of the year, it is very plentiful and one can collect hundreds in a few hours by picking them off flower heads.

ATRYTONOPSIS HIANNA Scud. The Dusted Skipper. This species probably is a straggler from Nebraska and it is considered a prize when taken. Perfect specimens are hard to get.

AMBLYSCIRTES VIALIS Edw. The Roadside Skipper. Not common. One year, a number of specimens were taken. Since that time, only about four or five strays are taken within the year.

LERODEA EUFALA Edw. Eufala Skipper. This drab Skipper is not uncommon during some seasons. It frequents the alfalfa and clover fields, and if any are to be found, they may be taken there.

**Macrolepidoptera : Species and Lower Concepts.**

By J. D. GUNDER, Pasadena, California.

(Continued from page 240.)

## THE TERM TRANSITION FORM.

For years lepidoptera check lists have patiently carried names under the term "ab.". "Aberration" was a category, a conglomerate unit as a whole, which no one knew very much about and one which no one troubled to study carefully. It was a place for a mixture of names, a dumping ground for those things roughly spoken of as sports, freaks, mutants, individual forms or whatever collectors and cataloguers cared to place under that heading. So the thought became prevalent in many quarters that "abs." were of little value and hence of less scientific use. The very meaning of the word "aberration" tended to taxonomically kill any name placed under that heading and the "no good" idea was further enhanced by the fact that most collections possessed few, if any, of these specimens in series. Besides that, the apparent lack of such variation in other insect Orders furnished basis for depreciation of that found in Lepidoptera.<sup>1</sup> Nevertheless, as the years went by, well known Lepidopterists like Scudder, Boisduval, Edwards, Holland, Barnes, McDunnough and others continued to recognize and name "aberrations". It was the best they could do using that title, being the only term open to them, regardless of the somewhat general disapproval of it. Those pioneer authors saw future value in much of the variation which came their way and they knew something must be back of its existence. The names they applied form the working basis of our present research and without such names, little could now be accomplished; likewise, the authors of today and tomorrow, by following their example, add to that volume of definite record which is essentially needed for corroborative demonstration.<sup>2</sup>

<sup>1</sup> The mere excuse that the Lepidoptera (and some Coleoptera) are the only or principal Orders showing sub-sub-specific variation is NO REASON within itself for such variation not being accorded status. It is all the more reason for according to status! The alibi of Authors that "some do and some don't" is poor exemption thought in itself. Their mental deduction is beyond my comprehension.

<sup>2</sup> The method of science in principle follows four steps: 1st, Observation of facts and things. 2nd, Classification of facts and things. 3rd, Experimentation with facts and things. 4th, Demonstration of facts or truth.

The reasons for naming variations are the same today as they were yesterday, it is only the kind of variation which should be named that has changed. *The kind of variation which should be named is a very important matter*, especially in the light of present knowledge. It leads us up to the question of what "aberrations" formerly were and that has been the subject of my investigation for the past several years. To unscramble the old "aberration" category meant that all available type material must be examined and that upper and under side photographs of every one must be secured. That was the only way to work-out the question and be certain of what the names represented. This necessitated the visiting of most of the American entomological centers and the taking of upwards of 2000 photographs, besides having many made in Europe. I found that specimens listed as "aberrations", for example, in the Barnes & McDunnough Check List of 1917, came under several different headings about as follows:

*First.* Various kinds of teratological aberrations, for example, *Argynnis coronis baroni* Edw.

*Second.* Diversely inflicted specimens, like *Danaus archippus pulchra* Stkr.

*Third.* Sexual forms, like the females of the *Eurymus*.

*Fourth.* Recurrent individuals which made up the vast majority of names, like *Euphydryas phaeton superba* Stkr.

From the above it can be seen that the term "ab." really consisted of a heterogeneous mixture of names and was not a homogeneous classification division at all. Therefore, if the taxonomy of the group was to be straightened out, a few radical changes must be made, even to the exclusion of the word "ab." and the substitution of a new categorical concept. Further diagnosis follows.

*First.* Regarding teratological specimens. In character these are, for the most part, the real aberrations. They are aberrations in the true sense of the word itself, hence I have restricted the word in macrolepidoptera classification (see its position on chart) to mean only examples showing their general abnormal peculiarities which are broadly considered non-inheritable and hence unnamable. Teratological aberrations, as



a whole, have been discounted when recognized in American and, I believe, in British lists. They are named after a fashion in Germany. If among these so-called abnormalities, there are certain recurrent types which can be shown, by reasonable deduction, as profoundly or otherwise affecting the evolution of a group, then they should be named and a classification as a *name control* worked out. This classification unit could be added under the existing transition form divisions. However, I see nothing on our American lepidopterological horizon at the present time to prompt naming them or their "non-obvious" equivalent, as it has been called, much less considering a classification for them or for any more names yet to be given to them.

*Second.* Regarding inflicted specimens or specimens whose wing patterns are changed by "sickness" or by external misfortune. These have no classification rating and also fall into the synonymy. It is unfortunate that such examples are occasionally named.

*Third.* Sexual forms which were listed as "abs.". These transfer into their own category. (See November section of this article.)

