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Life History Notes on the Wood-Roach, Ischnoptera deropeltiformis Brunner

By Phil Rau, Kirkwood, Missouri

Previous to these observations in 1945, I had occasionally taken adults under bark in dead logs in St. Louis County as late as June 7, and on one occasion in my search for sleeping insects I saw one on top of a weed at 4 A.M. on June 26 (Trans. Acad. Sci. St. Louis 24: 57, 1922).

With only this meager acquaintance with this insect, I was amazed to discover a large number of them at rest on the wild oats heads in a rural school-yard, on the evening of June 19, 1945.* Even though the twilight was rapidly fading, their dull-black bodies were easily discernible among the airy tops of the green grasses. There was no tendency toward gregariousness; each roach was independently perched high up on its stalk, and some distance from others of its kind. Each assumed a statue-like position, with head up, and remained thus during the entire evening. In spite of this "frozen" attitude, they were entirely alert; when approached within a foot or two, they tumbled, quick as a flash, into the tangled grass below.

There were 25 adults, scattered over this area of perhaps an acre. Although I watched them carefully until darkness fell, and later with a flash-light, I could detect no alteration in their attitude or behavior.

* Specimens kindly identified by Mr. J. A. G. Rehn.

The following evening I visited them again, and on several other evenings, until their disappareance on July 5, but never witnessed the courtship or mating behavior that I had expected. However, the following items of behavior were noted:

1. There were from 20 to 30 on exhibition each night, until the numbers dwindled during the last days of June, and they disappeared on July 5.

2. During that time, thorough searches netted only one female; all of the others were males, easily discernible by being winged.

3. The males readily escaped from the net when caught. They could sustain themselves in flight for 40 or 50 feet, and on rare occasions a resting male would voluntarily fly to another oat head.

4. They were much more agile on their feet than on the wing, running with great rapidity on a smooth surface, but when they fell into the tangled grass their movements were awkward, and they could readily be picked up with the fingers.

5. They maintained this frozen attitude even in a drizzling rain.

6. On my first visit, I came upon them in deep twilight, when all of the roaches were quiet in their places. On subsequent visits, I arrived at the school-yard while it was still daylight, and had the pleasure of seeing the roaches come up out of the tangled grass and climb slowly to the tops of the oats heads. At 6:15, there was not a roach to be seen, but as twilight deepened they crept out slowly and stealthily, one here and one there, until within a half-hour all 20 or 30 were in their places. One exceptional case was an ambitious creature which appeared on June 24, a half-hour before any of the others. At what hour they went back into hiding, I did not discover, but when I left, usualy at 9:30 P.M., all were still quiet in their respective places.

7. A year later, I often visited the school-yard, earlier in the season, to discover the date of their first appearance. The first ones were seen on May 25, almost a month earlier than my observations the previous year. Obviously, I had come upon them in 1945 at a date when their mating was already over, and the females (all but one) were elsewhere, probably ovipositing.

But in 1946, many trips and many hours of search led only to disappointment, for during the entire season only two or three males were seen at any one time on the high grasses, and their behavior differed in no way from that of the year before.

I still suspect that this well-defined habit of the males of coming out at twilight is some undiscovered part of the vital business of mating. If this is so, then their method of approach differs from that of their near kin, *Parcoblatta pennsylvanica,** who flies swiftly in the air and seeks, with display of emotion, the wingless females hidden in the logs. The males of *I. deropeltiformis* likewise come out at dusk, but merely sit in their frozen attitude. If they are awaiting the coming of the females, it must be a slow process, for the latter are wingless. The one female taken had been fertilized, for she oviposited soon after and the eggs were fertile. The place and behavior of mating are still to be discovered.

The one female already mentioned and 14 males were placed in a cage in the laboratory, and the following data gathered.

They fed on sliced apple, bread, cake, etc., and on several occasions they devoured a less vigorous one of their companions.

The female deposited three egg-cases before her accidental death. She was taken on June 19, and four days later a fine brown egg-case was protruding from her body. The second one appeared six days after the first, and again after an interval of seven days a third one appeared. This last one was distorted in shape, and nothing came from it. She did not carry the protruding egg-cases for days, as some roaches do, but dropped them from her body in less than twenty-four hours. One egg-capsule hatched after 38 days, the other after 37; and one produced 40 young, while the other gave 38.

The color of the egg-capsule is a shiny dark brown, almost black, slightly crescentic in form, and is a typically shaped cockroach case. The young mature simultaneously, and all leave the case within a period of a half-hour. The newly-hatched roaches are white, but gradually darken, and after about six hours are

* The Life-History of the Wood-Roach, *Parcoblatta pennsylvanica.* Entom. News 51: 5–6, 1940.

brown with two black spots on the last segment. The long, dark antennae are white for the distal fourth of their length.

The newly hatched nymphs are gregarious, living close together under a piece of bark in an insect cage. The gregariousness continues evidently through all of the immature stages, for at this writing (Nov. 1, 1946) these three-fourths grown nymphs continue the habit. The young, as well as the adults, are swift runners. They remain in hiding throughout the day, and feed at night, but when a light is switched on, they swiftly run for cover.

I had supposed that the length of life from hatching to maturity would be about a year, but in the laboratory those which hatched in July and August, 1945, are only about three-fourths grown after fifteen months. They prefer the moist parts of the floor of the cage, always under a piece of bark.

The adults are evidently long-lived, for the 14 which were already adult and of unknown age when captured lived from 21 to 48 days in confinement.

Pink Katydid (Amblycorypha oblongifolia DeG.) at Woods Hole, Massachusetts

By Edwin T. Moul, University of Pennsylvania, Philadelphia, Pa.

During late July, 1946, at Woods Hole, Massachusetts, a nymph of the katydid species *Amblycorypha oblongifolia* DeG. was brought into the class room by a student. Instead of the usual green color associated with katydids, this nymph was a deep pink. The specimen was given grass and leaves to feed upon and was kept in a make-shift cage. It appeared rather sluggish but ate some of the food material supplied. Examination of the cage on the sixth morning revealed an adult katydid. The nymph had moulted during the night, apparently eating its cast skin, as this could not be found. The color of the adult was less intense than that of the nymph, the ventral surface of the abdomen fading to almost white. It is evident that the coloration of this mutant carries over from nymph to adult. The pinned specimen has faded considerably and appears light brown with only a slight suffusion of pink here and there on the upper surface of the body.

Upon questioning the student, it was learned that a small colony of pink katydids has existed in the neighborhood of his summer home at Woods Hole for a period of at least two years. As evidence of the existence of other examples of this color phase, a second nymph like the first was collected. Upon searching the literature I have found a record of this pink form at "Woods Holl" as far back as 1886. Scudder (1897) reports specimens collected by Mrs. Sidney Smith, Mr. Richard Rathburn and Prof. A. E. Verril in August of that year. Again in 1912 this form is reported by Glaser (1912) to have been collected by Dr. A. S. Pearse and Mr. Gray of the Marine Biological Laboratory staff. Mr. Gray also collected a yellow color phase the same year. Apparently this colony has maintained itself for 60 years in spite of its conspicuous color, which defies all the laws of protective coloration.

This form is not an erratic color "freak" due to food habits or peculiarities of environment, but has been proved by Dr. Joseph L. Hancock (Hancock, 1916; Nabours, 1929) in a breeding experiment to be a dominant hereditary character. Green katydids crossed with green mates produce all normal green offspring. A cross between a pink female and a green male produced 4 green to 9 pink in the F_1 generation with sexes equally divided. The pink forms were inbred and the result in F_2 was 38 green to 90 pink.

In the "List of Insects of New York" (Leonard, 1928), the brown and pink examples of this species have been collected at W. New Brighton and Clove Valley on Staten Island. Davis (1913) reports it in Long Island. Scudder (1878) reports a pink specimen of *A. rotundifolia* collected by Dr. Joseph Leidy in August, 1878, at Sharp Mountain, Schuylkill County, Pennsylvania. The species determination of the Woods Hole specimens was made by Mr. J. A. G. Rehn and the specimens placed in the Academy Collection.

Bibliography

Davis, W. T. 1913. Jour. N. Y. Ent. Soc. 21: 74–75.
Glaser, R. W. 1912. Psyche 19: 159.
Hancock, J. L. 1916. Ent. News 27: 70–82.
Leonard. 1928. List of Insects of New York.
Lutz, F. E. 1921. Field Book of Insects. Plate 19.
Nabours, R. K. 1929. Ent. News 40: 14–16.
Scudder, S. H. 1878. Psyche 2: 189; 1897. Psyche 8: 54–55; 1901. Ent. News 12: 129–130.

A Note upon Two Neglected Species of Formica Linn. (Hym.: Formicidae)

By W. L. Brown, Jr., State College, Pennsylvania

In 1903, in a paper on Hymenoptera from Beulah, New Mexico, H. L. Viereck described a new variant of *Formica fusca* Linn. and named it "var. *densiventris* n. subsp." The description was vague and misleading, especially in regard to color details. Wheeler, in his 1913 revision of *Formica,* placed *densiventris* in the synonymy of *F. fusca* var. *subaenescens* Emery, though he followed the notation with a questionmark. In the short discussion of his action, Wheeler stated that he had never seen the types.

The author has recently come upon Viereck's types in the collection of the Academy of Natural Sciences in Philadelphia, and even cursory examination has convinced him that the specimens cannot belong to *subaenescens.* The red color of the head and thorax in the types at once separates them from *subaenescens,* which is colored black or blackish throughout these regions.

The type was keyed down in Wheeler's key to *Formica* in the 1913 paper to couplet 22, which includes *F. fusca* var. *neoclara* Emery and *F. fusca* var. *blanda* Wheeler. It agrees with neither alternative. After comparing the types with various members of the *fusca-rufibarbis* complex, the author is satisfied that *densiventris* is a valid subspecies. Presented below is an attempt to improve upon the original description.

Formica fusca subsp. **densiventris** Viereck

Formica fusca var. *densiventris* n. subsp. Viereck, Trans. Amer. Ent. Soc., XXIX, p. 73 (1903). Worker.

Formica fusca var. *subaenescens* Wheeler, Bull. Mus. Comp. Zool., LIII, pp. 504 and 505 (1913). Worker. Emery, Gen. Insect.; Formicidae: Formicinae, Fasc. 183, p. 248 (1925). Worker.

Worker (ANS Type No. 4955): 5.1 mm. Head in shape that of *fusca* group in general. The median clypeal carina extending from the anterior clypeal margin not quite to the anterior margin of the frontal area; maxillary palps long. Promesonotum and epinotum convex as seen from the side in profile, the mesepinotal constriction cut fairly deeply and broadly, and the epinotum without an angle, though rather high. Petiolar scale seen from in front rather narrow, the superior borders originating from an insignificant flattened space at the apex and passing through even, insensible curves into the lateral borders.

Head, thorax, petiole and gaster shagreened and opaque, frontal area and greater part of the legs shining. Mandibles longitudinally striate.

Hairs moderately long on dorsum of the head, truncate, scarce above compound eyes, absent on the gula. A few short subclavate hairs on the pro- and mesonotum, sides of the epinotum and on the ventral surface of the petiole. A set of three erect hairs on each side of the superior border of the petiolar scale. Dorsum and venter of gaster with scattered hairs of varying length, often truncate.

Pubescence of head and legs dilute and inconspicuous; of gaster, long, dense and slightly silvery under magnification.

Ground-color of head, thorax and petiole light brownish-red with an area between and above the compound eyes, dorsum of pro- and mesonotum, parts of the thoracic pleurae, coxae, and scale of petiole deeply infuscated. Gaster very dark brownish-black; legs brown with joints more yellowish; antennae light reddish brown and slightly infuscated toward their tips.

Paratype specimen: 4.5 mm. The petiolar node is narrower than in the type and much more acute, forming a distinct angle at its apex. Only one hair is present on the petiolar border, and it is far down on the lateral part of the border. Some hairs may be missing due to mishandling, however. In other respects, the paratype specimen is much like the type. Numbered ANS paratype 4955-1.

The two type specimens came from Beulah, New Mexico, and were collected by H. Skinner August 17, 1901.

There are two other workers in the collection which agree rather closely with the types, but which have the infuscated areas on the head and thorax lighter and less extensive. One of this pair has the petiole narrower even than the type and paratype, and more acute above. The latter are labelled "Head of Daily Canon" and were collected by T. D. A. Cockerell. "Daily" (or "Dailey") Canyon is in the region of Beulah, which lies at some 8000 feet altitude.

This subspecies is related to *F. fusca* var. *neoclara* and *fusca* var. *blanda,* but differs in having the gaster much darker in color and the petiolar scale narrower. The more rounded profile of the epinotum distinguishes the form from *F. rufibarbis* vars. *occidua* Wheeler and *gnava* Buckley.

Collections of the forms of the *fusca-rufibarbis* complex having reddish head and thorax should be made in the Beulah region before all doubt about this form is removed, since the *Formicas* of the complex are apparently quite variable even in series from one colony.

Formica aterrima Cresson redescribed

Formica aterrima Cresson, Proc. Ent. Soc. Phila. IV, p. 426 (1865). ♂.

Male (ANS Type No. 1853): Length 9.4 mm. Frontal area with very fine arching cross-striation, very slightly shining.

Head, thorax (especially the sides), femora and petiolar scale bearing abundant long, slender grayish hairs, also present but not abundant on the gaster. Eyes hairy; tibiae with oblique hairs. Pubescence of the gaster long, appressed, fairly dense, but allowing the visibility of the integumental surface, which appears under strong light as a shining, finely shagreened surface. Legs, funiculi of antennae and gaster very dark reddish brown. Scapes, head, thorax and petiolar scale a very dark brown approaching black. Wings clear except for the basal one-third, which is tinged with brownish-yellow. The specimens are quite possibly faded through age in both type and paratype specimens.

The *paratype male* (ANS Type No. 1853–2) agrees closely with the type specimen, but lacks most of the ventral and posterior portions of the gaster, due to the attacks of museum pests.

Cresson described this species from among collections made by James Ridings in the Colorado Territory during the summer of 1864. According to information obtained from persons familiar with the Ridings material, the collection was done in the Denver-Pike's Peak area. Cresson's description was based principally on color, and apparently no distinction was made between pilosity and pubescence.

No mention could be found of this species in later myrmecological publications, but there seems to be no reason why *aterrima* should not be considered a good subspecies of *Formica rufa*, or at least a form related to that species. Since the male is very close to some of the same sex of other American forms of *rufa*, the former course would seem to be the wisest. One of the geographical races of *rufa* will eventually have to be synonymized as *F. rufa* subsp. *aterrima* Cresson, but this will be very difficult to bring about because of the similarity among the *rufa* males of the various subspecies and because of the presence of four or five of these subspecies in the vaguely defined original collcting area.

Two New Spider Wasps from Southwestern United States (Hymenoptera, Pompilidae)

By Howard E. Evans, Ithaca, New York

In the course of studies on the Nearctic spider wasps of the tribe Pompilini in the department of entomology at Cornell University, at various museums, and in the field, a number of apparently undescribed species have been encountered, two of which are described herein. While I fully realize that the mere description of species can only add to the existing confusion in the group, it seemed best to describe these forms as a by-product of a more comprehensive review of the group, which may take considerable time.

Until a more satisfactory classification of these wasps can be attained, it is difficult to place many species generically with any degree of certainty. It should be understood that in describing the species below I have used the genera *Anoplius* and *Pompilus* in a rather broad sense, following Haupt (Deutsche Ent. Zeitschr., 1927, Beihefte, p. 168 and 230–231). Each of these may be divisible into a number of subgenera or species-groups, but for present purposes it has seemed sufficient merely to indicate the probable relationships of each within the two large genera.

Anoplius xerophilus new species

This species is closely related in general form to *Anoplius relativus* (Fox) and to *A. bellicosus* (Banks), but is readily distinguishable from each. The female is easily separable by the strongly inflated first abdominal tergite, the male by the absence of long hairs on the fourth or fifth ventral segment or the subgenital plate; both sexes have an unusually wide vertex and a depression on the inside of the anterior femora, unlike any other native species of the genus.

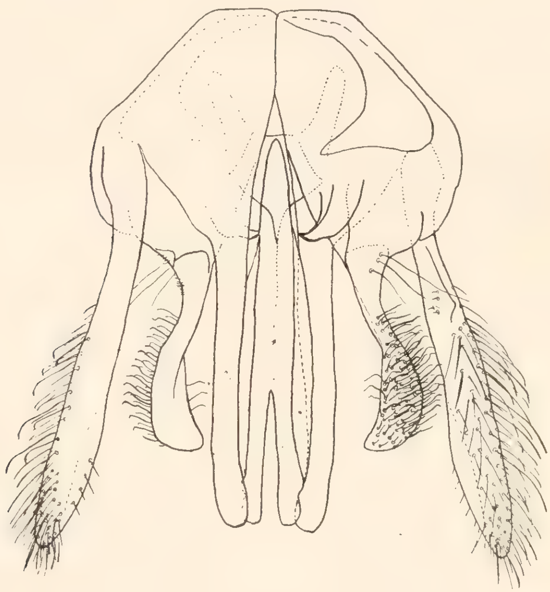
Male. 12 mm. long; forewing 9.5 mm. Fuscous-black, the body covered with a close brownish pubescence which in proper light reflects various shades of deep metallic colors, chiefly purple. Pubescence of lower front and disc of propodeum silvery and more coarse. Wings infuscated, slightly deeper apically, non-iridescent. Body with short erect hairs as follows: clypeus, front, vertex, temples, prosternum, pronotum, anterior coxae, posterior slope of propodeum; more sparsely on the mesonotum, scutellum, postscutellum, mesopleurae, and middle coxae.

Head considerably wider than high, the greatest width 1.3 times the distance from the lower margin of the clypeus to the vertex. Mandibles with a single strong tooth on the inner margin; clypeus twice as broad as high, the anterior margin straight. Eyes diverging above, the distance between the eyes at the top 1.24 times the distance at the bottom. Distance between the eyes at the emargination of the orbits, about half-way between the antennae and the vertex, 1.3 times the distance at the bottom, and .65 times the width of the head. Front somewhat gibbous above the antennal orbits; vertex slightly tumid about the ocelli. Postocellar line .7 times the ocello-ocular. Antennae relatively long and slender, the first four segments in a ratio of about 3 : 1 : 3 : 2.7, the first four together slightly greater than the distance between the eyes at the top.

Posterior margin of pronotum very weakly angled; postnotum narrowly exposed dorsally, linear; mesopleurae rather short. Propodeum sloping but very little to near the posterior margin, where it is quite abruptly declivitous, the posterolateral corners faintly protuberant.

Anterior femora briefly compressed on the inside near the middle, as though pinched; middle femora moderately and hind femora strongly compressed throughout, with numerous short spines on the upper, outer surface. Last segment of front tarsi asymmetrical, the inner side with a blunt lobe, the claw on this side strongly curved, the inner ray widely separated and acutely pointed. All remaining claws bifid, the inner ray truncate. Pulvillar comb of twelve rather strong, subparallel setae. Ultimate tarsal segments without spines beneath.

Transverse median and basal veins of forewing interstitial. Pterostigma short, a little longer than broad. Marginal cell rather long, slightly more than its length from apex of wing; radial vein rather evenly arcuate. First transverse cubital vein strongly curved; second submarginal cell nearly twice as broad as high, narrowed by about one half above. Third submarginal four-sided, not quite as broad above or below as second. First recurrent vein received about four-fifths of the way out on the second submarginal; second recurrent received near the middle of the third submarginal. Anal vein of hind wing interstitial with the cubitus.



Male genitalia of *Anoplius xerophilus* new species. Ventral surface shown on left half, dorsal on the right.

Abdomen cylindrical, slightly flattened above. Penultimate sternite with a V-shaped emargination, laterad of which it is rather hirsute. The usual pair of hooklets is present, situated about half way out the sides of the V, and each subtended by a short linear depression. Subgenital plate broad, obtusely pointed apically, slightly folded medially, the sides faintly and evenly sloping. Aside from a small apical fringe of bristles, there are no conspicuous hairs on this sternite.

Genitalia with the parameres the longest of the appendages, sublanceolate, nearly straight, beyond the basal third quite setose. Parapenials slightly shorter, simple and slender, embracing the simple, deeply cleft aedeagus. Volsellae about five-eighths the length of the parameres, somewhat sickle-shaped, broadened apically, acutely pointed. Disc of volsella set rather densely with stiff, erect setae, most of which are sinuate and somewhat upturned distally; base of volsella with several very long, straight hairs. Basal hooklets single as in all species of *Anoplius*. (See figure.)

Female. 12 mm. long, forewing 10 mm. In color much like the male, but without the silvery pubescence on the front and propodeum, the purple sheen somewhat stronger and extending to the femora. Head and thorax with erect hairs as in male; all abdominal sternites with a few slender hairs, as well as tergites three to five. Ultimate tergite with the dense brush of bristles which is characteristic of the genus. Corneous portion of last segment, just above sting, fulgid and somewhat fulvous.

Head in anterior aspect ovoid, the width 1.2 times the distance from the anterior margin of the clypeus to the vertex. Clypeus broader than in male, 2.6 times as broad as high, slightly broader than lower face. Eyes diverging somewhat above, the distance between the eyes at the top 1.1 times the distance at the bottom. Distance between the eyes at the emargination of the orbits 1.2 times the distance between the eyes at the bottom, and .6 times the width of the head. Postocellar line .8 times the ocello-ocular. First four antennal segments in a ratio of about 3:1:3.7:3.2, the third equal to slightly more than half the distance between the eyes at the top.

Wing venation and structure of thorax like male. Propodeum higher than in male, the declivity more oblique and somewhat concave behind. Front tarsi with a comb of spines only slightly longer than the width of the segments bearing them; three comb-spines on the basitarsus. Claws toothed; ultimate tarsal segments with a few median spines beneath. Femora as in male, the middle and hind femora less strongly compressed and less strongly spined.

First abdominal tergite strongly swollen, the anterior face nearly perpendicular to the dorsal plane. Dorsal part of first tergite with a median linear impression. Abdomen tapering beyond the third segment, the tip bristly.

Six paratypes, all males, vary from 8.5 to 12 mm. in length, and show minor differences in head measurements and in venation.

Holotype: ♂; NEW MEXICO, Steins, Grant Co., July 14, 1917 (J. C. Bradley and J. Bequaert; on *Acacia greggii*). *Allotype:* ♀; same data as type. *Paratypes:* ♂; same data as type. 2 ♂♂, New Mexico, Steins, Grant Co., July 14, 1917 (J. C. Bradley and J. Bequaert). ♂; ARIZONA, Bowie, Cochise Co., July 14, 1917. [all at Cornell Univ.] ♂; Arizona, Apache Camp, Santa Catalina Mts., 5500 feet, Pima Co., July 25, 1917 (J. Bequaert). [Mus. Comp. Zool.] ♂; CALIFORNIA, Coalinga, Fresno Co., June 1–3, 1907 (J. C. Bradley). [Cornell Univ.]

Pompilus orophilus new species

In general habit suggestive of members of the subgenus *Sophropompilus,* but the long, slender antennae and narrow front place it in *Pompilus* s. str. From such species as *Pompilus angularis* (Banks), *P. solonus* (Banks), and *P. luctuosus* Cresson it differs in the much longer comb-spines and more brilliant coloration.

Female. 7 mm. long; forewing 5.5 mm. Black, most of the body rendered a deep iridescent Prussian blue, ranging into dull bluish-violet in older specimens, by the minute, almost scale-like setulae which cover the body. Pubescence of lower half of clypeus and all the appendages brownish. Wings subfuscous, more dark beyond the cells, highly iridescent, the forewings above reflecting bluish-violet, the hind wings the colors of the spectrum. Body with erect hairs as follows: base of mandibles, clypeus, front, vertex, temples, and prosternum moderately densely; pronotum, front coxae, and tip of abdomen more sparsely.

Head in anterior aspect subcircular, the greatest width 1.14 times the distance from the lower margin of the clypeus to the vertex. Mandibles with two teeth on the inner margin, the outer subtended by a carina. Clypeus wider than face, 2.3 times as wide as high, anterior margin truncate. Face quite narrow, distance between the eyes at the bottom subequal to the distance between the eyes at the top. Space between the eyes at the emargination of the orbits 1.26 times the distance at the bottom, and .5 times the width of the head. Postocellar line 1.2 times the ocello-ocular. Antennae long and slender, the first four segments in a ratio of about 3 : 1 : 4.5 : 3.5, the third segment subequal in length to the space between the eyes at the top.

Pronotum rather short, posterior margin arcuate. Metapostnotum dorsally nearly as long as the postscutellum, showing very faint cross-striations, with a median impression laterad of which it is slightly arcuately broadened (though by no means as broadly and strongly as, for example, in *Sericopompilus*). Propodeum sloping rather smoothly, with a well-defined median line and a pair of weaker lines running obliquely ventro-caudad from the stigmata.

Anterior tarsi with a strong comb of spines which are about three times as long as the width of the segments bearing them; three are on the basitarsus, the last one nearly equal to the length of the second segment. Claws toothed; pulvillar comb of about eight rather weak setae. Ultimate tarsal segments without spines beneath.

Forewing with the transverse median vein meeting the median slightly before the basal. Pterostigma very short; marginal cell short, twice its length from the wingtip. Radial vein rather evenly arcuate from stigma to beyond the third submarginal, then nearly straight. Second submarginal cell almost twice as broad as high, narrowed by more than one half above by the convergence of the first and second transverse cubitals, the former starting proximad of a line drawn perpendicular to the costa at the base of the stigma. Third submarginal cell quite short, higher than broad, narrowed by about a half above, one third shorter on the radial vein than the second submarginal. First recurrent received two-thirds of the way out on the second submarginal, second recurrent two-thirds way out on the third submarginal.

Abdomen subsessile, shorter than head and thorax, tapering rapidly beyond the fourth segment, the tip with a few weak hairs above and below.

Except for minor venational differences, the two paratypes agree very closely with the type.

Holotype: ♀; NEW MEXICO, Raton, Colfax Co., 7000 feet, August 12, 1946 (H. E. Evans; taken on the stones of a dry stream-bed bordering a mountain meadow). [Will be deposited in Mus. Comp. Zool.] *Paratypes:* ♀; COLORADO, Texas Creek, Fremont Co., Sept. 18–19, 1917 (R. C. Shannon). [Cornell Univ.] ♀; CALIFORNIA, Los Angeles Co. (Coquillett). [U. S. Nat. Mus.]

On the Identity of Entomobora Gistel, 1857 (Hymenoptera: Psammocharidae)

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

In 1857, Johannes Nepomuk Gistel (or Gistl) published a work entitled *Achthundert und zwanzig neue oder unbeschriebene wirbellose Thiere.* This apparently was issued in two editions: one, as pages 515–603 of the second volume of Gistel's *Vacuna oder die Geheimnisse aus der organischen und leblosen Welt;* another, as a separate work of 94 pages; both appeared in 1857. I have seen only the latter in the library of the Academy of Natural Sciences of Philadelphia, but according to Strand, who gave a collation of this work in 1917,[1] both are identical except, of course, for the pagination.

In addition to the eight hundred and twenty new species described, Gistel proposed a considerable number of new genera. One of these was *Entomobora,* a Psammocharid, erected for the reception of the new Lusitanian species, *E. aestivalis.* Through an unfortunate oversight and clerical error, this name was omitted from my recent catalogue of the generic names of the Psammocharidae[2] and I take this opportunity to add it to

[1] Arch. Naturges. Abt. A, vol. 82, Heft 5, pp. 75–101 (1917).

[2] Trans. Amer. Ent. Soc., LXXII, pp. 65–137 (1946).

the list of names of these wasps. Gistel's work is rather rare, little known, and hitherto has largely escaped the notice of Hymenopterists. Consequently I append below Gistel's original descriptions: both genus and species were described on page 51 of the separate edition of the above mentioned work, and on page 563 of the second volume of Gistel's *Vacuna*.

Entomobora *

Corpus valde compressum.

Caput elypeatum [*sic*], clypeo quadrato maximo truncato-prominente; fronte devexa, plana.

Alae cellulis dentatis; cellula alarum anticarum tertia inframarginali trigona.

Habitus Pompili; ad familiam Pompilorum pertinet.

Aestivalis *. E. aterrima sericea, abdominis parte media rufescente, alis infumatis marginibus nigro-maculatis. ♀.

Algarbia. [in southern Portugal.]

Inasmuch as only one species, *E. aestivalis* Gistel, 1857, is mentioned in the original description of the genus, this species automatically becomes the type of *Entomobora* by monotypy.

The question now arises: what is *Entomobora?* Gistel's description, though brief, nevertheless gives several very distinctive features like the strongly compressed body, the very large, prominent and truncate quadrate clypeus, and the trigonal third submarginal cell of the fore wing. After a study of various European species and groups, I have come to the conclusion that *Entomobora aestivalis* is probably a species of *Pedinaspis* Kohl, 1884, possibly *Pedinaspis lusitanicus* Haupt, 1936,[3] or a closely related species. Of course, the specific identity of *Entomobora aestivalis* is entirely dependent upon an examination of Gistel's type which, before the recent war, was probably in the Munich museum.

Gistel's name was proposed almost a quarter of a century before Kohl established *Pedinaspis* which, if my conclusions are correct, must therefore be placed as a synonym of *Entomobora*.

[3] Boll. Ist. Ent. R. Univ. Bologna, IX, p. 79 (1936).

Moreover, Haupt [4] and Bradley [5] consider this genus to be type of a tribe or subfamily, Pedinaspini (correctly Pedinaspidinae or Pedinaspidini), which should henceforth be known as the Entomoborini.

Notes on District of Columbia Wasps

By David G. Shappirio, Washington, D. C.

Vespula squamosa (Dru.). An underground nest of this common yellow-jacket was attacked in September, 1946, in order to obtain any parasites present. When carbon disulfide was poured down the entrance in the usual manner, the inhabitants of the nest issued from several additional openings, some of which were three feet or farther away. An investigation revealed five distinct entrances, one of which was lined with paper of the type used by the wasps in covering their nest, and out of which queens and males *only* flew. From all the other entrances, all forms, queens, males, and workers, flew. Is this merely a coincidence, or is it of some special significance?

Podium luctuosum Sm. and *P. carolina* Roh. A number of specimens of these uncommon wasps were taken during June of 1944, 1945, and 1946 in Washington by Mr. Morton Vogel and myself, all but two on flowers of staghorn sumac (*Rhus hirta*). The remaining two were captured in an aerial trap.

Didineis latimana Mall. & Roh. and *D. texana* Cr. (Determined by Dr. K. V. Krombein.) One male specimen of *latimana* and twelve males and sixteen females of *texana* were taken between August 26 and September 5, 1946, at various localities in the District of Columbia, all by sweeping in lawns which had been allowed to grow to a height of six inches or more. Perhaps this interesting species has at last become a common member of our fauna.

[4] Mitt. Zool. Mus. Berlin, XV (1), p. 112 (April, 1929).

[5] Trans. Amer. Ent. Soc., LXX, pp. 29, 30, 34 (1944).

Notes and News in Entomology

Under this heading we present, from time to time, notes, news, and comments. Contributions from readers are earnestly solicited and will be acknowledged when used.

News from Italy. According to a letter received from Dr. Guido Grandi, Director of the Instituto di Entomologia della Università, Bologna, the Institute was destroyed by the Anglo-American bombardment, but by repeated removals during three years, partly preceding and partly subsequent to the period of bombardment, all the library, collections, and apparatus were saved. The Institute is now in reconstruction and has fully resumed its activities. Publication of the Bolletino has been continued and the 15th volume will shortly be issued.

The Societa Entomologica Italiana was seriously and irreparably damaged. The bombarding destroyed 50,000 volumes. The "Bolletino" and "Memorie" are nevertheless being continued in reduced scale.

Amongst Italian Entomologists, Dr. Grandi notes that Professor Gestro and Dr. Finzi have died. Corti, Giordani, Soika, Goidanich, Gridelli, Guiglia, Invrea, and Masi are alive and well.—J. C. Bradley.

Field Releases of Microplectron fuscipennis Zett., in New Jersey (Hymen.). The parasite laboratory of the New Jersey Department of Agriculture, reared and released during 1945, approximately 4,688,000 individuals of *Microplectron fuscipennis* Zett., a chalcid, cocoon parasite of the European pine sawfly. In general these parasites were liberated, at the rate of 3,000 per acre, in 32 sawfly infested plantations in the northern half of the state, between July 11 and August 23.—H. B. W.

Production of Macrocentrus ancylivorus Rohw., in New Jersey (Hymen.). During 1945, about 56,000 individuals of *Macrocentrus ancylivorus* Rohw., were produced for use in controlling the Oriental peach moth *Grapholitha molesta* (Busck) in peaches. The entire production was turned over to Dr. B. F. Driggers of the New Jersey Agricultural Experiment Station for experimental work designed to compare the relative effectiveness of parasites released against the first and second broods of peach moths. These parasites were produced by the parasite laboratory of the New Jersey Department of Agriculture. At present there are four other laboratories in New Jersey that are active in rearing this parasite.—H. B. W.

Summa Brasiliensis Biologiae. A new publication entitled *Summa Brasiliensis Biologiae* has come to hand. It is a publication of the Getúlio Vargas Foundation, established in December, 1944, and with Fascicle 11, dated October, 1946, was still in its first volume. Communications should be directed to the *Divisão de Intercambio e Documentação, Caixa Postal no. 4081, Rio de Janeiro, Brasil.* Fascicle No. 11, "Bunostoma brasiliensis n. sp. (Drosophilidae, Diptera)," is by O. Frota-Pessoa. Other fascicles of entomological interest are listed: "Odonata coligidos no Paraguay" and "Cendra cearana Navás, 1916 sinōnimo de Macrothemis griseofrons Calvert, 1909," by N. Dias dos Santos; "Nova espécie do gēnero Paradaemonia," by José Oiticica, Jr.; and "Estudos sōbre os crustáceos oniscídeos," by J. M. Lins de Almeida.—George C. Steyskal.

Pacific Science. The University of Hawaii, at Honolulu, is sponsoring *Pacific Science,* "a quarterly, devoted to the biological and physical sciences of the Pacific region." Vol. 1, No. 1 was printed December 10 and is dated January, 1947. Its editorial board includes Dr. F. G. Holdaway, Head, Department of Entomology, Univ. of Hawaii Agric. Expt. Sta. Subscription price is $3 per year.

This first number, 52 pages, contains 4 principal papers: 1) on sandalwood on Oahu, 2) the tsunami (tidal-wave) of April 1, 1946, 3) dolomitization of soils, 4) the red-billed Leiothrix. A section headed "Notes" is intended for shorter papers, reports, comments, etc. Here are reprinted the Recommendations of the Pacific Science Conference of the National Research Council, which met last June in Washington. Its recommendations of interest to entomologists are: the caution suggested in the use of DDT as well as of certain rodenticides and herbicides, and the desirability of thorough researches on the effects of such chemicals on all forms of life; the distribution of check lists; the appraisal of the biological consequences of the atomic bomb tests at Bikini during the repopulation of the waters and lands; advanced studies on evolution, taking advantage of the unique development of *Drosophila* and other forms on the Hawaiian Islands; ecological studies of termites; studies of diseases prevalent, including malaria, filariasis, dengue, etc., and their dissemination. Thus, although the scope of the journal is very broad, we may expect papers of interest to entomologists to receive a fair share of space.—R. G. S.

List of Titles of Publications Referred to by Numbers in Entomological Literature in Entomological News.

1. American Midland Naturalist. Notre Dame, Indiana.
2. American Museum Novitates. New York, N. Y.
3. American Naturalist. Garrison-on-Hudson, New York.
4. Annals of Applied Biology. London.
5. Annals of the Entomological Society of America. Columbus, Ohio.
6. Annals and Magazine of Natural History. London.
7. Annales Academia Brasileira Sciencias. Rio de Janeiro.
8. Anales del Instituto de Biologia Mexico. Mexico City.
9. Anatomical Record. Philadelphia.
10. Arkiv för Zoologie. K. Svenska Vetenkapsakademien i. Stockholm.
11. Arquivos de Higiene e Saude Publica. São Paulo.
12. Biological Bulletin. Woods Hole, Massachusetts.
13. Bios, Rivista Biol. Geneva.
14. Boletin de Entomologia Venezolana. Caracas.
15. Boletin del Museo de Historia Natural "Javier Prado." Lima, Peru.
16. Boletim do Museu Nacional do Rio de Janeiro. Brasil.
17. Bull. Acad. Sci. (Izvestia Akad. nauk) U R S S (S. biol.). Leningrad.
18. Bulletin of the Brooklyn Entomological Society. New York.
19. Bulletin of Entomological Research. London.
20. Bulletin of the Museum of Comparative Zoology. Cambridge, Mass.
21. Bulletin of the Southern California Acad. of Sciences. Los Angeles.
22. Comptes rendus Acad. Sci. (Doklady Akad. nauk) U R S S. Leningrad.
23. Canadian Entomologist. Guelph, Canada.
24. Canadian Journal of Research. Ottawa, Canada.
25. Ecological Monographs. Durham, North Carolina.
26. Ecology. Brooklyn, New York.
27. Entomologica Americana. Brooklyn Entomological Society, New York.
28. Entomological Monthly Magazine. London.
29. Entomological Record and Journal of Variations. London.
30. The Entomologist. London.
31. Florida Entomologist. Gainesville, Florida.
32. Frontiers. Philadelphia, Pennsylvania.
33. Great Basin Naturalist. Provo, Utah.
34. Iowa State College Journal of Science. Ames, Iowa.

35. Journal of Agricultural Research. Washington, D. C.
36. Journal of Animal Ecology. London.
37. Journal of Economic Entomology. Geneva, New York.
38. Journal of the Elisha Mitchell Science Society.
39. Journal of Entomology and Zoology. Claremont, California.
40. Journal of Experimental Biology. London.
41. Journal of Experimental Zoology. Philadelphia, Pennsylvania.
42. Journal of Heredity. Baltimore, Maryland.
43. Journal of the Kansas Entomological Society. Lawrence, Kansas.
44. Journal of Morphology. Philadelphia, Pennsylvania.
45. Journal of the New York Entomological Society. New York.
46. Journal of Parasitology. New York.
47. Journal of the Tennessee Academy of Sciences. Nashville, Tenn.
48. Journal of the Washington Academy of Sciences. Washington, D. C.
49. Memorias do Instituto Oswaldo Cruz. Rio de Janeiro.
50. Microentomology. Stanford University, California.
51. The Microscope and Entomological Monthly. London.
52. Mosquito News. Albany, New York.
53. Nature. London.
54. Nature. Washington, D. C.
55. La Naturaliste Canadien. Quebec.
56. Natural History. New York.
57. Occasional Papers of the Mus. of Zool., Univ. of Michigan. Ann Arbor.
58. Ohio Journal of Science. Columbus, Ohio.
59. Opinions and Declarations. Internat. Comm. Zool. Nomencl. London.
60. Pan-Pacific Entomologist. San Francisco, California.
61. Parasitology. London.
62. Proceedings of the Academy of Natural Sciences. Philadelphia.
63. Proceedings of the Biological Society of Washington. Washington, D. C.
64. Proceedings of the California Academy of Sciences. San Francisco.
65. Proceedings of the Entomological Society of Washington. Washington, D. C.
66. Proceedings of the Hawaiian Entomological Society. Honolulu.
67. Proceedings of the National Academy of Sciences. Washington, D. C.
68. Proceedings of the Royal Entomological Society of London. Ser. A.
69. Proceedings of the Royal Entomological Society of London. Ser. B.
70. Proceedings of the Royal Entomological Society of London. Ser. C.
71. Proceedings of the United States National Museum. Washington, D. C.
72. Proceedings of the Zoological Society of London. London.
73. Psyche, A Journal of Entomology. Boston, Massachusetts.
74. Quarterly Journal of Microscopical Science. London.
75. Quarterly Review of Biology. Baltimore, Maryland.
76. Revista Academia Columbiana de Cien. Exact. Fis. y Nat. Bogotá.
77. Revista Chilena de Historia Natural. Valparaiso, Chile.
78. Revista Instituto Salubridad y Enfermedades Tropicales. Mexico.
79. Revista Sociedad Mexicana de Historia Natural. Mexico City.
80. Science. Washington, D. C.
81. Scientific Monthly. New York.
82. Smithsonian Miscellaneous Collections. Washington, D. C.
83. Transactions of the American Entomological Society. Philadelphia.
84. Transactions of the American Microscopical Society. Menasha, Wisconsin.

85. Transactions of the Illinois State Academy of Sciences. Springfield.
86. Transactions of the Kansas Academy of Science. Manhattan, Kansas.
87. Transactions of the Royal Canadian Institute. Toronto.
88. Transactions of the Royal Entomological Society. London.
89. United States Dept. of Agric., Farmer's Bulletins. Washington, D. C.
90. United States Dept. of Agric., Technical Bulletins. Washington, D. C.
91. University of California Publications in Entomology. Berkeley.
92. University of California Publications in Zoology. Berkeley.
93. University of Kansas, Science Bulletins. Lawrence, Kansas.
94. Ward's Natural Science Bulletin. Rochester, New York.
95. Zoologica. New York.
96. American Journal of Public Health. Boston.
97. American Journal of Tropical Medicine. Baltimore.
98. Annals of Tropical Medicine and Parasitology. Liverpool.
99. Canadian Journal of Research. Section E, Medical Sciences, Ottawa.
100. Turtox News. Chicago, Illinois.
103. Proceedings of the Royal Society of London.
104. Anales de la Escuela Nacional de Ciencias Biologie. Mexico.
105. Journal of Cellular and Comparative Physiology. Philadelphia.
106. Redia. Florence, Italy.
107. Annales de la Société Entomologique de France. Paris.
108. Bulletin de la Société Entomologique de France. Paris.
109. Notulae Naturae. Philadelphia.
110. L'Entomologiste. Paris.
111. Revista Brasiliera de Biologie. Rio de Janeiro.
112. Eos, Revista Española de Entomologia. Madrid.
113. Ministerio de Agri. de la Nación, Inst. Sanidad Vegetal, Buenos Aires.

Current Entomological Literature

COMPILED BY EDWIN T. MOUL, RAYMOND Q. BLISS, CHARLES HODGE IV, MAURICE E. PHILLIPS, JOHN W. H. REHN AND HENRY K. TOWNES, JR.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, 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.

This list gives references of the current or preceding year unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

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 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. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

GENERAL—Coudert & Baud—Procédé de montage des échantillons parasitologiques dans les verres synthétiques.

[Annal. de Parasit. humaine et comparee] 21: 177–82, ill. **Heinrich, Harned and van Dine**—Ulphian Carr Loftin. (Obituary) [65] 48: 240–43. **Leary, Fishbein, and Salter**—DDT and the insect problem. N. Y., 176 pp. **Olson, T. A.**—Place of the entomologist in public health. [96] 36: 1031–34. **Paulian, R.**—Récolte et conservation des larves d'insectes. [110] 2: 156–59. **Romney, V. E.**—Insects found on Guayule in northern Mexico. [37] 39: 670–71. **Ross, E. S.**—Obituary of Louis S. Slevin. [60] 22: 141. **Weiss, H. B.**—Author and general subject index to volumes 1 to 50. Jour. N. Y. Entom. Soc., 135 pp.

ANATOMY, PHYSIOLOGY, MEDICAL—Abbott, C. E.—The physical and chemical requirements of mosquito larvae. [100] 24: 189–90. **Abbott, Roden and Yoeli**—Anopheline mosquitoes as natural vectors of equine dermal filariasis. [53] 158: 913. **Andrews, H. W.**—Some external aspects of the bodies of Diptera. [Proc. and Trans. S. London Ent. and Nat. Hist. Soc.] 1945–46: 58–63. **Bates and Roca-Garcia**—The development of the virus of yellow fever in Haemagogus mosquitoes. [97] 26: 585–606; An experiment with neurotropic yellow fever virus in Saimiri monkeys and Haemagogus mosquitoes. [97] 26: 607–12. **Bodenstein, D.**—Developmental relations between genital ducts and gonads in Drosophila. [12] 91: 288–94, ill. **Brues, C. T.**—Juvenile and imaginal luminescence in fire-flies (Lampyr.). [73] 53: 13–14. **Carpentier, F.**—Sur la valeur morphologique des pleurites du thorax des machilides (Thysanoures). [Bul. et Anal. Soc. Ent. Bel., Bruxelles] 82: 165–81, ill. **Crow, James F.**—The absence of a primary sex factor on the x-chromosome of Drosophila. [3] 80: 663–65. **De Meillon, B.**—Effect on some blood-sucking arthropods of "Gamme-xane" when fed to a rabbit. [53] 158: 839. **Du Porte, E. M.**—Observations on the morphology of the face in insects. [44] 79: 371–417, ill. **Eagles, T. R.**—Physiology of insects. [Proc. and Trans. S. London Ent. and Nat. Hist. Soc.] 1945–46: 84–91. **Elmendorf, Marucce, Griffin, Meyer and Ryan**—Longevity of killing effect of DDT for mosquitoes contacting screen wire painted with DDT solutions. [97] 26: 663–86. **Hinton, H. E.**—The "gin-traps" of some beetle pupæ; a protective device which appears to be unknown. [88] 97: 473–96, ill. **Merrill, Savit and Tobias**—Certain biochemical changes in the DDT poisoned cockroach and their prevention by prolonged anesthesia. [105] 28: 465–76. **Ribbands, C. R.**—Man's reaction to mosquito bites. [53] 158: 912–13. **To-**

bias and Kollros—Loci of action of DDT in the cockroach (Periplaneta americana). [12] 91: 247–55, ill. **Tobias, Kollros and Savit**—Acetylcholine and related substances in the cockroach, fly and crayfish and the effect of DDT. [105] 28: 159–82. **White, M. J. D.**—Cytology of the Cecidomyidae. II. Chromosome cycle and anomalous spermatogenesis of Miastor. [44] 79: 323–70, ill.

ARACHNIDA AND MYRIOPODA—Baker, E. W.—Some Tydeidae (Acarina) from the fig tree (Ficus carica). [104] 4: 255–61, ill. (*); New species of north and central American mites of the family Penthaleidae. [48] 36: 421–25, ill. (k*). **Chamberlin, R. V.**—A new centiped and two new millipeds from the Pearl Islands, Colombia. [60] 22: 145–47. **Fox, I.**—Three new mites from rats in Puerto Rico. [63] 59: 173–75, ill. **Jones, S. E.**—Description of Habrocestum parvulum (Banks). [73] 53: 27–29. **Keifer, H. H.**—A review of North American economic Eriophyid mites. [37] 39: 563–70.

SMALLER ORDERS—Carpentier, F.—(Thysanura). (See under Anatomy.) **Wright, M.**—A description of the nymph of Agrion dimidiatum (Odonata). [47] 21: 336–38, ill.

ORTHOPTERA—Merrill, Savit and Tobias—(See under Anatomy.) **Rehn, J. A. G.**—On the Punctulatus Species-Group of the Genus Melanoplus (Acrid.) with description of a new sp. from Kansas. [62] 98: 241–69 (k), ill. **Tobias and Kollros**—(See under Anatomy.) **Tobias, Kollros and Savit**—(See under Anatomy.)

HEMIPTERA—Banks, N.—Athysanus argentatus Fabr. in New England. [73] 53: 4–5. **Beament, J. W. L.**—The waterproofing process in eggs of Rhodnius prolixus Stahl. [103] 133: Series B: 407–18, ill. **Busvine, J. R.**—Comparative toxicity of various contact insecticides to the louse (Pediculus humanus L.) and the bed-bug (Cimex lectularius L.) [4] 33: 271–79. **De Long and Severin**—Taxonomy, distribution, and food plants of Gyponana hasta, a leafhopper vector of California aster-yellows virus. [Hilgardia] 17: 157–63, ill. **Hambleton, E. J.**—A new name for a mealy bug. [63] 59: 177. **Jenks and McKay**—Bubble-bathing bugs. [56] 56: 31–35, ill. **Roberti, D.**—Monografia del' Aphis frangulae Koch. [Bol. Lab. di Ent. Agraria di Portici, Naples] 6: 127–312, ill. **Russell, L. M.**—The identity of Chermes alni Linné, 1758 (Psyll.). [65] 48: 249–50. **Severin, H. H. P.**—Longevity, or life histories, of leafhopper species on virus-infected and on healthy plants.

[Hilgardia] 17: 121–37, ill.; Transmission of California aster-yellows virus by the first reported leafhopper vector in Gyponinae. Ibid. 141–53, ill. **Torres, B. A.**—Nuevas especies de Cicadidos perjudiciales a la agricultura en nuestra pais. [113] 2: ser. A, 18: 1–8, ill.

LEPIDOPTERA—Brown, N. R.—Studies on the parasites of the spruce budworm, Archips fumiferana. 1. Life history of Apanteles fumiferanae. [23] 78: 121–29, ill. **Clarke, J. F. G.**—Synopsis of the genus Nealyda, with descr. of new species (Gelechiid). [48] 36: 425–27, ill. **Dethier, V. G.**—Supplement to the bibliography of the described life-histories of the Rhopalocera of America north of Mexico. [73] 53: 15–20. **Leighton, B. V.**—Butterflies of Washington. [Univ. of Wash. Pub. in Biol.] 9: 49–63. **Lichy, R.**—Nota sobre un Lepidoptero singular de Venezuela. Copiopteryx semiramis cr. f: banghaasi Drdt. (Saturnioidea). [Bol. Soc. Venez. Ciencias nat.] 10: 241–51, ill (k). **Pastrana, J. A.**—La mariposita Europea del Brote del Pinto, Rhyaciona buoliana, [113] 2: ser. A, 15: 1–11; Una nueva mariposita en las Coles de la Republica Argentina Hellula phidicalis (Pyraus.). Ibid. 16: 1–8. **Satterthwait and Swain**—The sunflower moth and some of its natural enemies. [37] 39: 575–80.

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This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

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Wanted—Papers on Cicindelidae of any part of the world, especially South America and Pacific. R. G. Dahl, 3225 Grand Ave., Apt. 13, Oakland 10, Cal.

Chrysididae—Wanted for determination in preparation of revision. Wm. G. Bodenstein, Galesville, Maryland.

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Wanted—Hesperid genus Megathymus for exchange or purchase. P. S. Remington, 5570 Etzel Ave., St. Louis 12, Missouri.

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Notes on North American Enodias (Lepidoptera)

By RALPH L. CHERMOCK, Ithaca, N. Y.

The genus *Enodia* was erected by Hübner in 1818 in his "Verzeichnis Bekannter Schmettlinge," page 61, in which he included three species: *andromacha, dejeanira* and *hyperanthe*. Scudder, in 1872 in the Fourth Annual Report of the Peabody Academy of Science, selected *Enodia andromacha* Hübner as the genotype. *Andromacha* Hübner, 1818 is a synonym of *Papilio portlandia* Fabricius, 1781. On page 56 of the above work, Hübner proposed the generic name *Lethe,* citing only one species *Papilio europa* which becomes the genotype by monotypy. Scudder, in 1875 in the Bull. Buff. Soc. Nat. Sci., vol. II, p. 242, erected the genus *Satyrodes* with *Papilio eurydice* Linnaeus-Johanssen as the genotype.

The various members of the above genera will vary with regard to the shape of the wings, the presence and character of androconial patches, shape of the hindwing, and in maculation. However, none of these characters are limited to any one genus, thereby being generically diagnostic. Careful venational studies have not revealed any differences of generic rank. In all three of the genotypes, the primaries are almost identical: the subcostal is swollen at the base; the cell is half the length of the wing and broad; R_1 and R_2 arise before the end of the cell and extend to the costal margin; R_{3-5} originates at the end of the cell with R_3 intersecting the costal margin, R_4 the apex, and R_5 the outer margin; the upper discocellular is short and straight, the middle is curved basally, the lower is straight, over twice as long as the middle and meeting M_3 beyond its intersection with Cu_1. The venations of the secondaries of the three genotypes are also identical except for the following characters: the cell is closed in *europa,* open in *eurydice,* and closed by a very thin vein in *portlandia;* the humeral vein in *europa* is curved, in *portlandia* is short and angled, and in *eurydice* is very short and clubbed at the end. The rounded wing form of *eurydice* is also found in such species of *Lethe* as *epimenides* and *marginalis,* which, however, lack the distinctive form of valve of the former.

In genitalic studies of the three genotypes, the basic structures were identical. *Europa* is distinctive because it lacks the pair of socii at the base of the uncus. The valves of *portlandia* and *europa* are both long, narrowed distally, broader basally; the valves of *eurydice* are proportionally shorter, broader, with a distinctive rounded appendage at the distal end. None of the differences observed were, in my opinion, of generic rank, although the absence of the socii in *europa* along with the differences in venation are probably deserving of subgeneric distinction.

The author proposes, therefore, that *Lethe,* which has page priority over *Enodia,* be retained as the generic name applying to the entire group; and also as a subgeneric name to include *europa* and its relatives. *Enodia* Hübner may be used as a subgeneric name to include the North American representatives of the genus along with a large percentage of old world members such as *titania, marginalis* and *kansa* which agree with *portlandia* in genitalic and venational structure. *Satyrodes* Scudder is to be considered as a synonym of *Enodia,* having no characters of sufficient value to separate it from that genus. The generic names *Oreas* Hübner, *Tanaoptera* Billberg, *Debis* Doubleday, and *Zophoessa* Doubleday are all synonymic to *Lethe* as is adequately explained by Hemming, 1934.[1] Moore divided this group into numerous small genera. In 1880, in his Lepidoptera of Ceylon, vol. 1, p. 18, he erected the genus *Hampha.* In 1881, on page 305 of the Trans. Ent. Soc. Lond. he proposed the genus *Tansima.* In volume 2 of his "Lepidoptera Indica," he erected the following genera: *Rangbia, Nemitis, Dionana, Sinchula* and *Kerrata.* All of these genera are based on superficial characters and can be considered only as synonyms.

[1] The Generic Names of the Holarctic Butterflies, pp. 30–32, Oxford University Press.

Austin H. Clark, in the Proc. of the U. S. Nat. Mus., vol. 83, No. 2983, 1936, summarized the genus *Enodia* in North America, and described two new subspecies. His limiting of the name *portlandia* to the southeastern sub-species, with *andromacha* Hübner and *androcardia* Hübner as synonyms, is perfectly valid and adequately detailed in his paper. His recognition of *creola* as a distinct species also agrees with my findings, for the two species have an overlapping distribution in Virginia and North Carolina, with no apparent interbreeding; and differ in their flight behavior. The genitalia of *portlandia* have more blunt terminations to the valves than are found in *creola* although extremely similar in all other respects. The distinctive androconial patches found on the forewings of the male *creola* are also diagnostic for that species, though they may vary in their development.

Doctor Clark also described two subspecies of *portlandia* in his paper, one from Sullivan County, New York which he called *anthedon*, the other from Ontario which he named *borealis*. Both of these are distinguished from typical *portlandia* by the absence of white on the lower surfaces, the row of ocelli on the underside of the forewings being straight, and the ocelli on the underside of the secondaries having circular instead of elongate pupils. His principal distinction between *anthedon* and *borealis* is based on the breadth of the dark band between the light line bordering the fourth and fifth spots and the submarginal light band below. In long series from Pennsylvania, New York, Illinois, Ontario, Manitoba and smaller series from Quebec, West Virginia, Ohio, Maine, Minnesota and Missouri, examples matching both of his subspecies are sufficiently abundant so that neither one is overwhelmingly the dominant form. Consequently, using page priority, the author selects the name *anthedon* to apply to the northern subspecies. Although the name *borealis* could be used to designate a slight form, it is preferable to sink the name into synonymy.

Linnaeus-Johanssen described *Papilio eurydice* in 1763 in Amoenites Academicae, vol. 6, p. 406, this name preceding *canthus* Linnaeus and others. In 1840, Gosse in the Canadian

Naturalist, p. 247, described *transmontana* from Compton, Quebec. This name has been used to distinguish northern specimens of *eurydice* as a subspecies, but after studying long series from throughout the range of distribution of the species, no constant character can be found to distinguish the populations. The relative pale color usually used as a diagnostic feature of *transmontana* does not always occur in the more northern specimens, and occurs far too frequently in the more southern examples. For this reason, I sink it into synonymy. F. H. Chermock, in 1927, described an aberration of this species from Port Hope, Ontario, characterized by the absence of spots on the upper side of the primaries. Field, in 1936, described a "form" of this species from Bloomfield, Michigan, having a very pale color, almost albinic in character. Feeling that there is no need for names below the subspecific level which are used to designate the extremes of the normal range of variation of any given population, I sink these into synonymy.

Leussler, in vol. 27, p. 99 of the Entomological News for 1916, described a race of *eurydice* from a small bog in Sarpy County, Nebraska, a few miles south of Omaha. It was characterized by its darker color, larger size and larger markings on the upperside of the wings. In all other respects it was the same as typical *eurydice*. Apparently, this insect was restricted to a very small area, and has since become extinct. In examining cotypes and topotypes of *fumosus*, the author finds that actually the specimens described occurred only as a form of the typical species in the type locality along with the normal form.

The variation of *Lethe eurydice* is extremely interesting. They usually are restricted to swampy or boggy areas where their foodplant occurs, and because of their relatively weak flight habits, rarely leave these areas. Consequently, two bogs, which may be only a mile apart, will have little or no interchange of populations of this species. This affords perfect conditions for microevolution, and frequently light forms may develop in one bog, while in a nearby swampy area, darker colored forms may predominate. This variation may be duplicated in numerous local populations over a fairly large area, each of which has its own distinctive characteristics. Essentially, however, they represent local isolations of a potentially variable species. As such, the author feels that these local isolated populations are deserving of no subspecific designation. *Fumosus* is an example of a restricted population of this type, and consequently the author feels that it should be considered as a synonym of *eurydice*.

On the other hand, if the local populations of an area covering thousands of square miles collectively possess diagnostic characters which separate them from relatives inhabiting an adjacent large geographical area, we have true subspecies developed. In the zone where the ranges overlap, we may of course find an overlapping of the diagnostic features of both, or may find neighboring isolated populations of one or the other subspecies. However, considering the overall geographic distribution, the author feels that it is valid to use the term subspecies to designate the inhabitants of these large areas. For this reason, he proposes subspecific rank for members of the species *eurydice* inhabiting the southern Appalachians.