*Fourth.* Recurrent individuals within a species or within a race, which by change of color or by change of pattern graduate with persistent characteristic similarity from parental type to definitely limited variation away from parental type, have been termed transition forms. (See first reference, ENT. NEWS, May, 1927.) These are the only specimens, formerly listed as "aberrations", aside from those listed in paragraph just above, which are worth nomenclatorial rescue. They are in no sense like "aberrations", being neither related to cause (*they are considered the result of inheritance, and not of happenstance*<sup>3</sup>), nor by appearance (*they are superficially characteristic as a whole*), nor by classification (*they have a recurrent categorical value*). For these reasons and others, transition forms should not be confused with "aberrations". As entities they are entirely different. Taxonomically, it is simply a question of dropping the word "aberration" (or "ab.") in connection with many of the old names and employing the word transition form (or

<sup>3</sup>"Happenstance" is a newly coined word of expressive meaning.

tr.f.) instead. In the future if "aberrations" are named, they will most likely fall into the synonymy, but if transition forms are named, their worth will be assessed just as in any other classificatory group. To continue the use of the word "ab." in the light of a legitimate concept as formerly would be the same as telling the zoological world that entomologists still believe in basing names upon "freaks", "sports" and what-nots, all of which is not the case. Zoologists *have made fun* of the old aberrational division, as such, long enough; let us be rid of it.

Transition form classification, with its divisions under Change of Color and Change of Pattern, as shown on plate VII, July issue of this article, was evolved to include all component units which can be cited by name. Its formula serves taxonomy as a name control and in this respect is satisfactory for all transition forms which have come under my observation. By its use I see no "failure to classify transition forms", particularly in North American groups, found north of old Mexico and I have a pretty clear idea that the European and Asian fauna must of necessity fit in. Unfortunately, I have not space in this paper for a detailed discussion of its merits. Another article in the future can deal with that angle at a time when subsequent queries and assertions will be gone into.

In this paper I would like to enumerate a few salient points which I hope will awaken a more serious consideration of transition forms, as well as a deeper appreciation of their value. These evolve around the problems of inheritability, the mechanics of which the geneticists are gradually solving. My friend, Dr. T. H. Morgan, well-known geneticist of the California Institute of Technology at Pasadena, has said to me, "You entomologists have furnished genetics a problem and we will begin where you have left off"; meaning, of course, that the geneticists hope to prove the causes, the effects of which they have been shown. Entomological record of variation, therefore, has been of some use. The following general observations regarding transition forms were made in the course of my investigations.

*First.* Transition forms always occur year after year, espe-

cially in their own little localized localities, or segregated metropoli, more so than in the adjacent ranges of their species.

*Second.* Typical or parental stock from these segregated metropoli are always either slightly lighter or slightly darker according to the dominant or progressive tr.f. present.

*Third.* A comparison of parental stock from two similarly located metropoli having the same dominant tr.f. present may show the stock of one to average lighter than that of the other. This denotes an "older settlement" for the one and a comparatively recent habitation for the other.

*Fourth.* A species having an extensive distribution over a continent or portion of a continent may produce many tr.fs. in one region and few, if any, in others. A species inhabiting several continents or separate geographical land areas may produce tr.fs. on one and none on others. Another species, take for example *Picris rapae* L., produces two tr.fs. under Change of Pattern in Europe, *i.e.* immaculism and melanifusism; but only one in North America, *i.e.* immaculism.

*Fifth.* Tr.fs. have led to the discovery of new species. Change of Color tr.fs. have pointed out the existence of similarly colored races, *i.e.* tr.f. *foxi* of *aurilacus* led to the discovery of *anicia morandi*. Mr. W. G. Wright knew *chalcedona*, but if he had realized the significance of *chalcedona fusimacula*, he could have looked for race *olancha* Wri., instead of finding it by pure chance. *Euphy. chalcedona omnilitcofuscus* points to a race of yellow *chalcedona*. This may be eventually found in northwestern old Mexico or even in our own Great Basin, providing it has not become an extinct entity. (I believe the oldest *Euphydryas* are perhaps those groups having yellow or a yellowish cast ground color and I also believe it possible that the North American members of this genera which are red received that color in a definite sequence of shading, yellow through to red, since the Ice Age. *Morandi* has the purest yellow color of them all, its neighboring races being of intermediate shades between yellow and deep red. *Morandi* has a unique, high, desert-surrounded and very isolated mountain top habitat which has evidently preserved its color. The genus *Melitaca* has yellow (chromatism) tr.fs. as well.)

*Sixth.* Tr.fs. seldom occur in equatorial or tropical regions; if so, they are, what can be termed, of semi-tropical or most likely temperate zone genera which are "loitering south". I found no tr.fs. in Mexican collections when recently visiting that country though they must occur in certain species in the northern and northwestern section. South American, South African and Australian lists show nothing comprehensible. Therefore, it can be said that, with extremely few exceptions, *transition forms are only found in the Northern Hemisphere*, in regions termed temperate and near-arctic. This being the case, the supposition is that insect life-changes (in lepidoptera, at least) generate only "in the north". This is consistent with certain biological theories sometimes expressed.

*Seventh.* Tr.fs. of a kind always occur looking alike, their variation grades being along similar lines. A species in a genus and any races thereof always produce a kindred tr.f. variation. All tr.f. variation grading away from parental type always has a definite and similar limit for the design change; that is, the change is not boundless. It is confined to that portion of the wing surface and to those certain characters which are subject to the change, all other maculation remaining unchanged. A tr.f. of a kind is no more a "series of tr.fs." than a species is a "series of its specimens". Both are alike in this sense. The former has a wider range of variation than the latter and the one is as legitimately consistent in its wider range as the other is in its shorter range. It is just as necessary to have a series of a tr.f. to show its range of variation, as it is to have a series of a straight species (or race) to show its range of variation. In a collection, you would not simply have a pair of a species to show true variation, but a series; similarly in a collection you would not have a pair of a tr.f. to show true variation. In a genus, we name its species, though they look similar; in a species, we name races, though there is not much difference and they are similar; in a tr.f., we name its divisions, though they also "look similar". What holds good for one must hold good for another; otherwise, we break down the whole taxonomic system.

*Eighth.* In a species, or perhaps I should say a butterfly

group, two namable tr.fs. may be expected under Change of Pattern and two presumably under Change of Color, although in color change it is rare indeed that more than one is found or even possibly exists. Under Change of Pattern it is quite often the case that only one tr.f. is found, the opposite tendency having "died out" or rather the ability to produce no longer is there, no longer needed perhaps. In *Cynthia cardui* L. we have an example of this; its tr.f. *elymi* Ramb. (albifusism) being common and world wide, while its tr.f. *ate* Stkr. (melanifusism) is known by the single holotype collected in Summit County, Ohio.

*Ninth.* Of the two kinds or opposed tr.fs. in a species, the common or predominant type continues to be in excess, that is, within our idea of a localized geographical region. In southern California we have a preponderance of *Euphy. chalcadona*, tr.f. *fusimacula* B. The inbreeding of its elongated white spotting tends to lighten up the parental stock of this region. In northern California and Oregon we have an excess of *Euphy. colon*, tr.f. *medunnoughi* G. (similar to *chalcadona mariana* B.). Its melanifusism continues to retain or increase the dark design of *colon* and further restrict what light maculation is present. It would be interesting to know the theoretically balanced territory between these two.

*Tenth.* Examples of tr.fs. approaching or nearest parental type are always more numerous than those examples, termed well developed, which are farthest away from parental type. A charted arc of proportion usually shows 99 percent near parental type and 1 percent opposite. Sometimes the smaller percentage is larger, depending on the "state of flux", but never is the proportion anywhere near reversed. The grading of color and pattern of tr.fs. into parental type is absolute; that is, it is impossible to draw a line of demarcation.

*Eleventh.* A family or genus considered in a state of flux produces more tr.fs., while those considered constant have fewer, if any. As an illustration, the Satyridae are constant, while the Nymphalidae are not.

*Twelfth.* In some tr.fs. all four wing surfaces do not uniformly register color or pattern change. Sometimes only the primaries show development, other times only the secondaries.

In rare cases a left primary or a right primary only or a secondary is subject to change. Occasionally melanifusism and albifusism, for example, are found in combination. Tr.f. classification via the method of wing distribution or combination is taxonomically impractical. Dr. John A. Comstock in his "Butterflies of California", page 302, suggests this method, but he has since discarded it as wholly inadequate for obvious reasons.

*Thirteenth.* Fancy breeding tactics have thus far resulted in producing no more tr.f.s. than similar numbers which can be caught in the field, *oftimes less*. (A reason for this is given in last paragraph, page 108, April, 1928, ENT. NEWS.)

*Fourteenth.* Individual forms, freaks, abnormalities and sports (these are the unnamables) occur *in the same ratio* in tr.f.s. as they do in the typicals of same species.

*Fifteenth.* Color change or pattern change, as found on the wing of a tr.f. lepidopteron, is superficial to its physical well being and does not incapacitate the reproductive organism of the individual. (Sometimes tr.f.s. are spoken of as "weak". They are no weaker than similarly found weak typicals. The proportion is relative. This weakness is coincident and due to other causes.) As indicated elsewhere, tr.f.s. are capable of simple and well-defined classification, but if they are just derelicts of nature and not due to *a degree of inheritance*, then their classification would be as difficult and complex as are the various causes which contribute to an inconsistent, alien and terminative existence.

*Sixteenth.* Being fertile produce of a progressive or retrogressive inheritance which they transmit by their continual occurrence in parental stock, tr.f.s. are the undoubted medium or driving force behind modification. They are Nature's First Lieutenants, carrying out her orders by distributing those *over-developed characteristics* which bring to Lepidoptera that environmental ratio of change necessary as to wing color and pattern.

A careful perusal of the above statements will show that transition forms are IMPORTANT Lepidoptera and that they will continue to have as NECESSARY and LEGITIMATE a position in Macrolepidoptera classification as any concept lower than species.

## My Ideas on the Naming of Lepidoptera.

By JAMES E. COTTLE, Hayward, California.

I have always been an amateur in the field of entomology; that is, I have never attempted much real taxonomic work. There are certain advantages for anyone who can retain his amateur standing and I have had the opportunity of enjoying most of these. Being able to actually discover new species and track down the out-of-the-way habitats of the rarer sorts has its benefits and rewards. An amateur with a good collection, and I consider that I have a fair one, season after season of actual field experience, usually accumulates a little practical knowledge. Whether this is any better or any worse than that of "desk professionals", who have only book learning and laboratory experience with assorted material at best, is a matter of opinion. Sometimes younger professionals lack the broader essentials of analysis and their viewpoint never rises above some of the impractical sides of what they are taught. The character of their instruction, though, is oftentimes reflected in the ideas they exploit. This paper expresses adverse judgment in part on several papers<sup>1</sup> by such professionals which have of late decried the naming of butterfly variants.

I sometimes feel sorry for eastern American lepidopterists because they cannot live in the west to work where we have 75 percent of the butterfly habitats and most of the butterflies which show good variation. The better western collections are built up with the idea of showing variation, while those in the east, leaving out the Barnes' collection in part, are usually short on specialized series. Sometimes those eastern collections are wonderful from the standpoint of displaying thousands of world species, but they are negative, I am told, when it comes to showing the research specialist anything about the different kinds of variation range, and variation follows definite courses

<sup>1</sup>A. B. KLOTZ. On the Naming of Individual Variants in Lepidoptera. ENT. NEWS., Nov. and Dec., 1930.

G. TALBOT. The Naming of Individual Variants in Lepidoptera. ENT. NEWS., Mar., 1931.

A. G. RICHARDS, JR. Sub-Sub-Specific Names in Lepidoptera. ENT. NEWS., Oct., 1931.

in a species which can be demonstrated and traced by a proper order of arrangement.