Lethe (Enodia) eurydice appalachia, new subspecies

Male. Length of primary (measured from the base of the wing to the apex) 23–27 mm., average length 25.5 mm.; longer than in *eurydice eurydice*. Genitalia cannot be distinguished from the typical form. Upper Surface: ground color of a darker brown than that of the typical form, with very slight contrast between the limbal and discal areas of the primaries; the row of ocelli reduced in size and tend to be obscured by the general dark ground color of the primaries; there is no contrast between the limbal and discal areas of the secondaries, and the ocelli are larger than in the typical subspecies. The color, maculation and length of wing are comparable to that of *fumosus* Leussler. Lower surface: darker brown than in the typical form, homogeneous, with a slight purplish cast and lacking the yellow which occurs so frequently in *eurydice eurydice*. Ocelli large, filling the intravenous space, white pupilled, ringed with yellow, then a ring of the ground color, and finally a ring of light grayish-white as in the typical form. The most diagnostic feature is the structure of the dark brown band between the discal and limbal areas; in typical *eurydice* this band is strongly serrate on the primaries, in *Appalachia* it is consistently straight, very slightly curved, and slightly irregular between Cu_2 and A_2; on the secondaries this band is smoothly sinuate, having none of the sharp pointed irregularities usually found in the typical subspecies.

Female. Wing expanse 25 to 27 mm., average 25.5 mm.; exhibits all of the characteristics of the male but has more contrast between the limbal and discal areas of the upper surface.

Holotype: male, Conestee Falls, near Brevard, NORTH CAROLINA, June 28, 1941 (R. Chermock). *Allotype:* female, Conestee Falls, N. C., June 27, 1941 (R. Chermock). *Paratypes:* R. L. Chermock Collection: 4 males, Terra Alta, WEST VIRGINIA, July 2–3, 1939 (R. Chermock); 4 males, Conestee Falls, N. C., June 27–28, 1941 (R. Chermock). F. H. Chermock Collection: 1 male, Terra Alta, W. Va., July 2, 1939 (R. Chermock); 4 males, Conestee Falls, N. C., June 26 to July 8, 1937 (W. Sweadner); 1 male, Batesville, SOUTH CAROLINA, (F. H. Chermock). Don B. Stallings Collection: 1 male, Conestee Falls, N. C., June 29, 1941 (R. Chermock). American Museum of Natural History Collection: 1 male, Coosawhatchie, S. C., July 26, 1938 (R. B. Dominick); 2 males, Monticello, FLORIDA, Oct. 4–8, 1914. U. S. National Museum Collection: 1 female labelled Washington, D. C., July 17, 1929 (figured on Plate 1, figures 3 and 4, Bulletin 157 of the U. S. National Museum, as being from Beltsville, Md.); 2 males, Washington, D. C., July 4, 1930 and July 29, 1929; 1 male, Beltsville, Maryland, July 15, 1928; 4 males and 1 female, Little Meadows, Giles Co., Virginia, July 25–26, 1940 (L. G. Carr); 1 female, Speedwell, Va., August 11, 1938 (A. H. Clark); 1 female, Glen Carlyn, Va., August 12 (A. N. Caudell); 1 female, Vienna, Va., July 19, 1936 (A. H. Clark); 1 male, Burkes Garden, Va., July 19, 1936; 1 female, Longs Gap, Grayson Co., Va., August 11, 1938 (A. H. Clark).

This new subspecies ranges from the mountains of West Virginia, south through the Appalachian Mountains into Florida. Dr. Austin H. Clark, in correspondence, informs me that he has collected specimens of *appalachia* in the mountains of southwestern Virginia. In addition, he mentions it occurring in the coastal swamps of eastern Virginia and South Carolina. Apparently, *appalachia* is not found on the Piedmont, except in the vicinity of Washington, D. C. One of these specimens is figured by Dr. Clark on plate 1, figs. 3–4 of his "Butterflies of the District of Columbia" collected in Beltsville, Md., and is unquestionably referable to the new subspecies.

In summarizing the above conclusions, the author presents the following checklist of the North American representatives of the genus *Lethe:*

Genus *Lethe* Hübner, 1818. Genotype: *Papilio europa* Fabricius, 1775.
Subgenus *Enodia* Hübner, 1818. Genotype: *Enodia andromacha* Hübner, 1818 (= *Papilio portlandia* Fabricius, 1781).
  portlandia portlandia (Fabricius)
    synonym *andromacha* (Hübner)
    synonym *androcardia* (Hübner)
  portlandia anthedon (Clark)
    synonym *borealis* (Clark)
  creola (Skinner)
  eurydice eurydice (Linnaeus-Johanssen)
    synonym *canthus* (Linnaeus)
    synonym *cantheus* (Godart)
    synonym *transmontana* (Gosse)
    synonym *boisduvalii* (Harris)
    synonym as aberration *boweri* (F. H. Chermock)
    synonym as aberration *rawsoni* (Field)
    synonym as field form *fumosus* (Leussler)
  eurydice appalachia R. L. Chermock

I wish to thank Dr. C. D. Michener of the American Museum of Natural History; Mr. Don B. Stallings of Caldwell, Kansas; and Mr. F. H. Chermock of Butler, Pa., for the loan of material for study. I also wish to extend to Dr. Austin H. Clark of the U. S. National Museum and Dr. W. T. M. Forbes of Cornell University my appreciation for their many helpful suggestions.

Texas Lepidoptera (With Description of a New Subspecies)

By Don B. Stallings and J. R. Turner, Caldwell, Kansas

Since our first paper * on Texas Lepidoptera, H. A. Freeman has continued to make remarkable catches of butterflies around Pharr, Texas. In addition, we have done considerable collecting during the past year in Texas, up and down its southern border.

Again we wish to thank Dr. Wm. P. Comstock of the American Museum of Natural History for his valued assistance in checking determinations.

Freeman agrees with us that the Rio Grande Valley area around Pharr is tropical in nature. Preliminary work on this problem by Robt. Whittaker confirms our position.

The following list covers only the more interesting and unusual catches:

Papilio lycophron pallas Gray. A single female of this subspecies was caught by Freeman with the assistance of Kent Wilson near Brownsville, Texas on August 20th, 1946. We have reason to believe that this subspecies is native to the United States, even though this is the first recorded specimen. While collecting this subspecies near Victoria, Mexico, we recall that it was associated with *Papilio cresphontes* Cram. and *Papilio ornythion* Bdv. The males of *pallas, cresphontes* and *ornythion* look a good deal alike in flight and it is probable that males of this subspecies seen in flight in the U. S. have been mistaken for *cresphontes* or *ornythion.*

Melitaea chinatiensis Tinkham. We collected a small series of this newly described species ** north of Terlingua, Texas, at an elevation of 3800 feet on Oct. 29th, 1945. Our specimens were flying with *Melitaea definita* Aaron. On June 2nd, 1946, we caught a single specimen north of the Davis Mts., near Toyahvale, Texas, at an elevation of 3800 feet. This specimen was flying in association with *Phyciodes picta* Edw.

* Ent. News 46 (2): 44–49. Feb., 1946.

** Can. Ent., vol. 76 (1): 11–18, Jan., 1944.

Timetes chiron Fabr. We caught a single ragged specimen of this species near Del Rio, Texas, Oct. 25th, 1945.

Heterochroa eulalia D. & H. We collected several specimens of this species in the Davis Mts. of Texas on May 28th, 1946. The females were laying eggs on the oak trees in the area. This is the latest name applicable to what has heretofore been called *bredowi* Gey. and sometimes has been referred to as *Heterochroa bredowi californica* ** Butler.

Asterocampa leilia cocles Lintner. We have collected a series of this species around Del Rio and Laredo, Texas, and at Monterrey, Mexico. Freeman has collected a pair at Pharr. We do not agree with Barnes and McDunnough * in treating Texas specimens of *leilia* the same as Arizona *leilia*. In addition to the differences in ground color (Texas specimens are darker) mentioned by Barnes and McDunnough, we find a further distinct difference between the two subspecies which instantly separates them. On the lower surfaces of the secondaries of Ariz. *leilia* are 7 eye spots in the submarginal area. These eye spots are black, banded with yellow and pupilled with blue. On Texas specimens, we find the 7 eye spots in the submarginal area and in addition an eighth eye spot in the anal area, similar to the other 7 eye spots. Type locality of *cocles* is six miles above Hildago, Texas, which is a few miles from Pharr, Texas. *Leilia* is a distinct species from *Asterocampa celtis*. Some confusion has resulted from the fact that Holland pictures *A. celtis antonio* and calls it *leilia*. Seitz evidently copied Holland's figure. *Leilia* is easily distinguished from *celtis antonio*, which it sometimes flies with, by two characters. On the upper portion of the upper surface of the primaries of *antonio* are two black bars the innermost of which is composed of two spots. In *leilia*, both bars are brown and are solid. In *leilia*, the eye spots on the undersurfaces of the forewing are pupilled with blue while in *antonio* they are pupilled with white. We find these characters constant, except that females of *antonio* sometimes have the bars brown.

* Contributions to the Natural History of the Lepidoptera of North America, Vol. II, No. 3, Page 99.

Asterocampa clyton louisa new subspecies

Freeman has collected a good series of this subspecies around Pharr. At first we treated these specimens as belonging to the subspecies *subpallida* B. & M. described from Arizona, although they did not conform too well to the pictures of the type of *subpallida*. Recently Lowell Hulbirt and Ralph Chermock loaned us their series of Arizona *subpallida* and it immediately became evident that the Pharr, Texas specimens were not *subpallida* nor did they belong to the Texas subspecies *texana* Skinner. In addition to the specimens collected by Freeman, we have a single specimen from Victoria, Mexico that is like the Pharr specimens. We feel that these subtropical specimens merit subspecific status.

This subspecies varies from the subspecies *texana* and *subpallida* by the apex of the upper surface of the primaries having a black ground color rather than the usual brown or purplish brown, the black being much heavier in the males. In this respect this subspecies resembles the species *Asterocampa celtis* B. & L. rather than *clyton*. The brown ground color of the remainder of the primaries and all of the secondaries is a dead yellow brown and not the bright color of *subpallida* and *texana*. As a general result the females of *louisa* have a washed out appearance. The light spots on the upper surfaces of the primaries of *louisa* are white (again like *celtis*) in contrast to the creamy coloring of *texana* and *subpallida*. On the undersurfaces the males of *louisa* resemble *texana* and the females resemble *subpallida*. This is not to be considered as an intergrade between *subpallida* and *texana*, due to the black apex of the forewings, above and the white of the spots on the forewings, above.

Named in honor of Mr. Freeman's wife, Louise.

Holotype: Male. Expanse 44 mm. Pharr, Texas, Oct. 22, 1945. *Allotype:* Female. Expanse 62.5 mm. Pharr, Texas, Oct. 14, 1944. *Paratypes:* 13 males and 5 females. Collected by Freeman at Pharr, Texas: 9/29/44, 10/14/44, 3/10/45, 3/18/45, 3/21/45, 9/22/45 and 11/5/45 and 1 male collected at Victoria, Mexico, Oct. 18th, 1940 by R. L. Turner.

Types retained by the authors for the present. Paratypes divided between Freeman and the author's collection.

Thecla cestri Reak. Freeman caught a single specimen at Pharr on March 25th, 1945. This species has not been recorded previously from the U. S. Pictured by G. & S., Plate 58, Fig. 12–13 and by Seitz at Plate 1451.

Thecla yojoa Reak. (*daraba* Hew.). This hairstreak is also new to North American check lists. One male specimen caught by Freeman at Pharr, Texas on Dec. 12th, 1945. Seitz gives a fairly good figure on Plate 159k. See, also, "Diurnal Lepidoptera" by Hewitson, Vol. 2, Plate 36, Fig. 89 and Plate 62, Fig. 424–425–426.

Thecla spurina Hew. Freeman caught a female specimen of this new record at Pharr on Nov. 25th, 1945. Our small series of this species from Mexico shows considerable individual and seasonal variation. Seitz figures this species at Plate 152 h & i. Seitz lists the following names as synonyms: *Stagira* Hew., *volana* Hew., *timaea* Hew., *lydia* Ky. For further figures see Diurnal Lepidoptera by Hewitson, Vol. 2, Plate 51, Fig. 268–9; Plate 48, Fig. 225–6; Plate 43, Fig. 167, Plate 39, Fig. 120–1–2–3.

Strymon clytie form hiem. *maevia* G. & S. The first winter form of *clytie* that we saw appeared so different from the summer form that we first considered it a separate species. It was only after we had re-studied *Strymon leda* Edw. and its winter form *ines* Edw. that we realized that *clytie* also had a well-defined winter form. A study of the figure of *maevia* by G. & S. at Plate 58, Figs. 3 and 4, convinced us that this represented the winter form of *clytie;* hence we apply the name *maevia*. Many of the specimens caught by Freeman at Pharr, Tex. during Oct., Nov., Dec. and March are marked even more extremely than the figures of G. & S. *Maevia* generally may be distinguished from *clytie* in the same manner that *ines* is distinguished from *leda*, i.e., more and darker blue above, darker ground color below with the markings more heavily defined.

Strymon pastor B. & D. Considerable confusion has resulted with regard to this species, due to the fact that most authors (including Holland) have figured *longula* Hew. and called it *pastor*. *Pastor* belongs to the tailed *amyntor* (Cramer) group of hair-streaks. Freeman has collected a small series of what we now consider to be *pastor* at Brownsville during May and at Pharr during October. Our Mexican specimens of this group indicate that much work is needed in this group. This must wait until more specimens are available.

Strymon simaethis sarita Skin. Further study of the Texas specimens of *simaethis* convinces us that the name *sarita* * Skin. should be applied to the Texas and North Mexican specimens. *Sarita* was described by Skinner from a single specimen caught in Comal County, Texas. Typical *simaethis* is found in the Antilles, type locality being St. Kitts, B. W. I. See *Annals New York Academy of Sciences,* Vol. XLV, Art. 2 (Lycaenidae of the Antilles) by Comstock and Huntington, page 73 and Plate 1, Fig. 6.

The mainland race of Texas and Northern Mexico is distinguished chiefly from typical *simaethis* on the undersurfaces. On the forewing the lower ¼ of the silver-white line bends inward on *simaethis* and on *sarita* the line bulges outward. On the secondaries the silver-white line of *sarita* is fairly straight across the wing until the V is formed at the bottom. In *simaethis* and the Jamaica subspecies *jago* C. & H. this line is very irregular. This line on the secondaries of *sarita* starts at the top of the wing at about the same place as the line does in *jago*, thus differing from typical *simaethis* in that respect. All of our Texas and Mexican specimens (with one exception) show the "swollen" area in the middle of the silver-white line on the undersurfaces of the secondaries mentioned by Skinner. This "swelling" is the reason this line in *sarita* appears straight in constrast to the irregular line in *simaethis* and *jago* since the swelling fills in most of the angles.

Strymon alcestis oslari Dyar. We collected a small series of this subspecies in the Davis Mts. of Texas at an elevation of 4800 feet on May 28th and 29th, 1946. Freeman had previously caught a specimen in the same area in 1942. *Oslari* is distinguished from *alcestis* by the lighter ground color both above and below. We do not know of *oslari* being previously recorded from Texas.

* For Original Description see: Ent. News 6 (4): 112. April, 1895.

Adopaeoides simplex Feld. A single specimen of this species was caught by Don B. Stallings Jr. in the Davis Mts. of Texas (near Ft. Davis) on May 28th, 1946 at an elevation of 4700 feet. This genus and species are new to North American check lists. This species is well figured in G. & S., Plate 92, Figs. 30–33. Seitz gives rather poor figures on Plate 183d. This species resembles our *Thymelicus lineola* Ochs, which was imported from Europe during the last century. We are indebted to Mr. Freeman for the final determination.

Pseudohazis chinatiensis Tinkham. We collected a small series of this species near Dryden, Texas on Oct. 26th, 1946. This colorful moth was flying in association with *Megathymus mariae* B. & B.

On Some Millipeds from Micronesia

By Ralph V. Chamberlin, University of Utah

The new diplopods here described are represented by specimens collected on several islands of Micronesia by Dr. H. K. Towns in 1946 (May–Sept.). Also represented are the tropicopolitan milliped *Orthomorpha coarctata* (Saussure) and the centiped *Scolopendra subspinipes* Leach. Types of the new forms are for the present retained by the author.

SPIROBOLIDAE

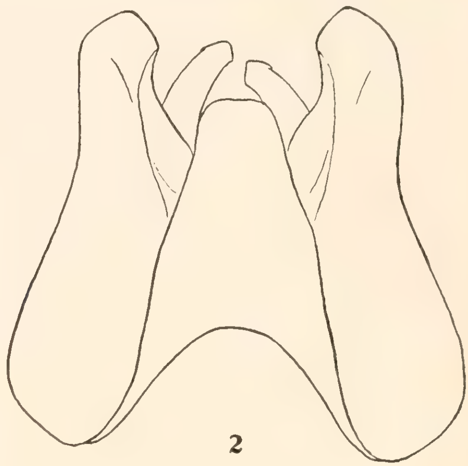
Genus **TRUCOBOLUS**, new

A genus of the Spirobolidae in which the completely separated posterior gonopods show no sign of subdivision and are distally in the form of moderately narrow blades which are distally blunt. Anterior gonopods distally entire, not furcate. Sternite of anterior gonopods a well developed plate. Repugnatorial pores upon the prozonites, lying slightly in front of the posterior sulcus. Labral foveolae 2 + 2. In the male the coxae of the third and fourth legs with short processes, those of the fifth with long, forwardly-directed processes.

GENEROTYPE—*Trucobolus townesi*, new species

Superficially distinguished from *Spirobolus* in having the supralabral foveolae $2 + 2$ instead of $4 + 4$, while in the male it is very distinct in the form of both posterior and anterior gonopods as well as in the coxal processes of the anterior legs.

1



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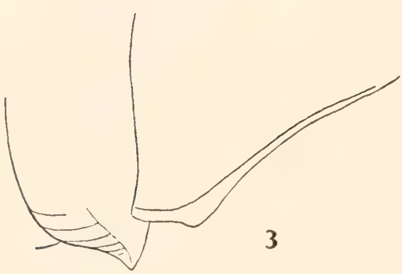

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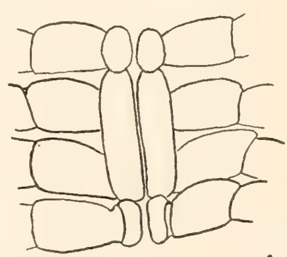

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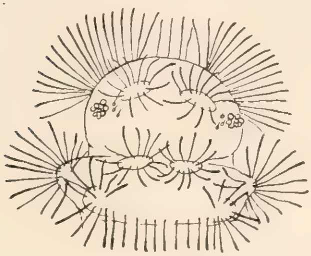
EXPLANATION OF FIGURES

1. *Trucobolus townesi*, n. sp. Left posterior gonopod, caudal view. 2. The same, anterior gonopods, cephalic aspect. 3. The same, lower end of collum and of second tergite, viewed from right side. 4. The same, coxae and process of third to sixth pairs of legs of male, ventral aspect. 5. *Apoxenus floricolens*, n. sp. Anterior end, dorsal view. 6. The same, posterior segments, dorsal view. 7. *Polyconoceras lissior*, n. sp. Scobina. 8. *Trigoniulus utagalus*, n. sp. Anterior gonopods, cephalic aspect. 9. The same, left posterior gonopod, caudal aspect. 10. The same, right posterior gonopod, distal aspect.

Trucobolus townesi, new species

In color strongly annulate, the metazonites varying from light yellowish brown to a deeper orange color, while the exposed portion of the prozonites is dark brown to black.



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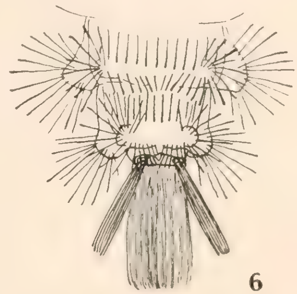

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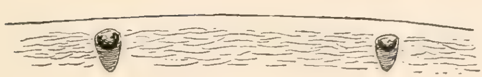

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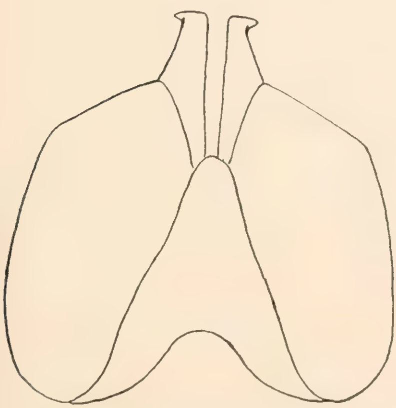

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9

The supralabral foveolae 2 + 2, the two on each side widely separated, well impressed. Antennae comparatively short and stout, distally somewhat compressed, the cross-section of the sixth article elliptical. Eyes large, convex behind but presenting a subrectangular angle adjacent to antennal socket. Ocelli in six subvertical curved series, e.g., 4, 6, 7, 9, 9, 10.

Collum strongly narrowed down each side, the lower ends of the form shown in the figure. The lower anterior border up to level of the eye set off by a submarginal sulcus, no other sulci being evident.

On the ordinary somites the sulcus is fine but distinct throughout, this excurved opposite the slightly removed pore. Surface smooth, with longitudinal striae evident only beneath.

Last tergite rounded caudally, a little surpassed by the anal valves. Valves with mesal borders strongly compressed and elevated, the elevated border set off by a shallow depression or furrow.

In the male the fourth legs and especially their claws are reduced in size. The coxal processes of the fifth legs long, subcylindrical, abruptly bent forward at base and contiguous with each other, lying against the lower ends of the processes of the fourth legs and with their distal ends fitting against the posterior sides of the processes of the third legs (fig. 4).

The anterior and posterior gonopods are of the forms represented in figures 1, 2 and 3.

Number of segments mostly 49–51. Diameter, 3.4 mm.

Locality.—Micronesia: Turk Atoll at Fefan. Eighteen specimens representing both sexes were taken by Henry K. Townes on May 27, 1946.

RHINOCRICIDAE

Polyconoceras lissior, new species

Exposed area of prozonites mostly dark brown, nearly chocolate colored but the sides especially yellowish or olive yellow anteriorly and over covered portion; metazonites dark reddish. Legs dark purple.

Head smooth and shining. Median longitudinal sulcus interrupted at level of antennal sockets. Eyes about two and a half times their diameter apart; ocelli in 8 longitudinal series, e.g., 3, 5, 5, 6, 7, 7, 6, 5. Clypeal foveolae 2 + 2. Sensory cones of antennae numerous.

Collum narrowly margined with a fine sulcus about lower end and up to level of eye, otherwise smooth and shining.

Ordinary tergites very smooth and shining, showing no impressed sulcus or furrow across dorsum or down the sides but a shallow furrow in its place below; no longitudinal striae except beneath. Scobina small, entire area depressed but anterior portion deep, pit-like and of semicircular form, the striae of posterior portion very fine; widely separated; disappearing at about 29th segment. (See fig. 7.)

Last tergite with a transverse depression or furrow setting off the triangular caudal portion; exceeded by the mesally strongly compressed anal valves.

Number of segments, 56. Length, 100 mm.; width, 9.9 mm.

Locality.—Micronesia: Palau group, Arakabesan. One female taken by Townes July 18, 1946 in tree crotch in damp native forest.

"This specimen exuded a copious brown caustic liquid when disturbed. The liquid had a very caustic odor, something like HCN. On the skin it immediately made a brown stain which soon turned to a purplish brown."

While the male is unknown, I believe this species can be recognized from the peculiarities of the scobina and the absence of segmental sutural sulci and other sculpturing on the tergites.

TRIGONIULIDAE

Trigoniulus utagalus, new species

Color dark brown to nearly black in front of posterior sulcus on each segment, the color behind this sulcus light brown or yellowish but the darker often spreading more or less over this lighter band above. Legs light brown, somtimes more or less ferruginous. Head light brown or yellowish except over vertex.

Frons and clypeus crossed by the usual deep median sulcus. Clypeal foveolae 2 + 2. Eyes large, about once and a half their diameter apart.

Collum extending below to about the same level as the second tergite.

Segments a little constricted along the sharply defined principal sulcus, the constriction more marked on the sides and below than dorsally. Pore on the prozonite close to the sulcus which is but little curved at its level. Striae on prozonites present to level of pore, those on metazonite not extending but part way up the side.

Last tergite without cross furrow, rounded behind and exceeded by the evenly inflated valves.

The features of the gonopods, by which the species is best distinguished, are shown in figures 8, 9, and 10.

Number of segments, 45. Diameter, up to 3 mm.

Locality.—Palm Group: Woleai Atoll, Utagal. About a dozen specimens taken July 28, 1946, by Henry E. Townes, who writes that the milliped is abundant on the atoll. The types are female and partly immature specimens with the exception of the holotype, which is an adult male.

POLYXENIDAE

Genus **APOXENUS**, new

Agreeing in most features with *Monographis*, but differing in having the setae of the caudal segment in three pencils, the principal one composed of fine silky hairs part of which are hooked, while the two smaller ones are composed of long, much coarser, setae similar to those of the pleural and dorsal whorls of the other segments. In addition there is the usual series of shorter setae along the caudal margin of the tergite.

GENEROTYPE—*Apoxenus floricolens,* new species.

Apoxenus micronesius, new species

Yellow above with a dark purple mark along caudal border of each segment each side of middle and down the sides, this band joined by a similarly colored mark at right angles to it on each side of tergite. The setae also more or less partaking of this color excepting their tips. Finer purple markings on the venter. Legs and antennae also tinged with purple.

Body composed of head and eleven segments. Pairs of legs, 13. The setae of all segments of one type excepting for variation in length and no true scales present (figs. 5, 6). In addition to the whorls of setae on the nine pairs of pleural processes, the setae at each side of each tergite are arranged in a group or whorl, the setae between these two dorsal whorls being shorter and more or less in transverse series.

Last segment with a caudally directed single brush of long, densely set setae and a pair of smaller brushes of setae arising on dorsal side and directed caudodorsad (fig. 6).

The penes of the male are very thick, proportionately short conical bodies.

Length (including caudal setae), 3 mm.

Locality.—Micronesia: Ailinglapalap Atoll, Bigatyelang Is. Five specimens, including two adult males, taken Sept. 25, 1946, by H. E. Townes "between calyx and radicle of Bruguiera while still on tree." The five specimens were taken from one calyx.

A New Macrosiphum from Chrysothamnus

By GEORGE F. KNOWLTON, Utah State Agricultural College, Logan

The following report deals with an apparently undescribed species of aphid of the genus *Macrosiphum*. In addition, distribution records are given for a few species of aphids collected from rabbitbrush.

Macrosiphum aaroni n. sp.

Alate vivipara: Color black to blackish; antennae and most of legs black or at least dusky; head and antennal I paler than thoracic lobes and balance of antennae; antennal tubercles moderately prominent; ocular tubercles present; body 2.63 mm. long; antennae about 3.67 mm. long; antennal III, .85 to .89 mm. with 34 to 40 sensoria; IV, .71 to .75, without sensoria; V, .65 to .68; VI, .15 plus 1.01 mm. long; rostrum slightly exceeds second coxae; rostral IV + V slenderly obtuse, .173 mm. long; wing venation normal, media of front wing twice branched; blackish patches on lateral margins of abdomen; prominent abdominal hairs have blackish area at base; cornicles black, largely cylindrical, .71 mm. long with distal approximately .16 mm. reticulated; cauda pale, .522 mm. long, very slightly constricted beyond base, with 7 or 8 hairs on each side; anal plate pale and broadly rounded.

Collection: Taken on rabbitbrush, *Chrysothamnus nauseosus* at Honeyville, Utah, September 13, 1927 by G. F. Knowlton. Type in the collection of the writer.

Taxonomy: Macrosiphum aaroni n. sp. resembles *Macrosiphum kosacaudis* (Knlt.), from which it differs in darker general color, pale cauda, more rounded anal plate and black patches on sides of abdominal segments.

Records from Rabbitbrush

Capitophorus chlorophainus K.-S. on *Chrysothamnus nauseosus* var. *lanceolatus,* Beaver Canyon, Utah, July 29, 1945.

C. elongatus Knlt. on *Chrysothamnus greeni* at Leeds, Utah, August 1942; Antelope Valley, Nevada, July 1926; on *C. parryi* var. *typicus* at Delta, Utah, July 1945; on *C. parryi,* Wildcat Canyon, Utah, July 11, 1945.

C. gregarius Knlt. on *Chrysothamnus nauseosus,* 12 mi. northwest of Reno, Nevada, and Mono, California, July 23, 1944 (Knowlton); Y–Mt., east of Provo, Utah, July 12, 1945 (C. L. Hayward).

C. magnautensis K.-S. on *Chrysothamnus viscidiflorus* var. *linifolius,* Ft. Duchesne, Utah, July 14, 1927; Myton, Utah, August 15, 1942; on *C. viscidiflorus* at Sisters, Oregon, August 24, 1944.

C. oestlundi Knlt. on *Chrysothamnus viscidiflorus* var. *elegans,* La Point, Utah, July 25, 1945; on *C. nauseosus* at Declo, Idaho, June 9, 1935; Winnemucca, Nevada, July 24, 1944; on *C. greeni,* Leeds, Utah, August 9, 1936; Ontario, Oregon, June 17, 1939; on *C. nauseosus* at Buchanan, Oregon, August 25, 1944; and Spokane, Washington, August 9, 1944.

C. palmerae Knlt. on *Chrysothamnus nauseosus* at Truckee, Mono and Boca, California, July 23, 1944; at 8, 12 and 13 miles northwest of Reno, Nevada, July 23, 1944, on *C. nauseosus* var. *gnaphalodes.*

C. utensus P.-K. on *Chrysothamnus viscidiflorus* var. *stenophyllus,* Trout Creek, Utah, August 6, 1945; on *C. viscidiflorus* at Ontario and Pleasant Valley, Oregon, June 17, 1939; *C. viscidiflorus* var. *linifolius,* Bryce Canyon, Utah, September 1939.

C. xerozoous K.-S. on *Chrysothamnus greeni,* Fillmore, Utah, July 9, 1942; on *C. wyomingensis,* Logan Canyon, Utah, September 23, 1934 (T. O. Thatcher); *C. nauseosus,* Uinta, Utah, July 18, 1937.

Obituary

Mr. Samuel Francis Aaron, usually known to entomologists as S. Frank Aaron, custodian of insects at the Academy of Natural Sciences of Philadelphia 1884–85, died at Pipersville, Bucks County, Pennsylvania, on January 15, 1947. He was born at Mt. Holly, New Jersey, March 5, 1862, and is known for his published work on Psocidae, Chrysididae and popular articles on natural history in many journals. We hope to publish a more extended account of his life in a later number of the News.

Notes and News in Entomology

Under this heading we present, from time to time, notes, news, and comments. Contributions from readers are earnestly solicited and will be acknowledged when used.

Revision of Australian Locusts.—At the request of the Council for Scientific and Industrial Research of the Commonwealth of Australia, Mr. James A. G. Rehn, Curator of Insects of the Academy of Natural Sciences of Philadelphia, is now engaged in preparing for publication by that body, a systematic analysis of the locusts (Acridoidea) of Australia and Tasmania. The extensive locust collections which have been assembled at Canberra, through the energy of Dr. K. H. L. Key, Senior Entomologist of the Council, are being sent in sections to Mr. Rehn for study, and the preparation of a revision of the Australian forms of these important insects is already well under way. Certain series of these insects belonging to a number of American institutions have also been made available for use in this connection. In order to make this study as fully comprehensive and as basic as possible Mr. Rehn would appreciate the opportunity to study at this time any considerable series of Australian representatives of these insects which may exist in other collections, both institutional or private. Mr. Rehn would be happy to hear from any entomologists who may be in a position to aid in this work by the loan of such relevant collections.

As the material which is being made available for examination contains types and paratypes of many species described from Australia in the past half century, the opportunity for physical comparison of other representations with these is one seldom presented.

Current Entomological Literature

COMPILED BY CHARLES HODGE IV, RAYMOND Q. BLISS, EDWIN T. MOUL, MAURICE E. PHILLIPS AND JOHN W. H. REHN AND HENRY K. TOWNES, JR.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, 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.

This list gives references of the current or preceding year unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

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 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. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

GENERAL—Beamer, Lucy—I'll tell you how. [43] 19: 127–29. **Beaumont, B. F.**—Fabre's "Souvenirs Entomologiques" with references to translations of this and other Fabre literature in English. [28] 83: 4–8. **Chagnon, G.**—Les insectes de la Niege. [55] 73: 436–37. **Fennah, R. G.**—On the formation of species and genera in the insect fauna of the Lesser Antillean Archipelago. [68] 21: 73–80. **Knowlton and Nye**—Some insect food of the sage sparrow. [43] 19: 139. **Lewis, H. L.**—Priority and its limitation. [28] 83: 16–17. **Peterson, A.**—Laboratory tests showing the effect of DDT on several important parisitic insects. [58] 46: 323–26. **Salmon, J. T.**—Portable apparatus for the extraction from leaf mould of Collembola and other minute organisms. [Dominion Mus. Records in Ent., Wellington, N. Z.] 1: 13–18, ill. **Shwanwitsch, B. N.**—On the system of Pterygota insects. [22] 52: 185–88. **Swezey, O. H.**—Insects of Guam II. [B. P. Bishop Mus. Bull.] 189: 1–237. **Tulloch, G. S.**—DDT—a new weapon in insect control. [18] 41: 162–63.

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Anisomorpha ferruginea (Beauv.)
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Another Case of Injury to the Human Eye by the Walking Stick, Anisomorpha (Phasmidae)

By Richard O. Albert, University of Texas, School of Medicine, Galveston, Texas

On the evening of Sunday, 18 August, 1946, I was rambling around in the woods at the Galveston County Fair Grounds near League City, Texas. A small bayou was nearby, and the lowlands here had a grove of large trees, mostly oak, and a rather heavy undergrowth of vines, weeds, etc.

When my two friends and I chanced upon the decaying stump of a tree lying in the undergrowth, curiosity dictated that I turn it over to see what was underneath. I noted a spider or two, and then my attention was attracted by a large grey-brown insect about three or four inches long sitting quietly on the under surface of the overturned stump. Closer observation revealed it to be not one insect but a pair in copulation.

The female was large and fat compared to the male, who was only about two-thirds as long as she was, and much thinner. He was on her back, with the caudal end of his abdomen curled down on the right side of her abdomen, the tip fastened to her genital pore on the ventral side.

When I touched the insects, the female started moving around rapidly, but the male seemed content just to sit and ride, only occasionally moving a leg or an antenna. After a moment the female stopped moving. On both insects I noted a tiny knob or protuberance on the dorsolateral surface of the prothorax, on the extreme anterior portion, but paid no particular attention to these structures at the time. I touched the insects again, and the female ran around for a moment and again stopped, sitting quietly with the male on her back.

I became more and more aware of a strong odor in the air, not pleasant, but not extremly unpleasant. In my opinion, it more nearly resembled the odor of the musk glands of the common garter snake than anything else I could think of. To make sure the odor was produced by the insects, I put my face down close to them to sniff. When it was still eight or ten inches away from the insects, however, I felt several tiny droplets of fluid strike me in the face, not all at once but in quick succession. I did not see the droplets at all, only felt them as they touched me. One or more struck me in the left eye, and in about four seconds I began to experience a severe burning sensation in that eye, with lacrimation. Blepharospasm became so pronounced that I could not keep the eye open. By great effort I could open it a little, but the muscle spasm was so severe that it closed the eyelids again almost immediately.

These reactions continued for some twenty minutes and then the burning pain, lacrimation and blepharospasm began to decrease in severity. The conjunctiva of the affected eye had become quite hyperemic by this time, but I could hold the eye open for short intervals now. I examined the insects again—not getting my face too close to them, however in an attempt to discover the source of ejection of the droplets. The only possibility seemed to be the tiny projections before mentioned, so we looked at them closely and touched them with a twig. They appeared wet, and bubbled very slightly when we touched them. We saw no droplets fly out, but noted that a rather thick, tenacious white material on them seemed to increase in amount at times, as though more were being secreted. When all this was wiped off, the protuberance appeared to have a tiny depression in the center, as though leading down into a duct. These protuberances were about alike in the male and female, except that they were larger and more prominent in the female. I concluded that they were the source of the toxic substance that had gotten into my eye.

I carried the insects in a paper cup until I found an empty whiskey bottle beside the road, to which bottle they were then transferred, still in copulation. My eye felt much better and, about forty minutes after first receiving the droplets in my eye, I reached some water and washed it out with plain water. By that time only a little burning sensation remained though hyperemia was still marked. I did not notice any reaction from the few droplets that struck the face in places other than the eye. By the next morning the conjunctiva was only very slightly hyperemic. All symptoms had completely subsided.

I took the insects to my good friend, Professor R. W. Strandtmann of the University of Texas School of Medicine in Galveston. We kept them several days without knowing what to feed them. When bananas were tried, the female seemed to eat some, but the insects did not look too happy, even though they were still in coitus and had been ever since I had found them. After three days the male died and after four days the female died, still in copulation.

The insects were subsequently identified by Dr. A. B. Gurney of the U. S. National Museum as *Anisomorpha ferruginea* (Beauv.). He added that this species is very similar to *A. buprestoides* (Stoll) and may eventually prove to be the same as that species.

The injury to the eye, though painful, was much less severe and of much shorter duration than the case reported by Stewart [1] who gave an account of a similar incident in which vision was impaired for about five days.

Epiperipatus braziliensis (Bouvier) on Barro Colorado Island, Canal Zone

By Ross H. Arnett, Jr., Cornell University, Ithaca, N. Y.

The interesting note regarding the habitat of *Peripatus* published by Prof. W. A. Hilton (1) brought to mind observations made by Mr. K. E. Frick and the author in late November 1944 on Barro Colorado Island, C. Z.

[1] Stewart, M. A. Phasmid injury to the human eye. Can. Ent. 69: 84–86, 1937.

While in search of beetles in decaying logs, we encountered several specimens of Onychophora, determined as *Epiperipatus braziliensis* (Bouvier) (2). Of the many logs broken open, only two or three contained Onychophora. These logs were very damp. They were located high on the island, far from the drainage streams. Here the specimens were close together working their way under the loose bark and in the runways of the *Passalus* beetles. These specimens all readily emitted the characteristic white slimy, gummy secretion when disturbed. They were all brownish-maroon in color and varied from one inch to two inches in length.

Neither this rotting-log habitat nor the stream bed habitat reported by Prof. Hilton is at all unique for these organisms These are the normal habitats usually reported for Onychophora.

The apparent controversial report of the Barro Colorado habitats is easily explained by the difference in the date when the two separate observations were made. Prof. Hilton visited the island in March, or during the last part of the dry season. Mr. Frick and I made our observations in late November, or during the last part of the rainy season. It is therefore rather safe to assume that *Epiperipatus* spreads out and inhabits rotting logs during the rainy season when that situation would be damp enough for the needs of these thinly cutinized forms. During the dry season it would not seem unlikely that the only place they would be found would be under stones in stream beds where it would be dampest. Whether there is a migration or not is unknown. Likewise the method *Epiperipatus* utilizes for passing through an unfavorable season of the year is unknown.

References

(1) Hilton, W. A., Jour. Ent. and Zool., 38: 27, 1946.

(2) Clark, A. H., and Zetek, J., Proc. U. S. Nat. Mus., vol. 96, No. 3197, 1946, pp. 205–213.

Undescribed Species of Crane-Flies from the Western United States and Canada (Dipt.: Tipulidae). Part VII

By Charles P. Alexander, Massachusetts State College, Amherst, Massachusetts

The preceding part under this general title was published in Entomological News 57: 173–179, 1946. In this paper I am characterizing three further new species from California, the types being preserved in my collection of these flies. Specific acknowledgments are made under the individual species.

Tipula (Lunatipula) palmarum new species

Size medium (wing, male, 14 mm.); mesonotum buffy gray, the praescutum with four entire pale brown stripes; a central dark stripe on vertex, scutum and scutellum; femora and tibiae obscure yellow, the tips narrowly darkened; wings with a grayish tinge, restrictedly patterned with darker, including the pale brown stigma; obliterative band at cord restricted; male hypopygium with the basistyle extensive, thin and scooplike, entirely cut off from the sternite; ninth tergite having the caudal margin with a V-shaped notch, heavily blackened and thickened; inner dististyle with the outer basal lobe appearing as two strong slender rods, the outer ones stouter, terminating in two spinous points; eighth sternite at apex with a semicircular flap that bears two long brushes of roughened setae.

♂. Length about 13 mm.; wing 14 mm.; antenna about 3.9 mm.

Described from a dried specimen, including the hypopygial characters. Frontal prolongation of head buffy, with a conspicuous dark brown lateral line, nearly as long as remainder of head; nasus elongate; palpi brownish black. Antennae (male) moderately long, as shown by the measurements; scape and pedicel yellow, flagellum black; flagellar segments only moderately incised; longest verticils subequal to the segments. Head buffy gray, the vertex with a capillary dark brown median vitta.

Pronotum buffy, with a narrow darkened central spot. Mesonotal praescutum buffy gray with four entire pale brown stripes, the intermediate pair separated by a more buffy ground line that is approximately as wide; humeral region of praescutum with an extensive paler brown area; posterior sclerites of notum buffy, sparsely pruinose; scutal lobes each with two brown spots; a narrow brown central stripe on scutum, extending caudad over most of the length of the scutellum; mediotergite with this line scarcely indicated, the outer lateral portions provided with conspicuous erect setae. Pleura testaceous yellow. Halteres with stem yellow, knob weakly darkened. Legs with the coxae and trochanters testaceous yellow; femora and tibiae obscure yellow, the tips narrowly darkened; tarsi passing into darker brown; claws (male) with a weak tooth. Wings with a grayish tinge, the cord and veins beyond very narrowly and vaguely seamed with darker; prearcular field narrowly yellow; stigma pale brown; obliterative areas restricted, extending from the outer end of cell R across the basal half of cell *1st* M_2 into the base of cell M_3; no prestigmal or poststigmal brightenings; veins brown, more brownish yellow in the prearcular and costal fields. Squamal setae few; stigmal trichia lacking. Venation: Rs somewhat less than twice $m\text{–}cu$; R_{1+2} entire; petiole of cell M_1 shorter than m; M_{3+4} shorter than the basal section of M_{1+2}.

Abdominal tergites obscure yellow, with three broken brown stripes, the central one narrowly interrupted at the incisures; sublateral stripes much more broken but conspicuous, each dark area preceded by a clearer yellow spot on the base of segment; sternites yellow, weakly more darkened medially; hypopygium yellow. Male hypopygium with the basistyle entirely cut off from the ninth sternite by a suture, appearing as an extensive thin and scooplike plate, the dorsal portion with numerous long yellow setae; posterior margin above the suture with an additional pencil of long setae. Ninth tergite entirely separate from the sternite; viewed from above appearing slightly narrowed outwardly, the posterior border with a V-shaped notch, the margin heavily blackened and sclerotized, including the entire posterior margin of the tergal notch, this portion irregularly toothed. Ninth sternite with its appendage relatively extensive, flattened, with inconspicuous setae, the longest at apex. Outer dististyle a small pale clavate structure. Inner dististyle appearing as a flattened-compressed blade, the beak jutting into the tergal notch; margin of beak blackened; lower beak lacking or very obtuse; on face of style at base of beak with a further blackened lobule or protuberance; what is interpreted as being the outer basal lobe consists of two slender rods or arms, the outer slightly stronger and curved, more or less expanded at tip, both the upper and lower apical angles further produced into acute spinous points, the space between the points with white setae; second arm lying more mesad at end of a flattened plate or flange, appearing as a more slender straight rod that is only a little shorter than the outer arm. Eighth sternite only slightly sheathing, the margin terminating in a semicircular flap that bears two long and dense brushes of roughened or crinkly setae.

Habitat.—CALIFORNIA. *Holotype:* ♂, Palm Canyon, Borego, San Diego Co., May 4, 1945 (A. L. Melander); Alexander Collection, through kindness of Dr. Melander.

The present fly is very distinct in its hypopygial characters, especially the tergite, inner dististyle and eighth sternite. In its general appearance it somewhat suggests species such as *Tipula* (*Lunatipula*) *boregoensis* Alexander, but is entirely different in hypopygial structure from all such flies.

TIPULA Linnaeus, subgenus HESPEROTIPULA new

Characters chiefly as in *Lunatipula* Edwards, differing in important differences in the genitalia of both sexes.

Wings of certain species, including the subgenotype, with sparse to more abundant macrotrichia in outer cells, particularly R_5. Male hypopygium with the ninth sternite very large, contiguous across the dorsum or virtually so, the eighth tergite and ninth tergite correspondingly reduced, the former semicircular in outline. Basistyle produced into elongate horns (except in *derbyi*). Ovipositor with the cerci reduced to small rounded or semicircular knobs, much shorter than the elongate hypovalvae, the latter pointed at tips.

Type of subgenus.—*Tipula* (*Hesperotipula*) *streptocera* Doane.

Other included species: *circularis* new species (California); *contortrix* Alexander (California); *coronado* Alexander (Arizona); *derbyi* Doane (California); *fragmentata* Dietz (Washington, Oregon, California); *linsdalei* Alexander (California); *micheneri* Alexander (California); *mutica* Dietz (California); *opisthocera* Dietz (California); *ovalis* Alexander (California); *supplicata* Alexander (California); *trypetophora* Dietz (British Columbia).

Tipula monochroma Dietz, 1919 (*pleuracicula* Alexander, 1915) and *T. devia* Dietz, 1919 (*translucida* Doane, 1901) do not belong to this subgenus. As restricted, it is eminently characteristic of the Vancouveran and Californian regions, particularly the latter.

Tipula (Hesperotipula) circularis new species.

Allied to *streptocera;* male hypopygium with the dorsal portion of ninth tergite produced into two circular blackened lobes or blades, their margins smooth, the space between the lobes transverse; spine of basistyle long and sinuous, strongly narrowed outwardly but scarcely twisted; inner dististyle with the beak short and slender, blackened; outer basal lobe placed far basad, about on a level with the lower beak.

♂. Length about 12–14 mm.; wing 13–14.5 mm.; antenna about 3.8–4 mm.

♀. Length about 13 mm.; wing 15 mm.

Frontal prolongation of head brown above, including nasus, paling to obscure yellow on sides; palpi brown, the terminal segment brownish black. Antennae moderately long, as shown by the measurements; basal three segments yellow, succeeding ones brown. Head above brownish black, the surface heavily pruinose.

Thorax above almost uniformly shiny yellow or reddish yellow, the praescutal stripes poorly differentiated. Pleura somewhat clearer yellow. Halteres with stem brownish yellow, the base restrictedly yellow, knob dark brown. Legs with the coxae and trochanters yellow; femora yellow, the tips narrowly brownish black; tibiae and tarsi gradually more infuscated, the outer tarsal segments brownish black; claws (male) toothed. Wings with a weak brownish tinge, the vicinity of the veins beyond the cord paler; prearcular and costal fields more yellowed; stigma and a small spot at origin of *Rs* pale brown; obliterative areas at cord and beyond stigma; veins pale brown. Rather numerous macrotrichia in outer half of cell R_3; stigmal trichia few. Venation: *Rs* about two and one-half times *m–cu*.

Abdomen yellow to reddish yellow, the tergites more or less distinctly trivittate with brown, the median stripe becoming heavier and more evident on the outer segments; sublateral stripe more broken. Male hypopygium with the ninth tergite distinctive, the dorsal portion produced into two circular blackened lobes or blades, their margins smooth, the space between the lobes transverse. Basistyle with the spine long and sinuous, strongly narrowed but not twisted. Inner dististyle with the beak short and slender, blackened; outer basal lobe placed more basad than in *streptocera*, about on a level with the lower beak. Eighth sternite with the setae of the lateral lobes abundant and conspicuous; those of the median lobe also unusually numerous, somewhat variable in number but usually totalling at least a score.

Habitat.—CALIFORNIA. *Holotype:* ♂, Livermore, Alameda Co., May 1, 1939 (T. H. G. Aitken). *Allotype:* ♀, Fairfax, Marin Co., April 13, 1919 (E. P. Van Duzee); California Academy of Science. *Paratopotype:* 1 ♂, pinned with type; *paratypes:* ♂, Berkeley, May 4, 1919 (E. P. Van Duzee); ♂, Sonoma Co., April 4, 1914 (Knoch), received from Dietz, identified as *streptocera;* ♂, Alum Rock Park, Santa Clara Co., May 5, 1939 (T. H. G. Aitken).

The most similar species is *Tipula* (*Hesperotipula*) *streptocera* Doane, which differs conspicuously in the structure of the male hypopygium, including the tergite, horn of the basistyle, inner dististyle and eighth sternite.

Phyllolabis hirtiloba new species

General coloration of head and thorax light gray; wings with a very weak brownish tinge, the large oval stigma only a trifle darker than the ground; veins R_3 and R_4 relatively short, slightly divergent, so cell R_3 at margin is approximately one-third more extensive than cell R_2; male hypopygium with the appendage of the ninth sternite broad, the caudal margin widely and shallowly emarginate, the lateral angles produced into small pale lobes; apex of outer lobe of basistyle with a group of strong dark setae on mesal portion; outer dististyle a microscopic knob; gonapophyses very slender.

♂. Length about 7 mm.; wing 7 mm.

Rostrum dark brown, pruinose; palpi black. Antennae black throughout, scape pruinose; flagellar segments passing through oval to long-oval. Head light gray.

Thorax almost uniformly light gray, the praescutum without evident pattern. Halteres whitened. Legs with the coxae brown, gray pruinose; trochanters yellow; femora and tibiae obscure yellowish brown to pale brown, the tips somewhat more darkened; tarsi brownish black. Wings with a very weak brownish tinge, the large oval stigma only a trifle darker than the ground; prearcular field a little more brightened; veins brown, more yellowed at wing-base. Venation: Sc relatively short, Sc_1 ending a short distance beyond the fork of Rs, Sc_2 exactly opposite this point; veins R_3 and R_4 relatively short and markedly divergent so cell R_3 at margin is approximately one-third more extensive than cell R_2; vein R_3 only a little more than one-half R_{2+3+4}; m–cu shortly beyond the fork of M_{3+4} on M_4.

Abdomen dark brown. Male hypopygium with the appendage of ninth sternite wide, the caudal margin very broadly and shallowly emarginate, the small lateral lobes pale. Basistyle projecting beyond the point of insertion of the dististyles as a stout lobe, the apex a trifle widened, obliquely truncated; on mesal edge at and back from tip with numerous strong dark-colored setae; lower lobe of basistyle a strong clavate structure that is provided with scattered relatively short setae. Outer dististyle a microscopic knob; inner style large but still smaller than the lower lobe of the basistyle, virtually glabrous, at apex narrowed into a lobe. Gonapophyses very slender, nearly straight.

Habitat.—CALIFORNIA. *Holotype:* ♂, Yosemite National Park, near Mirror Lake, altitude 4000 feet, June 6, 1939 (A. Downes).

Phyllolabis hirtiloba is perhaps most similar to species such as *P. claviger* Osten Sacken and *P. meridionalis* Alexander, differing from all described forms in every detail of structure of the male hypopygium, particularly the appendage of the ninth sternite, apical lobe of basistyle, and both dististyles.

Nocturnal Activities and Notes of the Ant Lasius (Acanthomyops) Interjectus Mayr

By HORACE GROSKIN

At my place in Ardmore, Montgomery County, Pennsylvania, there are three colonies of *Lasius interjectus,* which I had under observation from June 12th to August 20th, 1946. Many daylight observations were made during the period, as well as twenty-six night observations with flashlight at various hours from 10 P.M. to midnight, at temperatures ranging from 54°–82° F.

Colony No. 1 is a small colony with a mound nest located in short grass in clay soil, mostly shaded by a canopy of trees. Colony No. 2 is also a small colony with a crater nest located about 15 feet from colony No. 1, in clay soil, underneath a large Japanese maple without direct sun exposure. Colony No. 3 is a large colony containing an estimated 1,500 to 2,000 ants, including workers and sexual forms, located in the soil adjacent to a cinder-block garage wall facing eastward.

The nest of Colony No. 1 was observed on twenty-two nights; on nineteen of these nights, the workers were excavating soil, and on the three nights, the workers were inactive.

The nest of Colony No. 2 was observed on twenty nights, the workers being active carrying soil on fourteen nights and inactive on six nights.

The nest of Colony No. 3 was observed in daylight and at night from June 12th to July 29th, and while there was considerable activity on many days, these ants appeared on the surface of the ground on one night only.

The activity of the workers of Colony No. 1 and No. 2 consisted of bringing out soil while enlarging their galleries, and at no time, day or night, were they observed to forage, probably for the reason that this is a subterranean ant that feeds almost entirely on the excrement of root coccids and aphids which it attends inside of the nest.

Neither Colony No. 1 nor No. 2 was observed to swarm or to have a nuptial flight during the entire period of observation, possibly for the reason that they were young colonies and sexual forms had not yet been produced.

By referring to Table 1, it will be noted that when the ants were active at night, they were also active on many days during the daylight. For example, on July 9th, the workers of Colony No. 1 were carrying soil at 10 A.M., 5 P.M. and 8:30 P.M., and also at 12 midnight. The following morning, July 10th, at 10 A.M., the workers were still bringing out soil, and they continued to do so at 4 P.M. and again that night at 10:05 P.M. When observed the next morning, July 11th, at 10 A.M., the workers were still active, and at 10:30 P.M. that same night, they were as busy as ever. On the following morning, July 12th, at 10 A.M., the ants were again observed bringing out soil, and their activity was again noted at 4:30 P.M., and once more that night at 10:30 P.M. Altogether, these ants appeared to be active continuously for four days and four nights for the period from July 9th to July 12th. This same condition prevailed for the period from July 15th to July 18th, when there was continuous activity during day and night.

The number of workers participating in the work varied during the day and night. Uusually there were many more workers carrying soil at night than during daylight. Often at night there were twenty to thirty workers busily engaged, while in daylight the number rarely exceeded a dozen.

Low temperatures did not appear to affect the ants' activities. On July 15th at 11 P.M., the temperature was 54° F., and on July 16th at 11 P.M., the temperature was 55° F., yet on both of these nights the ants were very energetically carrying on their work and their numbers were at the maximum.

When the night observations were made, the flashlight was often held within an inch of the workers, but the ants were not disturbed by the sudden light and continued their activities, moving along in a file, carrying soil.

It would be of interest to know whether the workers that were active at night were the same individuals that were observed working during the day, or whether they work in relays and have rest periods. This could be determined only by marking the individual ants, and it is my intention to do this next year, if I am able to find a method that will not disturb the ants' normal behavior.

Colony No. 3, a large and well-established colony, was observed from June 12th to August 20th, 1946. Altogether twenty-nine observations were made during daylight, and at night from 10 P.M. to midnight, at temperatures ranging at night from 54° to 82° F. As already stated, this colony appeared on the surface on one night only, July 24th, at 10:15 P.M., temperature 80° F., at which time about 300 winged forms and workers were noted swarming in the short grass close to the nest entrances.

From June 12th to July 29th, the ants of the colony swarmed on eighteen late afternoons, between 6 and 8:30 P.M., E.D.T., and made five nuptial flights between 6 and 7:30 P.M., E.D.T., at temperatures ranging from 72° to 78° F. These marriage flights occurred on June 12th–13th–15th–23rd–24th.

This colony was also under observation in 1945, when it made four nuptial flights between the hours 7:30—8:05 P.M., E.D.T., temperatures ranging 66° to 84° F. These nuptial flights occurred on June 8th–12th–14th–20th. It is interesting to note that the marriage flights of this colony were made on almost the same dates in both years.

It may also be of interest to note that a closely related species, *Lasius* (*Acanth.*) *claviger* Roger, which belongs to the same subgenus as *L. interjectus,* swarms and has its nuptial flights at an entirely different time of the year than *L. interjectus,* at least it does so at Ardmore, Pennsylvania.

TABLE 1

No. 1 Colony

Date 1946	E.D.T.	Temp. F.	Weather	Carrying Soil	Remarks
7/3	10 P.M.	68	clear	active	Workers inactive during daylight until 8 P.M.
7/4	10 P.M.	70	clear	inactive	Inactive 10 A.M., 7 P.M. and 10 P.M.
7/6	10 P.M.	82	clear	active	Inactive until 8:10 P.M.
7/7	10:45 P.M.	68	clear	active	Inactive during daylight and at 9 P.M.
7/9	12 midnight	70	clear	active	Active 10 A.M., 5 P.M. and 8:30 P.M.
7/10	10:05 P.M.	76	clear	active	Active 10 A.M., 4 P.M., inactive 8:45 P.M.
7/11	10:30 P.M.	74	clear	active	Active 10 A.M. 20 workers active at 10:30 P.M.
7/12	10:30 P.M.	—	clear	active	Many workers active 10 A.M., 4:30 P.M.
7/13	11:30 P.M.	70	clear	inactive	Active 2 P.M., inactive 8:15 P.M.
7/14	10:45 P.M.	76	clear	active	Inactive during day from 10 A.M. to 8:45 P.M.
7/15	11 P.M.	54	clear	active	20 workers active 5 P.M.
7/16	11 P.M.	55	clear	active	Active 10 A.M., inactive 5 P.M., active 7 P.M.
7/17	10:15 P.M.	64	clear	active	Active 10 A.M., inactive 5 P.M., active 7:30 P.M.
7/18	10:30 P.M.	70	clear	active	Active 10 A.M., 6:30 P.M., inactive 8:30 P.M.
7/19	10:30 P.M.	—	clear	inactive	No activity day or night
7/24	10:15 P.M.	80	clear	active	Heavy rain previous 4 days. Active 7:30 P.M.
7/25	10:15 P.M.	68	clear	active	Active 7:40 P.M.–8:30 P.M.
7/26	10:30 P.M.	57	clear	active	Inactive 7:30 P.M.
7/28	10 P.M.	66	clear	active	Inactive during daylight until 8 P.M.
7/29	11 P.M.	64	clear	active	Inactive 7:45 P.M. and 8:30 P.M.
7/30	10 P.M.	68	clear	active	Inactive 4:30 P.M. and 7:30 P.M.
7/31	10:15 P.M.	67	clear	active	Active 8:45 P.M.