I wonder where Mr. Klots, followed by Mr. Talbot and trailed by Mr. Richards, Jr., ever picked up the idea that transition forms were anything so unworthy as to be called "individual variants"? I don't believe I have ever seen that term used before. Calling them that is misleading and makes me think of Edgar Allen Poe's no-never-hardly-ever origination. The well-known Stanislaus said, "*To believe with certainty we must begin by doubting*". There is a good deal of truth in that and I imagine the above three gentlemen who now doubt, and it is only natural that they would from their restricted viewpoints, will eventually stop calling butterflies "individual variants" and call them by their described names or in general by some other term which does them more justice. To call these specimens aberrations would be putting them in a class with the freaks and there is certainly no place for them in with that unfortunate group. Perhaps Mr. Gunder's term transition form is just as good as any other. Mr. Gunder at least originated that term for them. To be "individual variants", specimens must be of exceptional rare occurrence, hardly ever seen, unique, unprecedented, uncommon and scarce as hen's teeth. This is NOT THE CASE with the better-known transition forms and I hardly think it worth while to combat such lack of knowledge about them and their continual occurrence. However, I am going to give one instance of undiminished, regular and mass continuity and then not take up further valuable text space in that regard. I call attention to tr.f. *muelleri* of *Cynthia carye* Hbn. which was named by Mr. Letcher. I knew Letcher very well and he had a good series of these tr.fs. When *muelleri* was named in 1898, he said in his o.d., "It is found with such frequency as to entitle it to a name. Whether it is a remarkable case of 'aberration,' a number taking the same form, or an example of the evolution of a true variety, time only will tell." Is not that sentence by Mr. Letcher significant of what knowledge they had in an older generation? And doesn't it show plentifulness instead of indi-



vidualness even for that period? Two contemporary collectors, Mr. Mueller and Mr. Grinnell also possessed numbers of these specimens; in fact, Mr. Grinnell named one of these "steps in the grade of" *muelleri* which has since been shown by Mr. Gunder to be a synonym. Mr. C. J. Huguenin, another San Francisco man who passed away not long ago, also had 5 or 6 examples in his collection and his collection was not considered very large. My first collection, which was destroyed in the San Francisco fire, had a dozen or so phases of tr.f. *muelleri* represented. Around San Francisco at the present time most of the collections display specimens which stand under the name of tr.f. *muelleri* and there are quite a number of them. All the above recites only what I know of in my region. To the south in Los Angeles, I understand that *muelleri* is just as well represented. Mr. Gunder in his Butterflies of Los Angeles County, Calif. (Bul. So. Calif. Acad. Sci., plate 23, May-Aug., 1930) figures 20 specimens and they seem to be all of the well-developed types, so the nearer parental types, which he does not illustrate, must be even more in excess. To sum up all the above data, one would hardly be able to call tr.f. *muelleri* an "individual variant", considering its commonness. If not, then what transition forms can be called "individual variants" I don't think any of them can be. As a species is rare, so would their tr.f.s. be rare, but rareness is not a criterion of value to go by when seeking a term to call this group by: so, "individual variants" is wrong and very wrongly used as a headline by the gentlemen mentioned in the forepart of this article.

My idea on the naming of lepidoptera is that "concepts below the rank of subspecies MAY bear scientific names (Talbot)", but I go a step farther and say that they SHOULD bear scientific names; however, (now this is important), such names must be subject to regulation to save duplication. Mr. Gunder is using a scheme for their classification. Can anyone suggest a better scheme if "Gunder's scheme is untenable", according to Klots, Talbot and Richards, Jr.? Remember that for years Dyar, McDunnough, Benjamin and others have been praying for a way to hold in check or classify "abs.". Gentlemen, it is

easy to use the word "fail"; that is, it is easier to be critical than to be correct, but have you anything to offer in place of Gunder's system? Among the so-called "abs." in North American Check Lists, are you prepared to point out specific instances of failure as far as classification for name retention goes? You have used the word "fail"! Now, back up that statement, not with generalities, nor by citation of little-known exotics, but by instances of failure in American names given American butterflies.

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### Some Uses of Masonite Board in the Mounting of Insects

Being recently forced to devise some means of making serviceable spreading boards for Lepidoptera and a spreading surface for beetles cheaply and quickly I obtained some Masonite slabs from a nearby lumber company and setting to work soon produced the desired equipment. Hoping that the manner in which I managed to solve this problem may be of some help to others, I am giving here a brief description of what was done.

To those who are not acquainted with Masonite board, I will say that it is made of a soft pulp composition with one side smooth and the other slightly perforated and is used mostly for insulating the walls of houses. This material is coming in for more and more use among Entomologists as a substitute for cork and in the opinion of many is better than that for which it substitutes as well as cheaper.

The making of spreading boards with the aid of this material is child's play. The Masonite is simply cut up into strips a foot and a half long with the width varying with the size of spreading board desired. Then redwood boards are obtained of the same length, about three inches in width and three quarters of an inch in depth. These boards are placed on a flat wooden surface with their smoothest sides down and their finest edges parallel at a distance varying with the size of the insects which are to be mounted on that particular board. The Masonite strip is next placed down squarely over these two boards with its smooth side against them and is securely nailed to them with four nails, two at each end. In my particular case the nails were slightly too long and came through the boards, but a file soon fixed this up and the upper surfaces of the boards sandpapered to make them smoother. I have found spreading boards made in this way to be quite as

serviceable as the best of the custom made ones and it is easily possible to make a set of ten of them in the short space of an hour.