TABLE 1—(*Continued*)

No. 2 Colony

Date 1946	E.D.T.	Temp. F.	Weather	Carrying Soil	Remarks
7/9	midnight	70	clear	active	Inactive during daylight
7/10	10:05 P.M.	76	clear	active	15 workers carrying soil at night observation
7/11	10:30 P.M.	74	clear	active	Inactive during daylight
7/12	10:30 P.M.	—	clear	active	Workers active 10 A.M.
7/13	11:30 P.M.	70	clear	active	Inactive in daylight
7/14	10:45 P.M.	76	clear	active	Inactive during the day
7/15	11 P.M.	54	clear	inactive	Inactive during the day
7/16	11 P.M.	55	clear	active	Inactive 10 A.M., 5 P.M., active 7 P.M.
7/17	10:15 P.M.	64	clear	active	Inactive 10 A.M., 7:30 P.M.
7/18	10:30 P.M.	70	clear	active	Inactive 10 A.M., 6:30 P.M., 8:30 P.M.
7/19	10:30 P.M.	—	clear	inactive	Inactive 10 A.M. and 5 P.M.
7/25	10:15 P.M.	68	clear	active	Inactive 7:40 P.M., active 8:30 P.M.
7/26	10:30 P.M.	57	clear	active	A few workers active 7:15 P.M.
7/28	10 P.M.	66	clear	active	Inactive 8:30 P.M.
7/29	11 P.M.	64	clear	active	Inactive 8 P.M.
7/30	10 P.M.	68	clear	inactive	Inactive during daylight
7/31	10:15 P.M.	67	clear	inactive	Inactive during daylight
8/5	10:15 P.M.	76	clear	inactive	Inactive during daylight
8/9	10:45 P.M.	69	clear	inactive	Inactive during daylight
8/11	11 P.M.	60	clear	active	Inactive during daylight
					Observations continued to August 20th, but no further activity was noted after August 11th.

I have five large colonies of *L. claviger* on my place, which I have had under observation for the past five years, and at no time during this period have I ever observed any swarming or nuptial flight before the latter part of September, and from that time on, according to my notes, throughout October and November, and I have one record of swarming and nuptial flight as late as December 3rd, 1943, at 4:20 P.M., E.W.T., temp. 52° F.

This perhaps would indicate that some of the sexual forms of *L. interjectus* remain in the nest during the winter, and have their nuptial flight the following spring, while the sexual forms of *L. claviger* are born and raised during the same year and are not ready to leave the nest until autumn or late in the year.

Distributional Notes on Lauxaniidae Mostly from the Great Smoky Mountains National Park (Diptera)

By George C. Steyskal, Detroit, Michigan

The writer and Robert R. Dreisbach spent a week, beginning June 10, 1946, in the Great Smoky Mountains National Park collecting insects and enjoying the park and Dr. Arthur Stupka's hospitality. The following eight species of Lauxaniidae were secured. While the list is but fragmentary, it contains several interesting distributional records and for that reason is considered worth presenting. The localities cited are all in the Tennessee part of the park, except Andrews Bald, which is in North Carolina. Previous locality records known to the writer both from the literature and from material he has examined are given in parentheses after the Smoky Mountains data.

Homoneura fraterna Lw. Chimneys Camp, June 11 (Ont., Que., Man., entire New England, N. Y., N. J., Pa., Va., Md., Mich., Ill., Calif., Wash.).

H. houghi Coq. Park Headquarters, June 10 and 15; also Cumberland Co., Tenn., June 10 (Que.; Mt. Desert, Me.; Mass.;

R. I.; Conn.; N. Y.; N. J.; Va.; Md.; Raleigh, N. C.; Isle Royale and Cheboygan Co., Mich.; Sylvan Lake, S. D.).

Lauxania cylindricornis Fabr. Andrews Bald, June 16 (Alaska and throughout Canada; New England; N. Y.; N. J.; Pa.; Md.; Ga.; Ft. Myers, Fla.; Mich.; Wis.; Minn.; S. D.; N. M.).

Lauxaniella opaca Lw. Cades Cove, June 13; Headquarters, June 13 (N. J.; Murfreesboro, N. C.; Fla.).

L. trivittata Lw. Headquarters, June 10 (Md.; D. C.; Tenn.; Ga.; Ala.; Fla.).

Minettia lupulina Fabr. Chimneys Camp, June 11; Cherokee Orchard, June 14; Andrews Bald, June 16 (South to mountains of N. C.; Carter Co., Tenn.; Kans.; Colo.).

M. magna Coq. Chimneys Camp, June 11; Elkmont, June 15 (D. C.; N. J.; Md.; Raleigh, N. C.; Battle Creek, Mich.).

Xenochaetina muscaria Lw. Cades Cove, June 13 (N. J.; Md.; Raleigh, Rockingham, and Yonahlossee Road, N. C.; Ala.; Oxford, Miss.; La.; Fla.; Cuba; Mexico; So. Amer.).

A New Subspecies of Speyeria atlantis (Edwards) from New Mexico (Lepidoptera: Nymphalidae)

By A. H. Moeck,* Milwaukee, Wisconsin

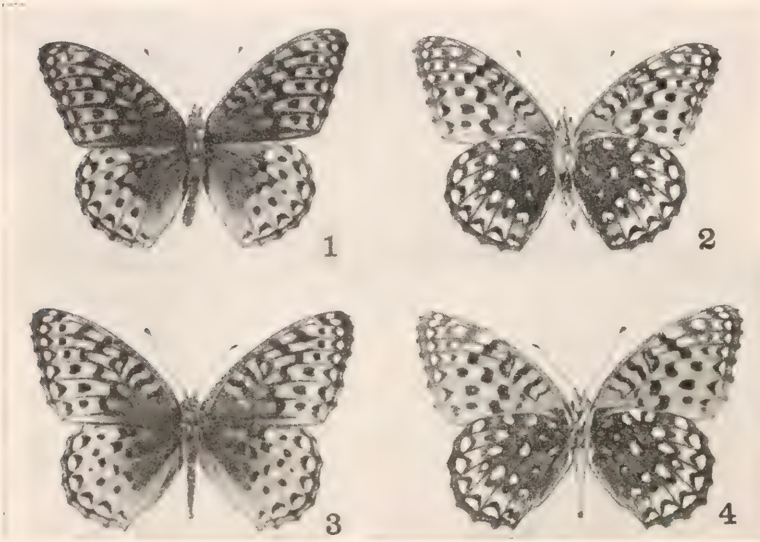
Speyeria atlantis dorothea, new subspecies

Above, both sexes are fiery ruddy, similar in size and wing-shape to *atlantis nausicaa* (Edwards) (1874, p. 104), the latter being a subspecies described from Arizona. In *dorothea* the basal suffusion usually is somewhat heavier and the black pattern markings bolder, thus *dorothea* is in these respects darker than the usual run of *nausicaa*.

Below, *dorothea* in both sexes differs from *nausicaa* in color, especially in the disk or basal two-thirds of the secondaries. In *nausicaa* the discal area is sordid reddish-brown which upon

* Assistance furnished by L. P. Grey, of Lincoln, Maine, is gratefully acknowledged.

close examination is seen to be flecked extensively or entirely overlaid with delicate hoary lavender. In *dorothea* the disk lacks this lavender entirely or nearly so, while the ground color is richer, ranging from shades of deep mahogany-red to brick-red. The spots below are brilliantly silvered, as in *nausicaa,* the submarginal band also being similar in color and extent; however, both stand out more contrastingly in *dorothea* because of the darker, more uniformly colored background.



SPEYERIA ATLANTIS DOROTHEA, new subspecies

1. Holotype ♂ 2. Holotype ♂, under surface
3. Allotype ♀ 4. Allotype ♀, under surface

Genitalically, the species *atlantis* (Edwards) (1863, p. 54) appears to be indistinguishable from the various species placed by dos Passos and Grey (1945, pp. 1–29, figs. 1–54) in their "*callippe* group." In a later elaboration an effort will be made to clarify the interrelationships of the southwestern subspecies of *atlantis,* and to indicate that *dorothea* represents an important link in these relationships, with *nikias* beyond Santa Fe to the north and east, and *nausicaa* to the westward in Arizona.

In wing expanse a series of fifty pairs of *dorothea* averaged 68 mm. in the males, 76 mm. in the females, the variation in size ranging from smallest male 62 mm. to largest female 82 mm. By way of comparison a like series of *nausicaa* measured 60 to 72 mm. in males, and 68 to 86 mm. in females, averaging the same size as *dorothea* except that females of *nausicaa* run a trifle larger. The subspecies *atlantis nikias* (Ehrmann) (1917, p. 55) is smaller, averaging in a series of ten pairs of topotypes, 62 mm. in males, and 66 mm. in females. The holotype of *dorothea* expands 68 mm. (All measurements were taken from tip of primary wing to center of thorax, doubled.)

Type Material: A long series of *dorothea* was collected by the author on Sandia Peak (Sandia Peak is in extreme southeastern Sandoval County bordering upon Bernalillo County, some fifteen miles northeast of and overlooking Albuquerque), Sandia Mountains, New Mexico, July 13 to 15, 1946, at elevations ranging from six to over ten thousand feet. The specimens were taken from the very peak to two-thirds of the way down the mountain, along the winding road which leaves Highway 44 and runs thence to the tip in a general southwesterly direction. The *holotype* male and *allotype* female were taken, *in copula,* July 15, at about 7,000 feet elevation. They have been deposited in The American Museum of Natural History, New York City. Of the type catch mentioned above, 100 males and 100 females are designated *paratypes* which are in the author's collection; a number of them will be distributed to various museums and individuals.

References Cited

dos Passos, C. F., and L. P. Grey. 1945. A genitalic survey of Argynninae (Lepidoptera, Nymphalidae). Amer. Mus. Novitates, No. 1296, pp. 1–29, figs. 1–54.

Edwards, W. H. 1863. Descriptions of certain species of diurnal Lepidoptera found within the limits of the United States and British America. No. 2. Proc. Acad. Nat. Sci. Philadelphia, vol. 14, pp. 54–58.

———. 1874. Description of new species of diurnal Lepidoptera found in North America. Trans. Amer. Ent. Soc., vol. 5, pp. 103–111.

Ehrmann, G. A. 1917. Some new North American butterflies. Lepidopterist, vol. 1, pp. 54–56.

Notes and News in Entomology

Under this heading we present, from time to time, notes, news, and comments. Contributions from readers are earnestly solicited and will be acknowledged when used.

The Rockefeller Foundation, A Review for 1946. From this annual review the following passages have been selected as of interest to entomologists. They deal with the mosquito campaign in Italy and with the yellow fever work.

A large factor in the reduction of malaria in Italy since 1887 has been the great amount of intelligent land reclamation. Work in the Tiber delta was begun between 1885 and 1890, but it was not until after World War I that extensive agricultural drainage was undertaken. . . . But World War II again brought a setback in the struggle against malaria, due to the systematic destruction by the German Army of the great land-reclamation projects. . . . In the whole of Italy the incidence of malaria in 1944 was five or six times as great as before the war. Indeed, in Littoria Province, south of Rome, malaria rates were 55 times their normal figure.

At the invitation of the Army, the Foundation undertook the study of the use of DDT against *Anopheles labranchiae*, a house infesting malaria vector. Armed with knapsack sprayers, teams of workers systematically covered a 120-square-mile area, spraying the walls and ceilings of every room in every building, from large apartment houses to rabbit hutches. Marshy areas were sprayed by Army planes with tanks of DDT or Paris green mounted in the bomb-bays.

Weekly inspections for larvae and adults were made for almost a full year to determine the effectiveness of the measures taken. According to one member of the Health Commission: "The total catch of adults for the 120-square-mile area by our inspectors for the season probably does not equal the number formerly found in one day in one good-sized pigsty."

Three times before in the history of the Roman Campagna since pre-Roman times the abandonment of hydraulic works due to war brought on a widespread plague of malaria. Each time, two centuries were needed to bring the area back to a normal state of health. The fourth time that war devastated this area, it took one thorough application of DDT to reduce the danger of malaria infection almost to zero.

As regards yellow fever, the Review reports increased activity at the laboratories at Lagos, Nigeria and at Entebbe, in the Uganda. An epidemic in Nigeria, centering at Ogbomoshi, the first major outbreak in 15 years, was the classic type of urban yellow fever caused by an old enemy, *Aedes aegypti.*

The jungle type of yellow fever is more easily studied in East Africa, where it occurs unmixed with the urban variety and where *aegypti* does not complicate the picture. Jungle yellow fever is caught only by human beings who enter the forest or who live on its outskirts. In this eastern section of the broad African belt the disease is apparently maintained by arboreal mosquitoes and animals until it is transmitted to man.

There is much supporting evidence for the theory that monkeys, whose population in this region is estimated at 400 per square mile, keep yellow fever alive, aided perhaps by a mosquito. The mosquito strongly suspected is the *Aedes africanus,* which breeds in tree holes and at night bites the monkeys which sleep in the trees. This still does not bring yellow fever to the ground where men can catch it. There are, however, certain arboreal monkeys which enter home gardens to steal bananas and thus bring themselves within the range of both men and another mosquito, *Aedes simpsoni.* Contaminated originally by the *africanus* mosquito, the monkey may in turn contaminate the *simpsoni* mosquito, which in its turn relays yellow fever to the human victim.

Much of this comes under the head of enlightened conjecture, but yellow fever research in the African laboratories is proceeding vigorously, and the mysterious activities of African mosquitoes are beginning to be a little less puzzling than they were formerly.

Current Entomological Literature

COMPILED BY EDWIN T. MOUL, RAYMOND Q. BLISS, CHARLES HODGE IV, MAURICE E. PHILLIPS, JOHN W. H. REHN AND HENRY K. TOWNES, JR.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, 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.

This list gives references of the current or preceding year unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

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 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. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

New Titles of Periodicals and Serials Referred to

101. Mitteilungen der schweitzerischen entomologischen Gesellschaft, Bern.
102. Revue de Entomologie. Rio de Janeiro, Brasil.

GENERAL—Bondar, G.—Bavineos em monocotiledoneas da familia das Bromeliaceas um novo genero e 18 especies novas. [102] 17: 313–38 (k). **Hinton, H. E.**—A new classification of insect pupae. [72] 116: 282–328, ill. **Kantmann, B. P.**—Spontaneous mutation rate in Drosophila. [3] 81: 77–80. **Ligondes, J. de**—La preparation des petits insectes. [110] 3: 30–32. **Mayr, E.**—The naturalist in Leidy's time and today. [62] 98: 271–76. **Tempere, G.**—L'instinct botanique des insectes phytophages. [110] 2: 219–24. **Wade and Caffrey**—Rufus Hiram Pettit. (Obituary.) [65] 49: 87.

ANATOMY, PHYSIOLOGY, MEDICAL—Dobzhansky, T.—Effectiveness of intraspecific and interspecific matings in Drosophila pseudoobscura and D. persimilis. [3] 81: 66–71. **Häfliger, E.**—Beitrag zur Biologie und Bekämpfung der Azaleenmotte Gracilaria azaleella Brants. [101] 20: 141–60, ill. **Morrison, W.**—The chordotonal organs of insects. [100] 25: 50–52, ill. **Rohm, P. B.**—Study of evolutionary chromosome changes in Sciara (Diptera), chromosome C in the salivary gland cells of S. ocellaris and S. reynoldsi. [3] 81: 5–29, ill. **Webb, J. E.**—Spiracle structure as a guide to the phylogenetic relationships of the Anoplura (biting and sucking lice), with notes on the affinities of the mammalian hosts. [72] 116: 49–119, ill. **Zalokar, M.**—Anatomie du thorax de Drosophila melanogaster. [Revue Suisse de Zoologie] 54: 17–53, ill.

ARACHNIDA AND MYRIOPODA—Bryant, E. B.—The genotype of Mimetus Hentz. [73] 53: 48. **Denis, J.**—Araignees rares. [110] 3: 1–9, ill. **Gibson, W. W.**—An ecological study of the spiders of a river-terrace forest in western Tennessee. [58] 47: 38–44. **Kohls, G. M.**—Notes on the tick, Ixodes howelli, with descriptions. [46] 33: 57–61, ill. **Mello-Leitão, C. de**—Arañas nuevas de mendoza, la Rioja y Cordoba colectadas por el Prof. M. Biraben. [Revista del Museo de la Plata] 3: 101–21, ill. (*); Arañas de la Provincia de Buenos Aires. *Ibid.* 311–93, ill. (*). **Radford, C. D.**—New species of larval mites (Trombiculidae) from Manipur State, India. [72] 116: 247–65, ill. **Strandtmann and Eads**—A new species of mite, Ichoronyssus dentipes (Liponyssinae), from the cotton rat. [46] 33: 51–56, ill.

SMALLER ORDERS—Brues, C. T.—Dragonflies as predatory enemies of the stable-fly (Stomoxys calcitrans). [73] 53: 50–51. **Burks, B. D.**—New Heptagenine Mayflies. [5] 39: 607–15, ill. **Christiansen, K. A.**—A new record of Oxyagrion (Zygoptera). [73] 53: 89. **Eads, R. B.**—A new species of flea from the field mouse, Baiomys taylori. [5] 39: 545–48, ill. **Geijskes, D. C.**—Observations on the Odonata of Tobago, B. W. I. [88] 97: 213–35 (k). **Gisin, H.**—Sur la nomenclature de quelques genres importants de Collemboles. [101] 20: 135–36. **Hopkins, G. H. E.**—Notes on mallophagan nomenclature I. [30] 80: 14–19. **Kennedy, C. H.**—Epigomphus subquadrices, a new dragonfly (Gomphidae) from Panama, with notes on E. quadrices and Eugomphus n. subgen. [5] 39: 662–66, ill. **Randolph and Eads**—An ectoparasitic survey of mammals from Lavaca County, Texas. [5] 39: 597–601. **Rapp, W. F., Jr.**—The generic and subgeneric names of Japygidae, with their genotypes. [5] 39: 704–5. **Sommerman, K. M.**—A revision of the genus Lachesilla north of Mexico (Corrodentia: Caeciliidae). [5] 39: 627–61, ill. (k*). **Traver, J. R.**—Notes on Neotropical Mayflies. Part I. Family Baetidae, subfamily Leptophlebiinae. [102] 17: 418–36, ill. (*). **Webb, J. E.**—(See under Anatomy).

ORTHOPTERA—Ebner, R.—Einige seltenere paläarktische Tettigoniidae und Gryllidae. [112] 22: 17–30, ill. (*). **Liebermann, J.**—Sobre una coleccion de Acridios Paraguayos de la mision cientifica Brasileña, 1940–1944. [102] 17: 452–56. **Rehn, J. A. G.**—On the Punctulatus species-group of the genus Melanoplus (Acrid., Cyrtacanth.) with the description of a new sp. from Kansas. [62] 98: 241–69, ill. (k).

HEMIPTERA—Delong and Hershberger—Some new species of Idiocerus (Cicadellid) from the upper Mississippi Valley. [58] 47: 45–48, ill. **Esselbaugh, C. O.**—A study of the eggs of the Pentatomidae. [5] 39: 667–91, ill. (k) **Hsiao, T.-Y.**—The genus Eccritotarsus Stal. with descriptions of a n. gen. and two n. sp. (Mirid.) [65] 49: 59–62; A n. gen. and sp. of Miridae from Guatemala. *Ibid.* 63–65. **Jeannel, R.**—Les Henicocephalides. Monographie d'un groupe d'Hemipteres hematophages. [107] 110: 273–368, ill. (k*), 1942. **Knowlton, G. F.**—A new maple aphid from Utah and some aphid records. [43] 20: 24–26. **Knowlton and Roberts**—Artenisaphis artenisicola (Williams). [43] 20: 26–27 (*). **Melis, A.**—Contributo alla conoscenza dell' Aspidiotus perniciosus. [106] 29: 1–170, ill. **Penner, L. R.**—Some notes on the genus Pentagramma and four n. sp. [43] 20: 30–39, ill. (k). **Wygodzinsky, P.**—Contribution towards the knowledge of the genus Malacopus, with the description of two new species (Reduviidae). [102] 17: 457–67, ill. (*k); Sobre um novo genero de Harpactorinae do Brasil, com notas sobre os generos Harpactor Laporte e Erbessus Stal. *Ibid.* 401–17, ill. (k*).

LEPIDOPTERA—Capps, H. W.—Description of the larva of Keiferia peniculo Heinrich, with a key to the larvae of related species attacking eggplant, pepper, potato and tomato in the United States (Gelechiid). [5] 39: 561–63, ill. (k). **Häfliger, E.**—(See under Anatomy.) **McGuffin, W. C.**—Larvae of some Canadian Geometrids. [23] 78: 160–62 (k). **Nabokov, V.**—Southern Pierids in New England. [73] 53: 42. **Oiticica Filho, J.**—Nova especie do genero Paradaemonia e notas sobre as especies afins (Arsenurinae). [Summa Brasiliensis Biologiae] 1: 143–54, ill. **Silva e Heinrich**—Stenoma decora (Stenomatidae), uma nova praga potencial do cacaneiro na Baia, Brasil. [102] 17: 361–74, ill. **Sylven, E.**—Systematic studies of the Swedish species of Pyralinae, Nymphalinae and Pyraustinae. [10] 38A: No. 13: 1–37, ill. (k).

DIPTERA—Alexander, C. P.—New nearctic craneflies (Tipulidae). Part XXVII. [23] 78: 155–59; Notes on the tropical species of Tipulidae, genus Teucholabis. [102] 17: 375–400 (*). **Bequaert and Renjifo-Salcedo**—Tabanidae of Colombia. [73] 53: 52–88 (k*). **Blanchard, E. E.**—Los Dipteros muscoideos del Museo de la Plata, Tachinidae. [Revista del Museo de la Plata] 3: 123–61, ill. (*). **Bohart, G. E.**—The phorid flies of Guam. [71] 96: 397–416 (k*). **Bouvier, G.**—Malformations chez les Tabanides. [101] 19: 692–94, ill. **Brooks, A. R.**—A revision of the N. A. spp. of Leschenaultia sens. lat. (Larvaevor.). [23] 78: 169–82 (k*). **Brues, C. T.**—(See under Smaller Orders.) **Callan, E. McC.**—A note on Sarcophaga lambens, a parasite of the South American bollworm, Sacadodes pyralis. [102] 17: 474–75. **Cresson, E. T., Jr.**—Synopses of N. Amer. Ephydridae. III. Tribe Notiphilini of Subfamily Notiphilinae. [83] 72: 227–40 (k*); A systematic annotated arrangement of the genera and species of the Ethiopian Ephydridae. Subfamily Psilopinae. *Ibid.* 241–64 (k*). **Dobzhansky, T.**—(See under Anatomy.) **Fairchild, G. B.**—Additional notes on the Tabanidae of Panama. [5] 39: 564–75, ill. (*). **Forbes and Horsfall**—Biology of a pest mosquito common in New Guinea. [5] 39: 602–06. **Hardy and McGuire**—The Nearctic Ptiolina. [43] 20: 1–15, ill. k*). **Horsfall and Porter**—Biologies of two malarial mosquitoes in New Guinea. [5] 39: 549–60, ill. **King and Hoogstraal**—New species of New Guinea Uranotaenia of the Tibialis group (Culicid). [5] 39: 585–96, ill. (k). **Knight and Laffoon**—The oriental species of the Aedes (Finlaya) Kochi group (Culicid). [83] 72: 203–25, ill. (k*). **Lane, J.**—New Brazilian Mycetophilidae (Nemocera). [102] 17: 339–60 (*). **Lopes, H. De Souza**—Contribuicão ao conhecimento das especies do genero Oxysarcodexia (Sarcophagidae). [Boletim da escola Nacional de Veterinaria, Rio de Janeiro] 1: 62–134, ill. (k*). **Melander, A. L.**—Some fossil Diptera from Florissant, Colorado. [73] 53: 43–48, ill. (*). **Penn, G. H.**—The larval development and ecology of Aedes (Stegomyia) Scutellaris (Walker) in New Guinea. [46] 33: 43–50, ill. **Pratt, H. D.**—The genus Uranotaenia Lynch Arribalzaga in Puerto Rico. [5] 39: 576–84, ill. (k). **Pratt, H. D.**—Shannonomyina, new name for Shannonomyia Dyar (not Alexander) (Psychodid). [65] 49: 86. **Reinhard, H. J.**—New genera and species of muscoid Diptera. [43] 20: 15–24. **Rock-**

wood; Zimmerman and Chamberlin—The wheat stem maggots of the genus Meromyza in the Pacific Northwest. [90] 928: 1–18 (k). **Rohm, P. B.**—(See under Anatomy.) **Vargas, L.**—Corethrella laneana n. sp. (Culicidae), procedente de Monterrey, N. L. [78] 7: 63–67, ill. (k); Macropelopia roblesi (Tendipedidae) n. sp. Neotropical procedente de Chiapas, Mexico. *Ibid.* 79–84, ill. **Zalokar, M.**—(See under Anatomy.)

COLEOPTERA—Alfaro, A.—Medios quimicos para exterminar el escarabajo de la patata. [Iberica, Barcelona] 3: 41–44, ill. **Bradley, J. C.**—Contributions to our knowledge of the Mylabridae, seu Bruchidae, with especial reference to the fauna of northeastern America. [73] 53: 33–42 (k*). **Buchanan, L. L.**—Hickory Curculios of the genus Conotrachelus. [65] 49: 41–54 (k*). **Frost, C. A.**—Polydrusus sericeus Schall. [73] 53: 51. **Hustache, A.**—Nouvelle contribution a L'Etude des Ceuthorrhynchininae (Curculionid). [102] 17: 444–51 (*). **Lanchester, H. P.**—Larval determination of six economic species of Limonius (Elaterid). [5] 39: 619–26, ill. (k). **Sanderson, M. W.**—The N. A. sp. of Stilicolina Casey (Staph.). [43] 20: 27–30 (k*). **Servadei, A.**—Contributi alla conoscenza dell'entomofauna delle leguminose foraggere. Phytonomus nigrirostris F. [106] 30: 129–79, ill. **Villiers, A.**—Revision des Languriides de l'Ancien monde. [L'Abeille, Paris] 37: 1–320, ill. (k*), 1945.

HYMENOPTERA—Berry, P. L.—Oviposition habits and early stages of a Eucharia (Kapula sp.). [65] 49: 77–80. **Cole, A. C., Jr.**—A description of Formica parcipappa, a new ant from Idaho. [5] 39: 616–18. **Moure, J.**—Contribuicão para o conhecimento dos Meliponinae (Apoidea). [102] 17: 437–43 (*). **Pate, V. S. L.**—New N. A. Belomicrus (Sphecid). [65] 49: 54–58. **Schuster, R. M.**—A revision of the sphaerophthalmine Mutillidae of Amer. n. of Mexico. [5] 39: 692–703, ill. (k*). **Smith, M. R.**—Ants of the genus Apsychomyrmex (Formicidae). [102] 17: 468–73 (k). **Starcke, A.**—Mededeeling over Cephalotes atratus (Formicidae). [Entomologische Berichten] 11: 263 (S). **Strandtmann, R. W.**—A review of the N. A. spp. of Philanthus, north of Mexico (Sphecid). [The Ohio State Univ. Press.] **Timberlake, P. H.**—N. sp. of Perdita from the Southern States (Apoidea). [65] 49: 81–84 (k). **Wishart, G.**—Observations on the emergence of Macrocentrus gifuensis (Braconid). [23] 78: 162–68.

Review

INSECT MICROBIOLOGY an account of the microbes associated with insects and ticks with special reference to the biologic relationships involved. By Edward A. Steinhaus. Comstock Publishing Company, Inc., Ithaca, New York. 1946. x + 763 pp. Price: $7.75.

In this important book the information concerning various associations and interrelations between microbes (bacteria, rickettsiae, yeasts, fungi, viruses, spirochaetes and protozoa) and insects and ticks has been brought together for the first time. The need for such a work has long been felt by those interested in various aspects of entomology and other biologists. The volume has attempted to summarize under the various categories the results of much widely scattered information and the many discoveries of the author. Although such a work is definitely needed one can not help but think that a more useful work would have been achieved if such broad coverage had not been attempted.

The presentation of material is by type and location of the microbe, with their classification explained. However, this leaves one interested in a particular group of insects without a concise picture. The hosts are listed but as their position in the insect classification is not well indicated one must check to ascertain the group represented.

The portions on extracellular and specific bacteria associated with insects is based mainly on the author's previous catalogue. In the section on intracellular bacteriumlike and rickettesia-like symbionts the discussion of the morphology of insect sex organs, mycetome and embryology seem out of place. However, this is followed by an interesting discussion on the nature, origin, transmission and cultivation of the symbiont forms. Selected examples of these are then discussed under an arrangement according to host.

The chapter on Rickettsiae is certainly the most interesting and instructive of the book. The author's knowledge of this field is such that it is regretted that it was not further expanded, even at the expense of some of the other sections.

Finally there is an interesting chapter on the little understood subject of immunity in insects. This is followed by a general discussion of methods and procedures which should be of use to those interested in work along these lines.

The extensive bibliography in itself makes the volume of considerable value and while not attempting completeness can easily be used as a starting point for gathering supplementary information.

J. W. H. REHN

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

Lepidoptera—Wanted, Hyloicus (Sphinx) and other Sphingidae in exchange for U. S. and Wisconsin Lepidoptera. Wm. E. Sieker, 119 Monona Ave., Madison 3, Wisconsin.

Hymenoptera-Aculeata (except ants and bees) and **Ichneumonidae** for exchange or purchase. Will collect any order in exchange. D. G. Shappirio, 4811 17th St., NW, Washington 11, D. C.

Wanted—Oriental Cerambycidae and Chrysomelidae for determination and research purposes: China, India, Philippines, Pacific. Will purchase from China, Assam, Burma, Siam, Formosa. Will exchange identified Chinese insects. J. Linsley Gressitt, Lingnan University, Canton, China.

Wanted—Papers on Cicindelidae of any part of the world, especially South America and Pacific. R. G. Dahl, 3225 Grand Ave., Apt. 13, Oakland 10, Cal.

Chrysididae—Wanted for determination in preparation of revision. Wm. G. Bodenstein, Galesville, Maryland.

Coccinelidae—Wanted from other localities. Will buy or exchange for misc. So. Cal. coleops. F. W. Furry, 1633 Virginia Ave., Glendale 2, Cal.

Wanted—Ataenius and allied Aphodiinae from all parts of the world, especially Mexico, Central and South America. O. L. Cartwright, Clemson, S. C.

Wanted—Reprints and unpublished mss. on biological control of mosquitoes; for preparing annotated bibliographies for publication. J. B. Gerberich, Michigan State College, East Lansing, Mich.

Wanted—Hesperid genus Megathymus for exchange or purchase. P. S. Remington, 5570 Etzel Ave., St. Louis 12, Missouri.

Wanted—Psychodidae of North America for revisional purposes. Wm. F. Rapp, Jr., 203 Harker Hall, Urbana, Ill.

Diptera—Tachinidae-Dexiidae wanted, No. Amer. and exotic. Will collect most orders in exchange or will purchase. P. H. Arnaud, 60 Woodrow St., Redwood City, Calif.

Will collect—Zoological and entomological specimens in tropical and subtropical parts of Peru. Jose M. Schunke, Pucallpa, Peru.

Wanted—Diplotaxis; will buy or exchange. E. W. Mange, 307 W. Walnut St., Hanover, Pa.

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New Reared Species of Tetrastichus. (Hymenoptera: Chalcidoidea)

By B. D. Burks, Illinois Natural History Survey

In the course of his study of some gall-inhabiting insects, Mr. S. E. Lienk, at the Department of Entomology, University of Illinois, reared three species of the chalcidoid genus *Tetrastichus*. Two of these species proved to be new to science and are here described. These descriptions are uniform with the descriptions in my synopsis of the North American species.[1]

Tetrastichus anthophilus, new species (Figs. 1, 3)

Shining, jet black, with a very faint iridescent blue-green cast when viewed under strong light; antennal pedicel and funicle and middle part of hind tibiae, brown; middle part of mid-tibiae light brown; apices of all femora, front tibiae, bases and apices of middle and hind tibiae, and basal three segments of all tarsi, yellow. Head, body, and legs provided with sparse, yellowish pubescence; hair borne by compound eyes extremely minute and sparse, fig. 1.

Female. Length 1.1–1.8 mm. Maximum width of head equal to maximum width of pronotum; antennae inserted at level of ventral margins of compound eyes; apex of scape reaching level of ventral margin of anterior ocellus; antenna, fig. 3, with scape slightly longer than pedicel and first funicle segment combined, first funicle segment slightly longer than pedicel, second funicle segment three-fourths as long as first, third slightly shorter than second, club as long as first and second funicle segments combined; height of compound eye one and one-half times

[1] Burks, B. D. 1943. The North American wasps of the genus Tetrastichus. Proc. U. S. Nat. Mus. 93: 505–608, 6 pls.

as great as length of malar space; postocellar line twice as long as ocellocular line. Mesopraescutum having maximum width and maximum length equal, one row of bristles present at each lateral margin; surface of mesopraescutum with minute but distinct shagreening; median, longitudinal furrow well marked; submarginal vein of forewing with three or four dorsal bristles, marginal vein three and one-half times as long as stigmal; apex of hindwing blunt, fringe at posterior margin one-fourth as wide as wing at hamuli; mesoscutellum bearing two pairs of bristles. Surface of propodeum very faintly reticulated, almost entirely smooth, paraspiracular carinae absent, spiracles almost touching anterior margin of propodeum; length of mesoscutellum two and one-half times as great as median length of propodeum; maximum width of gaster slightly less than that of thorax, gaster one and one-third to one and one-half times as long as thorax; surface of gaster very faintly sculptured, almost smooth, and clothed with a few sparse setae; gaster acute at apex, ovipositor slightly produced.

Male. Length 1.5 mm. Antennal scape with anterior carina present only on apical fourth; pedicel and first funicle segment equal in length, second funicle one-fifth longer than first, third and fourth equal in length and each one-sixth longer than second; club as long as second to fourth funicle segments combined; funicle segments enlarged at bases, these enlargements bearing long bristles; gaster and thorax equal in length.

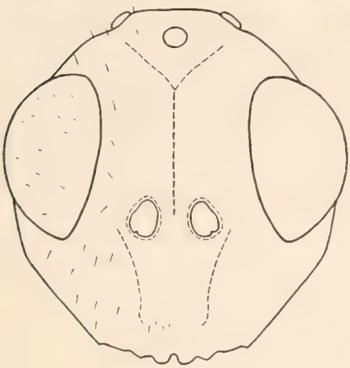
Holotype, ♀.—Mahomet, Illinois, reared October 31, 1946, from gall of *Rhopalomyia anthophila* O. S. in inflorescence of *Solidago,* S. E. Lienk.

Allotype, ♂.—Same data as for holotype.

Paratypes.—Same data as for holotype, 15 ♀; same, September 21, 1946, 1 ♀; September 24, 2 ♀; September 28, 7 ♀.

Holotype, allotype, and 23 ♀ paratypes deposited in the Illinois Natural History Survey collection; 2 ♀ paratypes deposited in the U. S. National Museum.

This species runs to *T. silvaticus* Gahan in my synopsis because the first funicle segment of the antenna is slightly longer than the second, the marginal vein of the forewing is three and one-half times as long as the stigmal vein, the propodeum possesses a nearly smooth surface, with the paraspiracular carinae wanting, and the spiracles almost touch the anterior propodeal margin. The two differ in that *T. silvaticus* never shows iridescent colored reflections, while *anthophilus* is faintly iridescent;



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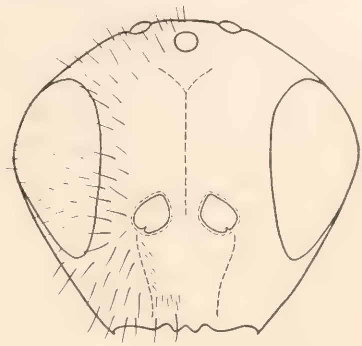

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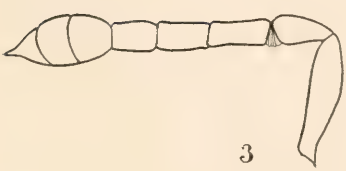

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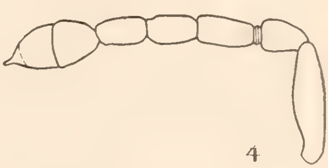

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EXPLANATION OF PLATE

1. *Tetrastichus anthophilus,* anterior aspect of ♀ head. 2. *T. hesperius,* anterior aspect of ♀ head. 3. *T. anthophilus,* lateral aspect of ♀ antenna. 4. *T. hesperius,* lateral aspect of ♀ antenna.

in *silvaticus* the length of the malar space is one-half as great as the height of the compound eye, while the length of the malar space in *anthophilus* is two-thirds as great as the height of the compound eye; the first funicle segment of the antenna is shorter than the pedicel in *silvaticus,* while it is slightly longer than the pedicel in *anthophilus;* and the second and third funicle segments are equal in length in *silvaticus,* but the third is shorter than the second in *anthophilus.*

Tetrastichus hesperius, new species (Figs. 2, 4)

Jet black, non-iridescent; antennae brown, yellowish toward apex of club; trochanters, apices of femora, bases and apices of tibiae, and basal segments of tarsi, very light yellowish-brown; basal part of femora black; middle part of tibiae and apical segment of each tarsus, dark brown. Head, body, and appendages clothed with relatively-long, erect, silvery bristles and hairs; hair borne by compound eyes relatively long, fig. 2.

Female. Length 1.4–1.8 mm. Maximum width of head one and one-half times as great as width of pronotum; antennae inserted dorsad of ventral margins of compound eyes, but ventrad of center of frons, fig. 2; scape short, its apex reaching only to level of ventral margin of anterior ocellus; antenna, fig. 4, with scape only one-seventh longer than pedicel and first funicle segment combined; pedicel one-eighth shorter than first funicle segment, second and third funicle segments equal in length and each as long as pedicel, club twice as long as third funicle segment; height of compound eye twice as great as length of malar space; ocellocular and postocellar lines equal in length, or ocellocular line very slightly the longer. Mesopraescutum with maximum length slightly greater than maximum width, one row of bristles present at each lateral margin; surface of mesopraescutum very lightly shagreened, almost smooth; median longitudinal furrow only faintly indicated, obsolescent; submarginal vein of forewing with four to six dorsal bristles, marginal vein three times as long as stigmal; apex of hindwing blunt, fringe at posterior margin one-third as wide as wing at hamuli; mesoscutellum bearing three pairs of bristles. Surface of propodeum lightly shagreened, paraspiracular carinae absent; spiracles contiguous with anterior margin of propodeum; median length of propodeum one-third as great as length of mesoscutellum; gaster short, compact, its length only slightly greater than that of thorax, and maximum widths of thorax and gaster equal; all of gaster but median dorso-basal area clothed with relatively long, dense, silvery pubescence; asetose area polished, setose area lightly shagreened; gaster relatively blunt at apex, ovipositor not produced.

Male. Length 1.3–1.7 mm. Antenna having scape with darkened anterior carina extending almost its entire length; pedicel one-fourth longer than first funicle segment, second funicle one-third longer than first, third and fourth equal in length and each one-sixth longer than second; club as long as third and fourth funicle segments combined; funicle segments enlarged at bases and these enlargements bearing long bristles; gaster and thorax equal in length.

Holotype, ♀.—West Frankfort, Illinois, reared May 27, 1946, from gall of *Diplolepis ignota* (Osten Sacken), on *Rosa carolina*, S. E. Lienk.

Allotype, ♂.—Same data as for holotype.

Paratypes.—Same data as for holotype, 7 ♀, 5 ♂; same, May 21, 1946, 1 ♀; May 25, 1 ♀; May 26, 7 ♀, 1 ♂; May 31, 1 ♀; June 1, 8 ♀; June 3, 1 ♂.

Holotype, allotype, and 23 ♀ and 5 ♂ paratypes deposited in the Illinois Natural History Survey collection; 2 ♀ and 2 ♂ paratypes deposited in the U. S. National Museum.

This species runs to *Tetrastichus tesserus* Burks in having the head wider than the pronotum, the antennae inserted dorsad of the level of the ventral margins of the compound eyes, and the postocellar and ocellocular lines nearly or quite equal in length. The two species differ as follows: in *hesperius* the antennal scape extends only to the level of the ventral margin of the anterior ocellus, while the scape exceeds the level of the vertex in *tesserus; hesperius* lacks the characteristic scale-like reticulated surface of the thorax, possessed by *tesserus;* in *hesperius* the mesopraescutum is elongate and narrow, while it is compact and semiquadrate in *tesserus;* and in *tesserus* the gaster is twice as long as the thorax, while the gaster and thorax are equal in length in *hesperius*. It should be noted that *hesperius* also shows some similarity to *T. varicornis* (Girault), although the antennae seem to be quite different in the two. *T. varicornis* is, however, at present known only from a single mutilated specimen; the antennae are preserved on a microscope slide and might have become distorted when the slide mount was prepared. The remains of the type of *varicornis* are in the U. S. National Museum.

Two New Elateridae (Coleoptera)

By Joseph N. Knull, The Ohio State University *

Genitalia of the following species have been mounted on slides in balsam and drawn from dorsal surface. Type material in writer's collection.

Dalopius allegheniensis n. sp. Fig. 1.

Male. Narrow, elongate, shining, dark brown, apical margin and hind angles of pronotum, mouth parts, apex of last abdominal segment and legs lighter brown; pubescence moderate.

Head densely, finely punctate; antennae extending over two segments beyond hind angles of pronotum when laid along side, scape stout, second and third segments about equal in length, fourth nearly as long as second and third united, fifth to tenth inclusive decreasing in length, last segment slightly longer than tenth.

Pronotum longer than wide, widest at basal angles, constricted at apex; sides expanded back of apex, constricted back of middle, hind angles divergent; lateral margin continuous, its junction with anterior margin external to that of prosternal suture; disk moderately convex, slight trace of median depression, hind angles strongly carinate; surface densely finely punctured, punctures more numerous along sides and at base. Scutellum elongate, minutely punctate.

Elytra with sides subparallel on basal half, gradually converging back of middle, apices truncate, surface with fine, oval, nearly contiguous punctures forming striae, interspaces minutely punctate.

Length of aedeagus 1.5 mm.

Length, 8.3 mm.; width, 2.1 mm.

Variations.—Umbone in some specimens light brown in color.

Holotype male labeled Renova, Pennsylvania., June 17, J. N. Knull. *Paratypes* from same locality, also Sullivan Co., Pennsylvania, June 3, 1933 and Columbus, Ohio, Sept. 11, 1936, all collected by author.

* Contribution from Department of Zoology and Entomology.

This species should be placed after *D. cognatus* Br. according to Brown's key.[1]

Dalopius ohioensis n. sp. Fig. 2.

Male. Size and form of *D. allegheniensis;* shining dark brown, apical margin and sides of pronotum, scutellum, umbone, last three segments of abdomen, mouth parts and legs lighter brown.

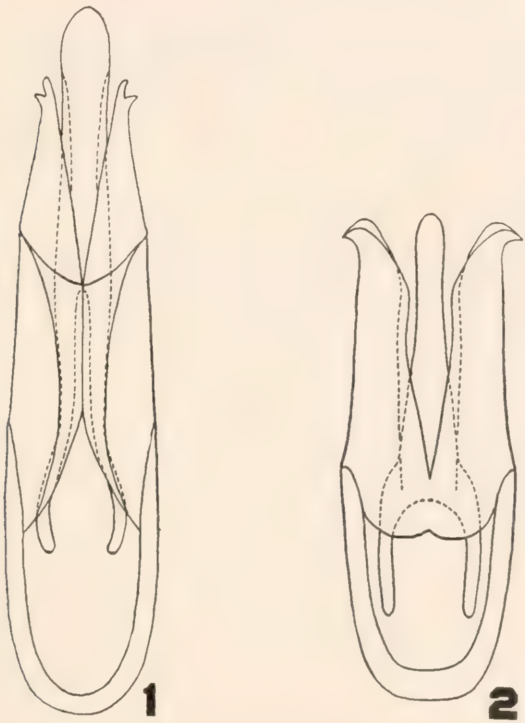

Fig. 1. *Dalopius allegheniensis* n. sp.
Fig. 2. *Dalopius ohioensis* n. sp.

Head densely, finely punctured; antennae extending over three segments beyond apices of hind angles of pronotum when

[1] W. J. Brown, 1934, Can. Ent. 66:35.

laid along side; second segment shorter than third, fourth segment nearly as long as second and third together, segments five to ten inclusive gradually decreasing in length, eleventh longer than tenth.

Pronotum and scutellum with proportions and sculpture similar to preceding. Elytra similar to preceding, apices emarginately truncate.

Length of aedeagus 1.2 mm.

Length, 8.1 mm.; width, 2.1 mm.

Holotype labeled Hocking Co., OHIO, May 26, 1938. *Paratypes* from same locality May 20, June 5–14, all collected by D. J. and J. N. Knull.

This species should be placed next to *D. vetulus* Br.

Unusual Larval Habitat of Ficalbia (Mimomyia) splendens (Theo.) and Aedomyia africana N.-L.

By LEWIS BERNER, Department of Biology, University of Florida

G. H. E. Hopkins, in his "Mosquitoes of the Ethiopian Region,"[1] states (p. 66) that *Ficalbia splendens* breeds "In clear water in borrow-pits, water-holes and the margins of swamps, invariably among *Pistia,* with which the association appears to be absolute." Of *Aedomyia africana,* he says (p. 89), "The constant feature of all breeding-places of this species is the presence of *Pistia.*"

During 1943 and 1944, these two species were found not only among *Pistia stratiotes,* as Hopkins states, but also in ponds covered with duckweed (*Lemna* sp.), where there was no *Pistia.* These collections were made at Sangalkam, Senegal, French West Africa and at Atima, a village near Accra, Gold Coast, British West Africa. The larvae were usually associated with *Anopheles funestus* Giles, *A. constani ziemanni* Grunb., *Culex poicilipes* (Theo.), *Mansonioides africanus* (Theo.), *M. uniformis* (Theo.), and *Ficalbia pallida* (Edwards).

[1] British Museum (Natural History), 1936.

On the Gorytine Wasps of the West Indies (Hymenoptera: Sphecidae)

By V. S. L. Pate, Ithaca, New York

Five species of Gorytine wasps, distributed among three genera, occur in the West Indies. These are found only on one or more of the Greater Antilles; none are known as yet from any of the Leeward or Windward Islands.

In 1798 Fabricius described the first Antillean Gorytine as *Mellinus tristrigatus* from the "Insulae Americae meridionalis"; this is probably a *Psammaecius* of the subgenus *Hoplisoides*. A decade later Latreille recorded *Stizus Hogardii* from the island of Santo Domingo; this species is now referable to the nominate subgenus of *Sphecius*, and has been reported from Jamaica, Cuba, and the Bahama Islands as well as from Hispaniola. Finally in 1865, Cresson characterized two Cuban species: *Harpactus insularis* and *H. scitulus*, both of which are referable to *Psammaecius*. Handlirsch considers the latter identical with *tristrigatus* of Fabricius, but until more evidence is forthcoming than that adduced by Handlirsch, I prefer to regard Cresson's *scitulus* a valid species. Two additional new species, *Ochleroptera jamaica* and *Psammaecius alaya*, are described below.

Cuba, at present, has three known Gorytines: *Sphecius* (*Sphecius*) *hogardii* (Latr.), *Psammaecius* (*Hoplisoides*) *insularis* (Cresson), and *Psammaecius* (*Hoplisoides*) *scitulus* (Cresson). The cicada killer, *Sphecius hogardii* (Latr.), has been reported from the Bahama Islands. Hispaniola is known to harbour two species, *Sphecius hogardii* (Latr.) and *Psammaecius alaya*, described below. Jamaica, in addition to *Sphecius hogardii* (Latr.), now numbers *Ochleroptera jamaica*, described below, as a member of its fauna. Puerto Rico, smallest of the Greater Antilles, is known at present to harbour only a single Gorytine, *Psammaecius scitulus* (Cress.). When the wasp fauna of the Caribbees is more fully known, many of the islands, particularly Jamaica, Hispaniola, and Puerto Rico, as well as perhaps some of the Lesser Antilles, will be found to have a larger representation of Gorytines than is known at present.

Ochleroptera jamaica new species

The present species is closely related to the North American continental form, *bipunctata* (Say), but is distinguished from it by the strongly concave mesothoracic epipleura, the absence of a carinule bisecting the dorsal trigonal enclosure of the propodeum, the strongly and vertically striatopunctate lateral areas of the propodeum, and the very finely and sparsely punctate abdominal tergites and sternites.

Type.—♂; Morce's Gap, Blue Mountains, JAMAICA.* Elevation, 4,980 feet. July 21, 1923. (James A. G. Rehn; in mountain rain-forest.) [Academy of Natural Sciences of Philadelphia, Type no. 10603.]

Male. Length 5.25 mm. Fulgid black; the following eburneous: palpi, mandibles except red apices; clypeus except apical margin and a large obtrapeziform discal spot extending to dorsal margin; scape anteriorly with a stripe lengthwise; pronotum dorsally; pronotal tubercles; postscutellum; second abdominal tergite with a small, transverse, oval spot laterally on each side; fore tibiae with a stripe lengthwise on outer faces; middle and hind tibiae with small spots at base; all tarsi except for bases of all metatarsi and last segment which are brunneous; middle coxae with a large spot beneath. Tegulae and axillary sclerites black. Wings clear hyaline; veins and stigma very dark brunneous.

Head fulgid; clypeus and supraclypeal area to antennal sockets and a line along inner orbits with dense, appressed, silvery sericeous pile; remainder of head with a thin vestiture of appressed, silvery puberulent hair. Front with very fine and close setigerous punctures; bisected by a strong impression running down from anterior ocellus. Vertex and temples subpolite, with scattered fine setigerous punctures; ocelli in a very low broad triangle, the ocellocular line about three-eighths (0.385) the postocellar distance. Antennae situated toward middle of face, one-half the length of clypeus above its dorsal margin; scape

* *V.:* Shreve, F. A montane rain-forest: a contribution to the physiological plant geography of Jamaica. *Carnegie Inst. Washington, Publ. no. 199 (1914).*

cylindrical to obterete, about four-ninths (0.45) the vertical eye length; pedicel suborcate; flagellum simple, filiform to weakly clavate apically; relative lengths: scape 18; pedicel 6; flagellar segment one 8, two 6, three 6, four 6, five 7, six 7, seven 6.5, eight 6, nine 6, ten 7, eleven 9. Clypeus transversely subhexagonal, twice as broad as long, its median length nearly three-eighths (0.35) the vertical eye length; disc flat to very weakly tumid; abruptly inflexed preapically before the narrow, linear, flat, truncate apical flange.

Thorax with a very thin and inconspicuous clothing of short, decumbent, silvery hair throughout. Mesonotum simple, with fine, very widely separated, setigerous punctures; scutellum and postscutellum punctured like mesonotum. Mesopleura with fine separated punctures; epimera finely, horizontally striate; epipleura completely and deeply concave. Propodeum with trigonal dorsal enclosure strongly impressed, finely, radiately costulate on basal half but not bisected by a carinule, the apical half polite; remainder of dorsal and posterior faces and posterior half of lateral faces strongly, vertically striatopunctate; posterior face bisected by a deep furrow, and at base by a strong carinule forking above into a broad U-shaped one; lateral carinae present basally; lateral faces with anterior half subpolite.

Legs simple, normal for genus. Longer hind tibial calcar two-fifths the length of slender hind metatarsi.

Fore wing with radial cell narrow, elongate, lanceolate, apex acuminate, four times as long as wide; radius with abscissae: first 7, second 10, third 14, fourth 24; cubitus with abscissae: first 26, second 20, third 20; first recurrent vein received in apex of first submarginal cell just before first transverse cubital vein; second recurrent vein interstitial with second transverse cubital vein. Hind wing with cubitus arising three times the length of the short, straight, perpendicular transverse median vein beyond that vein.

Abdomen fulgid; with a very thin vestiture of fine, short, decumbent silvery hair throughout. First segment petioliform, subnodose at apex. First two tergites with very fine, separated setigerous acupunctures; remaining tergites finely but more distinctly punctate; sixth with a transverse, subsemicircular pygidial area, the disc more distinctly punctate than preceding tergite. Sternites shining, with scattered, sparse, fine punctures.

This Jamaican species is known only from the unique male described above.

Psammaecius (Hoplisoides) alaya [1] new species

This Hispaniolan species is closely related to the Cuban *scitulus* but may be distinguished from the latter by its larger size, ivory white maculations, immaculate propodeum, and the dark brunneous costa and stigma of the fore wings.

Type.—♂; San Domingo. (No other data.[2]) [Academy of Natural Sciences of Philadelphia, Type no. 10604.]

Male. Length 7.5 mm. Black; the following eburneous: clypeus dorsally; inner orbits with a narrow line; scapes with spot at base and apex; pronotum dorsally; pronotal tubercles with a spot; prepectus with a large spot behind tubercles; scutellum with a broad transverse stripe on posterior half; first, second and fourth abdominal tergites with a narrow apical fascia; second sternite laterally with an elongate, transverse spot on each side; fore and middle tibiae with a stripe lengthwise on outer faces; middle metatarsi. Fore and hind tarsi dark fulvous. Tegulae and axillary sclerites dark brunneous. Fore wings with anterior half deeply infumated, particularly in marginal, submarginal, first discoidal, and apex of median cell; remainder of wings only weakly tinted; veins and stigma concolorous, dark brunneous.

Head subfulgid; with a moderate vestiture of appressed silvery hair throughout; impunctate save for a few scattered punctures on front and disc of clypeus. Eyes moderately convergent toward clypeus; front bisected by a weak groove from anterior ocellus. Ocellocular line two-thirds the postocellar distance; occipital carina strongly flanged, almost attaining the flanged hypostomal carinule bordering the broad, shallow, subtrigonal

[1] After the Alaya, who formerly inhabited Hispaniola.

[2] This material was probably collected by M. Abbott Frazar in or about Sanchez in the Samaná District of the Dominican Republic.

oral fossa. Antennae situated a little above the dorsal margin of clypeus; scapes thick, subcylindrical, one-half the vertical eye length; pedicel suborcate; flagellum simple, gently clavate apically, none of segments emarginate or dentate beneath; relative lengths: scape 10; pedicel 2; flagellar segment one 5, two 4, three 3, four 3, nine 3, ten 3, eleven 5. Clypeus irregularly transversely subhexagonal, twice as broad as long, the median length two-fifths the vertical eye length; disc gently tumid; with a weak, truncate apical flange; lateral angles without hair pencils.

Thorax polite, impunctate; with a thin clothing of appressed silvery hair throughout. Suture between mesonotum and scutellum strongly foveolate; mesosternum strongly carinate for entire width. Propodeum with vestiture similar to thorax; dorsal face with trigonal enclosure defined by weak impressed lines, the apex ending in a small but strong fovea, bisected by a narrow marginate groove, laterad of which on each side are three well separated short carinules running for only one-third of the enclosure, the remainder polite; remainder of dorsal and posterior faces with very few, widely scattered, fine punctures; posterior face with a strong carinule curving up on each side from just above hind coxae, bisected by a weak carinule, the supravalvular area weakly, irregularly costulate; lateral faces polite, impunctate.

Legs simple, unmodified. Middle and hind tibiae very weakly spinose. Longer calcar of hind tibiae one-half length of hind metatarsi.

Abdomen perfulgid; sessile; with a very fine and inconspicuous clothing of short, decumbent silvery hair. Tergites very sparsely and weakly punctate: the first two very finely, the third to fifth more strongly, the sixth almost coarsely; seventh completely obtect. Sternites polite, with a few fine, scattered, moderate punctures; fifth and sixth with concealed hair brushes basally.

Allotype.—♀; Topotypical; same data as type.

Female. Length 8 mm. Agrees with the male (type) except as follows:

Livery essentially the same, but maculations as follows: clypeus entirely; inner orbital stripe broader, wider; prepectus almost entirely; abdominal fasciae wider; stripes on fore and middle tibiae larger; hind tibiae with a large elongate subbasal spot; fore and middle femora with a large ovate spot apically beneath; mesosternal prongs with a small spot; middle coxae with a small spot beneath at apex.

Head as in male but eyes not as strongly convergent toward clypeus. Ocellocular line five-eighths the postocellar distance. Antennal scapes about five-ninths (0.56) the vertical eye length; relative lengths: scape 13; pedicel 3; flagellar segment one 6, two 4, three 3.5, four 3.5, eight 3, nine 3, ten 4. Clypeus shorter and more subrectangular, median length about four-tenths (0.43) the vertical eye length, and twice as broad as long.

Thorax and propodeum essentially the same but posterior face of latter more strongly wrinkled than male.

Abdomen with first two tergites almost impunctate, the following tergites more finely and sparsely punctate than male. Sixth tergite with an elongate trigonal pygidial area, the disc polite, with scattered coarse punctures.

Paratypes.—In addition to the types, I have examined five males and sixteen females, all topotypic. These agree with the types in all essential features of livery and structure.

Personal

Ezra T. Cresson, Jr., the well-known dipterist, long Associate Editor of "Entomological News," and for many years Associate Curator of Insects at the Academy of Natural Sciences of Philadelphia, resigned the latter post as of July first of the present year. Having served the Academy as a member of the staff of his department for thirty-nine years, Mr. Cresson intends to continue his studies free of the responsibilities of broader curatorial work. In recognition of his studies and their value to the institution, he has been appointed to the honorary post of Research Fellow of the Academy by its Board of Trustees.

Notes on the Type Locality of Speyeria egleis secreta dos Passos and Grey

By P. S. Remington, Jr., St. Louis, Missouri

In the "American Museum Novitates," Number 1297, entitled "A New Species and Some New Subspecies of Speyeria," by C. F. dos Passos and L. P. Grey, a new subspecies of *Speyeria montivaga* (since dropped for *egleis*), named *secreta* is described. The type material is described as follows: "The holotype male and the allotype female are from Rocky Mountain National Park, Colorado, 8000 feet, July 1942, collected by Roy Wiest in the Estes Park area." Students of Lepidoptera who are interested in collecting rare species in type localities should know that the subspecies *secreta,* which is a perfectly recognizable race, is a Western slope race and is not really found in the Estes Park area. Additional records of the occurrence of this subspecies establish this fact clearly and a correction of the type locality named above as "in the Estes Park area" should be made.

On August 11, 1946 the writer, in company with Dr. Roy Wiest and Donald Eff, visited the ravine where the type series was caught. This spot is at least twenty-five miles from the Estes Park area and is across the Continental Divide, which cuts through the middle of Rocky Mountain National Park. One proceeds from Estes Park by way of either the Trail Ridge Road or the older Fall River Road over the Divide at a height of more than 12,000 feet. The road then drops down about 2,000 feet to Poudre Lakes and on to the headwaters of the Colorado River. A short distance beyond Poudre Lakes, a small ravine angles off to the left of the road and this is the spot where Dr. Wiest told us he found *secreta.* None were flying that day, probably because *secreta* flies earlier in the year. The only *Speyeria* we saw was *S. mormonia eurynome.*

If *secreta* is living and breeding in the canyons on the west slope of the Divide and westward, it is easy to see for one who has made the trip as we did, that the insect would have difficulty crossing miles of windswept tundra uncongenial to it along the Trail Ridge to establish itself on the east slope. It is extremely doubtful whether it will ever be found on the east slope. Corroborative evidence of this view is now available. In February, 1946, the writer sent several hundred *Speyeria* to L. P. Grey for determination. These were nearly all collected by the author and his son during the past ten years mainly in the Rocky Mountain area from Pike's Peak and Hall Valley on the south up through Mt. Evans, Rocky Mountain National Park, the Snowy Range and the Tetons in Wyoming to Bozeman, Montana, north of Yellowstone. In all this mass of material there were three specimens of *secreta* collected by P. S. and C. L. Remington in the Routt National Forest on July 5, 1941, about fifty miles west of Rocky Mountain National Park. These specimens were obtained in ravines similar to the type locality at an altitude of about 9,000 feet. One ravine was in Rabbit Ears Pass and another in Muddy Pass as one descends toward Steamboat Springs. The evidence strongly suggests that *secreta,* well named, is a very uncommon race of *egleis* living in rather hidden ravines west of the Continental Divide at altitudes of eight to ten thousand feet in the Continental Plateau As dos Passos and Grey state, it can be easily overlooked among specimens of *hesperis,* but is fully distinct to the expert eye.

The importance of correctly locating type localities is well known to the serious student of biology and much difficulty has arisen through carelessness in this matter. In 1924 the author and W. J. Clench of the Museum of Comparative Zoology at Harvard spent three months attempting to locate type localities in which J. G. Anthony collected in 1853 and it was by no means easy to find many of these localities, due to inadequate data on labels and in the original descriptions. In order to be of value to future students and collectors, every specimen collected and preserved should be accurately labelled with exact locality so that anyone in the future can find that spot. Also the date of capture and ecologic data should be provided, if possible. This makes simpler the problems of taxonomists and ecologists in all branches of biology.

The Appearance of Two Species of Exotic Cockroaches in Center County, Pennsylvania

By VERNON R. HABER, Pennsylvania State College

In mid-October 1944, the author was called to control cockroaches in an apartment in State College, Pa. Upon investigation it was found that the pests were brown-banded cockroaches, *Supella supellectilium* (Serville), a tropical species of wide dispersal, and until rather recently regarded as of more common southern distribution.

On May 10, 1946, Mr. Lewis Stannard, then a senior student in the Pennsylvania State College, Department of Zoology and Entomology, captured an adult male cockroach of the same species in an upland sphagnum-bog region adjacent to, if not in Center County, Pennsylvania. It was found far from buildings of any kind, apparently wild. Since this species is regarded as tropical and, if found in the north, it is usually taken from houses, one is inclined to believe that the specimen may have dropped from a picnic basket of a visitor to that region, or perhaps it dropped from a passing airplane.

During the recent Christmas season, a cockroach taken from a shipment of tropical fruit sent into State College from Florida was submitted to me for identification. It is an adult female Australian cockroach, *Periplaneta australasiae* (Fabricius).

I believe that all three of the foregoing are the first published records of the appearance of these species in central Pennsylvania.

Observations on the Mating of Ficalbia (Mimomyia) splendens (Theo.)

By LEWIS BERNER, Department of Biology, University of Florida

At Sangalkam, three miles north of Rufisque, Senegal, French West Africa, *Ficalbia* (*Mimomyia*) *splendens* (Theo.) adults were observed in the act of mating on several occasions during

May, 1943. The mosquitoes were breeding along the quiet edge of a stagnant channel where water lettuce, *Pistia stratiotes,* was growing in small clumps. Also present in this situation with the larvae of *F. splendens,* were larvae of *Aedomyia africana* N.-L., *Culex poicilipes* (Theo.), and *Anopheles funestus* Giles. Adults were first noted while larval collections were being made. As the water lettuce was disturbed, the small mosquitoes flew up from the water giving the appearance of having just emerged. A more detailed examination revealed that the mosquitoes were fully mature and that numbers of them were resting in the strong rays of direct sunlight on the upper side of the *Pistia* leaves as well as on the shaded undersurface, not more than one-half to one inch above the water. When the mosquitoes were disturbed, they flew upwards to a maximum of six inches above the plants and then immediately descended to rest again on the leaves of the plants. The habit of resting in bright sunlight is not common among mosquitoes, most species normally preferring dark hiding places.

Copulation was first noted about three o'clock in the afternoon, while the adult mosquitoes were being collected with a suction tube. At this time, a pair of *Ficalbia splendens* was seen coupled in flight at a height of about three or four inches above the water lettuce. The coupling continued for only a few moments. A number of *F. splendens* were noted pairing at about the same level above the water plants.

Notes on Tanypteryx hageni

The NEWS is indebted to Dr. James G. Needham for the following extracts from a letter written by Mrs. Ruth Cooper Whitney of Portland, Oregon. The extracts comprise recent observations made by her on the habits of the rare and primitive dragonfly *Tanypteryx hageni* and also report a diligent search made by her for its unknown nymph, with useful hints to other collectors who may try to discover its whereabouts. They end with the question, Where?

"On July 28th, a clear and sunny Sunday, a number of *Tanypteryx* were to be seen in mating and feeding flights above the cat-tail swale at Swim. They seemed to be taking off from a 'home base' on the warm sunny rocks that dotted the wet muddy trailway beside a white-painted post. Quite often one or more of them alighted on the sunny side of the post, and let me come close (within a foot or so) to examine them, when I did not have my net with me! One or two sat flattened down on the low rocks with wings and legs widely outspread."

"When they did take off, the flight was low, uneven, and much like that of a cabbage butterfly, only swifter. A height of perhaps twenty feet would be gained, and then the wing-flapping became gliding. The circling went beyond the cat-tail swale. One *Tanypteryx* was seen a distance up the road beyond the picnic tables; but the 'home base' seemed to be always back at the Tom-Dick post."

"I searched the swift little streamlets near the swale for nymphs but found not a sign of one. I also dug into rotton and damp logs; scraped the slimy bottom of the swimming tank, and I almost did the cat-tails one by one, finding nothing but damselfly (*Argia*) skins. Where are the *Tanypteryx* nymphs?"

RUTH COOPER WHITNEY

Notice

The News was shocked to learn of the disappearance of **Dr. Vernon R. Haber** of State College, Pennsylvania. Dr. Haber is an associate professor at Pennsylvania State College and has been an occasional contributor to "Entomological News." He disappeared on the morning of June 3rd on his way to his office, therefore his family, physician and others believe him a victim of amnesia. They are employing every means, including the offer of a large reward, that might lead to his recovery. By this notice, we hope to enlist the help of his fellow entomologists also. Dr. Haber is 59 years of age (looks more like 50), is 5 feet, 6 inches tall, weighs 135 pounds, has brown eyes, gray hair worn in a short pompadour and a receding hair line. He ordinarily carries a hand lens in a black case.

Notes and News in Entomology

Under this heading we present, from time to time, notes, news, and comments. Contributions from readers are earnestly solicited and will be acknowledged when used.

The eighth **International Congress of Entomology** will be held in Stockholm, Sweden, August 8–15, 1948. The fact that all steamship sailings are currently booked to capacity for months in advance makes it seem necessary for those expecting to attend the congress in 1948 to arrange for passage as early as possible. Steamship companies have not issued sailing lists for 1948, but expect to do so in the early fall. A number of lines have listed sailings for the present season, among them, the Cunard, French, Belgian, Swedish, Norwegian, Gdynia (Polish), Holland-American, etc., the first mentioned expecting soon to have two new steamers in service. It is understood that the Thirteenth International Congress of Zoology will be held in Paris some time in July, 1948, and it is hoped that all entomologists going to Stockholm will plan to attend the Zoological Congress also in order that the interests of the entomologists may be fully represented before the more comprehensive body. Should a sufficient number of individuals indicate that they expect to sail about mid June, it may be feasible to engage passage on the same steamer. Early information as to the probable number of participants is especially desired in order that the housing committee in Stockholm may make the necessary arrangements. The undersigned, as member of the executive committee, would appreciate it if he be kept informed as early as possible as to plans of those expecting to attend the sessions.

O. A. JOHANNSEN,
Comstock Hall, C. U.,
Ithaca, N. Y. June, 1947.

A letter just received from **Dr. Otto Kröber,** well known dipterist of Hamburg, Germany, states that of the rich insect collection at the Zoologisches Museum und Institut in Hamburg, not a single specimen was saved, and not one of the types. Likewise, his own special collection, which was particularly rich in types and material of Tabanidae and Conopidae, and which was stored in the Museum, was entirely destroyed, together with all of his literature and manuscripts. This news differs from previous reports that types were saved even though the museum building and display collections were destroyed.—C. W. SABROSKY.

Current Entomological Literature

COMPILED BY EDWIN T. MOUL, RAYMOND Q. BLISS, CHARLES HODGE IV, MAURICE E. PHILLIPS, JOHN W. H. REHN AND HENRY K. TOWNES, JR.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, 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.

This list gives references of the current or preceding year unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

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 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. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

GENERAL—Alicata, J. E. -Parasites and parasitic diseases of domestic animals in the Hawaiian Islands. [Pacific Science, Honolulu] 1: 69–84. **Brues, C. T.**—Contributions of entomology to theoretical biology. [81] 64: 123–34, ill. **Cole, A. C., Jr.**—Illustrated keys to the immature forms (exclusive of eggs, nymphs, and pupae) of the more common orders and families of Tennessee insects. [47] 22: 28–44, ill. **Corona, L. T.**—Algunos insectos enemigos del aguacate en las zonas productoras de Queretaro, Guanajuato y Tamaulipas. [Fitofilo, Mexico] 4: 352–63, ill. **Duncan, C. D.**—Some remarks on the influence of insects on human welfare. [60] 23: 1–10. **Proverbs and Morrison**—Relative insecticidal activities of DDT and related organic molecules. [24] 25: 12–44. **Starkey, G. S.**—A method of preparing permanent slides of mosquito larvae and other arthropods in a tropical or semi-tropical climate. [W. Va. Univ. Bull.] 47: 25–26.

ANATOMY, PHYSIOLOGY, MEDICAL—Chauvin, R.—Contribution à l'étude physiologique du criquet pelerin et du determinisme des phenomenes gregaires. [107] 110: 133–272, ill.; Sur le phototropisme des orthoptères. [108] 46: 150–54. 1941. **Deschamps, P.**—Sur la digestion du bois par les larves de Cerambycides. [108] 49: 104–08, ill. **Hudson, G. B.**—Studies in the comparative anatomy and systemic importance of the hexapod tentorium. II. Dermaptera, Embioptera and Isoptera. [Jour. Ent. Soc. S. Africa, Pretoria] 9: 99–110, ill. **Lhoste, J.**—Aperçu anatomique et histologique du tube digestif de Forficula auricularia L. [108] 46: 43–46, ill. **Marshall, W. S.**—The labral sense organs of the red-legged grasshopper, Melanoplus femur-rubrum. [Trans. Wisc. Acad. Sci., Arts and Letters, Madison] 37: 137–48; The rectal glands of mosquitoes. [ibid.] 37: 149–55, ill. **McCoy E. E.**—Elimination of a microsporidian parasite in the mass rearing of Macrocentrus ancylivorous. [45] 55: 51–55. **Millot, J.**—L'anatomie interne des Ricinulei (Arachnides). [Annal. des Sciences Naturelles, Paris] 7: 1–29. **Paulian, R.**—Observations biologiques et anatomiques sur Agyrtes bicolor Lap. [108] 50: 12–16, ill. 1945. **Roonwal, M. L.**—Variation and structure of the eyes in the desert locust, Schistocerca gregaria (Forskal). [Proc. Royal Soc., Ser. B] 134: 245–72, ill. **Siang-Hsu, W.**—On the cytoplasmic elements in the midgut epithelium of the larvae of Drosophila melanogaster. [44] 80: 161–93, ill. **Sotavalta, O.**—Some studies on the flying tones of insects and the determination of the frequency of the wing strokes. [Suomen Hyonteistieteellinen Aikakauskirja, Fennici] 7: 32–52. **Tragardh, I.**—Contributions toward the comparative morphology of the Mesostigmata (Acarina). Praesternal hairs and the male genital aperture. [Entom. Tidskrift, Stockholm] 3: 88–108. 1946. **Verrier, M. L.**—Rémarques sur les yeux de la Squille (Squilla mantis L.) (Crustacea). [108] 46: 6–9, ill. **Wigglesworth, V. B.**—The epicuticle in an insect, Rhodnius prolixus (Hemiptera). [Proc. Royal Soc., Ser. B] 134: 163–81, ill. **Wilkes, A.**—The effects of selective breeding on the laboratory propagation of insect parasites. [Proc. Royal Soc., Ser. B] 134: 227–45. **Wilson, L. P.**—Tolerance of larvae of Drosophila for amino acids: methionine, cystine and cysteine. [Growth] 10: 361–73. **Wulff and Jahn**—The electroretinogram of Cynomya. [45] 55: 65–83.

ARACHNIDA AND MYRIOPODA—Chamberlin, R. V.—Seven new American millipeds. [63] 60: 9–16, ill.; On four new American chilopods. [60] 23: 37–39, ill. **Gertsch, W. J.**—Spiders that lasso their prey. [56] 56: 152–58, ill. **Goodnight, C. J. and M. L.**—An example of subspeciation in the Phalangida. [45] 55: 35–42; ill. (S.). **Hoff, C.**—New species of diplosphyronid pseudoscorpions from Australia. [73] 54: 36–56, ill. (*). **Millot, J.**—(See under Anatomy.) **Strandtmann, R. W.**—Atricholaelaps megaventralis, a new species of parasitic mite (Laelaptidae). [65] 49: 112–14, ill. **Tragardh, I.**—Acarina. (See under Anatomy.)

SMALLER ORDERS—Banks, N.—Some neropterous insects from Szechwan, China. [Fieldiana-Zoology, Chicago] 31: 97–107, ill. **Berger, B. G.**—How to recognize and control termites in Illinois. [Ill. Nat. Hist. Survey, Urbana] Circular 41: 1–44, ill. **Carriker, M. A., Jr.**—Studies in neotropical mallophaga (ix); Amblycera of the new world Galliformes, Part I, The genus Menacanthus. [76] 7: 115–37, ill. (*). **Paclt, J.**—Short observations on the nomenclature of some generic names in Collembola. [Notulae Entomologicae, Helsinki] 26: 82–85. **Traub, R.**—A new species of flea of the genus Opisodasys from Mexico. [48] 37: 134–39, ill. **Valle, K. J.**—A small list of Odonata from U. S. A. [Suomen Hyonteistieteellinen Aikakauskirja, Fennica] 8: 163–66, ill.

ORTHOPTERA—Chauvin R.—(See under Anatomy.) **Marshall, W. S.**—(See under Anatomy.) **Ramme, W.**—

Beiträge zur Kenntnis der palaearktischen Orthopterenfauna. (Teffig. u. Acrid.) III. [Mitteilungen aus dem Zoologischen Mus., Berlin] 24: 41–150, ill. (*). **Rehn, J. A. G.**—Notes on the phasmid genus Isagoras, with the description of six new species. [62] 99: 1–19, ill. (*). **Roonwal, M. L.**—(See under Anatomy.)

HEMIPTERA—Jeannel, R.—Nouveaux Henicocephalides sudamericains. [108] 48: 125–28, ill., 1943. **Knowlton, G. F.**—A small sage aphid. [60] 23: 35–36. **Oman, P. W.**—Types of auchenorrhynchous homoptera in the Iowa State College. [34] 21: 161–228, ill.; Miscellaneous notes on Cicadellidae. [45] 55: 59–63. **Ruckes, H.**—Notes and keys on the genus Brochymena (Pentatomidae). [27] 26: 143–238, ill. (k). **Tuthill, L. D.**—New species of the genus Triozoida (Psyllidae). [60] 23: 31–34. **Villiers, A.**—Note sur deux Reduvides Africano-bresilieus constituant une nouvelle sous-famille. [108] 49: 79–83, ill. (k*). 1944. **Wigglesworth, V. B.**—(See under Anatomy.)

LEPIDOPTERA—D'Andretta e Travassos Filho—Romual-disca dalmeidai n.g., n.sp. de Ctenuchidae. [Livro de homenagem a R. F. d'Almeida] 3: 17–40, ill. **Maria, H. A.**—Algo sobre esfingidos colombianos. [76] 7: 53–57, ill. **McCoy, E. E.**—(See under Anatomy.) **Paskevsky, V.**—Formes nouvelles et rares d'agrias de la collection de Mme. G. Fournier (nymphalids). [108] 45: 93–100, ill. (S). 1940. **Rawson, G. W.**—Moths congregating around the nest of Polistes wasps. [45] 55: 42. **Rindge, F. H.**—Designation and distribution of types of Nepticula braunella (nepticulidae). [60] 23: 25. **Rosseau-Decelle, G.**—Notes sur quelques formes nouvelles de Papilio americains. [108] 48: 109–13. 1943. **Tilden, J. W.**—An occurrence of the pupa of Glaucopsyche lygdamus behrii in an ant nest (Lycaenidae). [60] 23: 42–43. **Wind and Clench**—The genus Callictita. [73] 54: 57–61 (*).

DIPTERA—Abbott, C. E.—Distribution of malarial vectors. [100] 25: 82–83; The eggs of mosquitoes. [100] 25: 98–99. **Bailey, N. S.**—Field notes on Tabanus nigrovittatus. [73] 62–64. **Baisas, F. E.**—Notes on Philippine mosquitoes. XI. New species of Tripteroides. [Fieldiana. Zoology, Chicago] 31: 121–124, ill. **Champlain, A. B.**—Bird-flies. [Pa. Game News] 18: 17, ill. **Fluke and Hall**—The Cartosyrphus flies of N. Amer. (Syrphidae). [Trans. Wisc. Acad. Sci., Arts and Letters, Madison] 37: 221–63, ill (k*). **Galindo, P.**—Anopheles xelajuensis De Leon, a new addition to the known Anopheline fauna of Panama. [60] 23: 44. **Huckett, H. C.**—The N. A. sp. of the subgenus Botanophila, Genus Hylemyia sens. lat. (Mus.). [45] 55: 1–33, ill. (k*). **King and Hoogstraal**—New Guinea species of mosquitoes of the genus Aedes, subgenus Aedes. [48] 37: 113–34, ill. (k*). **Lane, J.**—The larva, pupa and adults of Wyeomyia melanopus (Culicidae). [65] 49: 97–101, ill. **Marshall, W. S.**—(See under Anatomy.) **McSwain and Bohart**—Some records of parasitism of solitary bees by Conopid flies. [60] 23: 30. **Penn, G. H.**—The larva of Aedes (Leptosomatomyia) aurimargo (Culicidae). [65] 49: 103–05, ill. **Rapp, W. F., Jr.**—The Pipunculidae of Quebec. [Canadian Field Naturalist, Ottawa] 60: 105. **Siang-Hsu, W.**—(See under Anatomy.) **Venturi, F.**—Studio biologico del genere Cerodonta Rond. [106] 31: 191–226, ill. **Venturi, F.**—(See under Anatomy.) **Wilson, L. P.**—(See under Anatomy.) **Wulff and Jahn**—(See under Anatomy.)

COLEOPTERA—Blackaller, A.—El mayate del tomate de Cascura [Fitofilo, Mexico]. 4: 364–70, ill. **Chamberlain, K. F.**—Notes on the ecology of Hydroporus rufiplanulus (Dytisc.). [45] 55: 57–58. **Deschamps, P.**—(See under Anatomy.) **Dethlefsen, E. S.**—Notes on some Coleoptera taken from wet paint. [60] 23: 36. **Lotte, F.**—Une Psiloptera nouvelle du Bresil. [108] 45: 59–60, ill. 1940. **Maria, H. A.**—Catalogo sistematico, sinonimico y geografico de los insectos del genero Carabus (latu sensu) que figuran en la coleccion del Museo del Instituto de la Salle. [76] 7: 57–62, ill. **Mansfield, G. S.**—Notes on Hippomelas californicus (Horn) and Chrysobothris cyanella (Buprestidae). [60] 23: 40–42; Northward range extension of Oeme gracilis (Cerambycidae). [60] 23: 43. **Mansfield and Tilden**—An additional locality for Aulicus terrestris (Cleridae). [60] 23: 34. **Paulian, R.**—Coleoptères Scarabaeidae nouveaux. [108] 47: 58–61, ill. 1942. **Paulian, R.**—(See under Anatomy.) **Ritcher, P. O.**—Description of the larva of Pleocoma hirticollis Vandykei (Scarabaeidae). [60] 23: 11–20, ill. **Ulke, T.**—A new genus and species of Curculionidae in Baltic Amber. [109] 193: 1–7, ill.

HYMENOPTERA—Banks, N.—Synopsis of west coast Cerceridae. [73] 54: 1–35, ill. (k*). **Benoist, R.**—Les hyménoptères qui habitent les tiges de Rouce aux environs de Quito (Equateur). [107] 111: 75–90 (*). 1942. **Cockerell, T. D. A.**—A new genus of bees from Honduras (Anthidiinae). [65] 49: 106. **Enzmann, J.**—Hercynia a new genus of myrmicine ants. [45] 55: 43–47 (S). **McCoy, E. E.**—(See under Anatomy.) **McSwain and Bohart**—(See under Diptera.) **Michener, C. D.**—Some observations on Lasioglossum (Hemihalictus lustrans (Halictid). [45] 55: 49–50. **Muesebeck, C. F. W.**—Two new species of Apanteles from California (Branconidae). [60] 23: 21–24. **Pate, V. S. L.**—A new genus and species of nocturnal wasps (Mutillidae: Chyphotini). [109] 192: 1–4, ill.; New pemphilidine wasps, with notes on previously described forms: III. [104] 109: 1–6; On Williamsita, a genus of wasps from New Caledonia (Pemphilidini). [65] 49: 107–12 (*). **Rawson, G. W.**—(See under Lepidoptera.) **Smith, M. R.**—A new species of Megalomyrmex from Barro Colorado Island, Canal Zone (Formicidae). [65] 49: 101–3. **Tilden, J. W.**—(See under Lepidoptera.) **Timberlake, P. H.**—Two new species of bees from Arizona (Aphoidea). [60] 23: 26–30, ill. (k*).

Three New Entomological Serials

On April 1, 1946, appeared the first number of a new serial, **THE COLEOPTERISTS' BULLETIN.** This is a mimeoprinted journal published by the Sherwood Press of Dryden, New York, under the editorship of Ross H. Arnett, Jr. The purpose of the Bulletin is "to provide closer cooperation among the various workers on Coleoptera by publishing a list of current workers and their specific interests and desires." In addition, "ecological and collecting notes, news items, short reviews, and notices of location of collections and types" will be featured. The first issue contains an annotated list of approximately fifty American Coleopterists and two interesting short articles: one on collecting beetles in the Adirondacks by Henry Dietrich; another by B. D. Valentine on Bougainville Coleoptera. The yearly subscription (10 issues) is $1.00, or 15 cents a single copy.

In February 1946, the Sherwood Press issued the first number of another serial publication: **SYSTEMA NATURAE.** This is also mimeoprinted, and appears at irregular intervals. Each number contains a review or conspectus of some group of insects: keys to most of the world genera, brief accounts of the group, its range, the number of species, and frequently bibliographic references to the original description, and the genotypes are given. To date the following eight numbers have appeared: No. 1—The Family Culicidae, 4 pp. (Feb. 1946). No. 1, Supplement—Keys to the Genera of Culicidae, 7 pp. (March 1946). No. 2—The Family Cicindelidae, 7 pp. (March 1946). No. 3—The Order Coleoptera, Part I: A Key to the Families of the World; A Phylogenic List of the Families, 21 pp. (July 1946). No. 4—The Order Coleoptera, Part II: Number of species, range, catalogue & monographs; Recent phylogenic studies, pp. 22–32 (August 1946). No. 5—The Family Histeridae, Part I, pp. [i +] pp. 33–40 (Jan. 1947). No. 5a—The Family Histeridae, Part II, pp. 41–43 (Feb. 1947). No. 6—The Family Silphidae, pp. 44–50 (March 1947). All of these contributions are signed by Ross H. Arnett, Jr. The last number contains a notice stating that suitable manuscripts by others will be published in this series, and that all correspondence be addressed to the publishers, The Sherwood Press, Box 84, Dryden, N. Y.

During May there appeared the first issue of another new serial, **THE LEPIDOPTERISTS' NEWS**, the monthly newsletter of the Lepidopterists' Society, edited by C. L. Remington and H. K. Clench, P.O. Box 104; Cambridge 38, Massachusetts. It consists of 12 mimeographed pages and contains a number of features that are planned to appear regularly. On page 3 is a review of Ford's book on butterflies which is followed by four pages of references with brief notes on recent papers of interest to lepidopterists. Then follow miscellaneous notes and a biography (of W. H. Edwards), some notes on life-history studies, on collecting trips by members and a page of exchange notices by members. The aim of the Society is to promote the sound and progressive study of Lepidoptera. Dues for membership, including subscription to Lepidopterists' News for 1947 are $1.00.

The Entomological News extends a cordial welcome to the Sherwood Press and its editor, Mr. Arnett; and to Messers Remington and Clench and wishes them all success in their new ventures.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

Wanted—Oriental Cerambycidae and Chrysomelidae for determination and research purposes: China, India, Philippines, Pacific. Will purchase from China, Assam, Burma, Siam, Formosa. Will exchange identified Chinese insects. J. Linsley Gressitt, Lingnan University, Canton, China.

Wanted—Papers on Cicindelidae of any part of the world, especially South America and Pacific. R. G. Dahl, 3225 Grand Ave., Apt. 13, Oakland 10, Cal.

Chrysididae—Wanted for determination in preparation of revision. Wm. G. Bodenstein, Galesville, Maryland.

Coccinelidae—Wanted from other localities. Will buy or exchange for misc. So. Cal. coleops. F. W. Furry, 1633 Virginia Ave., Glendale 2, Cal.

Wanted—Ataenius and allied Aphodiinae from all parts of the world, especially Mexico, Central and South America. O. L. Cartwright, Clemson, S. C.

Wanted—Reprints and unpublished mss. on biological control of mosquitoes; for preparing annotated bibliographies for publication. J. B. Gerberich, Michigan State College, East Lansing, Mich.

Wanted—Hesperid genus Megathymus for exchange or purchase. P. S. Remington, 5570 Etzel Ave., St. Louis 12, Missouri.

Wanted—Psychodidae of North America for revisional purposes. Wm. F. Rapp, Jr., 203 Harker Hall, Urbana, Ill.

Diptera—Tachinidae-Dexiidae wanted, No. Amer. and exotic. Will collect most orders in exchange or will purchase. P. H. Arnaud, 60 Woodrow St., Redwood City, Calif.

Will collect—Zoological and entomological specimens in tropical and subtropical parts of Peru. Jose M. Schunke, Pucallpa, Peru.

Wanted—Diplotaxis; will buy or exchange. E. W. Mange, 307 W. Walnut St., Hanover, Pa.

Hymenoptera-Aculeata (except ants and bees) for exchange. Will collect other orders in exchange. N. F. de Andrade, Casal Novo, S. João do Estoril, Portugal.

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ENTOMOLOGICAL NEWS

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The Relationship of the Neotropical Acridine Locust Genus Machaerocera (Orthoptera: Acrididae; Acridinae)

By James A. G. Rehn

Academy of Natural Sciences of Philadelphia

In 1859 the great orthopterist Henri de Saussure described under the name *Machaerocera* a rather unusual genus of locusts from Mexico, basing it on the then described *M. mexicana*.[1] His comment as to its affinities was vague and casual, and it was not until 1893 that we find any clearer indication of its relationship, when Brunner von Wattenwyl, in a generic key, placed it nearest to the western North American genus *Acrolophitus* of Thomas, with which it was briefly contrasted.[2] Dr. Lawrence Bruner in the Biologia Centrali-Americana, without comment, inserted *Machaerocera* in his generic key between *Acrocara* Scudder (now synonymized under the older *Pedioscirtetes* Thomas) and *Acrolophitus* on one hand, and *Gymnes* Scudder (now replaced by the prior *Bootettix* Bruner) on the other.[3] These references summarize the suggestions which have been made in the past as to the relationship of *Machaerocera*. In recent years the chromosomes of the latter genus have been studied by my friend Dr. E. R. Helwig, and the cytological conclusions [4]

[1] Revue et Magas. de Zool., (2) XI, p. 391 (1859).

[2] Ann. Mus. Civ. Stor. Nat. Genova, XXXIII, p. 120 (1893).

[3] Biol. Cent.-Amer., Orth., II, pp. 27, 49 (1904).

[4] "Unusual integrations of the chromatin in Machaerocera and other genera of the Acrididae (Orthoptera)." By Edwin R. Helwig. Journ. of Morph., 71, no. 1, pp. 1–26, pls. 1–3 (1942). (See specifically pp. 3–6.)

support others which slowly had been crystallizing, drawn from the external morphology, i.e., that *Machaerocera* holds an anomalous position as far as relationship with other American genera of the subfamily Acridinae is concerned.

There exists no modern classification of the genera of the world for the subfamily Acridinae, and in consequence no broad integration of the Old and New World genera has been attempted, and although basic study has been accomplished in a few genera groups, certain of the attempted correlations have left much to be desired. While we possess several arrangements of genera of the subfamily as occurring in portions of the New World, *Machaerocera* will be found only in those covering Mexico and Central America, and in none treating purely North or South American genera. We, however, do have a relatively recent comprehensive classification of the Old World genera by the late Dr. Ignacio Bolívar.[5]

A comparison of *Machaerocera,* which is relatively well-known and locally common over much of Mexico, with genera with which it has been associated in the literature, shows very clearly it is in no way related. The genera *Acrolophitus* and *Pedioscirtetes* are relatively close to one another in relationship, and together constitute the distinctive genera-group Acrolophiti, while *Bootettix* is the sole representative of an equally distinctive and peculiar North American and north Mexican genera-group, the Bootettiges. The latter group has a general facies resembling that of the Acrolophiti, but is at once separable by the male having the tegminal scapular field strongly dilated, the internal caudal tibial spurs with the flexor appreciably longer than the extensor, instead of the reverse as in the Acrolophiti, and in the caudal tarsi having the proximal article equal to less than half the entire tarsal length, instead of equalling or surpassing half the length, as in the Acrolophiti.[6]

[5] "Los Truxalinos del antiguo Mundo." Trab. Mus. Nac. Cienc. Nat., Madrid, Ser. Zool., núm. 20, pp. 41–110 (1914).

[6] The Bootettiges are virtually unique in possessing areas of mother-of-pearl (nacré) on various parts of the body chitin. For a discussion of *Bootettix*, its species, distribution and bionomics, see Rehn, Entom. News, LV, pp. 158–164 (1944).

When we attempt to integrate the Acrolophiti and the Bootettiges with the Old World genera-groups, as set forth by I. Bolívar in 1914, we find the Acrolophiti would run to the Parapleuri (= Mecostethi as understood to-day), and the Bootettiges to the Chrysochraontes, to neither of which are the two exclusively American genera-groups in any way related.

In 1891 Ferdinand Karsch erected a genus *Holopercna*,[7] basing it on a single new species, *H. coelestis*, from the Cameroons, West Africa. The previous year Ignacio Bolívar had described a species *Duronia gerstaeckeri* from Ashanti,[8] which we now know is identical with Karsch's *Holopercna coelestis*, and hence *gerstaeckeri* is the older and valid specific name for this relatively common locust of the Lower Guinea Forest Subregion of West Africa. I have had the opportunity to collect both *Machaerocera* and *Holopercna*, and their general morphological resemblance, plus that most unusual feature for the subfamily of the mutual possession of blue wing disks, had impressed me on more than one occasion. Bolívar, in his key to the Old World genera, above mentioned, placed *Holopercna* in the genera-group Phlaeobae, along with some twenty-nine other genera of that exceedingly complex and widely spread tropical and subtropical Old World assemblage. With representatives of the majority of these genera before me I proceeded to make a careful analysis of *Machaerocera* and *Holopercna* for evidence of relationship, and also of their position in relation to the other phlaeobid genera. As a result of this study it is clearly evident that *Machaerocera* is a New World relative of the African *Holopercna* and, on the basis of present group associations, a number of the hitherto Old World Phlaeobae.

When *Machaerocera* and *Holopercna* are compared it is seen they have the general form very similar, with numerous details of the head structure, such as that of the frontal costa and of the antennae, much the same, with similar basic alar, sternal and limb forms; and, further, they agree in the wing color pattern and the unusual discal color of the same. Noteworthy differ-

[7] Berlin Entom. Zeitschr., XXXVI, p. 176 (1891).
[8] An. Soc. Españ. Hist. Nat., XIX, p. 311 (1890).

ences of *Machaerocera* from *Holopercna* are: the fastigium, as seen from the dorsum, is more acutely produced with no definite discal carinula, the lateral foveolae are longer and more appreciable, reaching two-thirds of the distance to the apex of the fastigium as seen in profile, and also are shallowly excavate; the pronotum is more tectate and has the median carina somewhat more pronounced, cut by two sulci, instead of solely the principal one, while the lateral carinae are not sharply defined but are represented by marked shoulders, these broken at the principal sulcus, and on the prozona continuations of the shoulders subobsoletely descend ventro-cephalad across the lateral lobes as low ill-defined swellings (of which there are weak analogs in *Holopercna*), the caudal margin of the pronotal disk is rectangulately produced, while the surface of the metazona, and less definitely of sections of the prozona, bears scattered nodulose granules, as contrasted with the micro-cribrose subcoriaceous texture of *Holopercna*; the tegmina have the posterior axillary vein marked in both sexes and definitely joining the anterior axillary vein at two-fifths of the length of the anal field.

Unfortunately no chromosomal studies have as yet been made of *Holopercna*, but it is hoped this may soon be possible.

While we have a few approximately parallel patterns of genera-group distributions in the Orthoptera, such as the Sphenaria of the Pyrgomorphinae, which occurs in the Old World in Eastern Africa and the Oriental Region, and in America in Mexico and Central America, the presence in the latter areas of a relative of *Holopercna*, and hence a member of the Phlaeobae, which hitherto had been regarded as exclusively Old World, is of both systematic and zoogeographic interest.

The Larva of Pleocoma and its Systematic Position (Coleoptera, Pleocomidae) [1]

By Wm. P. Hayes and Peh-I Chang, University of Illinois

Introduction

Paulian (1941), in a study of adult characteristics, has attempted to settle the uncertainty of the relationships of the genus *Pleocoma* to other members of the superfamily Scarabaeoidea. He points out that the genus has been transferred from the Laparosticti to the Pleurosticti, that is, from the family Geotrupidae to the subfamily Dynastinae of the Scarabaeidae, and that authorities have not been in agreement on the systematic position of the genus. Arrow (1909, p. 484) placed *Pleocoma* in the subfamily Pleocominae and points out that *Pleocoma* and *Pachypus* have similar habits and "although by no means closely related are probably more nearly related to each other than to any other known forms, and that, while they are best classed among the Laparosticti, they are scarcely less related to the Pleurosticti." Böving and Craighead (1931) on the basis of larval characters have considered the genus as a subfamily, Pleocominae, of the Scarabaeidae, and Essig (1942) has considered *Pleocoma* as representing a new family, Pleocomidae. On the basis of Paulian's study of external adult characters and the male genitalia of *Pleocoma*, he believes the genus should be placed in a distinct subfamily the Pleocominae, in the family Geotrupidae. In the past a number of other workers have discussed the position of this genus. The two genera of the group, *Pleocoma* Le Conte and *Acoma* Le Conte are known only from the states of California, Washington, Oregon, Utah, Texas and probably Alaska. *Pleocoma* according to Essig contains 26 species.

The larva of *Acoma* is unknown, that of *Pleocoma* was illustrated and imperfectly described by Osten-Sacken (1874)

[1] Contribution No. 270 from the Entomological Laboratories of the University of Illinois, Urbana.

from a single specimen in the process of moulting.* Paulian (*l.c.*) has pointed out that larval characters which can be studied from Osten-Sacken's description and figures, because of their lack of detail, do not indicate the position of *Pleocoma*. He further noted that this larva does not approach the Lucanidae because the abdominal segments are divided into subsegments (annulets); nor can it be placed in the Pleurosticti because the maxilla has the galea and lacinia distinctly separated, whereas in Pleurosticti they are fused into a single structure (male).

Osten-Sacken (*l.c.*) concludes his description of the larva with the following comments on the relationships of *Pleocoma* based on a comparison of his larva with descriptions of *Geotrupes* and *Trox* by two European authors, "When I compare this larva with the analytical table of the lamellicorn larvae by Erichson, reproduced by Chapius (*Larves des col.,* p. 454), I find that it has the two separate maxillary lobes attributed to the Scarabaeidae Laparosticti; it has the segments divided by deep furrows into transverse bolsters, like the subdivision A in that table (Geotrupidae, Aphodiidae, Copridae, Trogidae). When I further compare our larva with the few existing descriptions of larvae of these groups, I soon perceive that the choice will lie between the Geotrupidae and Trogidae. The Aphodiidae and Copridae are excluded by the structure of their antennae, maxillae, labium, etc. Of those two groups we possess, as far as I am aware, only two good descriptions of larvae: Mulsant's of the larva of *Geotrupes stercorarius* and Chapius' of the larva of *Trox carolinus*. If we were to base our opinion upon these two descriptions only, it would incline in favor of a relationship of our larva with the Trogidae, rather than the Geotrupidae. Chapius' description of the larva of *Trox carolinus* agrees quite well with our larva; the description of the labium especially (lévre inférieure formée d'un menton et d'une piéce palpigére fondus en un real corps allongé) seems to indicate a structure somewhat analogous to that in our larva. On the contrary, Mulsant's description of the larva of *Geotrupes* disagrees with ours in several

* Since the present paper was sent to press, P. O. Ritcher has described the larva of *Pleocoma hirticollis vandykei* in Pan-Pacific Ent., 23: 11–20, (1947).

points. The antennae are said to be four-jointed, the maxillae to have two almost cylindrical lobes, the legs are described as bilobed at the end, etc. Finally, if it be true that the larva of *Geotrupes* has only two pairs of well developed legs, the third being almost atrophied, as Frisch (but not Mulsant) describes it, this would constitute another important difference."

Osten-Sacken in his discussion of this larva points out the "singular fact that the shape of the mandibles changes after moulting. A similar peculiarity has been already observed among larvae of other orders of insects. That the shape of the earlier mandibles is merely due to its being worn is a supposition that will hardly be entertained by any one who has compared the two mandibles."

Gerstaecker (1883) maintained that *Pleocoma* should be removed from the Scarabaeidae Laparosticti and placed in the Melolonthinae of the Scarabaeidae Pleurostici. He further asserted that the larva described by Osten-Sacken as *Pleocoma* cannot possibly belong to that genus nor to any genus allied to *Geotrupes*, and that it is undoubtedly a Lucanid. Gerstaecker's paper was translated by J. B. Smith and read at the November 18, 1885 meeting of the Washington Entomological Society (Proc. Wash. Ent. Soc., vol. 1, p. 32) and there the question was posed "what is the larva described by Osten-Sacken as that of *Pleocoma,* since there is no Lucanid known to occur in California which is of the size indicated by the larva." At the April 5, 1888, meeting of the same society (*l.c.*, p. 144), G. H. Horn criticized Gerstaecker's paper and stated that he believed the larva described by Osten-Sacken really belongs to *Pleocoma*.

A single specimen of an undetermined species of *Pleocoma* was available to the writers for study. It was collected at the roots of a pear tree at Camino, California, in November 1934 by R. H. Dart and was determined to the genus by him. Camino is in Eldorado County, California, and according to the distribution of this genus in California, as determined by Linsley (1938, p. 99), *Pleocoma fimbriata* Le Conte is the only species occurring in Eldorado County, and Linsley (p. 50) states that *fimbriata* "occurs commonly in the vicinity of Placerville, California." Camino is only a few miles east of Placerville. So it is quite probable that the species here described is *P. fimbriata* Le Conte.

Description of the Larva of Pleocoma

The third instar larva (fig. 2) which was available for study has a pale yellow head and whitish body. It is about 50 mm. long. The thoracic and first eight abdominal segments are dorsally divided into three annulets. The ninth abdominal segment is faintly divided dorsally into two segments and the tenth is undivided. The annulets are covered with minute setae on the dorsal surface. There are nine spiracles. One is located ventro-laterally on the prothorax and the other eight are on the first eight abdominal segments. The three pairs of thoracic legs are well developed. The anal slit (fig. 14) is T-shaped.

The Head. The head (fig. 6) is pale yellow in color in our preserved specimen. A Y-shaped epicranial suture divides the epicranium (EPI) and the epicranial arms are somewhat sinuate as they approach the bases of the antennae. A few scattered setae are located on the epicranium. The front (F) has a few setae on both sides of the mesal line. The clypeus (CLP) is much wider than long and is faintly divided into a preclypeus and postclypeus by a weak clypeal suture. The labrum (LAB) is roughly semicircular with a median projecting lobe on the anterior margin which gives the margin a trilobed appearance. The surface of the labium is rather densely setaceous.

The antennae (fig. 1) are three-segmented although a somewhat bulbous extension of the head capsule gives a four-segmented appearance. Some authors consider this bulbous part of the head to be an antennal segment but recent workers are inclined to disregard it as a segment. The first or basal segment is long and cylindrical, the second about the same length and the third is quite short, being about half as long as the second.

The epipharynx (fig. 5) is the ental aspect of the labrum and clypeus. Distally its margin is broadly trilobed. The median lobe projects quite prominently and is densely covered with long spinelike setae. The lateral lobes have two rows of long setae. Most of the entire surface is covered with setae which are generally pointing toward the median line. A small cluster of spines is located on the mesal area caudad of the median lobe. The tormae (T) are located at the sides of the clypeo-labral suture. They are nearly symmetrical and become somewhat pointed near the meson. Proximally on the labrum and overlapping the clypeal area are two converging clusters of fine setae which become longer proximally and eventually seem to cross each other. On each side of these setae are very minute spine-like structures that may be sensory in function. Near the tormae and located in the cluster of dense setae are two sensory cones (SC). Near the median line in the region of the fronto-clypeal suture are two sensory spines and a broadly curved, strongly sclerotized rod-like structure. The trilobed condition of the epipharynx, but not the setal arrangement, of *Pleocoma* is somewhat similar to that of *Geotrupes* as figured by Schiödte. (See *Ill. Biol. Monog.* vol. 12, pl. 6, fig. 58).

The mandibles (fig. 11 and 13) are nearly symmetrical. They articulate on the head capsule by a tricondylic articulation. The molar area is small with a few blunt teeth. The scissorial area is smooth and blade-like with the distal end truncate. The ventral aspect has a cluster of small setae near the molar area and a cluster of longer setae, caudad of the molar area. The scissorial area near the curved part of the inner margin has a series of fine striae that may correspond to the stridulating area on the mandibles of other scarabaeid larvae. These may rasp against certain spine-like processes that are found on the maxillae (fig. 12, ST) immediately under these striae. There are a few, faint, longitudinal striae ventrally on the distal end of the scissorial region.

The maxilla (fig. 12) has a nearly quadrangular cardo (CD) and the stipes (S) bears on its dorsal surface (fig. 12) a longitudinal row of stridulating spines (ST) similar to those found in other scarabaeid species. The right maxilla has 10 spines (fig. 9, right) in the row while the left maxilla has twelve (fig. 9, left). These spines are narrowly triangular in shape. The palpifer (PF) bears a four-segmented palpus (MP) with segments of nearly equal length. The distal segment becomes attenuated near the end. The galea (G) and lacinia (LC) are not united into a single piece as they are in the Pleurosticti but are composed of two parts, at least distally, as is common in the

Laparosticti. The mesal margin of the lacinia is covered with numerous setae and the distal end has one large dark spine. The galea has a few setae distally and also one large spine.

The labium (fig. 10, LA) has a subquadrate submentum (SM). The mentum (M) is also subquadrate. The ligula (L) bears the labial palpi at its disto-lateral angles. The glossae and paraglossae are fused into a single sclerite which is located between the palpi. The labial palpus (LP) is two-segmented. The basal segment is wider than long and the second segment is nearly two times longer than wide.

The three segments of the thorax are about equal in size. Each is divided dorsally into three subsegments or annulets. The prothorax bears a spiracle on each side just above the prothoracic leg. The other two segments, the meso-, and metathoracic, are similar except that they lack the spiracles.

The Legs. The first two pair of legs (fig. 8) are much alike. There is an elongated coxa (C), a small, triangular trochanter (TR), a long femur (FM), a short, broad tibia (TB) and a sharply attenuated, one-segmented tarsus (TA) ending in a single claw (CL). On the mesothoracic leg (fig. 8) the coxa bears a plectrum or stridulating plate (STP) composed of a series of fine transverse striae. All the legs are densely setaceous. The metathoracic legs (fig. 2) are somewhat shorter and stouter than the first and second pair of legs. The coxa (C) is shorter, more nearly cylindrical and subtruncate at both ends and lacks the stridulating plate of the mesothoracic leg. The trochanter (TR) is small and the femur (FM) larger and strongly emarginate on the mesal margin. On the cephalic aspect of the femur of the metathoracic legs are two rows of spine-like tubercles (figs. 15 and 16), almost at right angles to each other. One row, lying in a longitudinal direction, is composed of 5 tubercles; the other row is basad of the longitudinal row and lies almost transversely across the base of the femur. Each tubercle has arising behind it near its base a single unbranched seta. The distal tubercle of the transverse row is exceptional in that its seta is branched (fig. 16). These rows of tubercles correspond to the rows of stridulating spines found in some other Scarabaeoidea. It is interesting to note that this stridulating structure, if such it be, is different in arrangement than that found in the Passalidae and Geotrupidae wherein the metathoracic leg is greatly reduced in size and serves only as a rasping paw and lacks several of the leg segments. Distad of the femur on metathoracic leg is a small subquadrate tibia (TB) which in turn bears, distally, a much narrower one-segmented tarsus (TA) and a single claw.

The abdomen is ten-segmented. There are eight pairs of abdominal spiracles (fig. 3 and 4) on the first eight segments. The first eight dorsal segments are each subdivided into three subsegments and are rather densely and minutely spinose with a few scattered longer setae. The ninth and tenth segments are smooth and not strongly subdivided. The ninth has a faint transverse depression. The ventral aspect of the first eight segments is subdivided irregularly into at least two subsegments. The ninth and tenth are not subdivided and only indistinctly separated laterally from the dorsal area. The anal slit (fig. 14, ANS) is T-shaped, giving a trilobed appearance to the caudal end of the tenth segment.

The ventral aspect of the tenth abdominal segment (fig. 14), called the raster or radula, is not strongly developed. A faint transverse depression is located near the distal end and between it and the anal opening are numerous small setae. Cephalad of this depressed line are a few scattered setae but most of the remaining area is non-setose.

The spiracles are broadly oval with the long axis lying longitudinally. The first spiracle (fig. 4) located on the prothorax is smaller and more narrowly oval than the others (fig. 3). The dorsal part of each spiracle is a moon-shaped area with numerous perforations, the so-called "sieve plate." The ventral half is a quite smooth peritreme. There apparently is no slit-like opening nor a raised bulla as is found in the spiracles of some scarabaeid larvae.

Discussion of Larval Relationships

According to Paulian (1939, p. 356), Arrow was the first to propose raising the subfamily Geotrupinae to the rank of a distinct family equivalent to that of the Lucanidae and Passalidae.

This change was not recognized by others until Böving and Craighead (1931, p. 52) on the basis of larval characters again recognized the subfamily Geotrupinae as a family. These authors, however, placed the genus *Pleocoma* in a subfamily of the Scarabaeidae, called the Pleocominae. Paulian (1939) has discussed the larval and adult characters of *Geotrupes niger* Marsh. and concludes, as Arrow did, that *Geotrupes* should be regarded as of family rank. In a more recent paper, Paulian (1941), principally on the basis of adult characters, believes *Pleocoma* should be regarded as representing a subfamily of the Geotrupidae.

Paulian (1941) further states that Osten-Sacken's (*l.c.*) description of the larva of *Pleocoma* does not permit placing it definitely because the description is imperfect. It does, however, indicate, according to Paulian, that it does not belong with the Lucanidae because the abdominal tergites are divided transversely, nor with the Pleurosticta Scarabaeidae because the galea

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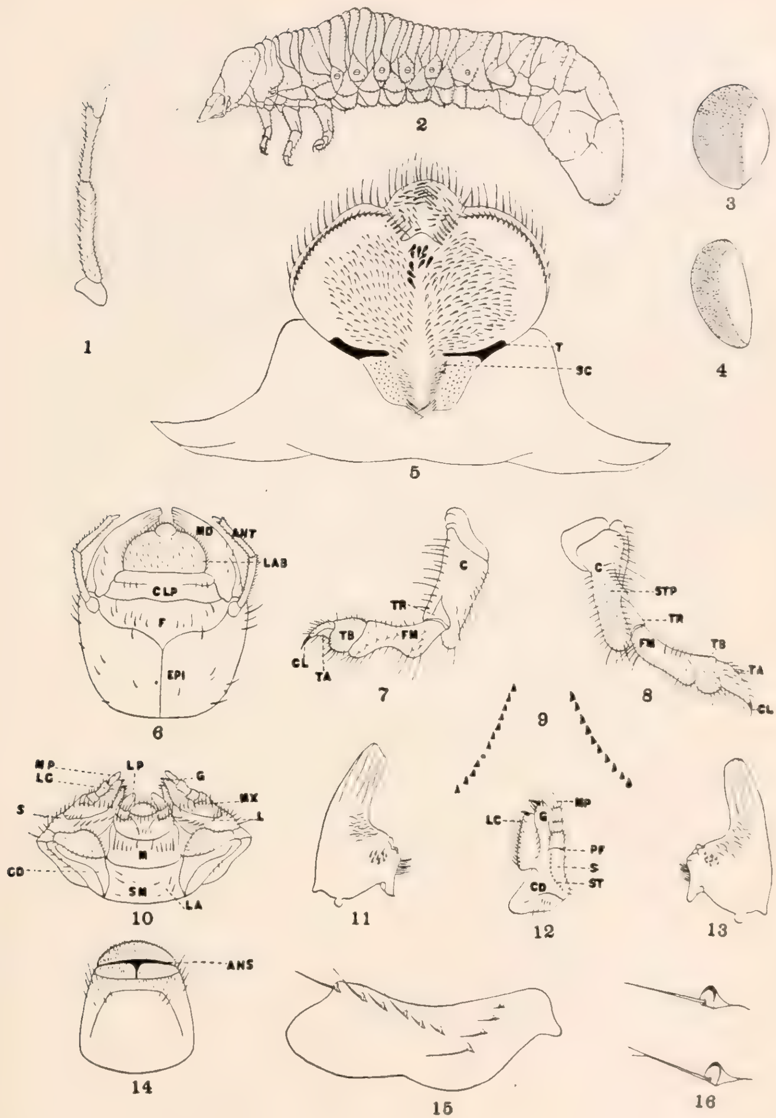
Explanation of Plate I

Structural Parts of the Third Instar Larva of *Pleocoma*

1. Antenna. 2. Lateral aspect of third instar larva. 3. Abdominal spiracle. 4. Thoracic spiracle. 5. Epipharynx or ental aspect of the labrum and clypeus. 6. Cephalic aspect of the head. 7. Metathoracic leg. 8. Mesothoracic leg. 9. Stridulating teeth on the stipes of the right and left maxillae. 10. Labium and maxillae. 11. Caudal aspect of the right mandible. 12. Cephalic aspect of the right maxilla. 13. Caudal aspect of the left mandible. 14 Ventral aspect of last abdominal segment (raster). 15. Cephalic aspect of metathoracic femur showing stridulating teeth and associated setae. 16. Two stridulating teeth enlarged to show a single and a branched seta.

Explanation of Abbreviations

ANS—Anal slit
ANT—Antenna
C—Coxa
CD—Cardo
CL—Claw
CLP—Clypeus
EPI—Epicranium
F—Front
FM—Femur
LA—Labium
LAB—Labrum
LC—Lacinia
LP—Labial palpus
M—Mentum
MD—Mandible
MP—Maxillary palpus
MX—Maxilla
PF—Palpifer
S—Stipes
SC—Sense cone
SM—Submentum
ST—Stridulating spines
STP—Stridulating plate
T—Torma
TA—Tarsus
TB—Tibia
TR—Trochanter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and lacinia of the maxillae are separated and not fused into a single mala. Essig (1942), on the other hand, considers *Pleocoma* as representing a distinct family which he calls the Pleocomidae.

On the basis of larval characters described herein it seems that *Pleocoma* is sufficiently different from *Geotrupes* and others to merit being placed as a separate family, Pleocomidae, principally on the degree of development of the stridulating legs and on the basis of other structures such as the mandibles and epipharynx. The posterior legs of *Geotrupes,* which are used for stridulating, are reduced in size as in the Passalidae but not to the extent that they are in the Passalidae. Those of *Pleocoma* are fully developed as are those of the Lucanidae. The rasping spines on the metathoracic leg of Geotrupidae are well developed while those in *Pleocoma* (fig. 15) have long setae associated with them that might make them less efficient. The mandibular-maxillary stridulating structures are well developed in the Scarabaeidae and poorly developed or absent in the Geotrupidae and Lucanidae. In this respect, *Pleocoma* seems to represent an intermediate condition in that the striae of the mandibular stridulating area are poorly developed while the maxillary stridulating teeth (fig. 9) are well developed. Hence it is probable that these structures do not function to produce stridulation in *Pleocoma.* In this respect they approach the Geotrupidae.

The mandibles of *Geotrupes* bear strongly developed teeth on the scissorial area which Paulian calls a "double retinaculum," while *Pleocoma* lacks any such teeth and has a smooth cutting area. The epipharynx is trilobed in both *Geotrupes* and *Pleocoma* but seems more highly developed in *Geotrupes.* The faint division of the ninth abdominal segment of *Pleocoma* into subsegments indicates a trend toward the Scarabaeidae rather than the smooth undivided segments found in Lucanidae and Passalidae. From the above differences of the larva it seems to the writers that the raising of the subfamily Pleocominae to family rank is justifiable and more logical than regarding it as a subfamily of Geotrupidae.

Literature Cited

Arrow, G. J. 1909. On the characters and relationships of the less-known groups of lamellicorn Coleoptera, with descriptions of new species of Hybosorinae, etc. Trans. Ent. Soc. Lon., 1909, pp. 479–507.

Böving, A. G. and F. C. Craighead. 1931. An illustrated synopsis of the principal larval forms of the order Coleoptera. Ent. Amer., 11: 1–351.

Essig, E. O. 1942. College Entomology. Macmillan Co., N. Y., 900 pp.

Gerstaecker, E. A. 1883. Ueber die Stellung der Gattung Pleocoma Lec. im System der Lamellicornia. Stett. Ent. Zeit., 44: 436–450.

Horn, G. H. 1888. Review of the species of *Pleocoma*, with a discussion of its systematic position in the Scarabaeidae. Trans. Amer. Ent. Soc., 15: 1–18, 2 pls.

Linsley, E. G. 1938. Notes on the habits, distribution and status of some species of Pleocoma (Coleoptera, Scarabaeidae). Pan-Pacific Ent., 14: 49–58 and 97–104.

Osten-Sacken, R. 1874. Description of the larva of Pleocoma Lec. Trans. Amer. Ent. Soc., 5: 84–87.

Paulian, R. 1939. Les caractères larvaires des Geotrupidae (Col.) et leur importance pour la position systématique du groupe. Bul. Soc. Zool. France, 64: 351–360.

——. 1941. La position systématique du genre Pleocoma LeConte (Col. Scarabaeidae). Revue Française d'Entom., Tome 8, fasc. 3, pp. 151–155.

Notes on the Genus Somatochlora Collected in Kentucky and Tennessee (Odonata: Cordulinae)

By Carl Cook, Crailhope, Kentucky

In 1941 and again in the 1946 collecting season the writer made an especial effort to collect as many species of the genus *Somatochlora* as possible from Kentucky and Tennessee. Most of the collecting was done in central and eastern Kentucky and southeastern Tennessee, chiefly in the Great Smoky Mountains National Park.

Seventeen specimens representing five species were taken and several others were seen but could not be captured. It is well known that these dragonflies are notoriously difficult to capture, as they often fly back and forth for hours at a time, keeping to a height of ten to twenty-five, often fifty, feet. Under such circumstances the collector finds a net almost useless; a much more useful piece of equipment for bringing down the high flyers is a shotgun and the finest possible shot. For several years the writer has been using a 20-gauge Model 12 Winchester with 20 in. barrel fitted with Cutts "compensator" to reduce muzzle blast from the short barrel. The best shot to use is known as dust-shot, which is of very small size; most dragonflies brought down with this size shot will be usable as cabinet specimens, and all are valuable for purposes such as this survey.

Our species of *Somatochlora* inhabit chiefly the colder areas of the United States and Canada, and with few exceptions are to be found in the southern states only in the more mountainous parts. It is in these mountainous areas that the writer has done most of his collecting and whence all the more interesting specimens were secured.

One species is being recorded for the first time south of Pennsylvania and a few others are recorded for the first time from the territory covered by this paper. It has always been assumed that these species could be found in Kentucky and Tennessee but there were no authentic records of their ever being collected there. In the following list of species collected, an effort has been made to add a few notes on the collecting areas visited by the writer and to point out some of the habits of these very interesting dragonflies, as well as to list date and locality data.

Somatochlora linearis Hagen

KENTUCKY: Donansburg, 1 ♂, 1 ♀, July 10, 1941; 1 ♂, Aug. 29, 1946; Crailhope, 1 ♂, June 19, 1941; 1 ♂, July 20, 1946; Somerset, 1 ♂, Aug. 6, 1946; Mammoth Cave National Park, 1 ♂, July 4, 1946; Hardyville, 1 ♂, Sept. 3, 1946.

TENNESSEE: U. S. 35, 6 miles south of Knoxville, 1 ♂, July 11, 1946.