The spreading surface stand that was produced with the aid of Masonite turned out very well and was made very quickly. Four redwood boards of the same size as those used in making the spreading boards are placed in an even square on a flat surface first. On top of them is placed a square of Masonite cut so as to fit over them evenly and this is nailed on to them strongly. Next a square of stiff paper of the same size is cut out and then soaked with water. The wet paper is stretched as tightly as possible across the upper surface of the stand opposite to the Masonite and tacked in place. This paper when allowed to dry in the sun should become as taut as the head of a drum and with the soft Masonite underneath to receive the points of the pins to any desired depth proves an admirable mounting stand for Coleoptera, Hymenoptera and similar insects.

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## Entomological Literature

COMPILED BY LAURA S. MACKEY UNDER THE SUPERVISION OF  
E. T. CRESSON, JR.

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 figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the list of Periodicals and Serials published in our January and June issues. This list may be secured from the publisher of ENTOMOLOGICAL NEWS for 10c. The number of, or annual volume, and in some cases the part, left, &c. the latter within ( ) follows; then the pagination follows the colon :

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

\*Papers containing new forms or names have an \* preceding the author's name.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

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.

‡Note the change in the method of citing the bibliographical references, as explained above.

Papers published in the *Entomological News* are not listed.

**GENERAL.**—Anon.—European trip of entomologists. Entomological work of the University of California at Riverside and Los Angeles. [68] 76: 402; 402-403. **Balduf, W. V.**—Our friends the insects. [Smiths. Rep.] 1931: 431-

442. **Cooper, K. W.**—Additions to the New York State List of Insects. [19] 27: 189-195. **Fassnidge, W.**—Entomology and ethics. Presidential address to the Entomological Society of the South of England, 1931. 1932: 16 pp. **Faust, E. C.**—Discussion of Symposium papers. [7] 25: 629-630. **Franz, E.**—Der 5 Internationale Entomologenkongress zu Paris 18-23. Juli 1932. [17] 48: 177-182. **Gunder, J. D.**—Lost in the forest of original descriptions. [19] 27: 205-206, ill. **Heller & Meisels**—Radiographs of Insects. [31] 130: 629. **Howard, L. O.**—Some human eye-spots classified zoologically. [68] 76: 409. **Lahille, F.**—Ciencia aplicada y ciencia pura Entomologia y Parasitologia. [104] 5: 49-60. **Meissner, O.**—Die insekten bei Homer. [17] 48: 186-188. **Ruediger, E.**—Vom anthropocentrischen standpunkt. [17] 48: 188-189. **Thorpe, W. H.**—Colonisation of the sea by insects. [31] 130: 629-630. **Zerkowitz, A.**—Bericht über den V. Internationalen Entomologen-Kongress. [14] 46: 110-111, 121-123.

**ANATOMY, PHYSIOLOGY, ETC.**—**Buxton, P. A.**—Terrestrial insects and the humidity of the environment. [Biol. Rev. & Biol. Pro. Cambridge Phil. Soc.] 7: 275-320, ill. **Herms, W. B.**—Non-bloodsucking flies as vectors of pathogenic micro-organisms. [7] 25: 623-628. **Hill & Burdett.**—Fertility of bees and vitamin E. [31] 130: 540. **Hinman, E. H.**—Mosquitoes in relation to human welfare. [7] 25: 613-623. **Maclagan, D. S.**—The effect of population density upon rate of reproduction with special reference to insects. [Proc. R. Soc., London] B 111: 437-454. **Marcu, O.**—Beitrag zur kenntnis der stridulationsorgane von *Hydrophilus* und *Hydrobius*. [34] 100: 80-81, ill. **Marshall & Staley.**—Influence of light on the gorging of *Culex pipiens*. [31] 130: 506-507. **Pagast, F.**—Ueber die Metamorphosestadien von *Chironomus vulneratus*. (Gruppe *Cryptochironomus* s. str.) [56] 11: 155-162, ill. **Pearce, E. J.**—A remarkable teratological specimen of *Haliphys obliquus*. [8] 68: 205-206, ill. **Richardson, H. H.**—An efficient medium for rearing houseflies throughout the year. [68] 76: 350-351. **Schwardt, H. H.**—Bloodsucking and non-bloodsucking-flies in relation to human welfare. [7] 25: 603-613. **Snodgrass, R. E.**—Evolution of the insect head and the organs of feeding. [Smiths. Rep.] 1931: 443-489. **Woodworth, C. E.**—Some effects of reduced atmospheric pressure upon honey bee respiration. [12] 25: 1036-1042, ill. **Zalesky, G.**—On the wing venation of dragonflies and mayflies

and their phylogenetic evolution. (Russian, Abs. English.) [Bul. Acad. Sci. Leningrad] 1932: 713-733, ill.

**ARACHNIDA AND MYRIOPODA.**—**Banks, Newport & Bird.**—Oklahoma spiders. [Univ. Oklahoma Publ.] 4: 1-49, ill. **Hilton, W. A.**—Tartarid whip-scorpions of Southern California. [13] 24: 45-46. **Hubbell, T. H.**—An unusual occurrence of spiders in northern Florida. [7] 25: 502-504, ill. **von Kolosváry G.**—Beiträge zu den dessinvariationen der spinnen. [34] 100: 192-198, ill.