This seems to be the commonest species of the genus in Kentucky. At Donansburg it was not uncommon to find the males coursing up and down a small stream in a manner suggestive of

Aeschna males. The stream flows through the center of an open, pastured meadow and at dusk they like to leave the stream and fly about over the meadow at a height of twenty to thirty feet. At a small clearing in a woodland area bordering U. S. Highway No. 35, just out of Knoxville, Tenn., five or six were patrolling back and forth at about 10:00 A.M.; one was taken but the others retired and had not returned when we left the clearing at 11:30 A.M.

Somatochlora tenebrosa Say

KENTUCKY: Jenkins, Letcher Co., 1 ♂, July 30, 1941; Prestonsburg, Floyd Co., 1 ♂, July 15, 1946.

So far this species has been taken only in the more mountainous parts of eastern Kentucky. It does not seem to be common in any of the areas visited by the writer; none were seen in the Great Smoky Mountains National Park.

One was flying fifteen or twenty feet high over an overgrown field, about 200 yards up from Levisa Fork River near Ky. Highway No. 80, 10 miles south of Prestonsburg. It was taken with great difficulty, since the writer was equipped with only a net at the time, which was just after sunset. *S. tenebrosa* is said to be crepuscular and this is apparently true of the examples seen by the writer, both his specimens having been taken after sunset.

Somatochlora provocans Calvert

KENTUCKY: Crailhope, Green Co., 1 ♂, June 28, 1946. TENNESSEE: Mt. Le Conte, Great Smoky Mountains National Park, 1 ♂, July 12, 1946.

My first example of this species was taken while it was patrolling at the usual height, over an old, unused, overgrown road in full sunshine at about 2:30 P.M. It seemed very determined to keep at its patrolling as two or three passes at it with the net failed to drive it away; finally, a lucky stroke with the net brought it down. The second specimen was taken at one of the most interesting and unusual collecting localities visited by the writer in this survey, Mt. Le Conte (6,593 ft.). It was here that we found also the northern *williamsoni,* on the same day and within 100 yards of the place where this specimen of *provocans* was taken.

The collecting ground here consists of an open pine woods bordering each edge of Le Conte Creek. Most of the collecting was done from near the source of this stream on down for a mile or more of its course. Near the headwaters of this stream and some 100 yards from its banks two brownish dragonflies were flushed from an uprooted tree. One after flying about in the woods for a few moments came back to the tree and lit again; it was taken immediately and turned out to be a fine male of *provocans.*

Somatochlora filosa Hagen

KENTUCKY: Mammoth Cave National Park, 1 ♂, June 27, 1941.

TENNESSEE: Nashville, 1 ♂, June 2, 1941; Spencer, Van Buren Co., 1 ♂, July 6, 1946.

This species has a very wide range in the southern and eastern states, Illinois and New Jersey to Florida. Therefore, it is not surprising that it occurs quite frequently in the territory covered by this paper.

My first chance at this species came one hot, humid, June afternoon in the Mammoth Cave National Park. On entering a large grove of tall oaks where the ground was shaded by the dense wide-spreading trees, I flushed a pair in copula from the trunk of one of the oaks. They immediately lit on the trunk of another tree but this time at a height of about twenty feet. As my shotgun was not at hand, the only solution was to climb the tree. This would have been difficult to do while carrying a net, so I decided to climb the tree from the opposite side from where they were hanging by their feet on a small twig and to try to get them with my fingers. The male was caught successfully but the female escaped.

At sunset several specimens were in active flight, soaring high over the tree tops in a park near the campus of Vanderbilt University, Nashville, Tenn. Occasionally one would swoop lower in pursuit of some small insect on which they were feeding. Only one could be taken, and it with great difficulty.

Somatochlora williamsoni Walker

TENNESSEE: Le Conte Creek, Mt. Le Conte, Great Smoky Mountains National Park, 1 ♂, July 12, 1946.

This is a significant extension to the known geographic range of this species; so far as known this is the first record of *williamsoni* being taken south of Pennsylvania. Its presence here is probably explained by the high altitude of the Great Smoky Mountains in the region where it was found; the altitude of Mt. LeConte is 6,593 feet. At the place where it was taken, Le Conte Creek is not very wide and the banks on both sides are partly shaded. It was first noticed on July 11th, while it was patrolling back and forth at a height of a foot or so, near the shaded bank of the creek. It was wild and unapproachable and at the first sign of danger went across to the other side of the creek out of my reach, however, after several moments of patrolling that bank it came back over on my side again. One wild swish with the net caused it to retire and not return that afternoon. Next day it was back at its patrolling over the same area of the creek. It had a habit of "marking time" in the air much in the manner of *Cordulia surtleffi*, so my opportunity for capture came at one of these haltings. It was caught off guard for an instant, a swift swing with the net and . . . it was mine!

Current Entomological Literature

COMPILED BY EDWIN T. MOUL, RAYMOND Q. BLISS, CHARLES HODGE IV, MAURICE E. PHILLIPS, JOHN W. H. REHN AND HENRY K. TOWNES, JR.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, 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.

This list gives references of the current or preceding year unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

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 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. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

GENERAL—Dustan, G. G.—Effect of temperature on toxicity of DDT. [23] 79: 1–4. **Frings, H.**—A simple method for rearing blowflies without meat. [80] 105: 482. **Macan, T. T.**—Taxonomy of aquatic insect nymphs and larvae. [53] 159: 595–96. **Pennak, R. W.**—Keys to aquatic insects of Colorado. [Univ. of Col. Studies, Ser. D., Boulder] 2: 353–83. **Sabrosky, C. W.**—The significance of the "editorial notes" in the reprints of the earlier opinions on zoological nomenclature. [5] 40: 152–53. **Wachs, H.**—Synergistic insecticides. [80] 105: 530–31. **Weiss, H. B.**—Entomological medicaments of the past. [45] 55: 155–68.

ANATOMY, PHYSIOLOGY, MEDICAL—Beament, J. W. L.—The formation and structure of the micropylar complex in the egg-shell of Rhodnius prolixus (Reduviidae). [40] 23: 213–33, ill. **Bick and Penn**—Resistance of mosquito larvae and pupae to experimental drought. [5] 40: 82–86. **Bodine and Fitzgerald**—A spectrophotometric study of a developing egg (Orthoptera) with especial reference to riboflavin and its derivatives. [41] 104: 353–63. **Carbonell, C. S.**—The thoracic muscles of the cockroach Periplaneta americana. [82] 107: 1–23, ill. **Demerec, M.**—Mutations in Drosophila induced by a carcinogen. [53] 159: 604. **Dobzhansky, T.**—A response of certain gene arrangements in the third chromosome of Drosophila pseudoobscura to natural section. [Genetics, N. Y.] 32: 142–60. **Dubinin and Tiniakov**—Inversion gradients and selection in ecological races of Drosophila funebris. [3] 81: 148–53. **Farnsworth, M. W.**—The morphology and musculature of the larval head of Anopheles quadrimaculatus. [5] 40: 137–51, ill. **Fish, W. A.**—Embryology of Lucilia sericata (Calliphoridae): I. Cell cleavage and early embryonic development. [5] 40: 15–25, ill. **Gregson, J. D.**—Benzene hexachloride ("666") as an acaricide. [23] 78: 201–02. **Morgan, L. V.**—A variable phenotype associated with the fourth chromosome of Drosophila melanogaster and affected by heterochromatin. [Genetics, N. Y.] 32: 200–19. **Patterson, J. T.** (editor)—Studies in the genetics of Drosophila. V. Isolating mechanisms. [Univ. of Texas Publ., Austin] 4720: 7–184. **Slack, H. D.**—Feeding mechanism of water-bugs. [53] 159: 605, ill. **Trager, W.**—Insect nutrition. [Biol. Rev., Cambridge Phil. Soc., Eng.] 22: 148–77. **Viette, P.**—Les Hepiales. [Rev. Française de Lepidopterologie] 10: 366–70, ill.

ARACHNIDA AND MYRIOPODA—Archer, A. F.—The Theridiidae or comb-footed spiders of Alabama. [Geol. Surv. of Alab., Univ. of Alab.] Museum Paper 22: 5–67, ill. (k). **Baker, E. W.**—Notes on mites of the family Tydeidae with descriptions of two new species. [65] 49: 133–36, ill. **Chamberlin and Ivie**—North Amer. Dictynid spiders: The Bennetti group of Amaurobins. [5] 40: 29–55, ill. (k*). **Gregson, J. D.**—(See under Anatomy.) **Hoff, C. C.**—The species of the pseudoscorpion genus Chelanops described by Banks. [20] 98: 473–550, ill.; Two new pseudoscorpions of the subfamily Lamprochernetinae from Venezuela. [95] 32: 61–64, ill. **Jameson, E. W., Jr.**—The geographic range of Ixodes soricis. [23] 78: 200. **Jenkins, D. W.**—A laboratory method of rearing chiggers affecting man (Trombiculidae). [5] 40: 56–68, ill. **Michener and Michener**—Chiggers. [56] 56: 231–35, ill. **Smith and Gouck**—Ixodes bishoppi, a new species from Georgia. [5] 40: 75–81, ill.

THE SMALLER ORDERS—Calvert, P. P.—Aeshna psilus, a new species of the group of Ae. cornigera Brauer (Odonata). [109] 194: 1–11, ill. (k). **Carpenter, F. M.**—Lower permian insects from Oklahoma. Part I. Introduction and the orders Megasecoptera, Protodonata, and Odonata. [Proc. Amer. Acad. Arts and Sciences, Boston] 76: 25–54, ill. (*). **Denning, D. G.**—Hydroptilidae (Trichoptera) from southern U. S. [23] 79: 12–20, ill. (*). **Froeschner, R. C.**—Notes and keys to the Neuroptera of Missouri. [5] 40: 123–36, ill. (k). **Hopkins, G. H.**—Stray notes on

Mallophaga. VII. [6] 13: 170–183, ill. (*). **Matthysse, J. G.**—Cattle lice, their biology and control. [Cornell Univ., Agr. Exp. Station] 832: 3–67, ill. **Spieth, H. T.**—Taxonomic studies of the Ephemeroptera. IV. The genus Stenonema. [5] 40: 87–122, ill.

ORTHOPTERA—Bodine and Fitzgerald—(See under Anatomy.) **Carbonell, C. S.**—(See under Anatomy.)

HEMIPTERA—Anderson, R. F.—Saratoga spittle-bug injury to pine. [37] 40: 26–33, ill. **Beament, J. W. L.**—(See under Anatomy.) **Caldwell, J. S.**—New Fulgoroidea from North America. [58] 47: 76–78. **China, W. E.**—A new species of the genus Arachnocoris with a key to the known species of the genus (Nabidae). [6] 13: 119–22, ill. (kS*). **Fennah, R. G.**—A synopsis of the Archilixiidae of the New World (Fulgoroidea). [6] 13: 183–91, ill. (k*). **Slack, H. D.**—(See under Anatomy.)

LEPIDOPTERA—Bell, E. L.—A new species of Hesperiidae from Venezuela. [95] 32: 67–68, ill. **Rau, P.**—Butterfly aggregations in temperate regions. [5] 40: 13–14. **Viette, P.**—(See under Anatomy.)

DIPTERA—Alexander, C. P.—Records and descriptions of neotropical crane-flies (Tipulidae). XXII. [45] 55: 173–84. **Bates, M.**—The development and longevity of Haemagogus mosquitoes under laboratory conditions. [5] 40: 1–12. **Bick and Penn**—(See under Anatomy.) **Brescia, F.**—A study of the migratory habits of salt marsh and anopheline mosquitoes. [5] 40: 69–74. **Bromley, S. W.**—Ohio robber flies. IV. (Asitidae). [58] 47: 67–68. **Demerec, M.**—(See under Anatomy.) **Dobzhansky, T.**—(See under Anatomy.) **Dodge, H. R.**—A new species of Wyeomyia from the pitcher plant (Culicidae). [65] 49: 117–22, ill. **Dubinin and Tiniakov**—(See under Anatomy.) **Farnsworth, M. W.**—(See under Anatomy.) **Fish, W. A.**—(See under Anatomy.) **Frings, H.**—(See under General.) **Michener, C. D.**—Mosquitoes of a limited area in so. Mississippi. [1] 37: 325–74. **Morgan, L. V.**—(See under Anatomy.) **Olsen and Davies**—The story of Syrphus weidemanni, a fly magnified in plastic. [45] 55: 107–13. **Patterson, J. T., ed.**—(See under Anatomy.) **Phillip, C. B.**—A catalogue of the blood-sucking fly family Tabanidae of the nearctic region n. of Mexico. [1] 37: 257–324 (k). **Rapp, W. F., Jr.**—Separation of adult Psychoda and Pericomal (Psychodidae). [45] 55: 169–71, ill. **Shaw, J. G.**—

Hosts and distribution of Anastrepha serpentina in n.e. Mexico. [37] 40: 36–40. **Weiss, H. B.**—Dry-cleaning fluid and the kelp-fly. [45] 55: 114; Smoke flies. [45] 55: 146.

COLEOPTERA—Anderson, W. H.—A terminology for the anatomical characters useful in the taxonomy of weevil larvae. [65] 49: 123–32, ill. **Bird, R. D.**—Sweetclover weevil, Sitona cylindricollis. [23] 79: 5–11. **Knull, J. N.**—New North American Coleoptera (Buprestidae, Schizopodida and Cerambycidae). [58] 47: 69–73, ill. **Leech, H. B.**—Collecting in southern British Columbia; Finding of the water beetle, Deronectes spenceri. [23] 78: 198–200; Crow eating serica beetles (Scarabaeidae). [23] 79: 4. **Marshall, M. Y.**—Studies in the Malachiidae. [23] 78: 183–95 (k*).

HYMENOPTERA—Banks, N.—Studies of S. Amer. Psammocharidae. Part II. [20] 99: 371–486, ill. (k*). **Burks, B. D.**—Nearctic species of the genus Dirhinus (Chalcididae). [65] 49: 136–40, ill. (k*). **Enzmann, J.**—New forms of Aphaenogaster and Novomessor. [45] 55: 147–53, ill. (k*). **Gregg, R. E.**—Altitudinal indicators among the Formicidae. [Univ. of Col. Studies, Series D, Boulder] 2: 385–403. **Pate, V. S. L.**—A conspectus of the Tiphiidae, with particular reference to the nearctic forms (Aculeata). [45] 55: 115–45, ill. (k*); A minute on Paramyrmosa Saussure (Tiphiidae). [23] 78: 196–97 (k). **Timberlake, P. H.**—A revision of the species of Exomalopsis inhabiting the U. S. (Apoidea). [45] 55: 85–106 (k*).

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

Wanted—Oriental Cerambycidae and Chrysomelidae for determination and research purposes: China, India, Philippines, Pacific. Will purchase from China, Assam, Burma, Siam, Formosa. Will exchange identified Chinese insects. J. Linsley Gressitt, Lingnan University, Canton, China.

Wanted—Papers on Cicindelidae of any part of the world, especially South America and Pacific. R. G. Dahl, 3225 Grand Ave., Apt. 13, Oakland 10, Cal.

Chrysididae—Wanted for determination in preparation of revision. Wm. G. Bodenstein, Galesville, Maryland.

Coccinelidae—Wanted from other localities. Will buy or exchange for misc. So. Cal. coleops. F. W. Furry, 1633 Virginia Ave., Glendale 2, Cal.

Wanted—Ataenius and allied Aphodiinae from all parts of the world, especially Mexico, Central and South America. O. L. Cartwright, Clemson, S. C.

Wanted—Reprints and unpublished mss. on biological control of mosquitoes; for preparing annotated bibliographies for publication. J. B. Gerberich, Michigan State College, East Lansing, Mich.

Wanted—Hesperid genus Megathymus for exchange or purchase. P. S. Remington, 5570 Etzel Ave., St. Louis 12, Missouri.

Wanted—Psychodidae of North America for revisional purposes. Wm. F. Rapp, Jr., 203 Harker Hall, Urbana, Ill.

Diptera—Tachinidae-Dexiidae wanted, No. Amer. and exotic. Will collect most orders in exchange or will purchase. P. H. Arnaud, 60 Woodrow St., Redwood City, Calif.

Will collect—Zoological and entomological specimens in tropical and subtropical parts of Peru. Jose M. Schunke, Pucallpa, Peru.

Wanted—Diplotaxis; will buy or exchange. E. W. Mange, 307 W. Walnut St., Hanover, Pa.

Hymenoptera-Aculeata (except ants and bees) for exchange. Will collect other orders in exchange. N. F. de Andrade, Casal Novo, S. João do Estoril, Portugal.

Meliponidae—Wanted, information on the bionomics, culture, and economic importance of the stingless bees, particularly of the Old World. P. Nogueira Neto, Av Cicade Jardim 170, S. Paulo, Brasil.

ENTOMOLOGICAL NEWS

JUNE 1947

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ENTOMOLOGICAL NEWS

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Samuel Francis Aaron

Samuel Francis Aaron, widely known as S. Frank Aaron, died near Pipersville, Bucks County, Pennsylvania, on January 15, 1947, as announced in the News for February, 1947. He was born at Mount Holly, New Jersey, March 5, 1862, where his father, Charles Eugene Aaron, was principal and owner of the Mount Holly Institute, a school for boys. His mother was Anna Murray Aaron. An older brother was Eugene Murray Aaron (1854–1940), first editor of the News, as mentioned in our issue for May, 1942, page 142. Later the family moved to Maryville, Tennessee, where Samuel Francis spent most of his boyhood.

On December 25, 1882, he was appointed to one of the Jessup Fund Scholarships at the Academy of Natural Sciences of Philadelphia, established by the children of Augustus E. Jessup, a position held by many young men and young women who subsequently made names for themselves in American biology, as George Howard Parker, Spencer Trotter, William M. Gabb, Charles Conrad Abbott, John A. Ryder and Angelo Heilprin.[1] He was reappointed to this scholarship July 27, 1885.

While a Jessup Fund scholar his first technical entomological paper was published: Descriptions of new Psocidae in the collection of the American Entomological Society (Transactions of the Society XI: 37–40, Dec., 1883). In it are described one new genus (*Dorypteryx*), eight new species and one new variety, mostly collected by himself, in or near Philadelphia, in the summer of that year. Three years later, another paper on the same group appeared: On some new Psocidae (Proceedings of

[1] A Short History of the Academy of Natural Sciences of Philadelphia by Edward J. Nolan. Founders' Week Memorial Volume. Published by the City of Philadelphia 1909, pp. 153–186. Separately paged 1–38.

the Academy 1886: 13–18, 1 plate). "The several new species described here are in the collections of the American Entomological Society" and comprised seven new species, one new variety and one new genus *Echmepteryx;* some of these are from his own collections in southern Texas, others from near Philadelphia. Aaron's types of sixteen species of Psocida are preserved in the Academy of Natural Sciences of Philadelphia.

In 1884 he made a trip to Texas with Corpus Christi as his headquarters. He collected insects for the most part within a radius of fifty miles to the north and west of that town, from mid-March to June. In the latter half of June he went along the coast to the Colorado River, over one hundred miles distant. All his excursions were made under the guidance of Mr. John Priour, of Corpus Christi, a collector in other branches of natural history. The story is told in Aaron's article, "Collecting on the Gulf Coast of Southern Texas," published in Papilio, a journal devoted to the Lepidoptera, of which his brother, E. M. Aaron, was editor, Volume IV: 159–161, for November, 1884. It mentions only the Lepidoptera which were observed or gathered. Another result of this expedition, nearly twenty years later, was the description of a dragonfly, *Neoneura aaroni,* by the present writer (Biol. Centr.-Amer. Neur. 139, 1903), while in 1890 *Lepthemis* (now *Brachymesia*) *gravida* Calvert had been described in part from material from the same source (Trans. Amer. Ent. Soc., 17: 35).

On March 27, 1885, he was chosen by the Committee in charge for the Entomological Section of the Academy to be custodian of insects for the balance of the year. In this period his most extensive entomological paper appeared: The North American Chrysididae (Trans. Amer. Ent. Soc. 12: 209–248, 5 pls., 1885). Its author writes: "The materials upon which this monograph is based are the almost perfect collections of the American Entomological Society, containing the types of Messrs. Cresson and Norton, together with a large number of undescribed forms, and the collection of M. Provancher, of Canada, kindly loaned me for study, containing all his type specimens described in the 'Naturaliste Canadien' with other rare and interesting species." It describes one new genus, *Diplorrhos,* and thirty-one new species. Alexander Mocsary, of the National Hungarian Museum at Budapest, expressed a favorable opinion of it in his Monographia Chrysididarum orbis terrarum universi [2] and replaces the preoccupied name *Chrysis hirsuta* Aaron with *C. aaroni* (p. 386). Aaron's types of thirty-two species of Chrysididae are listed by Cresson as being in the Academy of Natural Sciences of Philadelphia (Mem. Amer. Ent. Soc. 5: 28–30, 1928).

The writer possesses some manuscript "Notes and drawings of Odonata and Neuroptera S. Frank Aaron," undated, but probably of about this period, given to me many years ago by their author. They contain many notes in the characteristic handwriting of Dr. H. A. Hagen, indicating that Mr. Aaron was in correspondence with the great entomologist of the Museum of Comparative Zoology.

In 1896 he became economic entomologist at the Philadelphia Commercial Museum and held this position until at least 1906, according to data which doubtless he furnished to the first edition of American Men of Science of the latter year.

In 1907 he married Elsie W. Lindsey, who survives him. Mrs. Aaron has kindly supplied a number of facts concerning her husband and has presented to the Academy of Natural Sciences of Philadelphia a scrap book which he had made and entitled "The nearly complete periodical writings of S. F. Aaron from 1881 to Herein collected in 1914." It comprises 232 pages, 14 × 10 inches, with an index as far as page 154. The contents are printed clippings arranged in chronological order. Actually the collection extends to November, 1938, but does not include his papers already mentioned. They deal with many phases of popular natural history, the earliest being on "Odd bird songs" from the "Philadelphia Record about 1881" copied from the Boston Ornithologist. The earliest article on insects

[2] Budapestini 1889, 4to. pp. xv, 643, 2 pls. After referring to North American species described by previous authors "quas anno 1885 Aaron, maxima ex parte secundum specimina typica revisioni severae subiecit. Opus hoc, summa fide elaboratum ad determinationem specierum hujus orbis terrarum partis maxime difficilem optimum est. Tantum optandum fuisset, ut auctor species Cressoni de insula Cuba quoque non satis complete descriptas in suum opus assumsisset." P. 23.

in this collection, on "The bold robber fly" [*Asilus*], from the Philadelphia Times of 1889, with three illustrations, was reprinted in part in the NEWS for April, 1894, but without the figures. An article on "Migrating Insects," in the Times for 1891, records his observations on vast numbers of the butterfly, *Krigonia lyside*, "a certain large dragonfly" and a "common gray beetle known as the Spanish Fly," perhaps made during his Texas trips above mentioned.[3]

Other clippings on insects are from the Youths' Companion, Popular Science News, Scientific American, St. Nicholas, American Homes and Gardens, New England Magazine, Guide to Nature, Collier's, American Suburbs, Country Gentleman, Philadelphia Public Ledger, Farm Journal, Dearborn Independent and Nature Magazine, many of them with illustrations by the author.

On January 13, 1913, he began a series of daily articles in the Philadelphia Evening Bulletin, "Outdoor Life in Winter, in Spring, in Summer, in Autumn," which continued until July 19, 1915, and occupy pages 80–209 of the scrap book.

An article from the Philadelphia Record of September 15, 1918, describes an attempt in which he took part to eradicate mosquitoes in the Hog Island region of Delaware County, Pennsylvania, and to which is added a note in his handwriting that "The work was a failure throughout."

In 1920–1925 he lived out in the country about nine miles from Lincoln University, Post Office, Pennsylvania.

Mrs. Aaron writes of her husband: "He was a life-long student of nature, he knew trees and the wood from them and the wild flowers. He had a way of imparting his knowledge to old and young alike that made him an interesting companion on a hike, or just at home with me. He knew the birds intimately, as well as the four-footed little creatures in the wild. He would often sit down and sketch any of them he might come upon, dead, for future reference."

PHILIP P. CALVERT.

[3] There is, however, a series of three articles in the scrap book from "Our Boys and Girls," apparently a department of the Times, 1891, describing "a hunting trip that I took on the plains of Southwestern Texas when I was a boy of sixteen"; this trip would have been in 1878.

Electron Micrographs of Centipede Setae and Microtrichia [1]

By A. Glenn Richards and Frances H. Korda,
Division of Entomology and Economic Zoology,
University of Minnesota

In connection with a survey of various cuticles and sense organs to locate types most favorable to electron-microscope studies of cuticle structure, Mr. R. E. Snodgrass and Dr. R. V. Chamberlin suggested that we examine the setae on centipede maxillae and antennae. All of the work was done with the common house centipede, *Scutigera forceps* (Rafinesque).

On the midventral line between the bases of the first maxillae of the house centipede [2] there is a rather large pouch which is usually drawn in but which can be extruded. This pouch contains some hundreds of setae of two types: 1. Very long simple setae, 1–2 microns in diameter, which appear homogeneous in the electron microscope; these need not be discussed as we have learned nothing about them other than their apparent simplicity; 2. Flat, ovoid setae with helical thickenings and a short, fine-pointed tip (figs. 1 and 2).

The top and side views of these remarkable setae seem self-explanatory. From a small socket the setae swell out with a relatively heavy wall (cuticle); then the wall ceases to be uniform, for alternating thick and thin areas set at an angle of 35–40° to the cross-sectional plane give an appearance remarkably similar to that of a tracheal wall with its helical taenidia. These thickenings are 0.1 to 0.3 microns broad and separated for about the same distance by an extremely thin membrane (only about 0.01 μ thick when dry). Overall dimensions are: total length 80–90 μ, diameter of base 1–2 μ, diameter at broadest point on flatter surface 10–11 μ, diameter in shorter direc-

[1] Paper No. 2346, Scientific Journal Series, Minnesota Agricultural Experiment Station, St. Paul 1, Minn. The observations recorded in this paper were made in connection with work on a contract for studies on arthropod cuticle between the Medical Division of the Army Chemical Corps and the University of Minnesota.

[2] Dr. Chamberlin writes that these pouches of setae are found only in the family Scutigeridae of the Chilopoda.

tion 2–3 μ; the arc of curvature in "side view" is that of a circle with a radius of 75–80 μ.

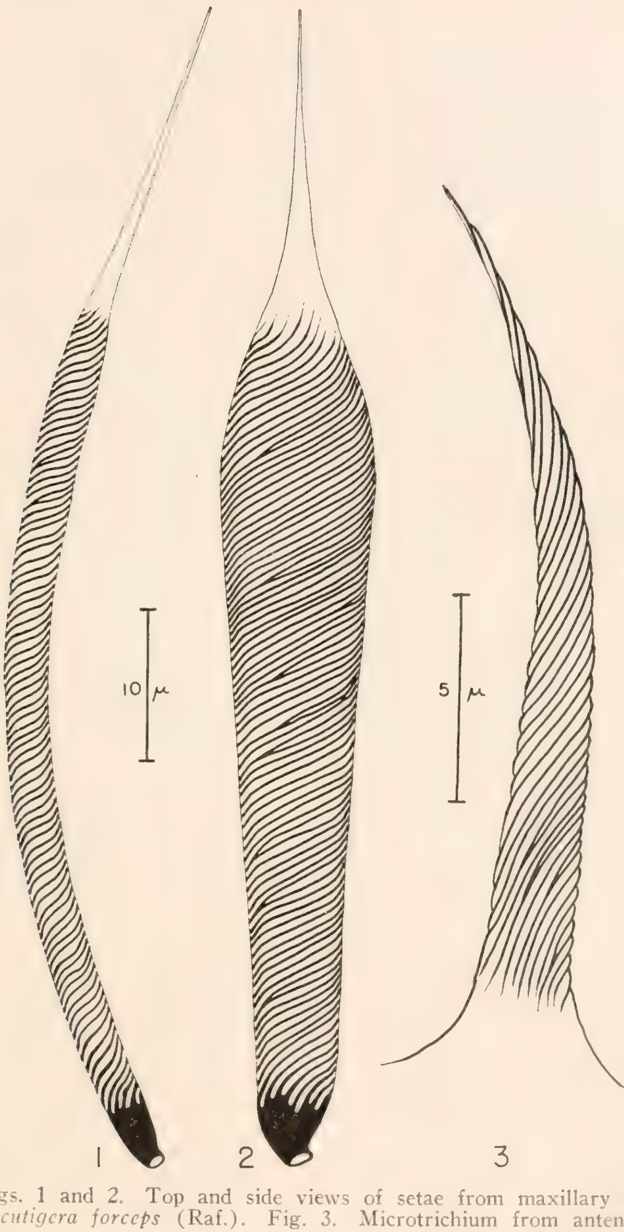
At the base of each seta some 12–14 of these helically pitched thickenings start; by branching, the number is increased to about twice this at the broadest point. Rather abruptly the seta contracts in diameter, the helical thickenings taper off into the membrane and are lost, and the tip of the seta tapers out to end with a rounded but none-the-less extremely fine point of only about 0.1 μ diameter. Each helix which extends the maximum length would make 5–6 turns around the seta. It might be repeated that at the base the helical thickenings start in thick, sclerotized cuticle by the development of lines of thin membrane, whereas at the tip the thickenings thin out into the thin membrane.

The structure is made more transparent and diffuse by converting into chitosan (concentrated KOH at 160° C. for 15 minutes) but is not destroyed. The iodine test for chitosan is positive, therefore the setae contain chitin.

When examined with the ordinary-light microscope, the contrast between specimen and mounting medium is usually so low that none of this structure can be discerned. However, if a cleaned seta is allowed to dry in air and is then examined with the high powers of a compound microscope and reflected light a typical diffraction grating pattern can be seen.

Serial sections examined with a light microscope show that these setae arise from sockets in a thin, highly convoluted cuticle that overlies a very thick epidermal layer of cells. No clue as to the possible function of these peculiar setae was obtained.

On the antennae are rows of true setae, of ordinary structure. In addition there are even more numerous rows of somewhat smaller microtrichia, i.e., small hair-like projections of the cuticle which have no special sockets at their base. These microtrichia (fig. 3) are 15–35 μ long and taper from 1–4 μ broad at the base to slightly less than 0.1 μ at the tip. These too show helical thickenings which, however, are not as distinct (the membrane between the thickenings is not so extremely thin and the thickenings themselves are not as heavy), extend all the way



Figs. 1 and 2. Top and side views of setae from maxillary pouch of *Scutigera forceps* (Raf.). Fig. 3. Microtrichium from antenna of same.

to the tip, are thinner (0.05–0.10 μ), more closely spaced (0.07–0.15 μ), and have a much greater pitch (70–80° to the cross sectional plane). We were not able to determine for certain what happens to these helical thickenings at the base of the microtrichium—presumably they are lost as the microtrichial wall curves out into the general cuticle of the antennal segment.

The origin of microtrichia in arthropods is by no means clear. They are customarily viewed as simply hair-like projections of the outer surface of the cuticle—and in whole mounts or sections viewed with a light microscope they appear to be just that. It would seem that these microtrichia from centipede antennae must be more complex. They are not destroyed by treatment in concentrated KOH at 160° C. for 20 minutes, and after this treatment give the typical chitosan color test. They are resistant to mild warming with concentrated nitric acid. Serial sections examined with a light microscope show that they must consist of a layer of endocuticle, a layer of exocuticle and a layer of epicuticle. Electron micrographs of microtrichia simply rinsed in distilled water indicate that they are nearly opaque to electrons except at the edges and tip, but microtrichia given only a mild treatment in alkali (5% NaOH at 25° C. for 5 days) are quite transparent to electrons and are clearly hollow; broken ones show a typical wall and central cavity. This should not be the case if we were dealing with a solid chitin-protein rod but would be expected if the structure contained a protoplasmic core. In an attempt to demonstrate such a core with the light microscope, serial sections (cross and tangential) were heavily overstained with Mallory's triple stain and examined. The tangential sections through the endocuticle showed spots and sometimes holes at points where protoplasmic filaments might be expected to be or have gone out to the microtrichia. The cross sections showed less contrast, but faint lines crossing the cuticle could be detected in those cases where the canal or filament appeared to have been sectioned. Whether or not living filaments extend through the cuticle into the microtrichia in the fully formed antennae is unknown; the data presented above suggest that such a minute filament does occur at some stage since a duct can be demonstrated and since the interior of the microtrichia can be readily dissolved away.

Incidentally, these figures reemphasize the fact that helical thickenings are no special property peculiar to the cuticle of tracheae. Helical structures, less clearly seen, have already been described for sensilla basiconica of some caterpillar antennae by Dethier [3] and for the anal setae of mosquito larvae by Anderson and Richards.[4] And, as is well-known, helical structures are indeed of wide occurrence, e.g., the pore canals of insect cuticle, in plant cell walls, in wool, in the flagella of protozoa, and even for one type of crack pattern developing in glass tubing. There are several conceivable ways for rationalizing the development of such helices but until some fairly direct evidence is available for cuticular helices there seems little profit in doing more than record these two new types as natural curiosities to be added to the array of simple and bizarre forms already known.

A Letter to the News

The retirement of Ezra T. Cresson, Jr., moves me to express as forcibly as possible his great value not only to the Philadelphia Academy but to the numerous entomologists who depended upon him for information of types. He labored steadily in the most important, though often overlooked, work of preparation, arrangement and preservation of the collection.

Such men are the foundation stones of a museum.

Nathan Banks.

[3] Bull. Mus. Comp. Zool., 87: 455–507. 1941.
[4] Sci. Monthly, 55: 187–192. 1942.

A Few Chilopods taken in Panama by N. L. H. Krauss

By Ralph V. Chamberlin

A small but interesting lot of chilopods collected in Panama Canal Zone in 1946 by N. L. H. Krauss consists of representatives of the five species here listed. The types of the two new species are in the author's collection.

Scolopendra viridis Say

One young specimen taken at Summit in July, 1946.

Cryptops annectus, new species

Cephalic plate overlapping the first tergite; with two short, parallel sulci running forward from the caudal margin.

First tergite with a transverse cervical sulcus well impressed, the sulcus angled at the middle in a pit or depression; with two longitudinal sulci which divide anteriorly, producing a W-shaped mark behind the cervical sulcus. Other tergites to the 20th with the usual paired longitudinal sulci.

Anterior margin of prosternum in form of two low convex bows meeting at a very obtuse angle at the middle.

Sternites with the usual median longitudinal sulcus crossed at middle by a transverse sulcus; with spiracles or other special developments.

Last ventral plate narrowly trapeziform; coxal pores moderate in number, 12–15 on each side, not extending to caudal end of joint.

In the anal legs both the prefemur and the femur are densely spinous beneath with a naked median longitudinal area on each. The prefemur bears a single stouter spine above at the mesocaudal corner. The femur bears a single tooth on the mesoventral line about one fourth the distance from caudal end to base. Tibia with a series of four teeth beneath and the first joint of the tarsus with two. These articles with no teeth above.

Length, 12 mm.

Locality.—Panama: El Valle. August, 1946. One specimen taken under bark of a dead tree. A small, apparently young, specimen taken at Summit is probably this species. N. L. H. Krauss, collector.

Distinct from other central American species having a cervical sulcus on the first tergite in the character of the anal legs as above described.

Genus **CYMOCHILUS**, new

A schendyloid genus resembling *Litoschendyla* in lacking true, rooted teeth on the labrum, the margin of the latter presenting crenatures at the middle, these becoming more acute or tooth-like at the sides. Distinct from *Litoschendyla* in having well developed claws on the anal legs. Claws of second maxillae pectinate. Ventral pores present in a median area. Last ventral plate wide. Coxal pores two on each side.

Generotype.—*Cymochilus panamicola*, new species

The genus may be placed with reference to the other known American genera of the family, excepting the inadequately described *Holitys*, by means of the following key.

Key to American Genera of the Schendylidae

1 (4). Anal coxae each with several pores................2
2 (3). Anal legs with a well developed claw; claw of second maxillae pectinate................*Escaryus* Cook
3 (2). Anal legs without claws; claw of second maxillae smooth....................*Sogolabis* Chamberlin
4 (1). Anal coxae with 0, 1 or 2 pores..................5
5 (6). Anal coxae without pores......*Nesonyx* Chamberlin
6 (5). Anal coxae with 1 or 2 pores.....................7
7 (12). Anal coxae with but 1 pore.......................8
8 (9). Claws of prehensors when closed much surpassing anterior margin of head......*Mexiconyx* Chamberlin
9 (8). Claws of prehensors when closed not surpassing anterior margin of head.........................10
10 (11). Ventral pores present........*Simoporus* Chamberlin
11 (10). Ventral pores absent........*Morunguis* Chamberlin

12 (7). Anal coxae each with 2 pores....................13
13 (18). Ventral pores absent..........................14
14 (17). Anal legs six-jointed beyond coxae, with claws....15
15 (16). Claw of second maxillae smooth; prosternum of prehensors with chitinous lines...*Sogodes* Chamberlin
16 (15). Claw of second maxillae pectinate; prosternum without chitinous lines.........*Parunguis* Chamberlin
17 (14). Anal legs five-jointed beyond coxae, without claws *Nannopodellus* Chamberlin
18 (13). Ventral pores present..........................19
19 (21). Labrum without true teeth, the margin simply wavy or crenate 20
20 (21). Anal legs armed with claws; first maxillae without lappets....................*Cymochilus,* gen. nov.
21 (20). Anal legs clawless; first maxillae with lappets *Litoschendyla* Chamberlin
22 (19). Labrum with true teeth.........................23
23 (24). Claw of palpi of second maxillae abortive *Schendylellus* Chamberlin
24 (23). Claw of palpi of second maxillae normally developed.25
25 (30). Anal legs clawless............................26
26 (27). Claw of palpus of second maxillae smooth *Schendyla* Berg. and Meinert.
27 (26). Claw of palpi of second maxillae pectinate........28
28 (29). Coxal glands heterogeneous...*Pectiniunguis* Bollman
29 (28). Coxal glands homogeneous....*Schendylurus* Silvestri
30 (25). Anal legs with claws........*Nyctunguis* Chamberlin

Cymochilus panamicola, new species

Pale yellow throughout. Head longer than wide, narrowed from behind middle forward; frontal suture not evident. Prebasal plate not exposed.

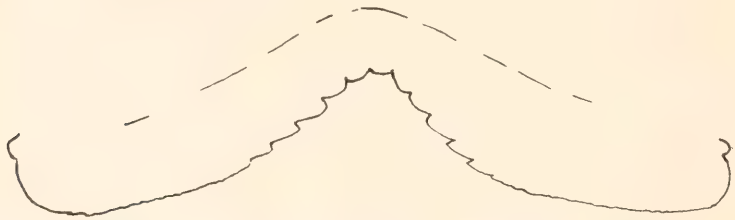


Fig. 1. Labrum of *Cymochilus panamicola* n. sp.

Labrum excised, the margin forming a right angle at middle, the crenatures about ten in number, these being apically less rounded, more acute, as shown in the figure. (Fig. 1.) Mandible with 5 long well sclerotized teeth which seem to be indistinctly separated into two blocks of 2 and 3 teeth respectively. First maxillae without lappets; palpi proportionately thick, biarticulate, the distal article rounded, bearing two setae. Claw of second maxillae well developed, pectinate, the article bearing the claw also with 5 or 6 setae on or toward its distal end.

Orphnaeus brevilabiatus (Newport)

One specimen was taken on Colorado Island on August 13, one at Cocoli on August 21, and one at Summit in October, 1946.

Mecistocephalus maxillaris (Gervais)

One specimen of this tropicopolitan species was taken on November 2, 1946, at Summit.

Notes on a few Scarabaeidae (Coleoptera)

By Mark Robinson, Springfield, Pennsylvania

Aphodius manitobensis Brown

1928. *Aphodius manitobensis* Brown, Can. Ent., LX, p. 302.

This species was described from a unique male specimen collected in Manitoba. Recently I collected both sexes in deer droppings in the Pocono Mountains of Pennsylvania. The female specimens differ from the male in having the anterior tibial spur thinner and not so strongly curved caudad. In addition the short spur of the middle tibiae in the female is about half as long as the long spur and it is acute at the apex.

Aphodius guttatus Eschscholtz

1823. *Aphodius guttatus* Eschscholtz, Mem. Soc. Imp. Nat. Moscou., VI, p. 97.

This species was described from Alaska and has been recorded from Labrador. In September 1946 this writer took a specimen near Pittsford, Vermont, in porcupine droppings.

This appears to be the first record of this species being collected in the United States.

Aphodius bicolor Say

1823. *Aphodius bicolor* Say, Journ. Acad. Nat. Sci., III, p. 212.
1938. *Aphodius comanchi* Robinson, Trans. Amer. Ent. Soc., LXIV, p. 146.

Aphodius comanchi is a large light-colored example of *A. bicolor* and the name should be suppressed in favor of the older species. The western forms of this species seem to be larger in size than the eastern forms but I believe they do not merit a distinctive name.

Ataenius insculptus Horn

1887. *Ataenius insculptus* Horn, Trans. Amer. Ent. Soc., XIV, p. 70.

Horn in his description of this species states that it lacks an accessory spinule at the inner angle of the apex of the hind tibiae. The type of this species was examined by the author and a coating of dirt cleaned off the hind tibiae thus revealing a short accessory spinule to be present. This species was described from Florida and has always remained rare in collections, but on May 11, 1947, 23 specimens were collected by the author at Martha, N. J., in deer droppings. These specimens average a little smaller in size but otherwise agree with typical specimens.

Ataenius wenzeli Horn

1887. *Ataenius wenzeli* Horn, Trans. Amer. Ent. Soc., XIV, p. 77.

As in the preceding species, a close examination of the type reveals a short accessory spinule at the apex of the hind tibiae although Horn states that the hind tibiae are without this spinule. The presence of this spinule places this species in the *strigatus* group of *Ataenius*. Mr. Robert Peters collected a small series of this species at Charleston, S. C., in May, 1944, and these specimens have the elytral intervals slightly raised instead of flat as in typical specimens; this condition makes *wenzeli* rather close to Fall's *rudellus*. Further study and a larger series of specimens may make it necessary to unite these species.

Phyllophaga georgiana Schaeffer

1909. *Phyllophaga georgiana* Schaeffer, Bull. Brook. Ins., I, p. 382.
1938. *Phyllophaga duvalus* Robinson, Trans. Amer. Ent. Soc., LXIV, p. 110.

Since *duvalus* was described the type of *georgiana* has been located in the author's collection. Schaeffer placed his species in Horn's group IV while I placed *duvalus* in group IX where I still think it belongs because the short, fixed spur of the hind tibiae is three-fifths as long as the long spur. The genitalia are missing in Schaeffer's type but on the basis of external characters I believe the two forms to be the same species.

Concerning Drosophila mallochi Frota-Pessoa

By O. Frota-Pessoa

In the June, 1946 issue of Entomological News, I published a note, under the title "*Drosophila mallochi* nom. nov." proposing *D. mallochi* as a new name for *D. lativittata* Malloch 1924 in Malloch & McAtee 1924 Proc. Biol. Soc. Wash. 57: 36–37 (nec *D. lativittata* Malloch 1923 Proc. Linn. Soc. N. S. W. 48: 618).

However, Dr. G. B. Mainland and Dr. G. Steyskal have called my attention to the note on page 64 of W. P. Spencer's paper (1942 Univ. Texas Pub. 4213: 52–66), in which he declares that *D. palustris* is a substitutive name for *D. lativittata*. In spite of this Spencer describes it as a new species and even declares that he sent paratypes to the Museum. The Zool. Record also refers to *D. palustris* as a new species. These facts induced a wrong interpretation.

So, *D. mallochi* remains as a synonym of *D. palustris* Spencer 1942.

Notes and News in Entomology

Under this heading we present, from time to time, notes, news, and comments. Contributions from readers are earnestly solicited and will be acknowledged when used.

More about Dancing Bees.—That honey-bees not only inform their hive-mates of the existence of new sources of nectar but also tell them quite exactly in which direction and at what distance to search are the startling new discoveries of Professor Karl von Frisch. These findings are so remarkable and deal with abilities so far beyond anything previously suspected of any insects that the NEWS is anxious to help make the facts more widely known.

In his first publication [1] on the "language" of bees, as well as in later reports,[2] von Frisch described a "Rundtanz," or circling dance (a running around in small circles with frequent reversal of direction), performed on the combs by any bee returning full of food to the hive. This dance excites nearby individuals and arouses them to rush forth from the hive and, it was said, to search at random for the same food, guided only by the odor that they had perceived upon the dancing bee. For pollen gatherers, another sort of dance was described, the "Schwänzeltanz" or wagging dance.

A new series of experiments [3] continued through 1944 and 1945 brought to light astounding facts, facts so strange, so fantastical, that von Frisch himself could accept them only after oft repeated experiments under varied conditions. In the first place, he found that the differences between the two styles of dance depends only upon the distance from the hive to the food source and not upon whether the food is nectar or pollen. His earlier observations were correct but he erred in his conclusions

[1] K. v. FRISCH, 1923, Über die "Sprache" der Bienen. Zool. Jahrb., Abt. allg. Zool. u. Physiol. 40: 1–186.

[2] For additional references to the literature see article "On Directing the Flight of Bees," by R. G. SCHMIEDER in ENTOMOLOGICAL NEWS 57: 16–19, January 1946.

[3] K. v. FRISCH, 1946, Die Tänze der Bienen. Österreichische Zool. Zeitschr. 1: 1–48.

because he had not varied his experimental conditions sufficiently; he had always placed the food near the hive while the pollen sources were always at a distance.

Bees returning from a distance of 50 meters or less perform the circling dance (Rundtanz); those from 100 meters or more, the wagging dance (Schwänzeltanz). At distances between 50 and 100 meters, there is a gradual change or rather the bee may make both sorts of movements. In the Schwänzeltanz, the bee runs in a semi-circle on one side, say in a clockwise direction, then runs a few steps straight back to where it started, then immediately makes another semi-circle on the other side, i.e., running in a counter-clockwise direction, and again straight back to the starting point. It is during the straight part of the run that the characteristic "Schwänzeln," i.e., the shaking or wagging of the abdomen, occurs.

At distances greater than 100 meters, the number of wagging runs (Schwänzelaufe) per unit of time decreases with the distance. At the same time the number of wagging motions increases so that the vigor of the dance appears as great as before, in fact it gains in emphasis. Thus it is possible by timing the number of runs per unit of time, say 15 seconds, to know with fair accuracy the distance from which the dancing bee has obtained her food.

Even more startling was the second discovery, that the wagging dance also indicates the direction from the hive in which lies the food. It is the straight part of the dance run that indicates with astonishing accuracy the direction as related to the direction of the sun at the particular time of day. If the runs are vertically upward on the comb, the food lies exactly in the direction towards the sun, if downward, opposite the sun. If the run deviates 10° to the right of the vertical, the direction of the food is at that same angle to the right of the sun. A deviation to the left, at whatever angle, would indicate that the food is to be found at the corresponding angle to the left of the sun. Sometimes a dancing bee may move to the opposite face of the comb but the dance will not change, a run to the bee's right still means the food is to the right of the sun, and the same applies if the entire hive is turned about. On the other hand, if the hive is laid on its side, the runs are then oriented directly towards the food supply and the bee will continue to run towards that same direction, in space, even though the hive be rotated horizontally.

Finally, experiments were devised that demonstrated beyond question that a dancing bee's hive-mates really act on the information received and do search diligently in the direction and at the distance suggested.

Altogether, this paper of von Frisch, like his earlier works, is a perfect example of good scientific writing; it is carefully organized, crystal clear and very readable. In it he allows us to accompany him, so to speak, along his path of discovery. He traces for us his ideas and early experiments that proposed the problems. Then, for each part of the work, he outlines the inductive reasoning that reveals the new hypothesis, and the deductive thinking that suggests to him all the possible conditions that must obtain if his hypothesis be true, and, finally, how he devised and carried out the crucial experiments.—R. G. SCHMIEDER.

The Distribution by States of United States Insect Collection Records. Any one who has studied the distribution of North American insects knows that there are extensive lacunae in the data, even as regards the United States. In order to determine the extent and location of these "blind spots," the writer compiled the number of State records cited in 108 synoptic or revisional papers wherein the distribution of the various species was given in sufficient detail. All too frequently the distribution of a species is cited as "east of the Rocky Mountains" or "Connecticut to Illinois and southward." Such citations mean very little. The 108 papers were all published during the present century and are divided among the various orders as follows: Coleoptera, 23; Diptera, 16; Hemiptera Heteroptera, 6; Hemiptera Homoptera, 9; Hymenoptera, 27; Lepidoptera, 7; Orthoptera, 6; miscellaneous (ten orders), 14.

The number of species cited for each State may be tabulated as follows:

N. Y.	1222	Md.	538	La.	266
Texas	1152	Ore.	530	Nebr.	265
Colo.	1092	Utah	521	Ala.	241
Calif.	1060	Ga.	489	S. D.	236
Ariz.	1036	Ohio	474	S. C.	222
Fla.	801	D. C.	466	Tenn.	196
Pa.	753	N. H.	428	Miss.	185
Ill.	744	Maine	423	Ky.	170
Mass.	744	Iowa	371	Okla.	163
N. J.	712	Idaho	365	W. Va.	133
N. M.	677	Mo.	330	Ark.	130
N. C.	654	Mont.	324	Vt.	125
Va.	636	Conn.	320	R. I.	121
Kans.	624	Wis.	296	N. D.	118
Wash.	558	Minn.	289	Del.	45
Mich.	555	Nev.	284		
Ind.	551	Wyom.	282		

As number of species per thousand square miles, the above data may be expressed as follows:

D. C.	6657	Ohio	12	Tenn.	5
R. I.	97	Colo.	10.5	Wis.	5
Mass.	90	Mich.	10	Idaho	4
N. J.	87	Ariz.	9	Ky.	4
Conn.	64	Ga.	8	Miss.	4
N. H.	46	Kans.	8	Tex.	4
Md.	44	Wash.	8	Minn.	3
N. Y.	25	Calif.	7	Nebr.	3
Del.	19	Iowa	7	Nev.	3
Pa.	17	S. C.	7	S. D.	3
Ind.	15	Utah	6	Wyom.	3
Va.	15	La.	5.5	Ark.	2
Fla.	14	N. M.	5.5	Mont.	2
Ill.	13	Ore.	5.5	N. D.	2
Maine	13	W. Va.	5.5	Okla.	2
Vt.	13	Ala.	5		
N. C.	12.5	Mo.	5		

Among the last half (24) in both the above tables are the following twenty States: Iowa, S. C., La., W. Va., Ala., Mo., Tenn., Wis., Ida., Ky., Miss., Minn., Nebr., Nev., S. D., Wyom., Ark., Mont., N. D., and Okla.

Only three States, N. Y., N. J., and N. C., have comprehensive published State lists which offset the above figures. Some have published lists of several orders or large families; among these are Ohio, Conn., Ill., Kans., Colo., and Iowa.

It was especially difficult to find papers on Lepidoptera in which detailed distributional data is given. There are, however, many State lists of butterflies.

No significant variation was seen between the various orders. It is believed, therefore, that the figures reflect to a large extent the relative amount of collecting that has been done in each State.

If the data be plotted on a map it will be seen that a broad band of nearly "virgin territory" exists from West Virginia through Kentucky, Tennessee, Mississippi, and Arkansas, to Oklahoma, all of which are areas of rich faunal content. A little collecting in these States would yield data of much zoogeographical significance.

Another and more extensive pallid area on the map would extend inclusively from Wisconsin to Idaho and take in Nevada, Montana, Wyoming, both Dakotas, Nebraska, Minnesota, Iowa, and Missouri. In the extreme east Delaware has hardly been touched and among the New England States Vermont has remained aloof.

It is hoped that the data here presented will influence to some degree the choice of collecting sites. However, the insect fauna of even the best-collected States is far from thoroughly known and activity there should not be lessened.—GEORGE C. STEYSKAL.

From Peru comes a request for information to be used in compiling a "Gazetteer of Entomological (or Zoological) Stations in Peru." The names of collectors who visited Peru are wanted and information on their routes, data and experiences regarding their localities that may be of use to subsequent collectors, and references to any published records of their trips and collections. Address: JAROSLAV SOUKUP, Box 999, Lima, Peru.

List of Titles of Publications Referred to by Numbers in Entomological Literature in Entomological News.

1. American Midland Naturalist. Notre Dame, Indiana.
2. American Museum Novitates. New York, N. Y.
3. American Naturalist. Garrison-on-Hudson, New York.
4. Annals of Applied Biology. London.
5. Annals of the Entomological Society of America. Columbus, Ohio.
6. Annals and Magazine of Natural History. London.
7. Annales Academia Brasileira Sciencias. Rio de Janeiro.
8. Anales del Instituto de Biologia Mexico. Mexico City.
9. Anatomical Record. Philadelphia.
10. Arkiv för Zoologie. K. Svenska Vetenkapsakademien i. Stockholm.
11. Arquivos de Higiene e Saude Publica. São Paulo.
12. Biological Bulletin. Woods Hole, Massachusetts.
13. Bios, Rivista Biol. Geneva.
14. Boletin de Entomologia Venezolana. Caracas.
15. Boletin del Museo de Historia Natural "Javier Prado." Lima, Peru.
16. Boletin do Museu Nacional do Rio de Janeiro. Brasil.
17. Bull. Acad. Sci. (Izvestia Akad. nauk) U R S S (S. biol.).
18. Bulletin of the Brooklyn Entomological Society. New York.
19. Bulletin of Entomological Research. London.
20. Bulletin of the Museum of Comparative Zoology. Cambridge, Mass.
21. Bulletin of the Southern California Acad. of Sciences.. Los Angeles.
22. C. r. Acad. Sci. (Doklady Akad. nauk) U R S S. Leningrad.
23. Canadian Entomologist. Guelph, Canada.
24. Canadian Journal of Research. Ottawa, Canada.
25. Ecological Monographs. Durham, North Carolina.
26. Ecology. Brooklyn, New York.
27. Entomologica Americana. Brooklyn Ent. Society, New York.
28. Entomological Monthly Magazine. London.
29. Entomological Record and Journal of Variations. London.
30. The Entomologist. London.
31. Florida Entomologist. Gainesville, Florida.
32. Frontiers. Philadelphia, Pennsylvania.
33. Great Basin Naturalist. Provo, Utah.
34. Iowa State College Journal of Science. Ames, Iowa.
35. Journal of Agricultural Research. Washington, D. C.
36. Journal of Animal Ecology. London.
37. Journal of Economic Entomology. Geneva, New York.
38. Journal of the Elisha Mitchell Science Society. Chapel Hill, N. C.
39. Journal of Entomology and Zoology. Claremont, California.
40. Journal of Experimental Biology. London.
41. Journal of Experimental Zoology. Philadelphia, Pennsylvania.
42. Journal of Heredity. Baltimore, Maryland.
43. Journal of the Kansas Entomological Society. Lawrence, Kansas.
44. Journal of Morphology. Philadelphia, Pennsylvania.
45. Journal of the New York Entomological Society. New York.
46. Journal of Parasitology. New York.
47. Journal of the Tennessee Academy of Sciences. Nashville, Tenn.
48. Journal of the Washington Academy of Sciences. Washington, D. C.
49. Memorias do Instituto Oswaldo Cruz. Rio de Janeiro.
50. Microentomology. Stanford University, California.
51. The Microscope and Entomological Monthly. London.
52. Mosquito News. Albany, New York.
53. Nature. London.
54. Nature. Washington, D. C.
55. La Naturaliste Canadien. Quebec.

56. Natural History. New York.
57. Occasional Papers, Mus. of Zool., Univ. of Michigan. Ann Arbor.
58. Ohio Journal of Science. Columbus, Ohio.
59. Opinions and Declarations. Intern. Com. Zool. Nomencl. London.
60. Pan-Pacific Entomologist. San Francisco, California.
61. Parasitology. London.
62. Proceedings of the Academy of Natural Sciences. Philadelphia.
63. Proceedings of the Biological Society of Washington. Washington, D. C.
64. Proceedings of the California Academy of Sciences. San Francisco.
65. Proceedings of the Entom. Soc. of Washington. Washington, D. C.
66. Proceedings of the Hawaiian Entomological Society. Honolulu.
67. Proceedings of the National Acad. of Sciences. Washington, D. C.
68. Proceedings of the Royal Entomological Society of London. Ser. A.
69. Proceedings of the Royal Entomological Society of London. Ser. B.
70. Proceedings of the Royal Entomological Society of London. Ser. C.
71. Proceedings of the U. S. National Museum. Washington, D. C.
72. Proceedings of the Zoological Society of London. London.
73. Psyche, A Journal of Entomology. Boston, Massachusetts.
74. Quarterly Journal of Microscopical Science. London.
75. Quarterly Review of Biology. Baltimore, Maryland.
76. Revista Academia Columbiana de Cien. Exact. Fis. y Nat. Bogotá.
77. Revista Chilena de Historia Natural. Valparaiso, Chile.
78. Revista Instituto Salubridad y Enfermedades Tropicales. Mexico.
79. Revista Sociedad Mexicana de Historia Natural. Mexico City.
80. Science. Washington, D. C.
81. Scientific Monthly. New York.
82. Smithsonian Miscellaneous Collections. Washington, D. C.
83. Transactions of the American Entomological Society. Philadelphia.
84. Transactions of the Amer. Microsc. Soc. Menasha, Wisconsin.
85. Transactions of the Illinois State Academy of Sciences. Springfield.
86. Transactions of the Kansas Acad. of Sci. Manhattan, Kansas.
87. Transactions of the Royal Canadian Institute. Toronto.
88. Transactions of the Royal Entomological Society. London.
89. U. S. Dept. of Agric., Farmer's Bulletins. Washington, D. C.
90. U. S. Dept. of Agric., Technical Bulletins. Washington, D. C.
91. University of California Publications in Entomology. Berkeley.
92. University of California Publications in Zoology. Berkeley.
93. University of Kansas, Science Bulletins. Lawrence, Kansas.
94. Ward's Natural Science Bulletin. Rochester, New York.
95. Zoologica. New York.
96. American Journal of Public Health. Boston.
97. American Journal of Tropical Medicine. Baltimore.
98. Annals of Tropical Medicine and Parasitology. Liverpool.
99. Canadian Journal of Research. Section E, Medical Sciences, Ottawa.
100. Turtox News. Chicago, Illinois.
101. Mitteilungen der schweitzerischen entomologischen Gesellschaft, Bern.
102. Revue de Entomologie. Rio de Janeiro, Brasil.
103. Proceedings of the Royal Society of London.
104. Anales de la Escuela Nacional de Ciencias Biologicas. Mexico.
105. Journal of Cellular and Comparative Physiology. Philadelphia.
106. Redia. Florence, Italy.
107. Annales de la Société Entomologique de France. Paris.
108. Bulletin de la Société Entomologique de France. Paris.
109. Notulae Naturae. Philadelphia.
110. L'Entomologiste. Paris.
111. Revista Brasiliera de Biologie. Rio de Janeiro.
112. Eos, Revista Española de Entomologia. Madrid.
113. Minist. de Agri. de la Nación, Inst. Sanidad Vegetal, Buenos Aires.