**THE SMALLER ORDERS OF INSECTS.**—**Bird, R. D.**—Dragonflies of Oklahoma. [Univ. Oklahoma Publ.] 4: 51-57. **Bonet, F.**—Introduccion al estudio de los Colembolos. [104] 5: 36-48, ill. **Brown, J. M.**—Report on the Collembola collected by the Oxford University Expedition to Hudson Strait, 1931. [75] 10: 330-340, ill. **Essig, E. O.**—The California salmon fly. [55] 8: 162. \***Geijskes, D. C.**—The dragonfly-fauna of Trinidad in the British West Indies (Odonata). [Zool. Mededeelingen, Leiden] 14: 232-262, ill. **Klots, E. B.**—Insects of Porto Rico and the Virgin Islands. Odonata or dragon flies. [Sci. Surv. P. R. & Virg. Ids.] 14: 107 pp., ill. \***McDunnough, J.**—New species of North American Ephemeroptera II. [4] 64: 209-215, ill. **Mills, H. B.**—The life history and thoracic development of *Oligotoma texana* (Embiidina). [7] 25: 648-652, ill. **Pearman, J. V.**—Notes on the genus *Psocus*, with special reference to the British species. [8] 68: 193-204, ill. **Pickens, A. L.**—Observations on the genus *Reticulitermes*. [55] 8: 178-180. \***Priesner, H.**—Neue Thysanopteren aus Mexiko, gesammelt von Prof. Dr. A. Dampf. [48] 49: 170-185. \***Smith, R. C.**—The Chrysopidae of Canada. [7] 25: 579-601, ill. **Snyder & Popenoe.**—The founding of new colonies by *Reticulitermes flavipes*. [95] 45: 153-157, ill.

**ORTHOPTERA.**—\***Ander, K.**—Neue Laubheuschrecken. [K. Fysiogr. Sälls. Lund Förh.] 2: 16 pp., ill. (S). **Bromley, S. W.**—Observations on the Chinese mantid *Paratenodera sinensis*. [19] 27: 196-201. **Caudell, A. N.**—Insects of the order Orthoptera of the Pinchot Expedition of 1929. [50] 80, Art. 21: 7 pp. (S). **Henderson, W. W.**—Crickets and grasshoppers in Utah. [Utah Agric. Exp. Sta.] Circ. 96: 38 pp., ill. \***Rehn, J. A. G.**—Wissenschaftliche ergebnisse der schwedischen entomologischen Reisen des Herrn Dr. A. Roman 1914-1915 und 1923-1924 in Amazonas Blattidae. [Ark. för Zool.] 24 A (11): 73 pp., ill. **Sjöstedt, Y.**—

Orthopteren typen im Naturhistorischen Reichsmuseum zu Stockholm. [83] 24: 1-89, ill.

**HEMIPTERA.**—\***Anderson, L. D.**—A monograph of the genus *Metrobates* (Gerridae). [Univ. Kansas Sci. Bull.] 20: 297-311, ill. \***Beamer, R. H.**—Some *Erythroneura* (Grape Leaf Hoppers) of the *Maculata* group. (Cicadellidae.) [4] 64: 174-181. \***Beamer, R. H.**—A new *Erythroneura* related to *Erythroneura rubricata* (Cicadellidae.) [55] 8: 183-184. \***Beamer, R. H.**—Some *Erythroneura* from the western United States. (Cicadellidae.) [103] 5: 123-127. \***DeLong, D. M.**—Three species of Empoasca leaf hoppers known to affect economic plants in Haiti (including the description of two new species). [Jour. Dept. Agric. Puerto Rico] 16: 113-115, ill. \***Drake & Harris.**—An undescribed water-strider from Honduras. (Gerridae.) [55] 8: 157-158. \***Hungerford, H. B.**—A new *Platygerris* with notes on *P. caeruleus* (Gerridae). [19] 27: 178-182. **Hungerford, H. B.**—Concerning a fossil water bug from the Florissant (Nepidae). [Univ. Kansas Sci. Bull.] 20: 327-331, ill. \***Lawson, P. B.**—The genus *Spangbergiella* (Cicadellidae) in America north of Mexico. [103] 5: 116-122, ill. \***McAtee, W. L.**—A new neotropical genus of Eupteryginae from Puerto Rico. [Jour. Dept. Agric. Puerto Rico] 16: 119-120, ill. \***Melichar, L.**—Monographie der Cicadellinen. [Ann. Hist.-Nat. Mus. Nat. Hungarici] 27: 285-328. (S.) \***Nottingham, J. O.**—The genus *Carneocephala* (Cicadellidae). [103] 5: 97-115, ill. \***Tissot, A. N.**—Three new aphids of the tribe Chaitophorini. [39] 16: 17-24, ill. \***Usinger, R. L.**—Miscellaneous studies in the Henicocephalidae. [55] 8: 145-156, ill.

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**SPECIAL NOTICES**—*Etude biologique des Coccides du bassin occidental de la Méditerranée* par A. Balachowsky. This Vol. 15 of *Encyclopedie Entomologique*. Series A. contains 214+61 pp. 46 fig. 14 map+7 plates and includes "Catalogue revise des Coccidae du Nord Africain."

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## OBITUARY.

### Dr. William G. Dietz.

Dr. WILLIAM GEORGE DIETZ died April 13, 1932, in his 83rd year. His entomological interests which were first shown in early childhood continued up to the end of his life. During his last few weeks, when he admitted an increasing weariness, he forced himself to work on his spiders so that they might be left in condition for others to use.

He was born in Southern Germany (Tüingen, we think) July 30, 1848, and early in life lost all his family, except a grandmother, in one of the smallpox epidemics which ravaged the country. This grandmother was apparently a woman of discernment. She early recognized his fondness for plant and beetle and encouraged him in his natural interests. The bond between them must have been very close for all through his long life he revered her memory and her birthdays were always for him holy days.

The education of his youth was thorough and broad. In later years he remembered more Latin and Greek from his early training than his daughters knew as they emerged fresh from three and four year courses in these subjects.