Current Entomological Literature

COMPILED BY EDWIN T. MOUL, RAYMOND Q. BLISS, CHARLES HODGE IV, MAURICE E. PHILLIPS, JOHN W. H. REHN AND HENRY K. TOWNES, JR.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, 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.

This list gives references of the current or preceding year unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

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 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. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

GENERAL—Blackwelder, R. E.—The dates and editions of Curtis' British Entomology. [82] 107: 1–27, ill. **Carpenter, F. M.**—Early insect life. [73] 54: 65–85, ill. **Curtis, W. P.**—Nomenclature again. [28] 83: 100–102. **Fullaway, D. T.**—Niihau insects. [66] 13: 51–53. **Haydak, M. H.**—Rearing clothes moth and black carpet beetle in the laboratory. [37] 40: 279–80. **Maimardi, A.**—Proposta di un modo di preparare gli insetti minuti, e descrizione di un apparacchietto per poterli studiare comodamenta al microsopio. [Riv. di Parassit.] 7: 113–18 (1943). **Osborn, H.**—On the status of grass insects. [65] 49: 149–50. **Sabrosky, C. W.**—Stability of family names: some principles and problems. [3] 81: 153–60. **Setterstrom, C. A.**—Banishing bug bites. [52] 6: 186–88. **Smith, Dean and Kelly**—The sixteenth or 1946 annual population summary of Kansas insects. [43] 20: 41–58. **Smith, H. S.**—Biological control of weeds in the U. S. [65] 49: 169–70. **Steedman, H. F.**—Ester wax: a new embedding medium. [74] 88: 123–33. **Woods, R. S.**—Addenda to the naturalist's lexicon. Abbey Garden Press, Pasadena, Cal.

ANATOMY, PHYSIOLOGY, MEDICAL—Callot, J.—Nouveaux cas de phorésie. [Annales de Parasit.] 23: 379–80, ill. (1946). **Calvert, P. P.**—How many mosquito larvae and pupae are required to make one dragonfly (Aeschnidae)? [65] 49: 171–72. **Ciaccio, G.**—Ricerche sull'accrescimento e sullo sviluppo delle ghiandole salivari delle larve li Anopheles maculipennis. [Riv. di Parassit.] 5: 217–34

(1941). **Corradetti, A.**—Sull'introduzione di metodi genetici per la determinazione delle specie negli anofelini. [Riv. di Parassit.] 7: 43–48 (1943). **Dean and Chapman**—Biology and control of the apple redbug. [N. Y. State Agr. Exp. Station] Bull. 716: 3–42. **Judd, W. W.**—The proventriculus of the larva of the caddis-fly, Macronema zebratum (Trichoptera: Hydropsychidae). [24] 25: 87–90, ill. **Nucciotti, L.**—Sulla resistenza all'immersione subacquea delle larva di Anopheles gambiae. [Riv. di Parassit.] 7: 87–90 (1943). **Oliveira e Moussatché**—Açãu do DDT sobre larvas e pupas de Musca domestica. [111] 7: 67–72, ill. **Salt, R. W.**—Some effects of temperature on the production and elimination of diapause in the wheat stem sawfly Cephus cinctus. [24] 25: 66–86. **Stammers and Whitefield**—The toxicity of DDT to man and animals. [19] 38: 1–73. **Thornton, D.**—The effect of 2,4-dinitrophenol on the larval growth of Drosophila melanogaster. [Growth] 11: 51–60. **Travis, B. V.**—Relative efficiency of six species of mosquitoes from Guam, M. I., as developmental hosts for Dirofilaria immitis. [46] 33: 142–45. **Vanni, V.**—Sulla biologica e morfologia di Phlebotomus perniciosus nella provincia di Napoli. [Riv. di Parassit.] 7: 121–26 (1943). **Villee, C. A.**—A spectrophotometric analysis of the eye colors of Habrobrucon. [Genetics, N. Y.] 32: 277–85. **Whittinghill, M.**—A doubly mosaic Drosophila of unusual type. [38] 63: 37–42.

ARACHNIDA AND MYRIOPODA—André et Ansel—Sur la présence d'un Oribatid (Notaspis coleoptratus) dans le tissu sous-cutané d'un triton marbré Triturus marmoratus. [Annales de Parasit.] 21: 376–77 (1946). **Banks, N.**—On some Acarina from North Carolina. [73] 54: 110–41, ill. (k*). **Bryant, E. B.**—A list of spiders from Mona Island, with descriptions of new and little known species. [73] 54: 86–99, ill. (*). **Delpy, L.-P.**—Revision, par des voies expérimentales, du genre Hyalomma C. L., Koch 1884 (Ixodidae). Note préliminaire. 1. Nécessite d'une révision du genre Hyalomma. [Annales de Parasit.] 21: 267–93, ill. (1946). **Grant, C. D.**—American mites of the genus Laelaps (Acarina). [50] 12: 1–21, ill. (k*); Redescription of a snake-infesting mite. [50] 12: 22–23, ill. **Pavlov, P.**—Richerche sperimentali sulla tassina delle uova di Ixodinae. [Riv. di Parassit.] 6: 101–06 (1942). **Schubart, O.**—Um novo representante da familia Leptodesmidae, Macrocoxodesmus marcusi, n. g., n. sp. (Diplopoda). [111] 7: 109–12, ill.

SMALLER ORDERS—Augustson, G. F.—Xenopsylla fleas of the Hawaiian Islands (Pulicid). [66] 13: 33-36, ill. **Bianchi, F. A.**—Thysanoptera Hawaiiensis, I. [66] 13: 37-42, ill. (*). **Brues, C. T.**—Predatory enemies of winged termites. [65] 49: 167-68. **Calvert, P. P.**—(See under Anatomy.) **Carpenter, F. M.**—Taxonomic notes on the Dilaridae (Neuroptera). [73] 54: 100-09, ill. (*). **Filho e de Castro**—Spongiphora moreirae, nome novo para Spongiphora dissimilis Moreira, 1930, com redescrição do macho (Labiidae, Dermaptera). [111] 7: 1-3, ill. **Hopkins, G. H. E.**—Notes on mallophagan nomenclature, II. [30] 80: 73-79. **Hubbard, C. A.**—Fleas of western N. Amer. [Iowa State Coll. Press, Ames], ill., 533 pp. **Judd, W. W.**—(See under Anatomy) (Trichoptera). **Sakimura, K.**—Thrips in relation to gall-forming and plant disease transmission: a review. [66] 13: 59-95. **Westfall, M. J., Jr.**—A new Macromia from North Carolina. [38] 63: 32-36, ill. (k*).

ORTHOPTERA—Chopard, L.—Orthopteroides de L'Afrique du Nord. [Faune de L'Empire Français, LaRose, Paris] 1: 1-447, ill. (k*). **Rehn, J. A. G.**—The removal of the mantid genus Callimantis from the N. Amer. fauna. [65] 49: 163-64.

HEMIPTERA—Beamer, R. H.—Some new species of Delphacodes with two old ones (Fulgoridae). [43] 20: 58-71, ill. (*). **Dean and Chapman**—(See under Anatomy.) **Ferris, G. F.**—Information concerning the genera Chortinaspis and Aspidiotus (Diaspididae). [50] 11: 37-49, ill. (k*). **Lent e Wygodzinsky.**—Sôbre algumas espécies de Zelurus Hahn (Reduviid). [111] 7: 25-55, ill. **McKenzie, H. L.**—Supplementary notes on the genera Aonidiella and Parlatoria (Diaspididae). [50] 11: 29-36, ill. (k*). **Steinweden, J. B.**—The identity of certain common American species of Pulvinaria (Coccidae). [50] 11: 1-28, ill. (k*). **Usinger, R. L.**—Notes on Graptostethus in Hawaii (Lygaeidae). [66] 13: 107-08. **Wygodzinsky, P.**—Novas contribuições ao conhecimentos dos Stenolemus das Américas (Emesinae, Reduviid). [111] 7: 127-44, ill. (k*).

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EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

Wanted—Papers on Cicindelidae of any part of the world, especially South America and Pacific. R. G. Dahl, 3225 Grand Ave., Apt. 13, Oakland 10, Cal.

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Coccinelidae—Wanted from other localities. Will buy or exchange for misc. So. Cal. coleops. F. W. Furry, 1633 Virginia Ave., Glendale 2, Cal.

Wanted—Ataenius and allied Aphodiinae from all parts of the world, especially Mexico, Central and South America. O. L. Cartwright, Clemson, S. C.

Wanted—Reprints and unpublished mss. on biological control of mosquitoes; for preparing annotated bibliographies for publication. J. B. Gerberich, Michigan State College, East Lansing, Mich.

Wanted—Hesperid genus Megathymus for exchange or purchase. P. S. Remington, 5570 Etzel Ave., St. Louis 12, Missouri.

Wanted—Psychodidae of North America for revisional purposes. Wm. F. Rapp, Jr., 203 Harker Hall, Urbana, Ill.

Diptera—Tachinidae-Dexiidae wanted, No. Amer. and exotic. Will collect most orders in exchange or will purchase. P. H. Arnaud, 60 Woodrow St., Redwood City, Calif.

Will collect—Zoological and entomological specimens in tropical and subtropical parts of Peru. Jose M. Schunke, Pucallpa, Peru.

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Meliponidae—Wanted, information on the bionomics, culture, and economic importance of the stingless bees, particularly of the Old World. P. Nogueira Neto, Av Cicade Jardim 170, S. Paulo, Brasil.

Wasps (Vespoidea, Sphecoidea, Chrysidoidea) of the world by exchange or purchase. Will collect other orders in exchange. D. G. Shappirio, 4811 17th St., N.W., Washington 11, D. C.

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ENTOMOLOGICAL NEWS

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Charles Liebeck

Charles Liebeck, long a resident of Philadelphia, died there on February 24, 1947, after a short illness, at the age of 83 years. In his younger days and in middle life, he was a diligent and enthusiastic collector of Coleoptera and he built up a fine representative collection of North American beetles, more than 100,000 specimens in a goodly number of species. The collection is notable for the long series of variant forms of the same species. He was an excellent preparator and any sample box of his collection showed his delicate handling.

He was a skilled mechanic and worked all his life at his trade, that of paper scorer, but devoted his spare time to his collection. About ten years ago he had come to the conclusion that he could not continue the care of his collection and at the same time keep up the necessary work at his trade. Being a man of decision he gave his collection outright to a congenial specialist and fellow worker in the same field, Dr. Henry C. Fall of Tyngsboro, Massachusetts, with whom he had been in frequent correspondence for more than 40 years. On the death of Dr. Fall, on November 14, 1939, with Mr. Liebeck's approval, the entire collection went to the Entomological Department of the Museum of Comparative Zoology of Harvard University, Cambridge, Massachusetts. After parting with his collection, Mr. Liebeck expressed himself repeatedly as well satisfied with his decision.

During the last World War and until more than 80 years of age, he worked in an essential plant full time and much overtime.

Mr. Liebeck never married, making his home at 1633 W. Columbia Avenue, later at 2000 N. Broad Street, Philadelphia, with his sister, Miss Lena Liebeck, who, with two brothers, survives him.

The following incidents in his life were related in a letter to the writer shortly before his death:

"We lived in Morrisania, suburb of New York City, for a number of years prior to the Centennial and there is one specimen or was, in my collection labeled Morrisania, 1874, *Phanaeus cornifex*. I had other insects there. . . .

"Our folks came here [to Philadelphia] in 1876—April of the Centennial year. I spent only one day at the Exhibition, Pennsylvania Day, which I believe was on the 26th of September, as a Grammar School boy, first division, when, with the aid of a white badge, admission was 25 cents instead of the regulation 50 cents. . . . What interested me most was the Colorado building with its exhibit of animals and birds of that state; the Army and Navy Building with the turret of a Monitor in front of the entrance . . . the Main Building where the two cases of mounted birds caught my eye; these I believe belonged to Harvard College. . . .

"I made some trips to Atlantic City, a small place at that time, via the narrow gauge railway, Phila. & Reading; on the first trip I was armed with a round pint bottle partly filled with alcohol and I spent my time along the beach front, collecting such Coleoptera as had somewhere fallen into those streams, which run out into the ocean, and then drifted in. This first trip resulted in a solid pint bottle of beetles, large and small, some of which later proved that some of Dr. Leconte's suppressed species not only did occur there but were entirely valid. . . .

"Like most people of the south end of the city, I used a gun when it was taller than I. I also mounted birds, possibly over 300, before I gave these up for the Coleopters. . . .

"About this time, I became acquainted with G[eorge] B. Cresson, who at that time had a small print[ing] shop on 7th Street below Arch. He came into the shop where I was working at that time, wanting some pamphlet cases made to hold folders of the Henshaw Check List of Coleoptera which he was printing. . . . He had his grandfather's, James Riding's, collection of Coleoptera, the Crotch duplicates and a large assortment of other N[orth] A[merican] duplicates, which I suppose were his grandfather's originally. [He later became the entomological curator at the Academy of Natural Sciences, Philadelphia.] He sent me a card one day: 'I saw Dr. [George H.] Horn last night and if you are willing to pin insects in return for specimens, I think we can give you enough to occupy your leisure moments.' Card is dated 1/5 '86. From that time I became a volunteer worker."

KATHARINE F. RICHMOND.

To the preceding entertaining account by Mrs. Richmond, sister of Dr. Fall, there may be added a few other data concerning Mr. Liebeck.

He was born in New York City, October 26, 1863, son of Barbara and Henry Liebeck. His sister writes: "There has been no one else in the family interested in natural history—the way we understand it he simply took a fancy to collecting and he eventually made a big thing of it." After coming to Philadelphia, as he has related above, he became a frequent visitor and worker at the Academy of Natural Sciences. He was elected a member of the Academy in January, 1892, and of the American Entomological Society on June 13, 1892. At the time of his death he was the senior member of the Society, although he had not been present at a meeting for many years before his death. He served on the Advisory Committee of ENTOMOLOGICAL NEWS from January, 1893, to December, 1941, and during my editorship I not infrequently asked and received his opinion on papers on Coleoptera.

Dr. P. J. Darlington, Jr., Fall Curator of Coleoptera at the Museum of Comparative Zoology, has written: "Mr. Fall spent the last years of his life rearranging his own general collection of North American coleoptera, and during the rearrangement he incorporated into his own collection whatever he needed from the Liebeck collection." The balance of the Liebeck collection—that is, the main part—will be incorporated into the Museum's general collection of North American coleoptera. Each specimen will be labelled with a small label reading, 'Liebeck collection.' Liebeck's material, as you probably know, was very rich and beautifully prepared."

Mr. Liebeck published very little. We have found a note by him on *Baris scolopacea* Ger. in the NEWS for April, 1893 (Vol. IV, no. 4, page 121).

He took part in several of the joint meetings and collecting excursions of the entomologists of Philadelphia, Newark, Brooklyn and New York at Jamesburg, New Jersey, on the Fourth of July in the 1890's. A photograph of one of these groups with the names below, on July 4, 1894, is reproduced as Plate VII of the NEWS, for September, 1894. It shows Mr. Liebeck seated in the first row, to the right, a good likeness.

PHILIP P. CALVERT.

Reflections on the Subspecies

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

Species in the biological world, just as in the world of the chemical elements, represent systems of relative dynamic stability. They are separated from one another by discontinuous variation, because of the relative instability of the intermediate states. These discontinuous systems are normally detectable from individual examples, provided the examples are of the proper sex and/or stage of development. Instances to the contrary should be viewed with suspicion as possibly impugning the validity of the alleged species.

During the past half century, it has been discovered that the populations that constitute a species are themselves frequently differentiated in different portions of the species' range. This is the result of one or more mutations occurring in one portion of the range and failing to spread or failing to spread evenly throughout all the populations of the species. Such populations have come to be regarded as geographical races or geographical subspecies or subspecies. In practice, subspecies are distinguished from species by the fact that they occupy contiguous rather than identical areas and intergrade with each other along the lines of their contiguity.

A great deal of attention has been given to subspecies in vertebrates and, more latterly, in insects. As available specimens have increased in number, their study has become more and more intense, and the sorts of characteristics used for the discrimination of subspecies have become more and more obscure. In many cases purely average differences in color, size, and shape are involved in their separation, with the result that sometimes a subspecific character is applicable only to a population and frequently or not at all to an individual.

At the same time, as authors have become increasingly familiar with subspecies, they have come to regard them in many instances as *the* taxonomic units, with species as more or less vaguely definable groups of subspecies. The result is that the basic taxonomic unit becomes recognizable only on the basis of a series of specimens.

The object of the present note is to deprecate this tendency to emphasize the subspecies and to suggest that we return to the species as the basic unit. Both species and subspecies are populational concepts, but the species can normally be recognized on the basis of a single specimen (of the proper age and or sex). Every subspecies, on the other hand, at least in certain portions of its range, intergrades with one or more other subspecies, and the assignment of an individual specimen is determined by the general complexion of the population of which it is a member. It thus follows that very nearly indistinguishable specimens may belong to diverse subspecies, depending on the populations from which they come! It follows, further, that no selection of specimens of a subspecies short of an extensive *unselected* series is an adequate representation of it. Merely average examples are obviously inadequate. A selection (or a description) of average, intermediate, and extreme specimens, while more satisfactory, is still not entirely so. Complete adequacy is secured only by a series extensive enough (or by a description) that shows the relative frequency of the several variants in the different parts of its range. Moreover, collectors and curators should avoid the almost inevitable tendency to select for preservation unnatural numbers of variant specimens, or, if such specimens are selected, some method should be developed for marking them so that they do not pass as normal members of their respective populations. Such considerations show the hopelessness of the old-fashioned synoptic collection with its two, six, or other definite number of specimens of each form. Species may, with considerable inadequacy, be so exhibited, but subspecies hardly at all.

As noted above, the present suggestion is that we return to the species as our basic biological units, and leave the subspecies for differentiation in fine print for recognition by those who happen to have adequate material. Moreover, since only a single subspecies by definition occurs in a single geographical region, a specific determination is sufficient for ecological purposes.

A Note on the Swarming of Stelopolybia pallipes var. anceps de Sauss.

Early in 1946 I received specimens of this social wasp, *Stelopolybia pallipes* var. *anceps,* belonging to the Polybiinae, from Mr. H. L. Parker, with his notation that they were migrating along the Tiete River at Itaquaquecetuba (Sao Paulo), Brazil, on Jan. 18, 1946. "They were migrating in large swarm for about twenty minutes, going East at 8 A.M. The day was clear with no wind."

The specimens were kindly identified by Dr. Joseph Bequaert, who states that all were females, and recalls that R. von Ihering found that swarms of members of this group do not contain males, and further that there is no differentiated worker caste.

PHIL RAU.

A New Species of Hydrobaenus (Chaetocladius) from Connecticut with Notes on related Forms. (Diptera, Chironomidae)

By O. A. Johannsen, Ithaca, N. Y.

A small collection of midges submitted to me for determination by Dr. S. W. Bromley contained two species closely resembling each other. One of these, *Diplocladius cultriger* Kieffer, first described from Europe, was recorded by me from New York about ten years ago on the basis of two reared specimens. The other could not be identified with any described species and therefore is herewith described as new. Although resembling each other in color, size, and other superficial features, *D. cultriger* differs in having short, but densely pubescent eyes, squama without a fringe of hairs, the hypopygium of the male with dististyles doubled and the basal lobe on the inner side of the basistyles long and free. All the specimens of both species were collected on a warm late afternoon in March as they were swarming over a stony, springy area in the young oak woods about 100 yards north of the laboratory of the Bartlett Tree Expert Co. in North Stamford.

The generic name Hydrobaenus adopted here was first used for a small European midge that recently has been considered by the late Dr. F. W. Edwards of the British Museum as congerneric with *Orthocladius* Van der Wulp and *Spaniotoma* Philippi. Since the term *Hydrobaenus* was proposed many years before either of the others it takes precedence.

Hydrobaenus (Chaetocladius) stamfordi n. sp.

Male. Black, including mouth parts, palpi, antennae, legs, and hypopygium; the narrow margins of the prescutellar space, a narrow longitudinal line in this space, and between the scutel vittae, the humeri, and very narrow incisions of the abdomen, more or less pollinose, most conspicuous when viewed obliquely. Halteres gray to blackish. Wings hyaline, veins brownish.

Eyes bare; palpi four-segmented; antennal ratio 2.0 to 2.2, no long hairs at apex of terminal segment, a few curved pre-apical sense bristles. Pronotal median incision present. Wings with microtrichia, visible under magnification of 400 to 500 diameters. Costa only slightly produced, first branch of the radius ends at the level of the tip of the second branch of the cubitus, second branch of the radius ends beyond the mid-distance between the tips of the first and third branches, media ends slightly behind the wing tip, r-m crossvein somewhat oblique, cubital fork slightly proximad of the crossvein, anal vein produced far beyond the level of the cubital fork. Lobe of wing large and right angled, the cilia ending slightly distad of the middle of the mesal margin of the lobe. Squama fringed. Hypopygium (Figure 1) with the distal margin of the very prominent inner lobe of the basistyle more or less at right angles to the longitudinal axis; anal point bare, slender, about half as long as the dististyle. Ratio of fore basitarsus to the tibia 0.65–0.7; fore tarsi not bearded; empodium well developed, nearly as long as the claws. Length 3.5 mm., wing 3.2 mm.

Female. Similar to the male in coloring. Antennae seven segmented, seventh segment slightly less than twice the sixth in length; sense bristles more than a half longer than the diameter of the segment (Figure 2); one whorl of long bristles on each flagellar segment except the last, seventh segment with eight to ten sense bristles, other segments with fewer. Wing venation as with the male; the radius and its branches (except the second) with a row of small, regularly but sparsely placed bristles. Halteres pale gray. Length 2.5 mm., wing 3 mm.

North Stamford, CONNECTICUT. March 1945. Dr. S. W. Bromley, collector. Holotype, allotype, and paratypes in the Cornell University collection; two paratypes in the collection of the U. S. National Museum.

This species resembles the European *H. pigra* Goetghebuer but differs in the antennal ratio of the male and in having a larger and differently formed inner lobe of the basistyle of the hypopygium. The North American species most nearly resembling it have in common the following characters in the male.

Black, usually without yellow markings; unmarked wings; posterior branch of radius extending beyond the level of tip of anterior branch of the cubitus; r-m crossvein slightly oblique; anal vein ending far beyond the level of the cubital fork; fore leg ratio exceeding 0.6; fore tarsi not bearded; a well developed empodium. The males of species recorded from the eastern states most nearly resembling *H. stamfordi* may be distinguished by the characters given below.

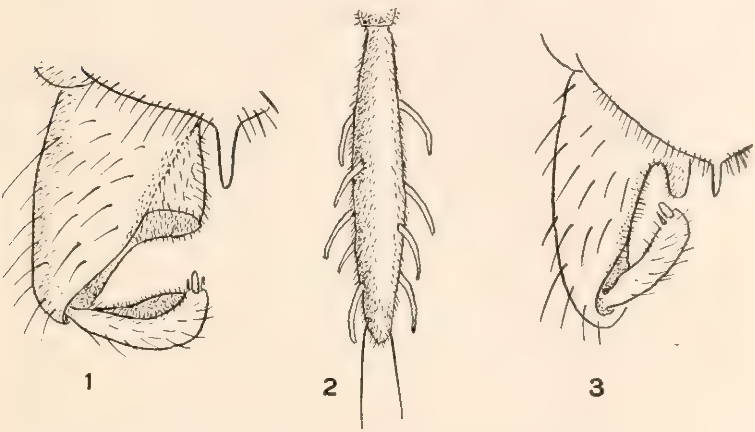


Fig. 1. *Hydrobaenus stamfordi,* hypopygium of male.
Fig. 2. *H. stamfordi,* seventh antennal segment of female.
Fig. 3. *H. nivoriundus,* hypopygium of male.

1. Anal point of tergite of hypopygium sparsely long haired . . (2)
   Anal point bare; wings with microtrichia visible under a magnification of 500 diameters . . . . (4)
2. Halteres dark; fore leg ratio 0.8; inner lobe of basistyle slender, rounded apically . . . . *nigritus* (Mall.)
   Halteres pale; leg ratio 0.75 or less . . . . (3)
3. Pronotum and humeri yellow; wings whitish; leg ratio 0.75; length 2.5 mm. . . . . *lacteipennis* (Mall.)
   Thorax of male dark (of female with yellow between the thoracic vittae); halteres yellow; antennal ratio 2; leg ratio 0.7 to .73; inner lobe of basistyle resembling that of *H. nivoriundus* but broader at base (as shown in Figure 5a, Edwards, 1929, Trans. Ent. Soc. London, page 329);

anal point of last tergite more than half as long as the distyle; length 3 mm.................*obumratus* (Joh.)

4. Anal point of hypopygium small and slender (Figure 3), inner lobe of basistyle thumblike; antennal ratio 2.5; leg ratio 0.75–0.8.......................*nivoriundus* (Joh.)

Anal point about half as long as diststyle, inner lobe of basistyle very prominent (Figure 1); antennal ratio 2–2.2; leg ratio 0.65–0.7.........................*stamfordi* n. sp.

Rhodesiella: A Genus New to the Western Hemisphere (Diptera: Chloropidae)

By Curtis W. Sabrosky, Bureau of Entomology and Plant Quarantine, Agricultural Research Administration, United States Department of Agriculture

The genus *Rhodesiella* Adams (= *Macrostyla* Lioy preoccupied, *Meroscinis* De Meijere, *Aspistyla* Duda) is a large and common genus that ranges widely in a number of species throughout Ethiopian and Indo-Australian regions. To date, however, no specimens properly referable to this genus have been recorded from the Western Hemisphere. The South American species that have been so identified belong to a different genus. It is therefore of interest to record the occurrence in southeastern United States of a characteristic species of true *Rhodesiella* and to correct the South American records.

When the first specimens were found, in material collected at Orlando, Fla., it was thought possible that it was a species introduced from Africa. Later, two specimens of the same species were collected at Raleigh, N. C., by C. S. Brimley. Detailed comparison with African species shows that the American specimens represent an undescribed form.

Rhodesiella brimleyi, new species

Male, female. Shining black, only the antenna (except for the infuscated apex of the third segment), stalk of the halter, knees narrowly, distal fourth to third of all tibiae, and all tarsi, yellow; fore tibiae paler than the others and not so distinctly marked; tarsi with a slight suggestion of brown on the distal segment; frontal triangle typically dark bluish black, occasionally without the bluish shine but those specimens in poor condition; all hairs and bristles black.

Head of typical *Rhodesiella* habitus, with bare eyes, linear cheeks, relatively small antennae, unusually long aristae (one and one-half times as long as the front), and long orbital and interfrontal hairs; frontal triangle long, attaining the anterior margin of the front, the apex acute; epistomal margin slightly produced, in profile the vibrissal angle distinct, approximately a 90° angle.

Mesonotum relatively short and broad, its length and width subequal; scutellum large, its length nearly one and one-fourth times its basal width, and two-thirds as long as the mesonotum; one pair of long strong apical and one pair of short subapical scutellar bristles, all set on stout enlarged bases.

Legs slender, the hind femur only slightly enlarged and with no spines or denticles on the ventral surface; no "sensory area" on the posterodorsal surface of the hind tibia.

Wing venation virtually the same as figured for *Macrostyla plumigera* (Meigen) by Duda (1933, Chloropidae, *in* Lindner, Fliegen Palaeark. Region, Lfg. 72, pl. 1, fig. 2), the ultimate section of the fourth vein at its base bent forward slightly more than in *plumigera;* length of costal sectors 2 to 4 as 21:28:12; small cross vein approximately opposite the middle of the discal cell.

Length, 2 mm.

Holotype: ♀, Raleigh, North Carolina, October 21 (C. S. Brimley). Type No. 58383 in the United States National Museum, deposited through the courtesy of the North Carolina Department of Agriculture. *Paratypes:* 1 ♀, Raleigh, N. C., June 9, 1942 (C. S. Brimley) [N. C. Dept. Agr. Collection]; 15 (10 ♂, 5 ♀), Orlando, Florida, November 16, 1937, "from cage over pile of grass in corner of grove" (J. T. Bigham) [U. S. Natl. Mus.].

The species is named in honor of the late C. S. Brimley, versatile naturalist and keen observer.

Rhodesiella brimleyi belongs to the *tarsalis* group (cf. Malloch, 1931, Ann. and Mag. Nat. Hist., Ser. 10, 8: 49–69) and is very close to *R. nigrifrons* Malloch, described from Southern Rhodesia. The latter is distinguished by having the first and second antennal segments black, apex of the frontal triangle truncate (though not as broadly so as in *tarsalis*), vibrissal angle weak and scarcely evident, and scutellum shorter than in *brimleyi*, its length subequal to its basal width and slightly less than half the length of the mesonotum, appearing more broadly rounded apically.

Becker (1912, Ann. Mus. Nat. Hungarici 10: 129, 177), in his monograph of the neotropical Chloropidae, placed *Onychaspidium* Enderlein (type, *O. sexdentatum* End., from southern Brazil) in synonymy under *Meroscinis*. In a more recent revision of the neotropical species of the family, Duda (1930, Folia Zool. Hydrobiol., Riga 2: 82–83) accepted this synonymy, referred several other species to the group, and gave a key to six neotropical species of *Meroscinis*. Included among them is *longiscutellatus* Enderlein, the genotype of *Leptopeltastes* End., which had been made a synonym of *Gaurax* by Becker (op. cit., p. 199) but which Duda thus refers to *Meroscinis*.

In my opinion, the neotropical species form a group quite distinct from the genus *Rhodesiella*. I therefore propose to resurrect *Onychaspidium* Enderlein, and I agree with Duda that *Leptopeltastes* is a synonym. The synonymy will be as follows:

Onychaspidium Enderlein, 1911, Gesell. f. Naturf. Freunde Sitzber., Jahrgang 1911, No. 4, p. 196. Type, *O. sexdentatum* Enderlein.
= *Meroscinis* De Meijere of Becker (1912) and Duda (1930), for the Neotropical Region.
= *Leptopeltastes* Enderlein, 1911, l. c., p. 229. Type, *L. longiscutellata* Enderlein.

The major generic characters are the following:

Onychaspidium: Ocellar bristles short and weak, cruciate at the tips; eyes densely short pubescent; notopleural bristles 1 + 2; scutellum relatively small, thin and flattened, *Elachiptera*-like; mesopleuron without hairs; "sensory area" on the posterodorsal surface of the hind tibia large and conspicuous.

Rhodesiella: Ocellar bristles well developed, strongly divergent; eyes bare; notopleural bristles 1 + 1; scutellum large and conspicuous, not strongly flattened; mesopleuron with numerous long hairs; "sensory area" on the hind tibia minute or absent.

It may also be noted that *Meroscinis quadridentata* Duda (1930, l. c., p. 83) from Brazil is a synonym of *Onychaspidium apicale* (Williston) (*Oscinis apicalis* Will.) [new synonymy]. I have seen the types of both and have found Duda erred in believing *apicale* to be a species with only two apical scutellar tubercles, thus redescribing it as *quadridentata.* The type of the latter is a female, Petropolis, Brazil, November 11, 1924 (Borgmeier), now in the collection of the Instituto Biologico in Sao Paulo, and recently loaned for study through the courtesy of Oscar Monte. A series of 14 specimens, Farm La Caja, Costa Rica, were labeled as types of *M. quadridentata* in the Zoologisches Museum in Hamburg, Germany, but since only Brazil was originally mentioned by Duda (1930), these specimens cannot be considered part of the type series.

New Elateridae with Notes on Eucnemidae (Coleoptera)

By J. N. Knull,[1] Ohio State University

Limonius meridianus n. sp.

Male. Form, size and color of *L. stigma* (Hbst.); black, head and pronotum with slight bronze luster, base of elytra and humeral angles reddish brown, tarsi light brown, both surfaces moderately pubescent.

Head with front somewhat depressed above clypeus, clypeal margin broadly arcuate; surface coarsely, densely punctured; antennae extending less than one segment beyond hind margins of pronotum when laid along side; scape stout, finely, densely punctate; second and third segments about equal in length, each longer than wide, together slightly longer than fourth; segments four to ten inclusive longer than wide, serrate; eleventh oval

[1] Contribution from Department of Zoology and Entomology.

Pronotum longer than wide, narrower at apex than at base; sides broadly rounded in front, sinuate behind middle, hind angles obliquely truncate; disk convex, depressed in front of scutellum, hind angles strongly carinate, surface coarsely, densely punctured, punctures in middle separated by less than their own diameters. Scutellum finely, densely punctate, pubescent.

Elytra with sides subparallel, broadly rounded in apical third to suture; disk convex; surface with striae coarsely punctured, punctures decreasing in size toward apex, separated by less than their own diameters, interspaces convex, densely, finely punctate.

Prosternal sutures grooved in front. Abdomen beneath densely, finely punctate.

Length 8.5 mm.; width 2.4 mm.

Female. Antennae extending over one and a half segments beyond middle of pronotum.

Holotype: ♂, labeled Old Man's Cave, Hocking Co., OHIO, May 17, 1936; *allotype*, Clifton Gorge, Ohio, May 30; *paratype* from Clifton, Ohio, June 4, 1940, all collected by D. J. & J. N. Knull and in collection of author.

Paratypes in H. W. Wenzel collection, Ohio State University from Charleroi, Pa., Ehrman and Cranberry, N. C., June 9–19, H. W. Wenzel.

This species would run to *A. crotchi* Horn in Van Dyke's key,[2] however punctures of pronotum are not as coarse in the new species. It has been confused with *L. stigma* (Hbst.) in our collection. The grooved prosternal sutures will separate it.

Limonius pubicollis Lec.

Trans. Amer. Philos. Soc., 1853: 429.

This species appears in Leng's list as a synonym of *L. auripilis* (Say) from which it differs as follows: reddish brown area at base of elytra more evident, lacking in some *auripilis;* dorsal surface less shining; legs darker, same color as ventral surface; light brown and lighter than ventral surface in *auripilis*. Clypeus less deeply emarginate, forming a more obtuse angle along

[2] E. C. Van Dyke, 1932, Proc. Calif. Acad. Sci., vol. 20: 334.

margin. Elytral intervals more densely punctate, punctures narrowly separated, giving elytra an opaque appearance.

Specimens examined are from South Carolina, Georgia, Florida, Texas and Oklahoma.

Mr. John Wilcox kindly compared specimens with the LeConte type for me.

Limonius olentangyi n. sp.

Female. Short, rather robust; shining, black, outer margin of elytra and legs dark brown; pubescence conspicuous especially on dorsal surface.

Head with front coarsely, densely punctured; clypeal margin broadly arcuate; antennae not extending to hind angles of pronotum when laid along side, scape stout, second and third segments of equal length, short, together slightly longer than fourth, segments four to ten inclusive longer than wide, serrate, eleventh longest.

Pronotum longer than wide, widest back of middle, wider at base than at apex; sides broadly rounded in front, sinuate at base, side margin visible for its entire length from above; hind angles obliquely truncate; disk convex, median depression in front of scutellum, carinae of hind angles faint; surface finely punctate, punctures separated by more than their own diameters in middle, dense at sides. Scutellum densely finely punctate and pubescent.

Elytra with sides subparallel, broadly rounded in apical third to suture; disk flattened in middle; surface striate, punctures small, well separated, interspaces finely, triseriately punctate.

Prosternal sutures grooved in front. Abdomen beneath finely, densely punctate.

Length 8.7 mm.; width 2.7 mm.

Holotype: ♀, collected in Delaware Co., OHIO, May 30, 1945 by D. J. & J. N. Knull, in collection of author.

This species would run to *L. confusus* Lec. in Van Dyke's key. It can be distinguished by its black color, short, more robust form, wider and less convex finely punctate pronotum.

Ludius robinsoni n. sp.

Male. Superficially resembling *L. bivittatus* (Melsh.) in size, form and color. Color dark brown, apex and base of pronotum, base of elytra and wide stripe down each elytron, yellowish brown; legs lighter than ventral surface; moderately pubescent.

Head densely coarsely punctured; antennae extending over three segments beyond hind angles of pronotum, second segment shorter than third, fourth longer than third, segments four to ten inclusive gradually lengthening, eleventh longest.

Pronotum much longer than wide, widest at base, constricted at apex; sides broadly rounded in front, divergent posteriorly, hind angles prolonged, angles obtuse; disk convex, a slight depression each side at base, hind angles faintly carinate; surface densely, coarsely punctured. Scutellum with sides subparallel, broadly rounded posteriorly.

Elytra with sides, subparallel, broadly rounded posteriorly, apices rounded; disk convex; surface with rows of coarse, closely placed punctures, diminishing in size toward apex, interspaces convex, minutely punctured.

Abdomen beneath, densely, finely punctate.

Length 9 mm.; width, 2.3 mm.

Holotype: ♂, labeled Dallas Co., TEXAS, May 11, 1934, J. Robinson collector. *Paratypes* same locality May 10–16.

This species is evidently confused with *L. bivittatus* (Melsh.) in collections. It differs by being slightly shorter, pronotum in greater part dark, lacking median and lateral light stripe; hind angles less divergent, angles more obtuse, side margin not so well marked, and third segment of antenna being considerably shorter than fourth.

It would run to *L. bivittatus* (Melsh.) in Van Dyke's key.[3]

Isorhipis ruficornis (Say)

Larvae were found in sapwood of a barked, partly decayed sugar maple (*Acer saccharum* Marsh.) log in Delaware Co., Ohio, March 2. Adults were ready to emerge April 19.

[3] E. C. Van Dyke, 1932, Proc. Calif. Acad. Sci., vol. 20: 390.

Deltometopus amoenicornis (Say) and **rufipes** (Melsh.)

Reared from badly decayed American beech (*Fagus grandifolia* Ehrh.) log from Delaware Co., Ohio. The species overwinters in larval stage.

Dirhagus pectinatus (Lec.)

Reared from badly decayed American beech log from Delaware Co., Ohio.

Nematodes penetrans (Lec.)

Reared from fallen limb of American beech from Delaware Co., Ohio. Adults are capable of snapping into the air.

A New Species of Taphrocerus (Coleoptera: Buprestidae)

By Burdette E. White, Merced, California

While sweeping a meadow of rushes in northwestern Merced County on April 18, 1946, this writer collected a single female specimen of *Taphrocerus*. Considerable effort failed to reveal any additional specimens at this time. After reviewing Professor Knull's paper on the *Taphrocerus* * it became apparent that this specimen belonged to an undescribed species. However, a male was necessary to establish this with certainty. Another trip to the area on April 22, 1946, yielded two more examples, one being a male, whose genitalia proved conclusively that here indeed was a new form. Two more females were collected on April 27 but three trips shortly thereafter produced no additional specimens, so it seemed that this was an early season form. With only five examples in hand, but with the prospect of obtaining additional material the following year, it appeared desirable to postpone publication of this find.

Two trips to the same area in early spring (March 23, April 1) of 1947 yielded nothing. However, on April 12, a series of

* Knull, J. N.—The Ohio Journal of Science, 1944, Vol. XLIV, 2, 90–93.

fourteen specimens was collected after two hours of vigorous sweeping. Ten additional examples were obtained the next day and two more on April 19. These records plainly indicate the seasonal range of this species.

Although there has been dubious reference to the existence of *Taphrocerus* in California, the writer believes that these specimens represent the first authentic record of that fact.

Taphrocerus mercedensis, new species

Male: Shining black throughout; three times as long as wide, pronotum at basal angles distinctly wider than elytra; surface sparsely, feebly pubescent without tendency to form concentrated patches; elytral apices smooth along the margin.

Head convex, front feebly concave vertically due to slight median depression; surface finely alutaceous with large, shallow punctures separated by a distance equal to their own diameters on the vertex; punctures more sparse on the front between upper two-thirds of eyes; front at lower third of eyes more densely punctate and noticeably more pubescent than upper head surface; each puncture normally with a short, appressed hair; front between lower third of eye slightly depressed.

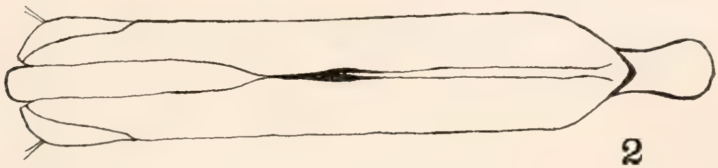
Pronotum two times as wide as long, widest at basal angles, gradually narrowing to apex to become equal to width of head; depressed across basal third; surface finely alutaceous with large, shallow punctures moderately dense over basal depression, along sides and across apex; punctures widely separated on disc; each puncture with a fine, short, appressed white hair. Scutellum triangular, glabrous, impunctate.

Elytra narrower than base of pronotum, sides constricted at basal third narrowly exposing abdominal sclerites along middle third; gradually narrowing from middle to near apex, then sharply rounded to suture; apices even (not serrulate); surface rather strongly alutaceous but shining; with coarse punctures arranged in rows and becoming less coarse posteriorly; the margin of each puncture somewhat rugose; each puncture normally with an appressed short, white hair.

Ventral surface alutaceous, shining; with large, shallow punctures; punctures with an appressed white hair.

Length 3.35 mm., width 1.25 mm.

Female: Differs from male by having the front area between lower third of eyes very much less pubescent. Strikingly similar in all other aspects.



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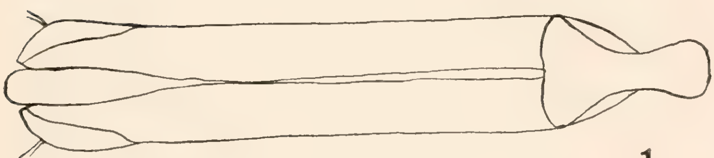

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Male genitalia of *Taphrocerus mercedensis.*

1. Ventral view. 2. Dorsal view.

Holotype male and *allotype* collected two miles east of Cressey, Merced County, CALIFORNIA on April 12, 1947 by Burdette E. White. Twenty-nine paratypes (thirteen males and sixteen females) collected at the same locality (dates cited above).

All specimens were swept from an association of *Juncus balticus* Willd. and *Carex densa* Bailey (determined by the author); the majority of the beetles were from the latter plant but there is no positive evidence that either is the true host.

Holotype, allotype, and paratypes are in writer's collection. Paratypes are deposited in the following collections: J. N. Knull; California Academy of Sciences; American Museum of Natural History; U. S. National Museum; J. J. du Bois; Academy of Natural Sciences at Philadelphia; Museum of Comparative Zoology at Cambridge; C. A. Frost; and William Barr.

Taphrocerus mercedensis is readily separable from all other species by the distinctive male genitalia (see accompanying figures). However, it is also quite unique in its smooth elytral apices, its broader thoracic base, and its general form. It is the size of *T. huachucanus* Knull but its form and color as well as its vestiture and male genitalia are quite different. The male genitalia are most similar to *T. howardi* Obenb.

So far as the writer is aware, *mercedensis* is found only in the San Joaquin Valley of California and its present recorded range is extremely narrow. However, later surveys may show its existence over a much wider area.

New Skipper Records for the United States

By H. A. Freeman, Pharr, Texas

After three years of collecting in the Rio Grande Valley of Texas the writer has come to the conclusion that many of the species of butterflies that occur in the vicinity of Victoria, Tamps., Mexico, will eventually be found to stray up around Pharr, Texas. Many of these species have been found to be native to this area, while others occur here only as stragglers. During 1944–45 the beautiful species, *Astraptes fulgerator* Walsh, was found to be very common and it was not unusual for the author to go out and collect as many as thirty or forty specimens in one afternoon. During the past year the writer has been unable to get more than two specimens. The past twelve months have been very dry here and this may account partially for the scarcity of that species. During 1946 over a hundred specimens of *Lerodea tyrtaeus* Ploetz were collected, thus establishing the fact that this species is very definitely native to this part of the state. Some of the other species of skippers that have been recorded from down here have failed to show up since the single specimen of each was caught. Examples of such stragglers are *Astraptes hopfferi* (Ploetz), *Astraptes anaphus* (Cramer), *Pellicia bromias* G. & S., and *Celaenorrhinus fritzgaertneri* (Bailey). Two of these species are very powerful flyers and could have very easily flown up from Mexico, namely *hopfferi* (Ploetz) and *anaphus* (Cramer), whereas, although the other two are swift of wing, it is more likely that they emerged from their chrysalides somewhere in this area as the specimens were very fresh when collected. Possibly, later studies of this part of Texas will result in the finding of more specimens of all four species.

Aguna asander form **panthius** (H.-S.)

This form differs from typical *asander* (Hew.) in the following way: *Asander* has a well defined silver stripe on the lower surface of the secondaries, extending from the costal margin nearly to the bottom of the wing; form *panthius* has this stripe reduced to a very narrow gray band and the silver is heavily overscaled with purplish-gray scales. Mr. E. L. Bell informed the writer that this form occurred wherever the typical species was found.

In the examination of some insects collected by members of the writer's class in entomology at the Pharr-San Juan-Alamo High School, a fresh male specimen of this form was found. It was collected by Richard T. Hall and Belva Jean Norman, October 21, 1946, at Pharr, Texas. This is the first record of this form having been collected in the United States.

Pellicia costimacula H.-S.

This species resembles *Pellicia bromias* G. & S. in some respects but can be distinguished at once by the absence of subapical spots. It is somewhat smaller than *bromias* and slightly darker.

The writer caught a fresh male specimen of this species ten miles south of Pharr, Texas, November 28, 1946. This is the first record of this species having been caught in the United States.

Gorgythion begga pyralina (Moschler)

There has been considerable confusion centered around the exact status of *begga* (Prittw.) and *pyralina* (Mschlr.). Some authors consider the two to be specifically distinct, whereas others consider *pyralina* to be a form of *begga*. In its extreme southern range, Central America to southern Brazil, *pyralina* does occur as a form of *begga*, whereas in its more northern range, northern Mexico, *pyralina* takes on a subspecific status as all of the specimens that the writer has seen from that part of Mexico lack the decided white area around the anal angle on the lower surface of the secondaries that characterizes *begga*.

While collecting with Dr. C. D. Michener, of the American Museum of Natural History, twelve miles south of Pharr, Texas, the writer caught a female specimen of *pyralina*, on March 31, 1946. This is the first recorded evidence of the genus *Gorgythion* occurring in the United States.

To sum up the seventeen new skippers recorded for the United States published by the writer, the following two divisions are made:

Species that are native to the Rio Grande Valley of Texas:

Astraptes fulgerator (Welsh) *
Spathilepia clonius (Cram.)
Carrhenes canescens (Feld.)
Lerodea tyrtaeus Ploetz
Lerodea edata (Ploetz)
Synapte malitiosa (H.-S.)

Species that are strays or else poorly established in the Rio Grande Valley of Texas:

Urbanus doryssus (Swains.)
Urbanus auginus auginulus (G. & S.)
Aguna asander (Hew.)
Aguna asander form *panthius* (H.-S.)
Astraptes anaphus (Cram.)
Astraptes hopfferi (Ploetz)
Pellicia bromias G. & S.
Pellicia costimacula H.-S.
Celaenorrhinus fritzgaertneri (Bailey)
Gorgythion begga pyralina (Mschlr.)
Pericharcs phocion dolores (Reak.)

* First recorded by W. D. Field, Jour. of the Kansas Ent. Soc., vol. 13: April 1940; no. 2, page 57.

Current Entomological Literature

COMPILED BY EDWIN T. MOUL, RAYMOND Q. BLISS, CHARLES HODGE IV, MAURICE E. PHILLIPS, JOHN W. H. REHN AND HENRY K. TOWNES, JR.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, 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.

This list gives references of the current or preceding year unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

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 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. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

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A Revisional Study of the Euptychia pyracmon Group

By Ralph L. Chermock, Ithaca, N. Y.

Doctor Nabokov, in 1942,[1] published the results of his studies of *Neonympha henshawi* and its relatives in the United States. In studying this work, I became interested in the suggested classification and tried to correlate his findings with the Mexican and Central American members of the group and to corroborate and supplement his data on the distribution of those species found in the United States. This study was facilitated by the coöperation of Dr. Walter Sweadner of the Carnegie Museum, who kindly permitted me to study its extensive series; Dr. C. D. Michener, who loaned me material from the collection of the American Museum of Natural History; Mr. William D. Field, who loaned me specimens of Central American species from the collection of the U. S. National Museum; Mr. F. H. Chermock, whose collection was helpful in providing additional data on distribution; Mr. Don. B. Stallings, who kindly furnished me with paratypes of *Euptychia gemma freemani* and its form *inductura;* Mr. Louis Schellbach, who sent me topotypes of *Euptychia dorothea dorothea;* Mrs. R. L. Chermock, who collected extensive series in southeastern Arizona for study; and Dr. W. T. M. Forbes of Cornell University, whose suggestions proved to be most valuable and helpful. To all of these, I offer my sincerest thanks.

The genera *Neonympha, Megisto,* and *Euptychia* were erected by Hübner simultaneously in 1818, in his "Verzeichniss bekannter Schmettlinge," the latter having "page priority." *Cissia* Doubleday, 1848, has also occasionally been used as applying to members of this group. Felder described the genus *Cyllopsis*

[1] Psyche, vol. XLIX, nos. 3–4.

in 1869, in Verh. Zool.-Bot. Gesellsch. Wien, vol. 19, p. 474, the genotype being *C. hedemanni* Felder, 1869, by monotypy. After studying the genotypes of these five genera, I feel that they all represent one genus, since they are extremely similar morphologically. The oldest available name is *Euptychia* Hübner, 1818 and should be applied to this genus. On the basis of genitalic structures and maculation, this genus can be further divided into two groups. The first group which includes the genotypes of *Euptychia, Megisto, Neonympha,* and *Cissia* is easily separated from the other which includes the genotype of *Cyllopsis* and the other species considered in this paper. Consequently I will refer to these species as belonging to the genus *Euptychia*, and subgenus *Cyllopsis*. Whether the remainder of this genus constitutes a single subgenus or not, I leave to future workers. However, the name *Neonympha,* which has often been applied to *pyracmon, henshawi,* etc. by other authors, is incorrect; and the name would more appropriately be considered as a synonym of *Euptychia*.

I have also studied the genotype of *Taygetis* Hübner, 1816, which is *mermeria* Cramer 1779, along with related species; and I am inclined to include this genus also in *Euptychia*, although it may constitute another distinct subgenus. The genitalia are very similar to those of *Euptychia herse,* and the maculation is such that it substantiates the opinion.

Subgenus **Cyllopsis,** Felder

The upper side of both sexes has a general brown ground color, frequently with a reddish suffusion, which changes to yellow in *philodice*. Two black marginal spots are usually present on the secondaries, one between M_1 and M_2, the other between M_2 and M_3. In some specimens, only one spot is present, that between M_2 and M_3; while in other specimens, an additional spot is found between M_3 and Cu_1. These marginal spots are not found in any other Euptychias. The males of many of the species have an androconial patch extending from the inner margin of the primaries to the end of the cell. On the lower surface, the primaries are crossed by four dark transverse lines (see figure 2): the first discal passing through the cell; the second discal passing around the end of the cell; a submarginal band distal to this; and a marginal band along the outer margin. On the secondaries, these bands still persist but are usually less well defined; and the submarginal band is heavily marked with silver. The marginal spots of the upper surface are ocellate on the lower surface, often pupilled or surrounded with silver. In many species, these spots are bordered basally by a blue-white patch traversed by fine striae. This maculation may be designated as a *marginal patch* and does not occur in other Euptychias. The male genitalia of *Cyllopsis* (see figures 3–11) are basically similar to those of the other Euptychias with the exception of the structure of the socii. In *Cyllopsis,* the socii are short, unarticulated, and curved concavely upward. In all other Euptychias (see figures 1 and 12) and Taygetis studied, which included the various genotypes, the socii are articulated at the base; the tips are strongly directed upwards, often extending dorsad to the uncus, and are either straight or reversely curved. The distinctive genitalic characters coupled with the basic pattern differences are the most diagnostic features of this subgenus.

In contrast to the studies of Dr. Nabokov, my observations have convinced me that the names he listed constitute only two species. In addition, I include several species not considered in Nabokov's paper, in the subgenus *Cyllopsis,* and will discuss my conclusions in the following pages.

Euptychia pyracmon Butler, was described from Oaxaca, Mexico, and, on the basis of specimens examined and records in Godman and Salvin, ranges from Chiriqui, Panama, north to southern Mexico. A specimen examined from Guatemala, collected by Schaus and now in the Carnegie Museum, agrees very well with Godman and Salvin's figure of typical *pyracmon* on Plate 107, figures 11 and 12, and is used as a basis for comparison. Nabokov recorded *pyracmon* from Palmerlee, Cochise Co., Arizona; Globe, Gila Co., Ariz.; and Paradise, Ariz. The author has, in his collection, a specimen from Palmerlee which agrees perfectly with Nabokov's description and comes from the same locality as the plesiotype of that species in the American Museum. On the upper side, it differs from the Guatemalan specimen by having smaller, less accentuated, paired marginal spots on the secondaries. On the lower surface, the basic pattern is identical in color and shape of markings, although the transverse bands of the Guatemalan specimen are much more heavily accentuated and broader. The Guatemalan specimen agrees with the original description of *pyracmon*, comes from an area nearer the type locality, and I consider it as being more typical than the Arizona specimens. *Euptychia hilaria* described by Godman and Salvin is a synonym of *pyracmon* as far as I can determine from the original description.

E. pyracmon is a polytypic species, the typical form being found in the area cited above, while *henshawi* (Edwards) represents the northern subspecies found in southern Arizona and extending south into Sonora. The basic patterns of the two are similar, with *henshawi* tending to have more red on the upper surface and less intense transverse bands on the underside. The genitalia of *pyracmon* and *henshawi* (see figure 3) are identical save that the uncus of the latter is proportionally slightly longer. The *pyracmon* of Nabokov is nothing more than a color form of *p. henshawi* within the limits of the range of variation of that subspecies.

Euptychia pephredo Godman and Salvin, is found in southern Mexico and Guatemala; and specimens from the latter country were used for comparison. Although this species exhibits certain characters similar to *pyracmon,* to which it is undoubtedly closely related, it can readily be distinguished by the characters given in the key. The male genitalia of *pephredo* (see figure 5) have a much shorter valve and uncus. The distributions of the two species overlap, but each species apparently remains distinct with no interbreeding.

E. dorothea. Nabokov distinguished another species belonging to this group which he named *dorothea,* and the evidence I have substantiates his findings. *Maniola,* however, which he described as a distinct species, is only a subspecies of *dorothea.* Biologically, *dorothea* is distinct from *henshawi* although their ranges overlap. The latter is definitely double-brooded in Arizona, one brood occurring in June and the other in late August and early September. Intensive collecting by Mrs. R. L. Chermock in the areas where both species were flying together in June, yielded large series of *henshawi* but no *dorothea* in the fall. On the basis of maculation, the two may also be separated by the characters mentioned in the key. The genitalia of *dorothea, maniola, edwardsi* (see figure 4), and *avicula* are all identical.

I have in my collection topotypical material of all of the subspecies of *dorothea* described by Nabokov. *Dorothea* came from Grand Canyon, Arizona; *edwardsi* from Gila Co., Ariz.; *avicula* from Fort Davis, Texas;[2] and *maniola* from the Chiricahua Mts., Ariz. *Maniola* is the most distinctive member of this polytypic species and represents the subspecies found in the Chiricahua, Santa Rita, and Baboquivari ranges of southeastern Arizona. However, the characters given by Nabokov to separate the remaining subspecies vary tremendously and can be found in any population throughout the range of distribution. Although there exist certain trends in these variations, they are insufficiently limited to any geographical area to merit subspecific designation. For this reason, I believe it wiser to consider them as synonyms. The intensity of the transverse markings on the underside of the wings and the extent of the red suffusion on the upper side vary in all populations, and no constant diagnostic features can be found. *Maniola*, however, is relatively constant and can be recognized by the characters given in the key.

Nabokov also emphasized in his work the importance of the distribution of the androconial patches in the male. This character, as in many Satyrids, is subject to great variation; and the stress which was placed on their distribution in separating *henshawi, pyracmon, maniola,* and *dorothea* was found to be unjustified. The most reliable character, I found, for species determination was the male genitalic structures, coupled with the actual basic pattern, not color or intensity.

Euptychia gemma Hübner, is also a member of this subgenus, exhibiting the same basic pattern of maculation and genitalic structure (see figure 6). However, its diagnostic specific

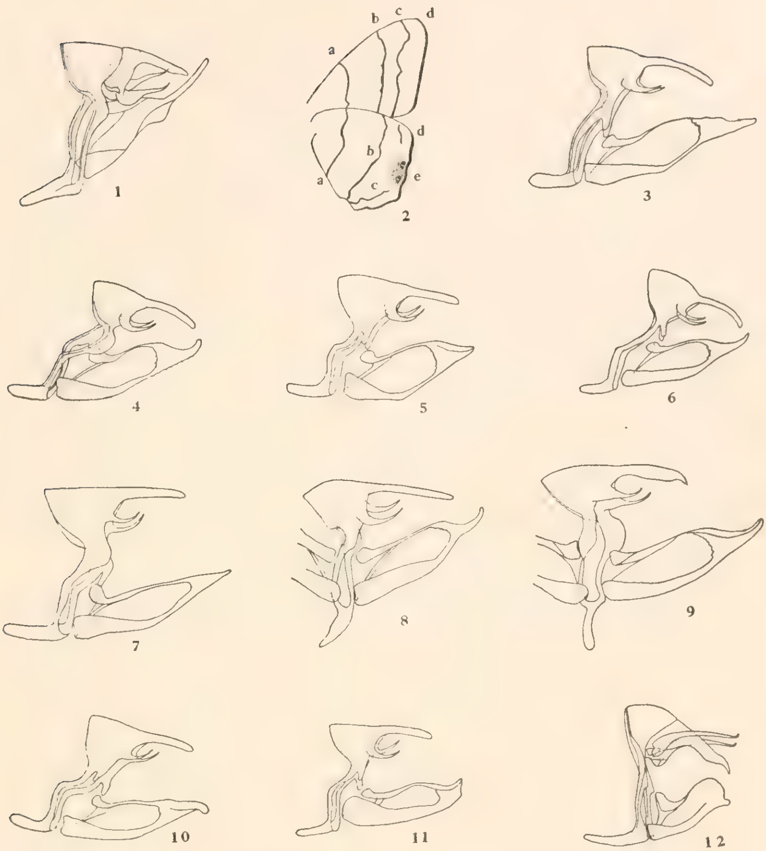
[2] Wind in Pan. Pac. Ent. redescribed this subspecies naming it *texana* from the same locality, thus automatically making it a synonym.

characters given in the key make it easy to recognize. It ranges throughout southeastern United States into Texas. In the tropical belt around Brownsville and Pharr, Texas, it occurs as the subspecies *freemani* Stallings and Turner, extending south along the coast into Mexico. The genitalia of *freemani* and *gemma* are identical, but the characters of maculation and color are sufficient to separate them. *Freemani* represents the winter brood, but Stallings and Turner also separated the summer brood giving it the form name *inductura*. As I feel that variation within a population, whether it be due to environmental influences or the expression of slight genic differences, does not deserve recognition in our nomenclatural system, I am considering it as a synonym. This summer brood is extremely close to typical gemma in its general characters, although the brighter ground color of the wings, along with the slightly heavier transverse bands, can be used to distinguish it. The typical winter form is more easily recognized, having dark, broad, transverse bands and a yellowish suffusion on the lower surfaces.

It is advisable to mention here two specimens which I have had the privilege of examining, each representing an undescribed species. Although I believe it is usually inadvisable to base descriptions on single specimens, I feel that these have sufficiently diagnostic characters to justify their being named.

Euptychia (Cyllopsis) nayarit, new species

Length of wing measured from base to the apex of the primaries, 177 mm. In general, the appearance, color, and maculation of the upper surface, similar to *gemma,* but possessing a well defined androconial patch on the primaries. Lower surface of secondaries: the metallic markings are reduced; the second discal band is heavily margined distally with bright yellow-orange; this same color is found on the submarginal band between M_3 and Cu_1, and on the marginal band; the marginal patch is smaller than in *gemma*, extending only halfway to the second discal band as in *maniola*. The genitalia have a short, straight uncus; and the valves have a distinct process on the lower portion of the tip (see figure 10), not found in any other



Explanation of Figures

1. *Euptychia* (*Euptychia*) *hermes,* Venezuela, R. Chermock Collection. 2. Diagrammatic drawing of lower surface of *E. pephredo: a,* first discal band; *b,* second discal band; *c,* submarginal band; *d.* marginal band; *e,* marginal patch. 3. *E. pyracmon henshawi,* Santa Rita Mts., Ariz., R. Chermock Col. 4. *E. dorothea dorothea,* Globe, Ariz., R. Chermock Col. 5. *E. pephredo,* Guatemala, Carnegie Museum Col. 6. *E. gemma,* Crailhope, Ky., R. Chermock Col. 7. *E. rogersi,* Los Bajos, C. R., U. S. Nat. Mus. Col. 8. *E. argentella,* Mt. Poas, C. R., U. S. Nat. Mus. Col. 9. *E. philodice,* Turrialba, C. R., U. S. Nat. Mus. Col. 10. *E. nayarit,* Type, Cornell Col. 11. *E. pseudopephredo,* Type, Am. Mus. Nat. Hist. Col. 12. *E. herse,* Brazil, Cornell Col.

members of *Cyllopsis.* Apparently, this species is between *gemma* and *pephredo.*

Type: Male, Compostela, Nayarit, Mexico, Oct. 30, 1942. Cornell University Collection.

Euptychia (Cyllopsis) pseudopephredo, new species

Length of forewing, 17 mm. General ground color of upper surface same as in *gemma,* and also lacking the androconial patch on the primaries. The hind wings, however, are slightly more angulate, suggestive of *pephredo.* The ground color of the lower surface is yellowish-tan, traversed by short, heavy, dark striae. The transverse bands are well defined. Lower surface of secondaries: the marginal patch is reduced as in *pephredo;* the second discal band is slightly margined distally with yellow. The male genitalia are distinct (see figure 11), the valves being relatively broad and terminated by a bluntly upturned tip. This species is fairly closely related to *pephredo* although the genitalia seem to indicate specific distinction.

Type: Male, S. Angel, D. F. Mexico, June 1910 (C. C. Hoffmann), collection of the American Museum of Natural History, New York City.

Euptychia hedemanni, of which I have two specimens before me from the U. S. National Museum, ranges from southern Mexico to Guatemala and Costa Rica. It is the largest member of this subgenus, wing length 22–26 mm. The primaries tend to be falcate, the secondaries angled, with a somewhat crenulate margin. Other characters which can be used to identify the species are given in the key. Although somewhat modified in appearance from the majority of the members of this subgenus, its genitalic characters, coupled with its basic maculation, indicate its close relationship. Mr. Field of the U. S. National Museum was also kind enough to lend me specimens of *rogersi, argentella,* and *philodice* from Costa Rica, all of which belong to *Cyllopsis;* and their distinctive characters are also outlined in the key. Their genitalia are represented in figures 7 to 9.

I have been unable to obtain specimens of *Euptychia nelsoni* or *E. clinas* for study. However, there is no question in my mind that they are also referable to *Cyllopsis,* and the characters included in the key are based on Godman and Salvin's illustrations of the types. It appears that *clinas,* which comes from Guerrero, Mexico, is more closely related to *hedemanni; nelsoni,* which was described from Cerro de Zunil, Guatemala, is probably a subspecies of *philodice.*

Key to the Species and Subspecies of Cyllopsis

**Marginal patch on lower surface of secondaries incomplete: the ocelli are not divided; no patch basal to the ocelli contrasting with the ground color of the wing.*

1. Apex of primaries angulate, outer margin strongly concave. Average length of forewing measured from base to apex usually greater than 22½ mm........................2

   Apex of primaries never angulate, outer margin either straight or convex; length of forewing less than 22 mm..........3

2. Cu_1 of hindwing elongated into a short broad tail; a single marginal eyespot between M_3 and Cu_1 on both surfaces of secondaries. Upper surface: mouse brown, with second discal band pinkish. Lower surface: first and second discal bands straight; area between base of wing and first discal, and also between discal and submarginal bands, lighter and yellowish in color.........................*hedemanni*

   Outer margin of hind wing round, slightly crenulate; anal angle elongated into a broad point; 2–3 marginal dark spots on upper side of secondaries. Lower surface of secondaries: 2 well developed marginal ocelli between M_2 and M_3, M_3 and Cu_1; first and second discal bands irregularly jagged; area between second discal and submarginal bands pale in color..................................*clinas*

3. Upper surface: 1 black marginal spot between M_2 and M_3, occasionally a smaller one between M_1 and M_2; color, mouse-brown. Lower surface of secondaries: a single well developed ocellus between M_2 and M_3; occasionally a rudimentary one between M_1 and M_2; silver band incomplete *rogersi*

   Two subequal marginal spots on both surfaces between M_2 and M_3, and M_3 and Cu_1, sometimes very reduced in the females 4

4. Lower surface of secondaries: a broad, straight, yellow-white band, 2 mm. in width, distal to second discal band; marginal ocelli of female reduced; silver submarginal band broken...5

No broad yellow band on secondaries; marginal eyespots of female not markedly reduced..........................6

5. Bright yellow markings on upper side of secondaries distal to the second discal band. Lower surface of primaries: area between second discal and submarginal bands heavily tinged with yellow-white..............*philodice philodice*

No bright yellow markings on upper surface. No yellow-white between second discal and submarginal bands on lower surface of primaries..............*philodice nelsoni*

***Marginal patch on lower surface of secondaries well developed consisting of two marginal eyespots, each in turn bisected, lying between* M_2 *and* M_3, *and* M_3 *and* Cu_1; *bordered basally by a pale colored patch, often bluish, and traversed by fine striae.*

6. Lower surface of secondaries: second discal band bordered distally by irregular, dentate, orange-yellow markings; the submarginal band bordered basally by similar markings..7

Second discal and submarginal bands not bordered with orange-yellow, marginal patch, bluish white............9

7. Outer margin of primaries straight; outer margin of secondaries straight from Sc to M_3, giving them an angulate shape. Lower surface of primaries: second discal band straight and parallel to outer margin, curving abruptly basad to meet the costal margin; submarginal band well developed, the central portion bowed away from the outer margin. Male with an androconial patch; genitalia as in figure 5. Wings brownish-gray above.........*pephredo*

Outer margin of primaries convex; secondaries very weakly angulate. Lower surface of primaries: second discal and submarginal bands parallel, usually very weakly developed. Wings delicate; mouse-gray above....................8

8. Male with an androconial patch, genitalia as in figure 10. Lower surface: cross bands narrow, reddish in color; wings brownish with very few dark striations...........*nayarit*

Male without androconial patch, genitalia as in figure 11. Cross bands broad, though incomplete, brown in color. Ground color of lower surface yellow-tan, traversed by numerous heavy striae..................*pseudopephredo*

9. No androconial patch in male; wings on upper surface homogeneous gray or gray-brown; body and wings delicate; genitalia as in figure 6; length of primaries in males, 15–17 mm.; in females, 17–20 mm........................10

Male with an androconial patch; wings on upper surface of a brownish-gray color, with some red suffusion on both surfaces. Transverse bands on lower surface usually with brick-red suffusion. Length of primaries in males, 18–22 mm.; in females, 18–25 mm. 11

10. Ground color on upper surface brownish-gray, lower surface also brownish-gray, sometimes suffused with yellowish; transverse bands frequently heavy and complete *gemma freemani*

Ground color on both surfaces grayish, rarely having a brownish cast on lower surface; transverse bands usually weakly developed . . . . *gemma gemma*

11. The second discal band of the lower surface of secondaries straight, outwardly toothed, extending to the costal margin where it connects with the second discal of the primaries. The valves of the male genitalia terminate in a point as in figure 3 12

The second discal band on the lower surface of secondaries irregularly curved away from the outer margin and extending to the costa where it appears to meet the submarginal band of the primaries. The valves of the male genitalia terminating in a dorsally turned hook as in figure 4 13

12. Transverse bands on lower surface of primaries well defined, brownish in color. Upper surface: male ground color more or less homogeneous brown with only a slight suffusion of red . . . . *pyracmon pyracmon*

Transverse bands on under side of primaries reddish; the first and second discal thin; subcostal almost obsolescent consisting of a row of small, thin, disconnected spots. Both sexes usually suffused with red on the upper surface *pyracmon henshawi*

13. The marginal patch basal to the ocelli on lower surface of secondaries is bright gray, traversed by regular dark striae, and extends to or almost to the second discal band *dorothea dorothea*

The marginal patch of the underside of secondaries extends only halfway to the second discal band, with very little gray, but more of the ground color invading the area, and is traversed only by a few irregular dark striae *dorothea maniola*

Checklist of Subgenus Cyllopsis

Genus *Euptychia* Hübner, 1818, Ver. Bekannt. Schmett., page 54. Genotype: *Papilio herse* Cramer, 1775.

Subgenus *Cyllopsis* Felder, 1869, Verh. Zool.-Bot. Gesellsch. Wien, vol. 19, p. 474. Genotype: *Cyllopsis hedemanni* Felder, 1869.

gemma gemma (Hübner) Zutr. Ex. Schmett., 1818, f. 7, 8.
gemma freemani (Stallings & Turner) 1946, Can. Ent., vol. 78, p. 136.
Synonym as form *inductura* (Stallings & Turner) ibid.
dorothea dorothea (Nabokov) 1942, Psyche, vol. 49, p. 64.
Synonym *edwardsi* (Nabokov) ibid. p. 66.
Synonym *avicula* (Nabokov) ibid. p. 67.
Synonym *texana* (Wind) 1946, Pan. Pac. Ent., vol. 22, p. 27.
dorothea maniola (Nabokov) 1942, Psyche, vol. 49, p. 68.
pephredo Godman & Salvin, 1882–1902, Biol. Cent. Am., Ins. Lep., vol. 2, p. 657.
pseudopephredo R. Chermock, in this paper.
nayarit R. Chermock, in this paper.
pyracmon pyracmon (Butler) 1866, Proc. Zoöl. Soc. Lond., p. 499.
Synonym *hilaria* Godman & Salvin, Biol. Cent. Am., Ins. Lep., vol. 2, p. 658.
pyracmon henshawi (Edwards) 1876, Trans. Am. Ent. Soc., vol. 2, p. 658.
hedemanni Felder, 1869, Verh. k.k. Zool.-Bot. Ges. Wien, p. 474.
Synonym *ithama* Butler, Lep. Ex., p. 9.
Synonym *vetones* Godman & Salvin, 1878, Proc. Zool. Soc. Lond., p. 265.
clinas Godman & Salvin, 1889, Ann. & Mag. Nat. Hist., vol. 3, p. 352.
rogersi Godman & Salvin, 1878, Proc. Zool. Soc. Lond., p. 265.
argentella Butler & Druce, Cist. Ent., vol. 1, p. 98.
philodice philodice Godman & Salvin, 1878, Proc. Zool. Soc. Lond., p. 264.
philodice nelsoni Godman & Salvin, Biol. Centr. Amer., p. 91.

Personal

Mrs. Ethel Melsheimer Miller, librarian for the Department of Entomology at the Ohio State University, has retired from active service but is planning a cumulative index of the Ohio Journal of Science and its predecessor, the Ohio Naturalist. Mrs. Miller is a great, great granddaughter of Frederick Valentine Melsheimer, one of America's entomological pioneers.

Undescribed Species of Crane–Flies from the Western United States and Canada (Dipt.: Tipulidae). Part VIII

By CHARLES P. ALEXANDER, University of Massachusetts, Amherst, Massachusetts

The preceding part under this title was published in ENTOMOLOGICAL NEWS, 58: 61–67. Most of the species discussed herewith were taken by me in California and the types are preserved in my personal collection of these flies. One further species was found in the California Academy of Sciences and was loaned to me for study by Dr. E. S. Ross, curator of the insect collections.

Tipula (Oreomyza) sequoicola new species

Size small (wing, male, less than 10 mm.); general coloration light gray, the praescutum with four narrow reddish brown stripes; claws of male toothed; wings with a pale grayish tinge; no squamal setae; cell M_1 about three times the length of its petiole; male hypopygium with the ninth tergite entirely pale, its caudal margin with a deep and narrow median notch, the broad lateral lobes truncated; outer dististyle pale, the distal third narrowed; beak of inner dististyle slender, the retracted lower beak terminating in a rounded blackened knob; eighth sternite terminating in two separate groups of long reddish setae, the apical margin between produced into a long median lobe that is only a little shorter than the setae, its surface with abundant small hairs.

♂. Length about 8.5 mm.; wing 9.5 mm.

Frontal prolongation of head testaceous yellow; nasus distinct; palpi with basal segments obscure yellow, the outer ones brown. Antennae with the scape and pedicel yellow, flagellum brown; flagellar segments with the basal enlargements only feebly indicated; segments about equal in length to the verticils. Head light gray.

Pronotum and mesonotum light gray, the praescutum with four narrow reddish brown stripes, the intermediate pair separated by a space that is wider than either stripe; scutal lobes variegated with reddish brown. Pleura and pleurotergite uniformly pale gray. Halteres with stem pale, knob darkened. Legs with all coxae pale gray; trochanters yellow; remainder of legs pale brown, the outer tarsal segments darker; tarsal claws (male) toothed. Wings with a pale grayish tinge, the short-oval stigma darker; obliterative areas inconspicuous or lacking; veins brown. Venation: *Rs* nearly twice *m-cu;* cell M_1 about three times its petiole; *m* oblique, the outer end of cell *1st* M_2 pointed; M_{3+4} short, about three-fifths as long as the basal section of M_{1+2}; *m-cu* close to the fork of *M;* cell *2nd A* wide.

Abdomen testaceous yellow, unpatterned or virtually so. Male hypopygium with the tergite entirely pale, without ventral or marginal armature; posterior border with a deep and relatively narrow median notch, the broad lateral lobes truncate, provided with short scattered setae only. Ninth sternite with its appendage a subglobular lobe that is cushioned with coarse subspinous setae. Outer dististyle elongate, pale, the outer third narrowed, the lower margin and apex with relatively short setae, the dorsal portion with fewer long coarse bristles. Inner dististyle with the beak slender, the lower beak far retracted, at base of the former, terminating in a rounded black knob; dorsal crest with the corrugations widely spaced, the setae nearest the beak very small, becoming longer and coarser outwardly; posterior crest high but very pale to hyaline, the posterior corrugations more crowded; outer basal lobe short, more or less sclerotized, near apex with three or four setae that are stronger than the others. Eighth sternite near posterior margin with two separated groups of long reddish setae; near margin between these two groups an elongate median structure, appearing as a long tail-like pale lobe, the surface with abundant short hairs.

Habitat. CALIFORNIA. *Holotype:* ♂, Sequoia National Park, Giant Forest near Sunset Camp, altitude 7000 feet, July 18, 1946 (C. P. Alexander); in grove of Jeffrey Pine, *Pinus jeffreyi* Murray, resting on trunk of this species.

This small fly seems to be most nearly allied to *Tipula (Oreomyza) mandan* Alexander, despite the unproduced basistyle of the male hypopygium. The elongate median appendage of the eighth sternite is distinctive.

Limnophila (Elæophila) nupta new species

Mesonotal praescutum gray with four brown stripes; wings relatively narrow, faintly tinged with yellow, conspicuously patterned with brown, the areas restricted to the vicinity of the veins; *Sc* short, Sc_1 ending a short distance before the fork of *Rs;* abdomen bicolored; male hypopygium with the basistyle at apex provided with a brush of long yellow setae; outer dististyle entirely blackened, the spine of the outer margin strong, the outer third of style more narrowed, with six or seven spines before the strong apical point; phallosome on either side of the small aedeagus produced into a strong black spine.

♂. Length about 6.5 mm.; wing 7.4 mm.

Rostrum and palpi brownish black. Antennae with the basal segments black, the scape pruinose, flagellum paler; antennae of moderate length; verticils longer than the oval segments. Head gray; anterior vertex broad.

Pronotum gray. Mesonotal praescutum light gray, with four dark brown stripes that are separated by narrow gray lines; pseudosutural foveae black, conspicuous; posterior sclerites of notum somewhat darker gray, the scutum weakly patterned with darker. Pleura gray. Halteres with stem pale, knob dark brown. Legs with the coxae and trochanters yellow; femora yellow basally, broken at near midlength. Wings relatively narrow, faintly tinged with yellow, more saturated in the prearcular and basal costal fields; a conspicuous brown pattern, including about six larger costal areas, the second at origin of *Rs*, and the third at tip of *Sc* relatively close together and confluent in the costal cell; other dark areas over cord, outer end of cell *1st* M_2, over the supernumerary crossvein in cell *M*, and at ends of the longitudinal veins, all dark areas being restricted to the vicinity of the veins; veins brown, slightly darker in the patterned areas, light yellow at the wing base. Venation: *Sc* short, Sc_1 ending a slight distance before the fork of *Rs*, Sc_2 about opposite two-thirds *Rs*, the latter angulated and long-spurred at origin; cell M_1 subequal to its petiole; cell *1st* M_2 small with *m-cu* at about one-third its length.

Abdomen bicolored, the bases of the segments yellow, the narrower apices dark brown, the pale color clearer on the more proximal segments. Male hypopygium with the outer apical angle of basistyle slightly produced into a blackened obtuse lobe that bears a group of long yellow setae that are subequal in length to the outer dististyle. Outer dististyle entirely blackened, relatively narrow, the spine of the outer margin strong, placed at near two-thirds the length; outer third of style more narrowed, the apex a strong curved spine with about six or seven smaller teeth on margin back from this spine. Inner dististyle an oval pale lobe with abundant pale setae but with no modified brush or pencil. Phallosome on either side of the small aedeagus produced into a strong black spine that is about three-fourths as long as the aedeagus itself.

Habitat. CALIFORNIA. *Holotype:* ♂, Yosemite National Park, Bridalveil Creek, altitude 7075 feet, July 22, 1946 (C. P. Alexander).

The most similar species is *Limnophila* (*Elæophila*) *angustior* Alexander which agrees most closely in the shape and coloration of the wings and in the general structure of the male hypopygium, including the brush of setae at apex of the basistyle. It differs in all other details of the hypopygium, including the outer dististyle and the lack of the spines subtending the aedeagus.

Elephantomyia (Elephantomyia) curtirostris new species

Mesonotum yellow, the praescutum with three brown stripes; rostrum unusually short, only about two-fifths as long as the wing; antennae black; wings with a faint yellow tinge, restrictedly patterned with brown, including very narrow seams over most of the veins; abdomen yellow, the tergites with a narrow pale brown central stripe, widened on the proximal two segments; sternites yellow, the lateral borders brownish black.

♀. Length, excluding rostrum, about 10.5 mm.; wing 10.5 mm.; rostrum 4 mm.

Rostrum unusually short, dark brown throughout, about two-fifths as long as the wing; palpi dark brown. Antennae with the scape black, sparsely pruinose; pedicel piceous brown; flagellum black; fusion-segment more than twice the length of the succeeding segment. Head light gray; anterior vertex (female) narrow, about one-fourth greater than the diameter of the scape.

Pronotum obscure yellow. Mesonotal praescutum yellow, with three brown stripes, the median one broad and distinct, the laterals more diffuse; posterior interspaces obscured; centers of the scutal lobes and the mediotergite dark brown, the scutellum darkened medially, the remainder of mesonotum yellow. Pleura yellow, with a major brown area on the mesopleura. Halteres broken. Legs with the coxae and trochanters yellow; femora yellow, the tips dark brown, broadest on the fore pair where more than the outer half is included, narrowest on the posterior legs where about the outer tenth is included; tibiae obscure brownish yellow, the tips narrowly darkened; tarsi brownish yellow, the terminal two segments dark brown; tibial spurs present. Wings with a faint yellow tinge, restrictedly patterned with brown, including pale brown cells *C* and *Sc*, a long darker brown stigma, and very narrow but evident pale brown seams over most of the veins, lacking on *1st A;* veins brown. Venation: *Sc* relatively short, the strong Sc_2 ending a short distance before the outer end of *Rs,* the weak Sc_1 at its tip; branches of *Rs* extending generally parallel to one another, diverging slightly at their outer ends; *m-cu* at midlength of the lower face of cell *1st* M_2.

Abdomen yellow, the lateral borders of the sternites brownish black, more or less interrupted on the narrow basal rings of the segments; on the seventh sternite the posterior border is similarly darkened; tergites with a delicate pale brown median line, more extensive on segments one and two, on the latter more or less hour-glass shaped. Ovipositor with the valves, especially the cerci, elongate.

Habitat. ARIZONA. *Holotype:* ♀, Chiricahua Mountains, Cochise Co., Rustler Park, altitude 8500 feet, July 26, 1927 (J. A. Kusche); California Academy of Sciences.

The present fly is very different from the other regional species, including the only other Nearctic species, the genotype, *Elephantomyia* (*Elephantomyia*) *westwoodi* Osten Sacken and rather numerous Mexican forms. From all of these it differs especially in the unusually short rostrum which is only about two-fifths as long as the wing.

A New Species of Hippomelas with Notes on Two other Buprestidae (Coleoptera)

By J. N. KNULL, Department of Zoology and Entomology, Ohio State University, Columbus, Ohio

Hippomelas brunneata n. sp.

Female. Short, robust; head, prothorax, scutellum, ventral surface and legs dark bronze, elytra brown, pubescence short, inconspicuous, irregularly clothed with white flocculent material.

Head convex, median line on vertex extending down front; clypeus deeply, broadly emarginate; surface densely, finely punctured; antennae extending beyond middle of pronotum when laid along side, scape stout, second segment longer than wide, third as long as fifth and sixth taken together, fourth shorter than third, segments five to ten inclusive as long as wide, eleventh with appendicle, serrate from fourth segment.

Pronotum wider than long, widest in front of middle; sides broadly rounded in front, sinuate near base, lateral margin extending from base, not reaching middle; anterior margin with broad lobe; posterior margin sinuate, median lobe broad; disk convex, a median depression separating two smooth callosities in front, transversely depressed in front of scutellum; surface irregularly coarsely punctured. Scutellum much wider than long, rounded in rear.

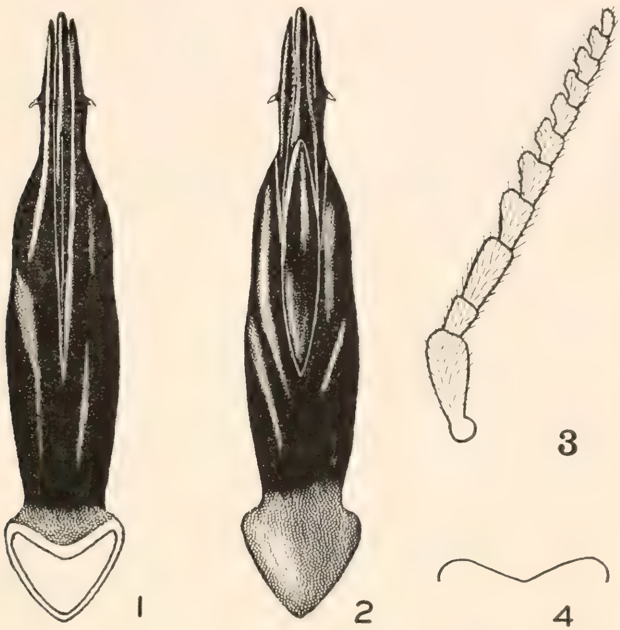
Elytra back of base wider than widest part of pronotum; sides sinuate in front, converging to subtruncate apices, serrulate on apical third; disk convex; surface densely punctured, punctures same size as those on head, indistinctly striate on apical fourth.

Abdomen beneath convex; surface finely densely punctate. Posterior tarsi shorter than tibiae, first segment as long as third and fourth together, other segments decreasing in length.

Length 13 mm.; width 4.2 mm.

Described from unique female specimen in collection of author labeled Palm Springs, CALIFORNIA, June 30, 1946, D. J. and J. N. Knull collectors.

This species is close to *H. californica* (Horn) and can be separated by its larger size, brown elytra, more deeply emarginate clypeus and wider, shorter, less parallel sided metaepisternum.



CHRYSOBOTHRIS MULTISTIGMOSA Mann.

1. Male genitalia, dorsal view. 2. Ventral view of No. 1. 3. Male antenna. 4. Clypeus.

Acmaeodera lataflava Fall

Reared from dead flower stems of *Agave consociata* Trel. collected on Pinyon Flat, Santa Rosa Mountains, California.

Chrysobothris multistigmosa (Mann.),[1] Figs. 1, 2, 3 and 4.

Colobogaster multistigmosa Mannerheim, 1837, Bul. Société Impériale des Naturalistes Mosc., 10 (8) : 82.

[1] Determination by W. S. Fisher, U. S. N. M.

Type locality of this species is Oaxaca, Mexico. Specimens are at hand from Arizona: Wickenburg, July 8, 1937, August 20, 1938; Congress Junction, July 7, and Baboquivari Mountains, Sept. 1, 1938, all collected by D. J. and J. N. Knull.

This species looks very much like *C. basalis* Lec., and will run to it in Fisher's key.[2] The male can be distinguished by the elongate third antennal segment and by the genitalia.

A Note on the Occurrence of the Flea, Corrodopsylla hamiltoni Traub, on Shrews

By W. R. Enns, Department of Entomology,
University of Missouri

On 11 March 1947, a specimen of *Cryptotis parva* Say,[1] the little short-tailed shrew, was taken at Columbia, Missouri by the writer. On this shrew several pairs of fleas were found which were determined by Major Robert Traub of the U. S. Army Medical Museum, Washington, D. C., as *Corrodopsylla hamiltoni* Traub.

This flea was described in 1944 from specimens taken on *Blarina* in Illinois. According to Major Traub, two females of the flea are known which were taken on *Cryptotis* in New York.

Mr. E. W. Jameson, Jr., of Cornell University, has informed me that he took forty-seven specimens of *C. hamiltoni* on *Cryptotis* and eight specimens on *Blarina brevicauda* at Lawrence, Douglas County, Kansas in 1946.[2]

It has not been determined whether *Cryptotis* and *Blarina* are parasitized to the same degree by this flea but in view of Jameson's records, it would appear that *Cryptotis* is the more common host. Apparently it is restricted to shrews.

[2] W. S. Fisher, 1942, Misc. Pub. U. S. D. A., 1–274.

[1] Determined by Dr. William H. Elder, Assistant Professor of Zoology, University of Missouri.

[2] To be published as part of a thesis on the prairie vole in the Museum of Natural History Publication, University of Kansas.

Some Synonymy in Coniontellus (Coleoptera: Tenebrionidae)

By Ira La Rivers, University of California, Berkeley

In 1908, Col. Thomas L. Casey described three species from a series of the nondescript genus *Coniontellus* collected in and about Reno, Nevada (Washoe County), *C. hystrix, C. longipennis* and *C. ampliatus.* Previously (1890), he had described *C. inflatus* from the same locality, also from material he had collected. The late Dr. Frank E. Blaisdell, Sr., recognized the species *longipennis, ampliatus* and *inflatus* among my material from Reno and vicinity.

In his 1908 key to the species, Casey distinguished between *hystrix-longipennis* and *inflatus-ampliatus* by integumental coloration alone, listing the first two as "castaneous in color," and the remaining two species as "black." During a familiarity of nearly fifteen years with the genus as it is represented in the Truckee Meadows (in which Reno is situated), I was led to a perusal of the status of the four described species by the facts that (a) all of Casey's descriptions seemed to be rather arbitrarily drawn up with respect to the characters used in differentiating the species, (b) all his descriptions seemed to fit equally well any and all specimens of the very large series I had accumulated, and (c) such variation in size and coloration was exhibited by my specimens, some of it obviously seasonal, as to render these characters, as used by Casey, of little taxonomic significance.

After studying several hundred specimens of the genus from in and about Reno, I am convinced that but one species is present, a species exhibiting considerable variation in size and coloration, but no more abnormal in these respects than other species of *Coniontellus* and the closely-related and much larger genus *Coniontis,* with which Casey also experimented. Castaneous specimens are merely tenerals. The synonymy should be indicated as:

Coniontellus inflatus Casey 1890
C. hystrix Casey 1908
C. longipennis Casey 1908
C. ampliatus Casey 1908

As I have mentioned before (1946), no lasting interpretation of either *Coniontis* or *Coniontellus* (and related groups) will be possible until the taxonomic possibilities presented by the chaetotaxy of larvae are thoroughly investigated. And even then, it will be a major task to correlate such larvae with the adult descriptions of Casey. A consideration of the extensive synonymy in the now large genus *Coniontis* will be reserved for a future time.

References

Casey, Thomas L. 1890. Coleopterological notices II. Ann. N. Y. Acad. Sci., 5: 307–504.

———. 1908. A revision of the tenebrionid subfamily Coniontinae. Proc. Wash. Acad. Sci., 10: 51–166.

La Rivers, Ira. 1946. On the genus Trogloderus (Coleoptera: Tenebrionidae). Ent. News, 57 (2): 35–44.

Review

Nature and prevention of plant diseases. By K. Starr Chester. 2d ed. Blakiston Company, Philadelphia, 1947. Pp. xi + 525, 224 figs. $5.00.

Entomologists that are fascinated with the complex life-histories of certain insects, e.g., *Adelges, Micromalthus,* will be amazed at the involved life-history of the organism causing stem rust of wheat that begins this text. Many other plant diseases are also described as to recognition, etiology and control. The book is a practical one but it also expounds clearly the scientific principles of plant pathology that are necessary for a true understanding of the disease-producing organisms. Some insect vectors mentioned are the leafhoppers that carry sugar-beet curly top, bees that carry fire-blight and the beetles that carry Dutch elm disease. In one instance at least, in peach yellows, the causative virus is transmitted in no other way except through the feeding of the leafhopper *Macropsis trimaculata,* in the body of which the virus must undergo an incubation period of from 8 to 28 days, after which it is found in the saliva.

The book is exceptionally well written, is concise yet very readable.—R. G. Schmieder.

Current Entomological Literature

COMPILED BY EDWIN T. MOUL AND RAYMOND Q. BLISS.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, 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.

This list gives references of the current or preceding year unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

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 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. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

GENERAL—Bailey, J. W.—Report on the status of the entomological collections in certain European museums, 1945. [5] 40: 203–12 **Blackwelder, R. E.**—The dates and editions of Curtis' British Entomology. [82] 107: No. 5: 1–27, ill. **Chamberlain, F. K.**—Frederick Edward Winters (obituary). [18] 42: 72–74. **Grensted, L. W.**—On the formation of family names. [28] 83: 137–41. **Light and Weesner**—Methods for culturing termites. [80] 106 (2745): 131. **Olsen and Davies**—The story of Syrphus weidemanni, a fly, magnified in plastic. [45] 55: 107–13. **Peyer, B.**—An early description of Drosophila. [42] 38: 195–99. **Talbot, C.**—A little-known method for preserving larvae of Lepidoptera and other insects in the dry state. [28] 83: 152. **Van Cleave and Ross**—Use of trisodium phosphate in microscopical technique. [80] 106 (2748): 194. **Weiss, H. B.**—Entomological medicaments of the past. [45] 55: 155–68. **Williams, C. B.**—The field of research in preventive entomology. (Pres. address, Assoc. Appl. Biol.) [4] 34: 175–85.

ANATOMY, PHYSIOLOGY, MEDICAL—Anon.—Dry-cleaning fluid and the kelp-fly. [45] 55: 114. **Daviault, L.**—Action de la température et de l'humidité sur la biologie de Pristiphora geniculata (Tenth ed.). [Rev. Canad. de Biol.] 6: 366–68. **Davis, R. A.**—Notes on urticating lepidopterous larvae becoming of some medical importance. [68] 22: 3–4. **Dustan, Armstrong and Putman**—The influence of air currents on the insecticidal action of DDT, benzene hexachloride, hercules toxicant 3856, and velsicol 1608. [23] 79: 45–50, ill. **Gier, H. T.**—Growth rate in the cockroach Periplaneta americana. [5] 40: 303–17. **Judd, W. W.**—The proventriculus of a ground beetle, Chlaenius sp. (Carabid). [23] 79: 58–60, ill. **Krause, J. B.**—The development of the gonads of the wood-eating beetle Passalus cornutus Fab. (Passal.). [5] 40: 172–202, ill. **Leone, C. A.**—Systematic serology among certain insect species. [12] 93: 64–71. **Murray, D.**—Some unusual forms of genitalia. [29] 59: 90, ill. **Reiter, R.**—The coloration of anther and corbicular pollen. [58] 47: 137–51, ill. **Richards, A. G.**—Studies on arthropod cuticle. [5] 40: 227–40. **Roebuck, Broadbent and Redman**—The behaviour of adult click beetles of the genus Agriotes (A. obscurus, A. lineatus and A. sputator). [4] 34: 186–96. **Russell, W. C.**—Biology of the dermestid beetle with reference to skull cleaning. [Jour. of Mammalogy] 28: 284–87. **Sautet, Levavasseur et Vuillet**—Action biologique des ultra-sons sur les culicides. [Rev. Canadienne de Biol.] 6: 179–210, ill. **Schneirla, T. C.**—A study of army-ant life and behavior under dry season conditions with special reference to reproductive functions. [2] 1336: 1–20, ill. **Simmonds, F. J.**—Improvement of the sex-ratio of a parasite by selection. [23] 79: 41–44. **Smith, R. I.**—The action of electrical stimulation and of certain drugs on cardiac nerves of the crab, Cancer irroratus. [12] 93: 72–88, ill. **Snodgrass, R. E.**—The insect cranium and the "epicranial suture." [82] 107: 7: 1–52, ill. **Squire, F. A.**—Genetic behaviour of the red form of Dysdercus discolor Walker in the West Indies. [68] 22: 5–7. **Williams, J. L.**—The comparative anatomy of the internal genitalia of some Tineoidea (Gracil-Tisch). [68] 22: 8–17, ill.

ARACHNIDA AND MYRIOPODA—Ewing and Baker—Myonyssus jamesoni a new liponyssid (Acar., Laelapt.) from Blarina brevicauda. [46] 33: 376–79, ill. (k). **Cooley, R. A.**—Dermacentor dissimilis, a new species of tick from S. Mexico. [2] 1332: 1–3, ill. **Goodnight, C. J. and M. L.**—Studies of the phalangid fauna of Central America. [2] 1340: 1–21, ill. (*); Studies of the phalangid fauna of Trinidad. [2] 1351: 1–13, ill. (*). **Grandjean, F.**—Étude sur les Samarisidae et quelques autres Érythroïdes (Acariens). [Arch. de Zool. Exp. et Gén.] 85: 1–126, ill. (*). **Grant, D. C.**— N. Amer. mites of the genus Laelaps (Acar., Parasit.). [50] 12: 1–21, ill. (k*); Redescription of a snake-infesting mite (Parasit.). Ibid.: 22–24, ill. **Moore, E. R. and G. C.**—The helminth parasites of cottontail rabbits in Alabama with notes on the Arthropod Linguatula serrata (Pentastomidae). [Jour. of Mammalogy] 28: 279–84. **Muma, M. H.**—North American Agelenidae of the genus coras Simon. [2] 1329: 1–20, ill. (*); North American Agelenidae of the genus Wadotes. [2] 1334: 1–12, ill. (*). **Petrunkevitch, A.**—Fossil spiders in the collection of the Amer. Museum of Natural History. [2] 1328: 1–36, ill. (*). **Wharton, G. W.**—Studies on N. A. chiggers. 2. The subfamilies and Womersia strandtmani n. g., n. sp. [46] 33: 380–84, ill. (k).

SMALLER ORDERS—Ahmad, M.—New termites from the Indo-Malayan and Papuan regions. [2] 1342: 1–7, ill. (*). **Borror, D. J.**—Notes on Ypirangathemis Santos (Libellul.) with a description of the female of Y. calverti Santos. [5] 40: 247–56, ill. (S). **Broadhead, E.**—New species of Liposcelis (Corrodentia) in England. [88] 98: 41–58, ill. **Fraser, F. C.**—The Odonata of the Ivory Coast based on the mission of Dr. R. Paulin and P. Lepesme. [88] 98: 19–39, ill. (*). **Klots, E. B.**—Chinese dragonflies in the Amer. Museum of Natural History. [2] 1341: 1–15, ill. (*). **Light and Weesner**—Methods for culturing termites. [80] 106 (2745): 131.

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EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

Wanted—Papers on Cicindelidae of any part of the world, especially South America and Pacific. R. G. Dahl, 3225 Grand Ave., Apt. 13, Oakland 10, Cal.

Chrysididae—Wanted for determination in preparation of revision. Wm. G. Bodenstein, Galesville, Maryland.

Wanted—Ataenius and allied Aphodiinae from all parts of the world, especially Mexico, Central and South America. O. L. Cartwright, Clemson, S. C.

Wanted—Reprints and unpublished mss. on biological control of mosquitoes; for preparing annotated bibliographies for publication. J. B. Gerberich, Michigan State College, East Lansing, Mich.

Wanted—Hesperid genus Megathymus for exchange or purchase. P. S. Remington, 5570 Etzel Ave., St. Louis 12, Missouri.

Wanted—Psychodidae of North America for revisional purposes. Wm. F. Rapp, Jr., 203 Harker Hall, Urbana, Ill.

Diptera—Tachinidae-Dexiidae wanted, No. Amer. and exotic. Will collect most orders in exchange or will purchase. P. H. Arnaud, 60 Woodrow St., Redwood City, Calif.

Will collect—Zoological and entomological specimens in tropical and subtropical parts of Peru. Jose M. Schunke, Pucallpa, Peru.

Wanted—Diplotaxis; will buy or exchange. E. W. Mange, 307 W. Walnut St., Hanover, Pa.

Hymenoptera-Aculeata (except ants and bees) for exchange. Will collect other orders in exchange. N. F. de Andrade, Casal Novo, S. João do Estoril, Portugal.

Meliponidae—Wanted, information on the bionomics, culture, and economic importance of the stingless bees, particularly of the Old World. P. Nogueira Neto, Av Cicade Jardim 170, S. Paulo, Brasil.

Wasps (Vespoidea, Sphecoidea, Chrysidoidea) of the world by exchange or purchase. Will collect other orders in exchange. D. G. Shappirio, 4811 17th St., N.W., Washington 11, D. C.

Lepidoptera—Large quantities of Plexippus, Colias, Cardui, Vanillae wanted for cash or exchange for tropical butterflies. G. MacBean, 710 Miller Rd., Sea Island, Vancouver, B. C.

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Swarm Behavior of Hexagenia atrocaudata in Relation to Temperature and Relative Humidity (Ephermeroptera)

By Herman G. Cooke, Department of Biology, Hampton Institute, Hampton, Virginia

Introduction

In a previous paper [1] an attempt was made to record the swarming phenomena manifested in the behavior of *Stenonema vicarium* at sundown over the banks of Darby Creek near Clifton Heights, Pennsylvania. In a later publication,[2] observations were made on *Isonychia christina* maneuvering at a high altitude a short distance from the same location. As a result of these observations it was reasonable to conclude that a more intensive and thorough study of such behavior patterns would be of interest. Possibly, also, these patterns might be correlated in some degree with genetic relationships.

Methods

The methods used during both nymphal and imaginal surveys involved a close analysis of the area in order to determine any change occurring among the population. Reluctantly, it was found that the best time for collecting adults in numbers was about 9 o'clock P.M. (E.S.T.), at which time the insects would be circling vigorously about electric lights on the banks of the stream in a nightly performance that lasted for thirty minutes,

[1] Cooke, Herman G., 1940. Observation on mating flights of mayflies, *Stenonema vicarium*. Ent. News, 51: 12.

[2] Cooke, Herman G., 1942. Mating flights of *Isonychia* mayflies (Ephemeroptera). Ent. News, 53: 249.

after which the insects vanished. Observations throughout the night revealed only scattered individuals returning at random.

The duration of these performances paralleled those indicated for normal flights, but differed widely both in the absence of those graceful movements and in the attempts to copulate that so strikingly characterize active mating. Each summer both nymphal and imaginal collections contained members of the three genera known in the area, namely, *Stenonema, Isonychia,* and *Cloeon.*

The methods used in determining the amplitude of rhythmic movements and their height above the surface of the land or water were as follows: (1) Tags were tacked at known levels on wooden strips that were placed vertically in or beside the stream and allowed to project above the surface of the water or ground over which the maneuvering took place; (2) rolls of tape with tags attached at measured intervals were suspended from the upper branches of trees or nearby shrubs to the water or ground beneath. The average distance reached by the insects while ascending and descending was plotted by reference to these devices.

During observations on flight behavior, it became apparent that the occurrence of swarming depended also upon weather conditions. Since almost nightly visits were made to Darby Creek and records kept, it is possible to study activity with relation to the temperature and humidity records of the weather bureau.

Observations on Temperature

Beginning July 27th, 1942, all searches were temporarily suspended because of a period of heavy rainfall (two inches of rain fell within a thirty minute period) accompanied by high winds lasting for several days. Then, on August 8th, 1942, it was observed that the entire area had been invaded by countless numbers of *Hexagenia* imagines. Although the source of these newcomers was uncertain, nevertheless, advantage was taken of their presence for the purpose of investigating the nature of their swarming behavior.

On August 23rd, at 7:30 P.M., as the thermometer registered 72° F., flight movements were observed over a wide area. On the following two days there was a sharp fall to 64°, and flight activities ceased. This temperature proved to be unfavorable both for swarming and for nymphal emergence in this and in related genera. At the same hour on the 26th, at a temperature

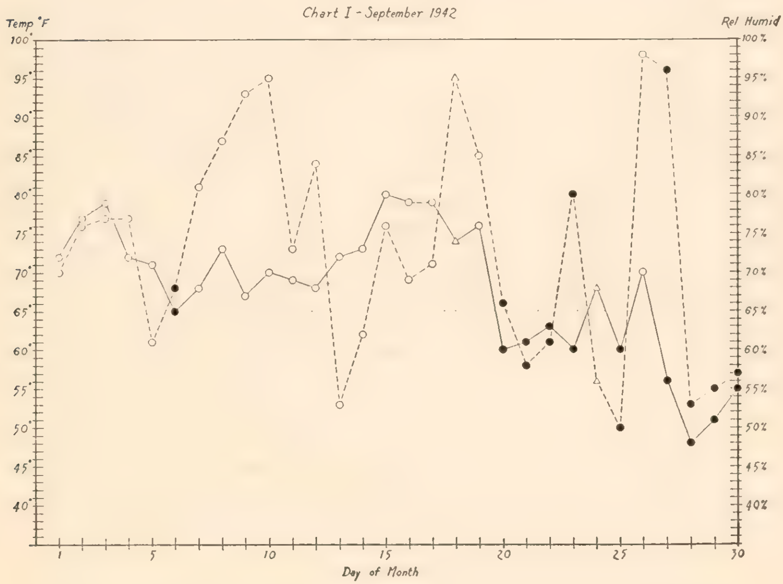

Fig. 1. Records for September 1942. Solid line is temperature; broken line is relative humidity; ○ = activity observed; ● = no activity; ⊗ = no record; △ = rain.

four degrees higher, activity was resumed. This incident revealed the limiting effect of temperature upon the activities of these insects even during the month of their greatest abundance.

The following table gives the temperature and humidity data [3] for a part of the period under discussion.

[3] Records of relative humidity and temperature were obtained through the courtesy of the U. S. Weather Bureau at Philadelphia, Pennsylvania. All readings are given at 7:30 P.M., Eastern Standard Time.

Dates	Relative Humidity	Temperature	Activity Observed
August 22nd, 1942	74%	80°	Activity
August 23rd, 1942	92%	72°	Activity
August 24th, 1942	57%	64°	No activity
August 25th, 1942	52%	64°	No activity
August 26th, 1942	58%	68°	Activity
August 27th, 1942	59%	68°	Activity
August 28th, 1942	70%	72°	Activity

The dependence of swarming on environmental conditions is further documented by the detailed comparison that appears on the two graphs (figs. 1 and 2). These graphs represent weather bureau data for September 1942 and 1943 together with the

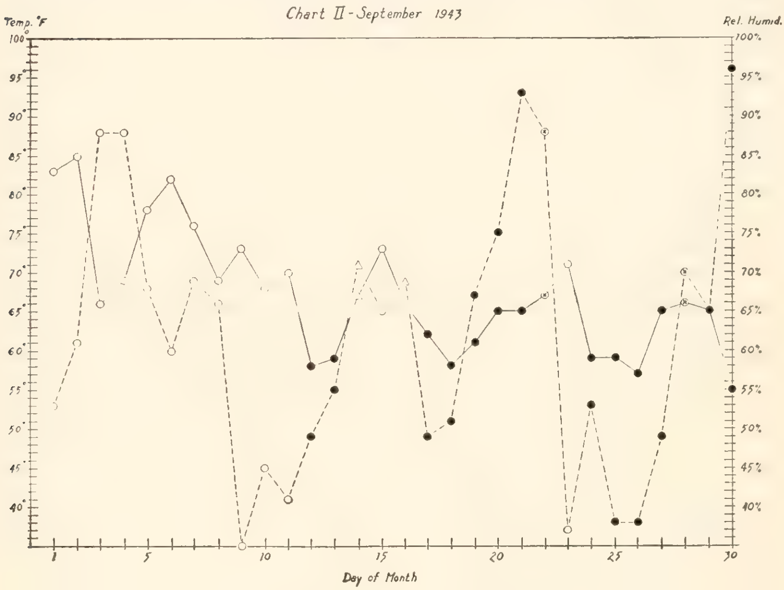

Fig. 2. Records for September 1943. Symbols are the same as in fig. 1.

daily records on flight activity. Temperature and humidity are both represented, by a solid and a broken line respectively, and are plotted against the days of the month. The 65° temperature level is indicated by a dotted line, for at temperatures below this no activity was ever observed by the writer. Attention is called to those days that show a sudden drop in temperature correlated with absence of activity, for example, on September 12th, 1943, when the temperature registered 58°, 12° lower than on the day before. During the remaining days of the month, except the 15th and 23rd, which were recorded at 73° and 71° F., respectively, the temperature maintained a constant low level, thus causing all flight movements to be discontinued. The humidity difference, however, does not appear to represent a limiting factor as regards the aerial performances of these insects.

Observations on Swarming Maneuvers

The observations for 1943 were made on a series of companies of *Hexagenia atrocaudata* swarming over the stream near the same locality as in the previous year. The performances began well after sundown and lasted until fully covered by darkness.

Copulation was observed in several instances and took place in a manner strikingly similar to that found in other genera of this order.

The following detailed observations on the swarming or mating-flight were made about 7:00 P.M., August 9th, 1943.

The individuals ascended to about fifteen feet above the water and then descended in an almost vertical power dive to about eighteen inches from its surface. At this point they pulled upward again and forward to a horizontal position, from whence they again descended. These movements were repeated over and over until darkness intervened.

As regards the flights occurring over the land, these were, for the most part, far more compact than those conducted over the stream. They were of shorter duration and were executed in a series of vertical zigzag-like movements, describing 45° angles, in rapid succession. At the height of the performance the individuals showed a high nervous tension with only feeble attempts toward copulation. Near the end of activity, the swarm apparently reached such a state of flux and disorder that the failure of individuals to avoid capture was far more noticeable than their attempts to elude the net; a tendency so unlike that observed in *Isonychia,* which I found very net-shy, or in *Callibaetis,* which Needham [4] records as among the most wary forms.

Discussion

Clemens [5] and Murphy [6] have already recorded that low temperatures inhibit activity. My own observations, as recorded in detail above, also indicate cessation of activity below 65° F. Although the records are for *Hexagenia* the essential facts involved are also manifested in the behavior of *Isonychia.* As regards the possible influence of humidity, no definite conclusions are drawn.

The movements in the mating flight of *Hexagenia* are characteristic and peculiar and readily distinguishable from those of *Stenonema* and *Isonychia.* They appear to differ also from the movements of other genera as described in the literature by Needham and other writers.

Although they had not been found in the preceding years, during the two years of this study, 1942 and 1943, members of *H. atrocaudata* were quite numerous. During August of the following year, 1944, the swarm became so greatly reduced that only small companies could be encountered under the most favorable condition, and, finally, by the summer of 1945, flight movements became completely suspended. The decline and disappearance of this species during certain seasons remains one of the most baffling mysteries of my ephmeridal investigations in this area.

In a recent report on the emergence and flight movement of the species of *Hexagenia,* Lyman [7] observed that wind direction aided in the distribution of sub-imagines and imagines while in flight. He also advanced the theory, supported by Langlois,

[4] Needham, J. G., Jay R. Traver, and Yin-Chi Hau, 1935. The biology of the mayflies. P. 10.

[5] Clemens, W. A., 1917. An ecological study of the mayfly Chirotenetes. University of Toronto Studies Biol. Ser. 17.

[6] Murphy, Helen, 1922. Notes on the biology of the mayflies genus *Baetis.* Bull. Lloyd Library, Ent. Ser. 2.

[7] Lyman, Earl F., 1944. Emergence, swarming and mating in *Hexagenia.* Ent. News, 55: 207–210.

that the difference in emergence for alternating years indicated a cyclic trend in the population of *Hexagenia*.

Because of the very nature of the rocky stream-bed over which my own surveys have been constantly conducted, it seems that only with the greatest difficulty could the immature stage of *Hexagenia atrocaudata* have survived without having been previously encountered.

The writer wishes to acknowledge his gratitude to Dr. Philip P. Calvert, of the University of Pennsylvania and the Academy of Natural Sciences, for his stimulating interest freely shown during the course of this study. Thanks are also due Mr. Howard Levy of City College, New York City, graduate student of Dr. H. Spieth, for confirming the classification of the species here involved.

Odonata of Voyages under the Auspices of the New York Zoological Society

By Philip P. Calvert, Cheyney, Penna.

When sending me Odonata collected at the Tropical Research Station of the New York Zoological Society at Kartabo, British Guiana,[1] Dr. William Beebe, Director of the Station, sent also some Odonata collected on various voyages made under the auspices of the Society. These are listed below with a few comments.

I. Voyages of the Steam Yachts *Noma*, 1923, and *Arcturus*, 1925, to the Galápagos

Indefatigable Island, Seymour Bay, April 22, 1923: *Pantala flavescens* (Fabricius), one male.

South Seymour Island, April 23, 1923: *P. flavescens*, three males.

Hood Island, Lake, 27.IV.1925: *Tramea (Trapezostigma) cophysa darwini* Kirby, one male.

[1] These are reported on in a paper to be published in Zoologica, the Society's journal.

Albemarle Island, 8/6/25: *T.* (*T.*) *cophysa darwini,* three females.

It is to some of these 1923 specimens that the following observations, recorded in Dr. Beebe's book, Galapagos World's End,[2] doubtless refer.

"Large dragonflies were hawking about, taking toll of the mosquitoes which I frightened out of the grass. I found it almost impossible to capture them in a net. So . . . using a 22 calibre rifle, and shot cartridges, I shot at them." Seven specimens were secured; South Seymour Is., April 23, 1923.

"On other evenings as long as there was light enough for us to see, we never failed to observe a host of dragonflies hawking back and forth, while now and then little yellow-bellied flycatchers [*Myiarchus magnirostris* (Gray), p. 435] would dive into the mass, their beaks snapping like castanets; South Seymour Is., April 26, 1923."

The following specimen resulted from the voyage of the *Noma: Pantala hymenaea* (Say), one female "2535 Panama 60 M[iles] offshore 6/5/23."

The following three specimens bear no dates or other identifying labels but are products of the voyage of the *Noma* or of the *Arcturus:*

"N 4° 30′ W 87°," *P. flavescens,* one male, *P. hymenaea,* one female; "N 4° 30′ W 80°," *P. hymenaea,* one female.

Both reckonings indicate points in the Pacific Ocean to the northeast of the Galápagos, the former roughly 535 km. (335 statute miles, 288 nautical miles) distant, the latter roughly 1100 km. (687 or 594 miles) distant from them.

P. hymenaea and a species of *Tramea* were apparently first recorded from the Galápagos by McLachlan[3] from collections made by Commander W. E. Cookson and Staff Surgeon Bett, of H.M.S. *Petrel,* in June, 1875, on Charles, Abingdon, and Albemarle Islands, but no indication is given as to which of

[2] Galapagos World's End. Published under the auspices of the New York Zoological Society. G. P. Putnam's Sons, New York and London, The Knickerbocker Press, 1924. Pages 285, 291, 292.

[3] Proc. Zool. Soc. London, 1877: 84–86.

these islands furnished the Odonata. McLachlan did not describe the three adult Trameas which he examined, as they were in bad condition, but mentioned that they had "only a very small dark anal spot on the hind wings," a feature which agrees well with *T. darwini* Kirby, but he described nymphs which he referred to *P. hymenaea* and *Tramea*. *Darwini* was described [4] from the "Galápagos Islands" with no mention of the individual islands from which they hailed.

In the fullest account of the Odonata of the Galápagos which we possess, that by Mr. R. P. Currie,[5] based on the collections of Mr. R. E. Snodgrass in 1899, and the U. S. Fish Commission, *P. flavescens* and *P. hymenaea* are recorded from Charles Island, *T. darwini* from Albemarle, South Albemarle, Charles, Chatham and Hood Islands, not to mention other species not represented in the present collection.

II. Cruise of the Tug *Light Horse*, 1928

"100 m[iles] off shore, 25187," *Ischnura ramburi* Selys, one heterochromatic (orange) female. This is a common Atlantic coastal species from Rhode Island to northern South America.

III. New Nonsuch, Bermuda

"New Nonsuch, Bermuda, 9–VI–40 pool" and Bermuda, 1937, *Tramea* (*Trapezostigma*) *abdominalis* (Rambur), one male; *Pachydiplax longipennis* (Burmeister), one male.

Both of these species and five others, according to Verrill,[6] were recorded from the Bermudas by J(ohn) Matthew Jones [7] in 1876, based on identifications by Dr. H. A. Hagen. Later captures of *P. longipennis* are mentioned by Uhler [8] and Verrill.[6]

[4] Trans. Zool. Soc. London, 12 (9, 3): 315, pl. LI, fig. 1. 1889.

[5] Proc. Washington Acad. Sci., 3: 385–386. 1901.

[6] The Bermuda Islands. Trans. Connecticut Acad. Arts & Sci., 11 (2): 812–816, 850. 1901–02.

[7] The Visitor's Guide to Bermuda. Halifax, New York and London, 1876, 12mo., 159 pp. I have not seen it.

[8] In Angelo Heilprin, The Bermuda Islands, Philadelphia, 1889, p. 154.

IV. Bahama Islands

Erythrodiplax umbrata (Linn.), one female, "on Ancon, 2 miles off Castle Rock Light, Dec. 22, '40."

This widespread tropical American species has been recorded [9] from the following Bahaman localities: Strange Cay, New Providence, Andros, Crooked and Great Inagua Islands.

Astata in the Caribbees (Hymenoptera: Sphecidae)

By V. S. L. Pate, Ithaca, New York

Over eighty years ago Cresson described *Astata insularis* from Cuba.[1] In all the intervening years no other member of the genus has been recorded from any of the Antilles. Now, however, another closely related but quite distinct form, *Astata dominica*, is known to inhabit the island of Hispaniola and is described below.

Astata (Astata) dominica new species

The completely red abdomen, the presence of a fine impunctate line bisecting the front, the more finely punctate mesonotum, and the punctate postscutellum differentiate the present Hispaniolan *dominica* from Cresson's Cuban *insularis*. In addition, the dorsal propodeal face of *insularis* is bisected by a carina on each side of which are divergent longitudinal rugulae which radiate from the posterior margin of the postscutellum, whereas in *dominica* this area is furnished with transverse carinulae and lacks any bisecting carina.

Type.—♀; San Domingo. (No other data.[2]) [Academy of Natural Sciences of Philadelphia, Type no. 10606.]

Female. Length 11 mm. Black; abdomen completely bright ferruginous. Wings hyaline, tinged with fuscous, rather heavily infumated apically beyond the cells; veins and stigma dark brunneous.

[9] Biol. Centr.-Amer. Neur., p. 253, 1906; Ann. Carnegie Mus. Pittsburgh, 6 (1): 247–248, 1909.

[1] Proc. Entom. Soc. Philadelphia, IV, p. 140, (1865); [♀].