He began the study of medicine at Heidelberg in 1867. His university reports, which have been recently found, are annotated by his professors with words of praise for his industry and skill. His work at the university was interrupted by the Franco-Prussian war in which he served on the medical staff. He evidently came to America soon after the close of the war and finished his interrupted medical work at Hahnemann Medical College in Philadelphia.

While studying in Philadelphia, Fairmount Park was an oasis for him. Here he collected beetles and studied flowers. I have found among his things a collection of mounted, pressed wild flowers all named, classified and dated 1875. They are remarkably well preserved.

His entomological interests enriched his whole life. Through his busy years as a physician in Hazleton, Pennsylvania, he combined vocation and avocation so closely that life was busy for him from early morning until late into the night. As a daughter looking back upon his life, I recall no shadows of illness, nor weariness, nor depression. He took practically no vacations. After his strenuous hours of professional work, he would go into his library and work on his entomological material. It was the one room in the house where children were expected to touch nothing and where efforts at house-cleaning raised heavy protest. During his active years he wrote many entomological papers and made some beautiful drawings. First Coleoptera, then Lepidoptera, next the Diptera and finally the Arachnida held his interest. He did much collecting himself and of course had many who collaborated with him. His collections are preserved in various institutions, his Coleoptera and Microlepidoptera in the Museum of Comparative Zoology, his Diptera and Arachnida in the Philadelphia Academy. His family life was simple and serene. He was devoted to his wife, Bertha Katherine Waaser, of Schuylkill Haven, Pennsylvania, and never became reconciled to the separation caused by her death seven years prior to his own. Every evening at six o'clock, when the bells of a nearby church played the evening hymn, it was his unbroken custom to retire to his bedroom and commune with her memory. It seems more than a coincidence that, after a brief illness of scarcely three days, he should have slipped away at that same hour with such simplicity, such dignity and with such apparent willingness to go that his passing seemed to be a beginning rather than the ending of life.

To me he seems a perfect example of an attuned personality.

These recent years of financial depression did not reach him emotionally. His philosophy of life was remarkable. So often, I have heard him say, "Do your best as you see it and then don't worry." And again, "As you look back on life, nothing much matters except giving others a helping hand, help others all you can." Perhaps if more of us could combine such an abiding interest in nature with such a humanitarian attitude toward our fellowmen and could hold such a steadfast faith in a future life, we might be better able to look beyond the common, material difficulties of life and see more clearly the vision which shines for us all on the horizon.

MARJORIE D. BATCHELOR.

BIBLIOGRAPHY OF WILLIAM G. DIETZ, M.D.

Compiled by E. T. CRESSON, JR.

1. On the species of *Macrops* Kirby, inhabiting North America. [27 n.sps.] *Trans. Am. Ent. Soc.*, XVI, pp. 28-54, 1 pl., 1889. [Col.]
2. Notes on the species of *Dendroctonus* of Boreal America. [1 n.sp.] *Trans. Am. Ent. Soc.*, XVII, pp. 27-32, figs., 1890. [Col.]
3. Revision of the genera and species of Anthonomini inhabiting North America. [13 n.gen., 69 n.sps.] *Trans. Am. Ent. Soc.*, XVIII, pp. 177-276, 3 pls., 1891. [Col.]
4. Revision of the genera and species of Desmori of North America. [2 n.gen., 50 n.sps.] *Trans. Am. Ent. Soc.*, XXI, pp. 113-178, 2 pls., 1894. [Col.]
5. Revision of the genera and species of Ceutorhynchini inhabiting North America. [8 n.gen., 66 n.sp.] *Trans. Am. Ent. Soc.*, XXIII, pp. 387-480, 3 pls., 1896. [Col.]
6. Some new genera and species of N[orth] A[merican] Tineina. [2 n.gen., 3 n.sps.] *Ent. News*, XI, pp. 349-353, 1 pl., 1900. [Lep.]
7. On *Pigritia* Clemens. [3 n.gen., 26, n.sps.] *Trans. Am. Ent. Soc.*, XXVII, pp. 100-120, 2 pls., 1900. [Lep.]
8. Revision of the genera and species of the Tineid subfamilies Amydriinae and Tineinae inhabiting North America. [13 n.gen., 58 n.sps.] *Trans. Am. Ent. Soc.*, XXXI, pp. 1-95, 6 pls., 1905. [Lep.]
9. The North American species of the genus *Ornix* Tr. [10 n.sps.] *Trans. Am. Ent. Soc.*, [XXIII, pp. 287-297, 1 pl., 1907. [Lep.]

10. Note on *Dryaphthorus bituberculatus* Fab. *Ent. News*, XXI, pp. 47-48, 1910. [Col.]
11. Revision of the Blastobasidae of North America. [3 n.gen., 37 n.sps.] *Trans. Am. Ent. Soc.*, XXXVI, pp. 1-72, 4 pls., 1910. [Lep.]
12. A correction [for *Americides* Kirkaldy]. *Can. Ent.*, XLII, p. 104. [Lep.]
13. A synopsis of the described North American species of the dipterous genus *Tipula* L. *Ann. Ent. Soc. Am.*, VI, pp. 461-484, 1913.
14. The Hebes group of the dipterous genus *Tipula* Linnaeus. [7 n.sps., 1 n.var.] *Trans. Am. Ent. Soc.*, XL, pp. 345-363, 2 pls., 1914.
15. A preoccupied specific name in *Tipula* (Dipt.). *Ent. News*, XVI, p. 125.
16. Two new Tipulidae from northern Alberta. [2 n.sps.] *Can. Ent.*, XLVII, pp. 329-332, fig., 1915. [Dip.]
17. Synoptical table of the North American species of *Ormosia* Rondani (*Rhyphlophus* Kolenati), with descriptions of new species. [11 n.sps.] *Trans. Am. Ent. Soc.*, XLII, pp. 135-146, 1 pl., 1916. [Dip.]
18. Key to the North American species of the Tricolor group of the dipterous genus *Tipula* Linnaeus, with descriptions of four new species. *Ent. News*, XXVIII, pp. 145-151, 1 pl., 1917.
19. A revision of the North American species of the Tipulid genus *Pachyrhina*, with descriptions of new species (Diptera). [27 n.sps., 1 n.var.] *Trans. Am. Ent. Soc.*, XLIV, pp. 105-140, 4 pls., 1918.
20. The Streptocera group of the dipterous genus *Tipula* Linnaeus. [6 n.sps., 1 n.var.] *Ann. Ent. Soc. Am.*, XII, pp. 85-92, 1 pl., 1919.
21. Three new crane-flies from eastern Canada. [3 n.sps.] *Can. Ent.*, LII, pp. 5-8, 1920. [Dip.]
22. A new species of *Coptodisca* (Lepid.). *Can. Ent.*, LIII, p. 44.
23. Impudica group of the dipterous genus *Tipula* Linnaeus. [8 n.sps.] *Ann. Ent. Soc. Am.*, XIV, pp. 1-14, 1 pl., 1921.
24. Descriptions of two new species of the Angustipennis group of the dipterous genus *Tipula* Linnaeus, with table of species. *Ent. News*, XXXII, pp. 299-302, 1921.
25. A list of the crane-flies taken in the vicinity of Hazleton, Pennsylvania (Diptera). [22 n.sps., 2 n.var.] *Trans. Am. Ent. Soc.*, XLVII, pp. 233-268, 1921.

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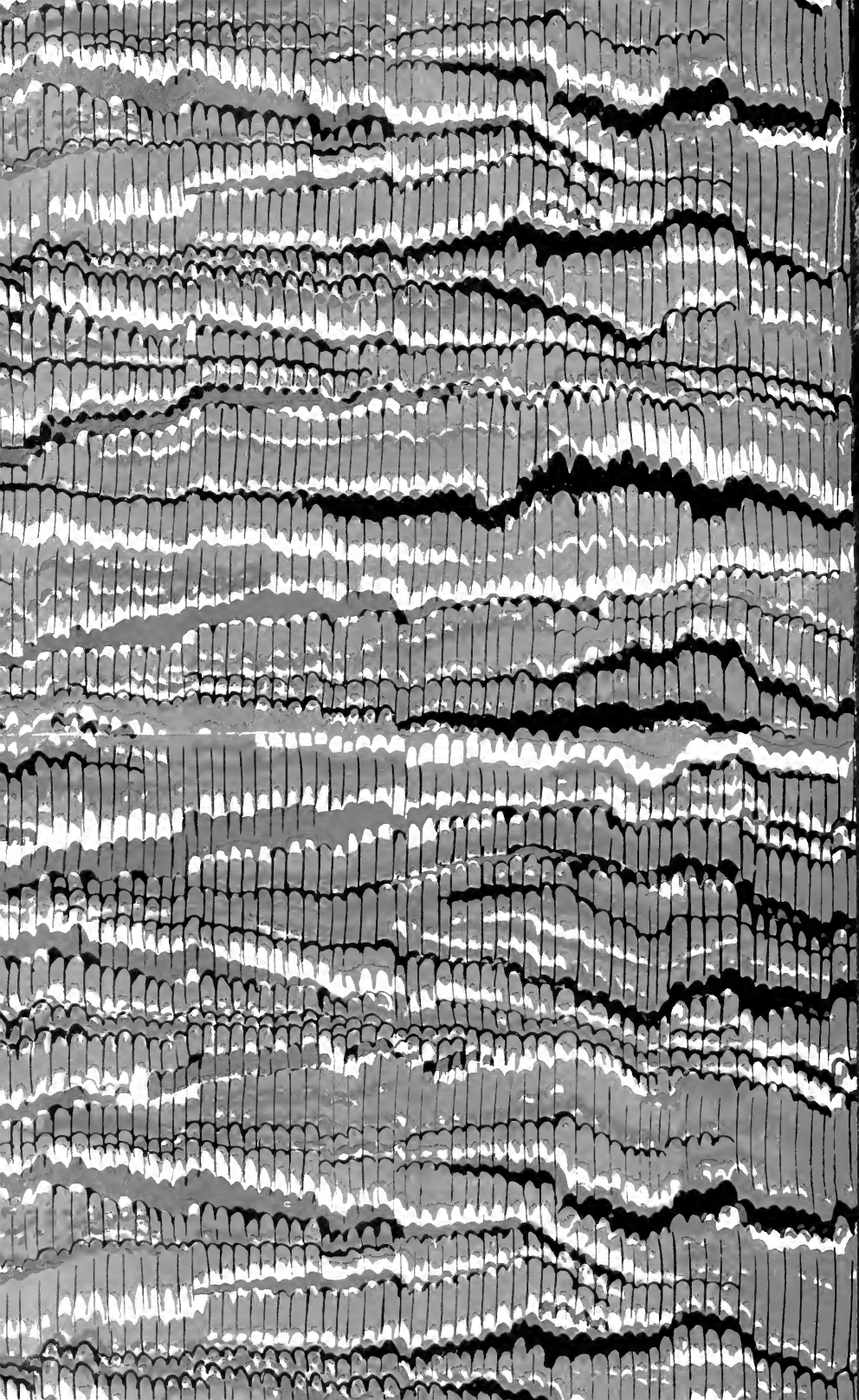












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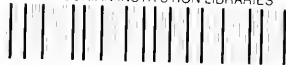
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