[2] This specimen was probably collected by M. Abbott Frazar in or about Sanchez in the Samaná district of the Dominican Republic.

Head fulgid; with a rather heavy vestiture of long, erect white hair except on vertex. Front gently tumid, with separated, fine punctures throughout except for a polite, small quadrate area between and above antennal sockets, and a narrow line bisecting front from anterior ocellus to clypeus; ocelli in a subequilateral triangle, the ocellocular line four-ninths (0.44) the postocellar distance; vertex and posterior orbits polite, almost impunctate. Clypeus with fine, well-separated punctures throughout, disc gently tumid; median length one-fourth the vertical eye length; median lobe terminating in a broad, impunctate, polite, truncate flange. Antennae with scapes strongly obterete, coarsely punctate, three-tenths the vertical eye length; pedicel suborcate; flagellum simple, filiform; relative lengths: scape 25; pedicel 8; flagellar segment one 30, two 24, three 22, four 20, five 15, six 18, seven 15, eight 15, nine 13, ten 15. Upper interocular line six-tenths the vertical eye length.

Thorax fulgid; with a moderate clothing of erect white hair which is longer and more noticeable on pleura and venter than on mesonotum. Pronotum situated well below level of arched mesonotum, gently declivent from posterior margin; with fine, separated punctures; anterior half bisected by a fine impression. Mesonotum with fine, rather close punctures anteriorly but disc and posterior two-thirds almost impunctate; parapsidal furrows distinct on posterior two-thirds; scutellum finely, closely punctate laterally and along posterior margin, the disc polite, impunctate; postscutellum finely punctate throughout. Mesopleura with strong, rather close punctures which become striatopunctate dorsally and posteriorly; metapleura glabrous, polite, impunctate. Propodeum fulgid; dorsal face glabrous, posterior and lateral faces with a moderate vestiture of very long, erect, white hair; dorsal face impunctate, traversed by fine, sharp, well-separated carinulae which are arcuate anteriorly but become transverse posteriorly; posterior face coarsely punctate save for polite, immarginate, pyriform discal fovea, laterally with coarse horizontal carinulae which pass around onto posterior half of lateral faces, the anterior half of which are polite and subimpunctate.

Legs stout; tibiae and tarsi spinose.

Fore wing with marginal cell three and a quarter times as long as wide and broadly, squarely truncate at apex; radius with relative lengths of abscissae: first 5, second 6, third 25, fourth 20 fifth (truncation) 12; cubital abscissae: first 36, second 48, third 25. First submarginal cell about nine-tenths (0.924) the length of marginal cell.

Abdomen cordate, depressed; fulgid; impunctate; subglabrous. Last tergite with an elongate trigonal pygidial area, the disc finely shagreened, the lateral margins fringed with brushes of stiff dark setulae.

This insular form is known only from the unique female described above.

Megarhinus septentrionalis from Pennsylvania

By Robert M. Stabler, Colorado College, Colorado Springs

In their excellent listing of the mosquitoes of Pennsylvania Wilson, Barnes, and Fellton (1946) do not mention the occurrence of a *Megarhinus*. Matheson (1944), in his Handbook of the Mosquitoes of North America, lists the two species *M. septentrionalis* and *M. rutilus*. Of the former he says, "It occurs in the eastern United States, from Virginia south to the Gulf. . . ." The latter is from Florida. Headlee (1945) states of *M. septentrionalis*, "Southeastern United States. No females have been trapped from 1932 to 1941 inclusive" [New Jersey]. It is the purpose of this note to record the first taking of *Megarhinus septentrionalis* from Pennsylvania.

On September 20, 1946, Dr. R. G. Schmieder noticed a large, long-legged insect flying about his living room in Elwyn, Delaware County, Penna. It lit on the wall, was captured, and finally came to the attention of the writer. It proved to be a perfect specimen of *Megarhinus septentrionalis*. As neither of the two species of *Megarhinus* thus far found in the United States has been reported from Pennsylvania, determining the ultimate source of this specimen (female) is something of a problem. Was she actually hatched in Delaware County? Did she "hitch-hike" up from the south in an automobile? The closest point at which she might have gotten off a train from the south is Chester, Penna., some five miles from the point of capture.

The fact that the Delaware County Mosquito Extermination Commission, which has reliable records going back more than ten years, lists no single individual of this species only serves to heighten the mystery of her sudden and unique appearance in a state completely foreign to her genus. But these are the delightful biological exceptions which make the routine more bearable.

The writer is most grateful to Dr. Schmieder for allowing him to present this new record. The specimen is in the writer's collection.

Literature Cited

Headlee, T. J. 1945. The mosquitoes of New Jersey and their control. Rutgers Univ. Press, 326 pp.

Matheson, R. 1944. Handbook of the mosquitoes of North America. Comstock Pub. Co, Inc., 314 pp.

Wilson, C. A., R. C. Barnes, and H. L. Fellton. 1946. A list of the mosquitoes of Pennsylvania with notes on their distribution and abundance. Mosquito News, 6 (2) : 78–84.

A New Species of Stenocrates from Central America

By Mark Robinson, Springfield, Pennsylvania

Stenocrates bicarinatus new species

1890. *Stenocrates laborator* Bates not Fabr., Biologia Centrali-Americana, Vol. II, part 2, p. 313.

This is probably the species mentioned by Bates as *Stenocrates laborator* Fabr. from Tuxtla, Mexico. It differs from the older species as mentioned by Bates by the margin of the frontal suture being somewhat raised on each side and in the fewer punctures of the thorax. In addition to the differences in the external characters the extreme tip of the male genitalic claspers of *laborator* are bilobed while the new species has these claspers unilobed.

The male of *bicarinatus* has the club of the antennae a little longer and the pygidium a little more convex than the female.

Body elongate, subcylindric; color black the underparts dark reddish.

Edge of clypeus reflexed, the anterior edge a little more than the sides; anterior edge sinuate with the angles on either side broadly rounded. The posterior edge of the clypeus is raised on either side of a median area into a carina which runs to the side margins. The surface of the frons and clypeus is smooth with a few fine punctures except for the part behind the clypeal edges, the clypeal suture and the median area between the carinae which are coarsely rugous.

The side margins of the pronotum are margined. The pronotal area is finely, very sparsely punctured with a few coarse punctures near the hind angles.

Scutellum impunctate. Elytral punctures shallow, coarse, annular, arranged on either side of four costae and in the intercostal areas; costae impunctate.

Pygidium coarsely, annularly punctured, with these punctures separated from one to three times their diameters. Anterior tibiae tridentate. Post-coxal process of the prosternum long, gradually acuminate, with a few yellowish hairs about the tip.

Length, 18.5 to 20.0 mm.; breadth, 9.5 to 10.3 mm.

Type.—♂; Corozal, CANAL ZONE, May 31, 1937 (R. Bliss). In the collection of the author.

Allotype.—♀; Piedras Negras, GUATEMALA, June 30, 1933 (D. W. Amram). In the collection of the Academy of Natural Sciences, Philadelphia.

Paratype.—♂; Yariza, PANAMA, May 25, 1933 (D. Elmo Hardy). In the collection of the author.

Notes and News in Entomology

Under this heading we present, from time to time, notes, news, and comments. Contributions from readers are earnestly solicited and will be acknowledged when use.

Recollections about Samuel Francis Aaron. After reading Dr. Philip P. Calvert's account in ENTOMOLOGICAL NEWS (June, 1947), of S. Frank Aaron who died on January 15, 1947, it occurred to me that the following recollections might be of supplementary interest. I became acquainted with Mr. Aaron during the summers of 1904 and 1906, while employed by the Philadelphia Commercial Museum. As Dr. Calvert has stated, Mr. Aaron was the economic entomologist of the Museum. At this period he was concerned with the preparation of exhibits of various economic insect pests. He did much of this work himself and many of the exhibits were illustrated by his drawings which showed considerable artistic skill. During 1906 Mr. Aaron, together with a Mr. Hamilton, organized the Scientific Preservation Company and obtained the financial backing of several wealthy Philadelphians. This company, located in an imposing building at 305–307 Walnut Street, Philadelphia, was prepared to exterminate mosquitoes, San José scale, household pests, etc., and did considerable advertising to this effect. It also provided moth-proof storage and manufactured a "moth proof" storage chest for household use. This was a well-made, tight, cedar chest furnished with a small inside compartment containing two charges of sulphuric acid and potassium cyanide. These chemicals were brought together, by an operation outside the chest by the owner, which liberated hydrocyanic acid gas in the chest. After an interval long enough for eggs to hatch, the second charge was set off.

Most of the customers of the company were hotels and warehouses in the Philadelphia area and wealthy estate owners in the suburbs of the cities of Philadelphia and Camden. At that time the San José scale was doing much damage to fruit trees and the company used a mixture of hydrocyanic acid gas and a small amount of chlorine in its fumigation work. Large fumigation tents were erected over the trees by means of long poles of several sections. It is my belief that the Scientific Preservation Company was the first large scale effort to commercialize entomology in the east. The fumigation of orchard trees by commercial firms was going on in California at that time but the Scientific Preservation Company was the first eastern firm in the field.

I was taken into the company by Mr. Aaron, shortly after its organization, as a sort of assistant chemist and biologist and, at one time, was very nearly killed by breathing, over a period of several hours, minute quantities of hydrocyanic acid gas in the laboratory atmosphere. The men employed to do the fumigation work were warned to open the windows of fumigated buildings from the outside, but frequently they were careless or too lazy to affix cords to upper sashes and preferred to take a chance by holding their breaths while entering a room and opening windows. No fatalities occurred but the workers always returned with blood-shot eyes after engaging in this practice.

Mr. Aaron was manager of the company, which was organized during the latter part of 1906. It remained in operation only until the end of 1907. The idea behind it was good and a modest amount of business was done during its existence. Unfortunately its first year of operation coincided with the business panic of 1907 which lasted until the middle of 1908. Its financial backers refused to invest additional funds to keep it going and so it came to an end in December, 1907. At this time the business was leased by Harry B. Weiss and Thomas W. Shaw, both former employees who hoped to keep it going, with a reduced overhead. However, they were starved out after four or five months. I still have the agreement, signed by Mr. Aaron in a spirit of fun and generosity on December 3, 1907, in which he promised to give each of the lessees ten thousand dollars worth of stock in case the business of the Scientific Preservation Company increased so as to enable dividends to be paid.

After this venture, Mr. Aaron, for a short time, managed a private hunting lodge in Delaware and then devoted himself to writing popular entomological articles and nature papers for magazines and newspapers. I recall him as a very well informed, affable, enthusiastic and entertaining companion, who got much enjoyment out of natural history.—H. B. Weiss.

How far can a fly fly?—In reply to a question that came to the American Entomological Society, Dr. Calvert answered as follows:

I am not able to answer fully your subscriber's question: "What distance is a fly able to fly before it is forced to stop for rest?" The best I can do follows.

H. M. Bernard, investigating the effects of fatigue upon the microscopic structure of fly's muscle wrote: "I caught a number of large Blue-bottles—*Musca vomitoria*. Some were kept resting under glass, the others, one at a time, I compelled to fly about a nearly empty room. In a few minutes they dropped down exhausted, so that no pushing or handling could induce them to fly." (Zoologische Jahrbücher, Abt. f. Anat. 7: 540–41. 1894.) Unfortunately, he does not specify the actual number of minutes before the flies "dropped down exhausted."

A. Magnan, in his elaborate study of the flight of insects, measured the speed of their flight by two different methods and gives a table including the maximum speed of flight in the blue-bottle fly, *Calliphora vomitoria,* as three meters per second, of the house fly, *Musca domestica,* as two meters per second. (La Locomotion chez les Animaux I. Le Vol des Insectes. Paris, Hermann & Cie. 1934. P. 71.)

Calliphora vomitoria is the same species to which Bernard refers as *Musca vomitoria*.

If we combine the results of these two authors, we find that the blue-bottle fly can fly 3 m. $\times$ 60 = 180 meters per minute. We may suppose that Bernard's "few" minutes were probably as many as five so that his flies could go 900 meters in that time. If a "few minutes" were as many as ten, then 1800 meters might be the extent of their flight. 900 meters = .56 mile, 1800 meters = 1.12 miles.—PHILIP P. CALVERT.

Dr. Calvert expresses the hope that some reader can supply fuller data on this question.—EDITOR.

Current Entomological Literature

COMPILED BY EDWIN T. MOUL AND
RAYMOND Q. BLISS.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, 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.

This list gives references of the current or preceding year unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

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 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. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

GENERAL—Anduze, Pifano and Vogelsang—Nomina de los artropodos vulnerantes conocidos actualmente en Venezuela. [14] 6: 1–16. **Anon.**—DDT for control of household pests. [Bur. Entom. and Plant Quarantine] March, 1947. **Bateman, A. J.**—Contamination of seed crops. Insect pollination. [Jour. Genetics] 48: 257–75. **Essig, E. O.**—Abstracting entomological articles and publications. [37] 40: 456–58. **Faure, J. C.**—A plea for brevity and sanity in zoological nomenclature. [6] 13: 595–601. **Callan, E. McC.**—Technique for rearing thrips in the laboratory. [53] 160: 432. **Leonard, M. D.**—The "Special survey in the vicinity of ports of entry" as a contribution to "A list of the insects of New York." [45] 55: 215–17. **McAtee, W. L.**—Popular names of Gyrinidae. [45] 55: 205–06. **Osborn, H.**—On the status of grass insects. [65] 49: 149–50. **Reed, Bunn and Blanton**—Entomology in the army. [37] 40: 289–93. **Smith, H. S.**—Biological control of weeds in the U. S. [65] 49: 169–70.

ANATOMY, PHYSIOLOGY, MEDICAL—Balfour-Browne, J.—On the false-chelate leg of an aquatic beetle larva. [68] 22: 38–41, ill. **Callan and Montalenti**—Chiasma interference in mosquitoes. [Jour. Genetics] 48: 119–34. **Calvert, P. P.**—How many mosquito larvae and pupae are required to make one dragonfly? [65] 49: 171–72. **Gjullin, C. M.**—Effect of clothing color on the rate of attack of Aëdes mosquitoes. [37] 40: 326–27. **Goldschmidt, E.**—Studies on the synapsis in salivary chromosomes of hybrid Chironomus larvae. [Jour. Genetics] 48: 194–205. **Gounin, F.**—Le cardia de l'intestin larvaire de quelques chironomides, son importance pour la systématique (Nematocères). [Rev. Franç. d'Ent.] 13: 28–33, ill. **Grasse and Hollande**—Structure de l'appareil copulateur mâle des acridiens et ses principaux types. [Rev. Franç. d'Ent.] 137–46, ill. **Hinton, H. E.**—The gills of some aquatic beetle pupae (Psephenidae). [68] 22: 52–60, ill. **Horen, W. P.**—Effects of ultra-violet radiation on Tenebrio molitor. [37] 40: 433–34. **Jeannel and Paulian**—Morphologie abdominale des Coleoptères et systématique de l'ordre. [Rev. Franç. d'Ent.] 11: 65–110, ill. **Mickey, G. H.**—Division cycle in grasshopper chromosomes. [Proc. Louisiana Acad. Sci.] 10: 49–66, ill. **Lamy, R.**—Observed spontaneous mutation rates in relation to experimental technique. [Jour. Genetics] 48: 223–36. **Linsley and MacSwain**—The effects of DDT and certain other insecticides on alfalfa pollinators. [37] 40: 358–63; Factors influencing the effectiveness of insect pollinators of alfalfa in California. *Ibid.* 349–57. **Mackensen, O.**—Effect of carbon dioxide on initial oviposition of artificially inseminated and virgin queen bees. [37] 40: 344–49. **Millot, J.**—Sur l'anatomie et l'histophysiologie de Koenenia mirabilis Grassi (Palpigradi). [Rev. Franç. d'Ent.] 9: 33–51, ill.; Notes complémentaires sur l'anatomie, l'histologie et la repartition géographique en France de Koenenia mirabilis Grassi. *Ibid.* 127–35, ill. **Muller, J.**—Investigacion de una cera producida por un insecto coccido Venezolano. [Bol. Soc. Ven. Cien. Nat.] 10: 365–81. **Pfadt, R. E.**—Effects of temperature and humidity on larval and pupal stages of the common cattle grub. [37] 40: 293–300. **Pierre, F.**—La larve d'Heterocerus aragonicus Kiesw. et son milieu biologique. [Rev. Franç. d'Ent.] 12: 166–74, ill. **Risbec, J.**—Sur le determinisme de la metamorphose chez les Lepidopteres. A propos d'une chenille ayant evolue dans un nid d'Eumenes. [Rev. Franç. d'Ent.] 13: 144–50, ill. **Roberts, W. C.**—A syringe for artificial insemination of honey bees. [37] 40: 445–46. **Snodgrass, R. E.**—The insect cranium and the "epicranial suture." [Smithsonian Misc. Coll.] 107, no. 7: 1–52. **Swann and Mickey**—Parthenogenetic grasshoppers and their bearing upon polyploidy and sex-determination. [Proc. Louisiana Acad. Sci.] 10: 73–92, ill. **Tate, P.**—A sex-linked and sex-limited white-eyed mutation of the blowfly (Calliphora erythrocephala). [53] 160: 361; [Jour. Genetics] 48: 176–91; The effect of cold upon the development of pigment in a white-eyed mutant form of the blowfly C. erythrocephala. [Jour. Genetics] 48: 192–93. **Vogt, G. B.**—Salinity tolerance of Anopheles quadrimaculatus and habitat preference of A. crucians bradleyi. [37] 40: 320–25. **Wigglesworth, V. B.**—Water relations of insects. [Experientia] 2: 1–14, ill. **Williams, J. L.**—The anatomy of the internal genitalia of Fumea casta Pallas. [83] 73: 77–84, ill. **Wolfenbarger, D. O.**—Tests of some newer insecticides for control of subtropical fruit and truck crop pests. [31] 29: 37–44.

ARACHNIDA AND MYRIOPODA—Killington and Bathe—Acarine parasites of Odonata. II. [28] 83: 116–24. **Millot, J.**—(See under Anatomy.) **Paulian de Felice, L.**—Les Oniscoides de la Guyane Française. [Rev. Franç. d'Ent.] 10: 142–45, ill. (S*). **Saunders, L. G.**—Canadian solpugids. [Canad. Field Nat.] 60: 132.

SMALLER ORDERS—Anderson, A.—Dragon flies feed on termites. [Great Basin Nat.] 7: 29. **Broadhead, E.**—The life-history of Embidopsocus enderleini (Corrodentia). [28] 83: 200–03. **Brues, C. T.**—Predatory enemies of winged termites. [65] 49: 167–68. **Callan, E. McC.**—Technique for rearing thrips in the laboratory. [53] 160: 432. **Calvert, P. P.**—The odonate collections of the California Academy of Sciences from Baja California and Tepic, Mexico, of 1889–1894. [64] 23: 603–09. (See also under Anatomy.) **Hopkins, G. H. E.**—Lice. [Uganda Journal] 10: 97–105. **Killington and Bathe**—(Odonata, see under Arachnida.) **Mullen, J. A.**—Termites in cold frames. [100] 25: 164.

ORTHOPTERA—Grasse and Hollande.—(See under Anatomy.) **Mickey, G. H.**—(See under Anatomy.) **Rehn, J. A. G.**—The removal of the mantid genus Callimantis (Manteidae) from the North American fauna. [65] 49: 163–64. **Rosewall, O. W.**—Biology of the praying mantis, Brunneria borealis Scudder. [Proc. Louisiana Acad. Sci.] 10: 67–71, ill. **Swann and Mickey**—(See under Anatomy.)

HEMIPTERA—Fennah, R. G.—Notes on West Indian Flatidae (Fulgoroidea). [63] 60: 107–18, ill. (*). **Knowlton, G. F.**—Aphids from Mt. Timpanogos, Utah. [Great Basin Nat.] 7: 1–6. **McKenzie, H. L.**—Diaspid scale studies, with notes on California species (Coccoidea: Diaspididae). [Bull. Dept. Agric. State of Cal.] 36: 31–36, ill. (*). **Muller, J.**—(See under Anatomy.) **Tanner, V. M.**—Ranatra quadridentata found in Utah. [Great Basin Nat.]

7: 29. **Wygodzinsky, P.**—Sobre um novo genero e uma nova especie de schizopterinae do Brasil (Cryptostemmatidae). [14] 6: 25–35, ill. (k).

LEPIDOPTERA—Bell, E. L.—A catalogue of the Hesperioidea of Venezuela. [14] 5: 65–203. **Bourquin, F.**—Metamorfosis de Tolype pauperata. [Rev. Soc. Ent. Argentina] 13: 301–08, ill. **Clark, A. H.**—The interrelationships of the several groups within the butterfly superfamily Nymphaloidea. [65] 49: 148–49. **Darlington, E. P.**—Notes on certain types of Lepidoptera described by Brackenridge Clemens. [83] 73: 85–104. **Dexter, R. W.**—A checker-spot butterfly with three antennae. [100] 25: 145, ill. **Evans, W. H.**—Hesperiana. [65] 49: 162–63. **Judd, W. W.**—Leaf-rollers of the genus Cacoecia (Tortricidae). [Canad. Field-Naturalist] 60: 136. **Needham, J. G.**—A moth larva that lives on fern spores (Heliodinidae). [65] 49: 165–66. **Neiswander, C. R.**—Variations in the seasonal history of the European corn borer in Ohio. [37] 40: 407–12. **Risbec, J.**—(See under Anatomy.) **Shaw, J. G.**—Parasites of a bag-making pierid Eucheira socialis in Morelos, Mex. [37] 40: 436–37. **Warren, B. C. S.**—Some principles of classification in Lepidoptera, with special reference to the butterflies. [30] 80: 208–17. **Williams, J. L.**—(See under Anatomy.)

DIPTERA—Abonnenc and Floch—Clef d'identification de 140 Phlebotomes mâles du nouveau continent. [14] 6: 1–24 (k). **Arnett, R. H., Jr.**—Notes on the distribution, habits and habitats of some Panama mosquitoes. [45] 55: 185–200. **Blanchard, E. E.**—Dasyuromyia lloydi nueva especie de Prosenido, Argentino. [Rev. Soc. Ent. Argentina] 13: 258–62, ill. **Bromley, S. W.**—Diptera of Connecticut. Part VI. Asilidae. [State of Conn., Geol. and Natural History Survey, Hartford] Bull. 69, 1–48, ill. (k). **Callan and Montalenti**—(See under Anatomy.) **Calvert, P. P.**—(See under Anatomy.) **Gjullin, C. M.**—(See under Anatomy.) **Goldschmidt, E.**—(See under Anatomy.) **Gouin, F.**—(See under Anatomy.) **James, M. T.**—A review of the Larvaevorid flies of the tribe Leskiini with the setulose first vein (R.). [71] 97: 91–115, ill. (k*). **Kessel, E. L.**—American smoke flies (Microsania: Clythiidae). [The Wasmann Collector] 7: 23–30. **Knight, K. L.**—The Aedes (Mucidus) mosquitoes of the Pacific (Culicidae). [48] 37: 315–25, ill. (k*). **Lamy, R.**—(See under Anatomy.) **Pfadt, R. E.**—(See under Anatomy.) **Pletsch, D.**

J.—Anopheles mosquito records and observations in Montana. [Great Basin Nat.] 7: 23–28. **Rapp, W. F., Jr.**—The Pipunculidae of Quebec. [Canadian Field-Naturalist] 60: 105. **Shaw, J. G.**—(See under Lepidoptera.) **Tate, P.**—(See under Anatomy.) **Vogt, G. B.**—(See under Anatomy.) **Walton, W. R.**—Local unique Tabanid unrecovered after 28 years. [65] 49: 168.

COLEOPTERA—Alonso, R. G.—Escarabajos comunes a chile y la Argentina. [Rev. de la Soc. Ent. Argentina] 13: 309–14. **Balfour-Browne, J.** —(See under Anatomy.) **Barber, H. S.**—Diabrotica and two new genera (Chrysomelidae). [65] 49: 151–61, ill. **Barr, W. F.**—A new subspecies of Enoclerus from the Great Basin region of the western U. S. (Clerid). [Great Basin Nat.] 7: 21–22. **Blake, D. N.**—New eumolpid beetles from West Indies. [48] 37: 310–15, ill. **Bosq, J. M.**—Interesantes longicornios de Catamarca. [Rev. de la Soc. Ent. Argentina] 13: 292–300, ill. **Buck, J. B.**—Studies on the firefly, IV: Ten new lampyrids from Jamaica. [71] 97: 59–79, ill. **Davis, A. C.**—Review of the weevils of the tribe Ophryastini of America north of Mexico. [71] 3207: 96: 483–551, ill. (k*). **Dawson, R. W.**—New spp. of Serica (Scarab) VIII. [45] 55: 223–35, ill. **Gilmour, E. F.**—Further new Lamiinae (Cerambycidae). [28] 83: 187–90, ill. (S). **Green, J. W.**—New eastern American species of Podabrus (Cantharidae). [83] 73: 63–76, ill. **Guignot, F.**—Genotypes des Dytiscoidea et des Gyrinoidea. [Rev. Franç. d'Ent.] 13: 112–18. **Hinton, H. E.**—(See under Anatomy.) **Hustache, A.**—Naupactini de l'Argentine et des regions Limitrophes. [Rev. de la Soc. Ent. Argentina] 13: 3–146 (k*). **Jeannel and Paulian**—(See under Anatomy.) **La Rivers, I.**—Notes on the Histeridae known to occur in Nevada. [Great Basin Nat.] 7: 7–9. **Lepesme and Paulian**—Les nemosoma et genres voisins (Ostomatidae). [Rev. Franç. d'Ent.] 10: 136–41, ill. (S). **Lepesme, P.**—Un remarquable Cerambycide nouveau de Guyane. [Rev. Franç. d'Ent.] 9: 135–37, ill. **McAtee, W. L.**—(See under General.) **Martinez, A.**—Insectos nuevos o poco conocidos V. [Revista Soc. Ent. Argentina] 13: 263–80, ill. **Mequignon, A.**—Contribution a l'étude des mordellides palearctiques. [Rev. Franç. d'Ent.] 13: 52–76, ill. (k*). **Monros, F.**—Revision de los megalopidae Argentinos. [Rev. Soc. Ent. Argentina] 13: 150–217, ill. (*). **Pierre, F.**—(See under Anatomy.) **Plank, H. K.**—DDT for powder-post beetle control in bamboo. [80] 106: 317. **Portevin, G.**—Description de Liodides nouveaux. [Rev. Franç. d'Ent.] 9: 75–78, ill. (S). **Prosen, A. F.**—Nuevos cerambicidos Argentinos. [Rev. Soc. Ent. Argentina] 13: 254–57, ill.; Cerambycoidea de Santiago del Estero. *Ibid.* 315–34. **Robert, Frère A.**—Un dermestidé nouveau pour la Province de Québec (Thylodrias contractus). [Le Nat. Canad.] 74: 189–94. **Vosz, E.**—Nachtraeglich bekannt gewordene exotische Attelabinen und Apoderinen (Curculionidae). [Rev. Franç. d'Ent.] 10: 29–34, ill. (S*).

HYMENOPTERA—Cushman, R. A.—A generic revision of the ichneumon-flies of the tribe Ophionini. [71] 96: 417–82, ill. (k*). **Dreisbach, R. R.**—A new sp. of the genus Therion (Ichneumon) with a key to the species of the northeastern states. [45] 55: 201–03. **Enzmann, J.**—Ants associated with apiaries in the New England States. [45] 55: 219–22. **Farrar, C. L.**—(See under Anatomy.) **Farrar, C. L.**—Nosema losses in package bees as related to queen supersedure and honey yields. [37] 40: 333–38. **Fletcher, H. B.**—Magnetic ants. [54] 40: 415, ill. **Haviland, E. E.**—Biology and control of the Allegheny mound ant. [37] 40: 413–19. **Krombein, K. V.**—An unnoticed subgeneric name in Bombus. [65] 49: 170. **Linsley and MacSwain**—(See under Anatomy.) **Mackensen, O.**—(See under Anatomy.) **Moure, J.**—Notas sobre algunas abejas de la Provincia de Salta. [Rev. Soc. Ent. Argentina] 13: 218–53, ill. (*). **Roberts, W. C.**—(See under Anatomy.) **Santis, Luis de**—Dos nuevos Calcidoideos interesantes (Chalcidoidea). [Rev. Soc. Ent. Argentina] 13: 281–91, ill. **Shaw, J. G.**—(See under Lepidoptera.)

Institutum Entomologicum Choui

In order that the work of scientific research may not be affected by the school-lords or political influences, **Prof. Dr. Chou Io**, a famous Chinese entomologist, has contributed all he has saved and scrimped during the eight years of the War of Resistance and all his specimens collected from many a dangerous expedition to the far and remote hinterland of China to establish the Institutum Entomologicum Choui. But, owing to the limitation of means, only a small-scale printing office has been set up on the basis of a scanty equipment for the publication of the two magazines: **Entomologia et Ars** and **Insecta Sinensium.** A volume has now been rounded off. The institute is now busying itself with the collection of reference literature. Any donations of publications or materials for exchange from entomologists, entomological societies, research institutes or schools will be cordially welcome.—LU JINSHENG, *Address:* Chang-Chia-Kang, Shensi, China.

Reviews

PULGAS. BIBLIOGRAFIA, CATÁLOGO E ANIMAIS POR ELAS SUGADOS. By A. da Costa Lima and C. R. Hathaway. Monografias do Instituto Oswaldo Cruz, No. 4; December, 1946; pp. 1–522; octavo, paper covers (not illustrated). Imprensa Nacional, Rio de Janeiro, Brasil.

This publication is a catalogue of the fleas of the world. It concerns the species described through 1943, and it includes a few American species published during 1944. The first section of the book is devoted to bibliography. The references are arranged chronologically, and within each year, the titles are arranged alphabetically according to authors. This plan is logical from the taxonomist's standpoint, and if one wishes to locate references according to authors, he will find the authors' names listed in the general index, which is very complete and is a guide to the use of the catalogue.

The major portion of the book is the catalogue of species. The ordinal name Suctoria Degeer 1778 is adopted, and the reasons for this are given. It is pointed out that Oudemans' (1908, 1909) division into suborders Integricipita and Fracticipita is no longer tenable. The fleas of the world are arranged principally according to the generic and higher categories employed by Wagner (1939), incorporating the classification of Ewing and Fox (1943) for North American species. The ten families are: Pulicidae, Hectopsyllidae, Malacopsyllidae, Coptopsyllidae, Vermipsyllidae, Lycopsyllidae, Ischnopsyllidae, Stephanocircidae, Hystrichopsyllidae and Dolichopsyllidae. The grouping of fleas into families, subfamilies and tribes is admittedly a highly controversial problem, and the authors have wisely avoided a long discussion or an attempt to propose a new classification. In the general index to species, or synopsis, preceding the actual catalogue, there are listed 177 genera, 21 subgenera, and 1,193 species and subspecies. This may give the reader some idea of the magnitude of the task of compiling such a catalogue.

For each species the authors give the complete synonymy and references, and also the recorded hosts and distribution. They do not indicate the type host and type locality for each species, and this information, while not necessarily of biological significance, would have enhanced the usefulness of the work for the taxonomist. With regard to the chigoe flea, the authors adopt the generic name *Tunga* Jarocki 1838, following Rothschild (1921) and subsequent authors. They do not cite *Dermatophilus* Guérin-Méneville 1838, a citation which has apparently been overlooked by many authors, including Rothschild. Bequaert (1926) has pointed out that it would be very difficult to decide which of the two generic names was published first, and the reviewer believes that this matter should have received consideration in the catalogue.

The authors have accepted Ewing and Fox's use of *Trichopsylla* Kolenati 1863. This usage includes many North American species, involving a lumping of certain of Jordan's genera and the reduction of *Pleochaetis* Jordan 1933 to subgeneric standing. Since Ewing and Fox were in all probability ill advised in their ideas on this matter, it is unfortunate that the authors have followed them.

Certain emendations have been made, for example: *Dellopsylla* (sic) for *Delopsylla* Jordan 1926, and *Justapulex* (sic) for *Juxtapulex* Wagner 1933. The reasons for these emendations should be given in each case, although it is possible that the former is a lapsus.

On page 147, we find *Parapsyllus huincae* Del Ponte and Riesel 1939 listed as a valid species. In the reviewer's opinion it is a *nomen nudum,* for in their original publication Del Ponte and Riesel merely listed the species with host and locality, stating that it would be described subsequently. This applies also to *Polygenis litargus puelche* (Del Ponte and Riesel 1939, as *Rhopalopsyllus*), although in this case (page 144) the authors state that this species has not yet been described.

The third portion of the book is a list of avian and mammalian hosts, with the species of fleas recorded for each. In the introduction, the authors give the references consulted with regard to host names. The reviewer is well aware of the difficulties of trying to ascertain correct or nearly correct host names from the literature. Doubtless a mammalogist or ornithologist would have numerous comments on the classification and nomenclature adopted. Being neither of these, the reviewer is not competent to criticize the host list. It is an extremely worthwhile contribution in itself, and it serves its purpose adequately.

The few critical remarks of a specific nature should be construed as constructive criticism, as they are not meant to be derogatory. Of particular interest to medical entomologists will be the wealth of information on recorded hosts and distribution. The book is not intended as a textbook on fleas, and it may not appeal to the worker who lacks training and experience in taxonomy. It is of unusually high calibre and its excellence will be recognized by those who consult and use it. The publication is a useful, valuable, and timely contribution, which is highly recommended for use by trained entomologists. —HENRY S. FULLER, M.D., Assistant Professor of Preventive Medicine, Bowman Gray School of Medicine, Winston-Salem, North Carolina.

FLEAS OF WESTERN NORTH AMERICA; Their Relation to the Public Health. By Clarence Andresen Hubbard. The Iowa State College Press, Ames, Iowa. 1947. ix + 533 pp. Price $6.00.

This is the companion book to Dr. Irving Fox's, "Fleas of Eastern United States," which appeared in 1940, also published by the Iowa State College Press.

Hubbard gives, besides the systematic classification, some history of the study of the western fleas with portraits of the students of Western American Fleas and their contributions.

The medical importance of fleas is stressed as regards the bubonic plague, typhus fever and tularemia. The author gives warning, particularly, of the presence of the causative organism of bubonic plague in the wild rodents of the Pacific and Rocky Mountain regions; another chapter is given to field and laboratory technique. His illustrations accompanying most of the descriptions of more than 230 species and subspecies are original and clearly give the features he considers of importance.

Under each species, besides the more important bibliographical references, is given a brief description of what is known of the range of the species, preferred hosts, seasonal distribution, biology, and records of material examined.

Part III contains pp. 391–533, includes the host index: of western rodent fleas, fleas of western carnivora, of western insectivora, of western bats and birds, and fleas reported from man; also a selected bibliography and a complete index.

This should be an indispensable book to the students of Siphonaptera.—E. T. Cresson, Jr.

Chemical insect attractants and repellents. By Vincent G. Dethier. Blakiston Company, Philadelphia, 1947. Pp. xv + 289, 69 figures. Price, $5.00.

The coming into common use of the new and easier word "attractant" (the 1915 Webster gives only "attrahent") is indicative of the rapidly developed interest in the study of substances that attract insects. In recent years, a great many empirical investigations on the attrahent and repellent qualities of innumerable chemical compounds have been carried out; but there has also been much thoughtful research on the fundamental problems involved in the specific reactions of insects to the chemical stimuli of their environment. The facts and ideas that are contained in the voluminous literature have now been, in this book, for the first time, sifted out, critically examined, and presented in a carefully organized form.

The book can be used for practical, economic, purposes, for it names the substances and gives formulae and references to the literature. But of far greater interest and value is the thorough understanding it imparts of the basic principles involved in the studies on attractants, the descriptions of methods of investigation that it outlines, and the attention it gives to the difficulties and complexities inherent in any work on olfactory responses.

Attractants are classified as related to food, to oviposition and to sex. The various kinds are then taken up in turn, with a study of their source, chemistry and effect on the insect. Baits and traps are considered and, finally, the chemical basis of taste and olfaction, and the search for some relation between attrahency and repellency to molecular configuration or to physical properties come up for discussion. The last chapter deals with the mechanism of choice, its physiological and genetic basis, and the evolutionary relationship between polyphagy and oligophagy.

The documental tables, graphs and illustrations, the literature references following each chapter, and the full index are excellent features of the book.—R. G. Schmieder.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

Chrysididae—Wanted for determination in preparation of revision. Wm. G. Bodenstein, Galesville, Maryland.

Wanted—Ataenius and allied Aphodiinae from all parts of the world, especially Mexico, Central and South America. O. L. Cartwright, Clemson, S. C.

Wanted—Reprints and unpublished mss. on biological control of mosquitoes; for preparing annotated bibliographies for publication. J. B. Gerberich, Michigan State College, East Lansing, Mich.

Wanted—Hesperid genus Megathymus for exchange or purchase. P. S. Remington, 5570 Etzel Ave., St. Louis 12, Missouri.

Wanted—Psychodidae of North America for revisional purposes. Wm. F. Rapp, Jr., 203 Harker Hall, Urbana, Ill.

Diptera—Tachinidae-Dexiidae wanted, No. Amer. and exotic. Will collect most orders in exchange or will purchase. P. H. Arnaud, 60 Woodrow St., Redwood City, Calif.

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ENTOMOLOGICAL NEWS

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ENTOMOLOGICAL NEWS

Vol. LVIII DECEMBER, 1947 No. 10

New Species of Trichoptera from the United States

By D. G. Denning, University of Wyoming, Laramie

Recently the writer had the opportunity to examine several large collections of Caddis flies from Minnesota and southern United States. A number of undescribed species were encountered, nine of which are described herein. I would like to express my appreciation to Dr. H. R. Dodge, Dr. C. E. Mickel, and Dr. R. H. Daggy for collecting this material and making it available for study. Unless designated otherwise, holotypes are in the author's collection at the University of Wyoming.

Protoptila talola n. sp.

This species is closely related to *maculata* (Hagan) but can be distinguished from that species by the gradual, not abrupt, upturned apex of the lateral spines of the oedagus, by the mesad-directed instead of laterad-directed apices of the lateral spines, by the evenly rounded caudo-ventral corner of the oedagus and several other details of the male genitalia.

Male.—Length 4 mm. Spurs 0–4–4. Anterior margin of hind wing abruptly narrowed beyond hamuli. Color and general structure similar to *maculata*, but smaller in size. Male genitalia as in fig. 1. Sternite of sixth segment with an acute mesal projection reaching just beyond margin. Eight sternite produced into a long bifid process, apical incision shorter than in *maculata*, upturned only slightly distally. Tenth tergite with lateral arms directed ventro-caudad, apex nearly truncate, turned mesad but not sufficiently to enclose oedagus, a few setae dorsally; inner aspect as in fig. 1, apparent cerci ovate from lateral view, triangular from dorsal view. Lateral spines of oedagus short, sinuate from lateral view, attenuated distally and gradually curved dorsad; from dorsal aspect, fig. 1A, distal portion curved mesad, almost touching oedagus, a brush of minute caudad-curved setae along margin near apex. Oedagus with distal portion considerably enlarged, ventral margin rounded, caudo-ventral corner not produced beyond margin.

Holotype, male. Pine County, MINNESOTA, May 23, 1941, C. E. Mickel. Holotype deposited in the entomological collection of the University of Minnesota.

Protoptila georgiana n. sp.

This species bears some resemblance to *alexanderi* Ross but can readily be distinguished from that species and other described species of the genus by the tenth tergite, the lateral spines of the oedagus and the eighth sternite.

Male.—Length 3 mm. Spurs prominent, 0–4–4. Hind wings sabre-shaped, anterior margin abruptly narrowed beyond hamuli. Color and general structure typical for genus.

Male genitalia as in fig. 2. Sternite of sixth segment with a prominent mesal projection, fig. 2A. When viewed from dorsal aspect eighth tergite considerably flared laterally; apical margin heavily pigmented, slightly incised and bearing a few large setae. Eighth sternite produced into a long bifid process with apical incision wide, fig. 2B. Dorsad to the eighth sternite is a concave, deeply bifid plate-like process bearing a single seta at apex of each lateral lobe, best viewed from ventral aspect, fig. 2B. Tenth tergite divided into a pair of sclerotized structures projected caudad and gradually ventrad; apex of lateral lobe beak-shaped, turned slightly mesad but not quite enclosing oedagus, a few scattered setae along dorsal margin. Oedagus extending caudad beyond any other portion of genitalia, middle portion considerably narrowed, widened apically, slightly incised when viewed dorsally, caudo-ventral corner produced slightly beyond remainder; lateral spines of oedagus slender, arcuate, apex attenuated and bearing a few minute setae. Ventrad from base of oedagus arises a pair of slender setose lobes, directed caudo-ventrad. Ventrad and mesad to these lobes is a pair of structures bearing no setae and abruptly curved dorsad.

Holotype, male. Macon, GEORGIA, May 1944, H. R. Dodge.

Chimarra moselyi n. sp.

This species is related to *florida* Ross; it can be separated from that and other described species by the flat sinuate lateral processes of the tenth tergite, the slender rod-like structures associated with the oedagus and the wide prominent mesal process of the ninth sternite.

Male.—Length 5 mm. General color dark brown, legs pale yellowish with spurs darker, wings uniformly dark brown; antennae slightly darker than wings. Genitalia as in fig. 3. Tenth tergite, except lateral processes, semi-membranous, distal margin irregular; lateral sclerotized process extends caudad beyond remainder, twisted so that when viewed from dorsal aspect distal portion flattened, widened, rounded at apex; on dorsal surface are two short setae on an enlarged flattened tubercle; from base arises the prominent cercus. Claspers with base narrow, dorsal portion elongated into a clavate caudad directed process, apex quadrate when viewed dorsally; ventro-mesal portion from caudal view enlarged into a large triangular process, bearing several long setae along lateral margin (this margin and setae discernible from lateral view). Two pairs of sclerotized rods are associated with the oedagus: a ventral pair, long and slender, extending caudad beyond any other portion of genitalia, apex curved ventrad; a dorsal pair, heavily sclerotized, shorter than ventral pair, apex acute and slightly curved dorsad. Mesal process of ninth sternite very large and prominent.

Holotype, male. Macon, GEORGIA, July 1944, H. R. Dodge.

I take pleasure in naming this species in honor of Mr. Martin E. Mosely of the British Museum (Natural History), who has made so many noteworthy contributions to our knowledge of the Trichoptera.

Nyctiophlax celta n. sp.

This species is closely related to *vestitus* (Hagen); it can be distinguished from that species by the shape of the tenth tergite, the shape and size of the apical lobes of the clasper, the shape and size of the oedagus and the much narrower condition of the ninth sternite.

Male.—Length 5 mm. Wings light brown, antennae and legs yellowish. Wings with R_2 absent. General characteristics typical for genus. Male genitalia as in fig. 4. Tenth tergite lightly sclerotized, viewed from dorsal aspect apical margin with a distinct incision which forms a pair of short setiferous points. Cerci quadrate, extending caudad beyond tenth tergite, ventromesal portion projected ventro-caudad as a sclerotized process, its apex broadly rounded, not sub-acute as in *vestitus;* apical portion bearing several short stout setae. Claspers, seen from lateral aspect, with base rounded, gradually narrowed apically, apex with lateral lobe digitate, mesal lobe acute, not much longer than lateral lobe; seen from caudal view, fig. 4A, concave near base, apical portion widely and deeply incised; mesal lobe viewed from dorsal or caudal aspect quadrate apically. Oedagus somewhat tubular, apical portion enlarged and colored dark brown, apex bluntly rounded, no discernable dorsal rods present.

Holotype, male. Tallulah River, Tallulah Falls, GEORGIA, June 16, 1945, R. H. Daggy.

Cheumatopsyche wabasha n. sp.

Male.—Length 8 mm. Wing irrorate with brown and light tan. Head and thorax dark brown. The five basal segments of flagellum with a distinct dark brown V-mark.

Genitalia as in fig. 5. Tenth tergite somewhat wider than long, lateral lobes conspicuous, not extending dorsad to level of segment; seen from caudal view fig. 5A, lateral margin rounded, apical portion constricted, apices blunt and widely separated. Viewed from dorsal aspect apex of tenth tergite with a small incision; setae covering apical portion of lateral lobes quite long and curved caudad. Setiferous wart near base of tenth tergite lateral lobes elongate, irregular and bearing a number of setae. Basal segment of clasper narrow, gradually widened apically, apical segment tapering to a narrow apex, curved cephalad. Oedagus with basal portion only slightly enlarged, apical portion abruptly directed dorsad, lateral lobes short and ovate.

Holotype, male. Wabasha, MINNESOTA, July 19, 1941, Light trap, H. T. Peters. Holotype deposited in the entomological collection of the University of Minnesota.

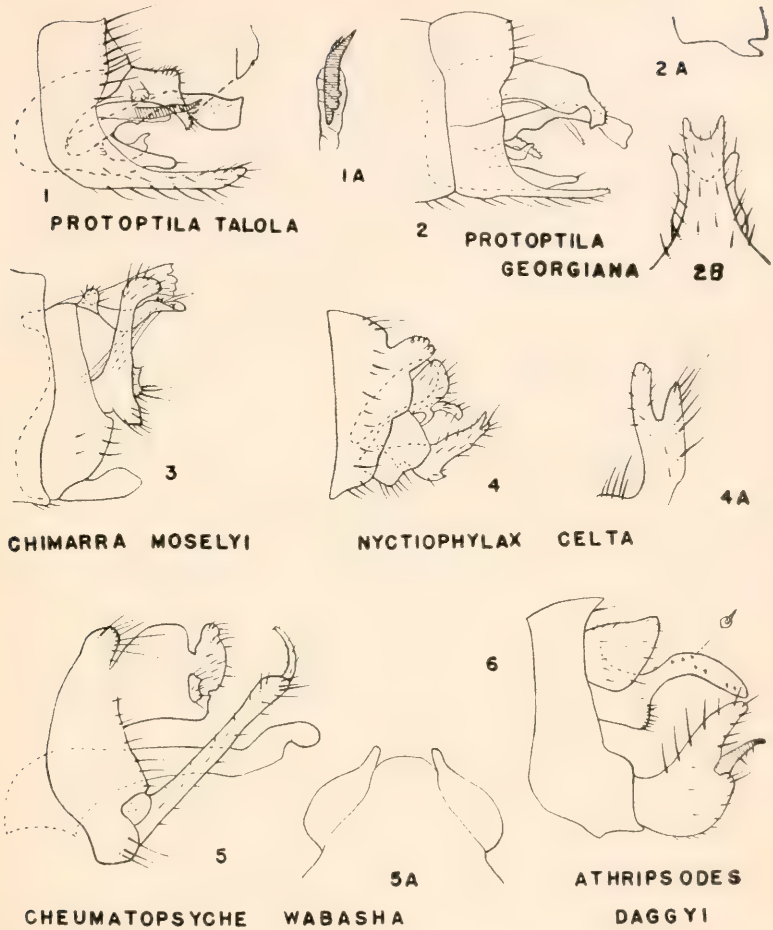

Fig. 1. *Protoptila talola,* male genitalia, lateral aspect; 1A, lateral spine of oedagus. Fig. 2. *Protoptila georgiana,* male genitalia, lateral aspect; 2A, sternite of sixth segment; 2B, sternite of eighth segment. Fig. 3. *Chimarra moselyi,* male genitalia, lateral aspect. Fig. 4. *Nyctiophylax celta,* male genitalia, lateral aspect; 4A, clasper, caudal view. Fig. 5. *Cheumatopsyche wabasha,* male genitalia, lateral aspect; 5A, tenth tergite, caudal view. Fig. 6. *Arthripsodes daggyi,* male genitalia, lateral aspect.

Athripsodes daggyi n. sp.

This species is closely related to *ophioderus* Ross, from which it differs in the shape of the tenth tergite, the much wider cerci, the wider basal portion of the clasper and the pair of stout straight dorsal spines of the oedagus.

Male.—Length 10 mm. Eyes small; general characteristics same as for genus. Color of head, body and appendages dark brown. Genitalia as in fig. 6. Tenth tergite long and narrow, as in *ophioderus* somewhat s-shaped when viewed laterally; basal portion large and wide, along ventro-distal corner a group of eleven short stout yellowish setae, dorsal surface bearing a pair of very short triangular protuberances; the dorsal surface of the apical portion bears a number of scattered minute stout spines; inner surface deeply excavated, viewed ventrally apical portion tapers gradually to a blunt point which is narrower than remainder. Cerci deeply incised dorsally, short and wide, ventro-caudal corner rounded, a few scattered setae over most of surface. Claspers with digitate lobe rather short, stout, bearing a considerable number of long setae; the heavily sclerotized spine acute distally, gradually curved mesad, bearing three short spines. Ventral spatulate plate of oedagus slightly longer than main structure; dorsal spines short, stout, heavily sclerotized and straight, apex acute.

Holotype, male. Flat Shoals, 5 miles south of Concord, GEORGIA, May 27, 1945, R. H. Daggy. *Paratype,* 2 males. Same data as for holotype.

Hydropsyche bidentata n. sp.

This species bears some resemblances to *betteni* Ross but differs markedly in the shape and incised apex of the oedagus, the vary short apical segment of the claspers, and the very irregular outline of the tenth tergite.

Male.—Length 10 mm. Genitalia as in fig. 7. Tenth tergite incised on meson almost one-half distance to base, apical dorsal corner with a sharp flat angulation, apical margin markedly declivous, truncate, very irregular; ventro-distal corner with a setiferous process which extends to the margin as a distinct,

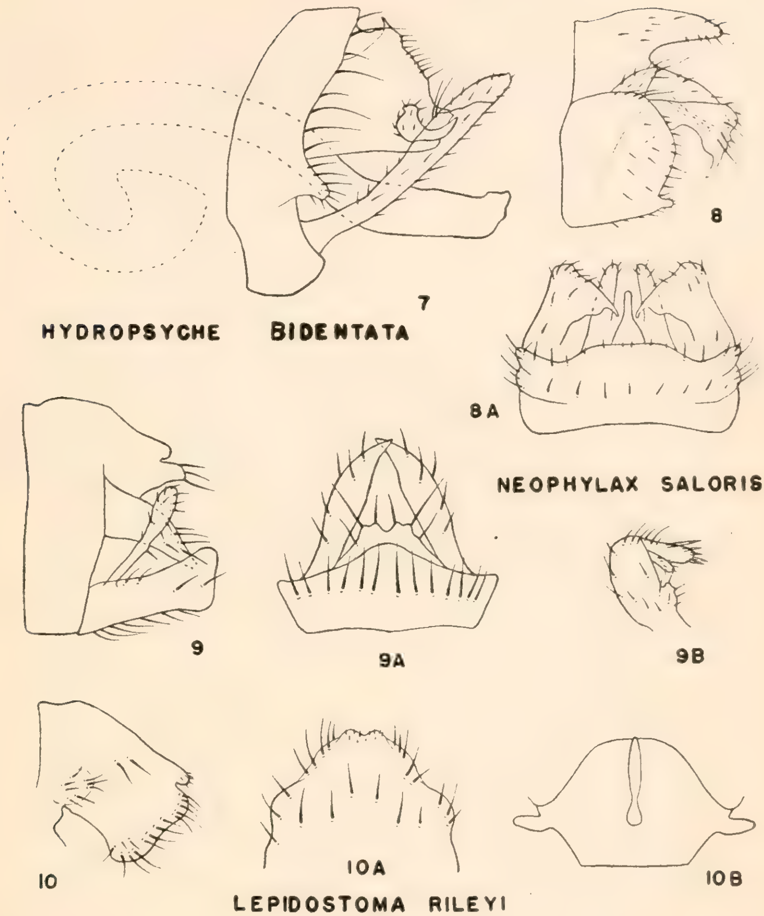

Fig. 7. *Hydropsyche bidentata,* male genitalia, lateral aspect. Fig. 8. *Neophylax saloris,* male genitalia, lateral aspect; 8A, tenth tergite, dorsal aspect. Fig. 9. *Lepidostoma rileyi,* male genitalia, lateral aspect; 9A, tenth tergite, dorsal aspect; 9B, clasper, ventral aspect. Fig. 10. *Lepidostoma rileyi,* female genitalia, lateral aspect; 10A, tenth tergite, dorsal aspect; 10B, spermatheca.

sharp, dorsad-directed tooth. Claspers with basal segment gradually widened toward apex; apical segment very short, acute apically and directed mesad. Oedagus cylindrical, long, basal portion does not quite form a complete circle, remainder extends gradually ventrad with the apical portion upturned to it; apex truncate except for a slight ovate lobe laterally, apico-dorsal portion flat and incised.

Holotype, male. Columbia, SOUTH CAROLINA, August 5, 1943, D. G. Denning. PARATYPE, male. Some data as for holotype.

Neophylax saloris n. sp.*

This species bears some resemblance to *nacatus* Denning but differs markedly from that and other described species in the long caudad-directed dorsal branch of the tenth tergite, the abruptly ventrad-directed clasper and the wide flattened mesal portion of the ninth sternite.

Male.—Length 10–10.5 mm. Head, body and appendages luteous. Wings irrorate light brown, apical portion of forewings considerably darker. Spurs brownish, inner spur of hind legs almost twice as long as outer spur, attenuated to a narrow apex. Sternite of seventh segment with an acute prominent mesal projection. Genitalia as in fig. 8. Tenth tergite with dorsal branch convex, directed caudad, seen from dorsal aspect incised one-half distance to base, forming a pair of slender digitate lobes bearing a few short setae apically; ventral branch directed ventrad, also deeply incised, both portions lying on each side of the slender attenuated oedagus, fig. 8A. Lateral portion of ninth segment with a triangular mesad-directed lobe, bearing several long setae. Claspers extend caudad as far as tenth tergite, apical portion directed ventrad into an acute apex, lateral margin nearly straight; viewed from ventral aspect claspers flattened, entire clasper curved mesad. Ninth sternite with apical margin produced into a wide flat projection.

Holotype, male. MACON, GEORGIA, November, 1943, H. R. Dodge. *Paratypes,* 3 males. Same data as for holotype.

* While this paper was in press this species was described as *Neophylax atlanta* by H. H. Ross (Trans. Amer. Ent. Soc. 73: 152. 1947). *N. saloris* is thus a synonym of *N. atlanta* Ross.

Lepidostoma rileyi n. sp.

Male.—Length 6.5 mm. Wings, body and appendages light brown. Wings without any unusual modifications. Maxillary palpi short, apparently one-segmented, held closely appressed to head and not extending beyond it. Antennal scape about as long as width of head. Genitalia as in fig. 9. Ninth segment approximately annulate, division between ninth and tenth tergites indistinct from lateral view. Seen from dorsal aspect tenth tergite divided into a pair of small irregular processes, each bearing several large setae, fig. 9A. Lobes of ninth segment directed gradually ventrad, acute distally, several scattered setae over dorsal surface; from dorsal aspect lobes are curved mesad so that apices overlap, fig. 9A. Claspers present a two-segmented appearance due to the distal portion being abruptly turned mesad and not discernible from lateral view; seen from lateral aspect, fig. 9, basal portion of clasper somewhat rectangular, and bearing near base a long slender dorsal process which is directed dorsad nearly to level of tenth tergite; seen from ventral aspect, fig. 9B, a small sub-triangular process is present along lateral margin, distal portion slender, elongate, apex rounded, lateral and apical margin bearing several large prominent flattened setae; where distal portion turns at a right angle from basal portion a slender digitate process arises on mesal surface.

Female.—Length 7 mm. Same general color and characteristics as male. Genitalia as in fig. 10. Viewed from dorsal aspect tenth tergite incised distally forming a pair of small protuberances bearing minute setae, fig. 10A. Viewed laterally, fig. 10, distal margin irregular with sides developed ventrad into a thin flange, quite heavily setose. Ventral groove of spermatheca, fig. 10B, occupying posterior two-thirds. Prominent lateral projections of spermatheca continue dorsad to form a large concave cephalad directed plate.

Holotype, male. Ela, NORTH CAROLINA, May 30, 1941, S. S. Easter. *Allotype,* female.—Same data as holotype. *Paratypes,* 2 females.—Same data as holotype. Types deposited in the entomological collection of the University of Minnesota.

It is with pleasure that I name this new species in honor of Dr. W. A. Riley, retired head of the Division of Entomology, University of Minnesota.

A New Food Supply for Latrodectes mactans

By Mark Robinson, Springfield, Pennsylvania

The black widow spider is very common in southwest Philadelphia in an area which is used as an automobile graveyard and for dumping other refuse. By turning over an auto fender as many as five or six full grown female spiders can be found there in late summer or early autumn. In addition to their being so plentiful around the auto parts they can be found under pieces of paper, rocks, boards, and the ties of a railroad which runs through the site. In this one small area of about forty acres it was possible to collect two hundred adult female spiders in one afternoon.

The food of these spiders consists of ground beetles, wasps, flies and other insects that fly near the ground or have a habit of hiding under cover during the daylight. In recent years this area has become infested with the "Scarab" beetle *Autoserica castanea* which comes out to feed at night on almost all varieties of foliage or flowers.

In the daylight these beetles hide just under the soil or under boards, rocks, or pieces of paper or most anywhere in subdued light. The advent of these beetles to this area has been a boon to the black widows and most of their food during the season the adult beetles are present consists of these pests. Examination of the web and the ground under the web often reveals a score or two of husks of these beetles and at times a greater number can be found. On one occasion I counted seventy-eight husks of these beetles under or in the web of one adult female *Latrodectes mactans.*

The black widow spider has been condemned in a great many areas as a serious menace and it may be, but in some cases at least it is doing a good job in helping to control a pestiferous insect.

A Canthon with an Abnormal Tibia (Coleoptera)

By Mark Robinson, Springfield, Pennsylvania

A specimen of *Canthon nigricornis* Say in my collection from Goliad, Texas, collected by Hubbard and Schwartz has the anterior right tibia composed of three fairly normal tibiae grown together. Tibia number one is nearly normal in shape, except what should be the proximal end is unattached and what would normally be the anterior face is grown into what would normally be the anterior face of tibia number two. The end that would normally be the proximal end of tibia number two is also unattached. The end that would normally be the distal end of number two tibia is grown fast to the distal end of tibia number three. Only tibia number one has the normal number of teeth, both tibia number two and three have but two teeth. The outer edge of all three tibiae are crenate in the regular manner. The tarsus is attached to the distal end of tibia number one while the proximal end of tibia number three is attached to the femur. The spur is missing.

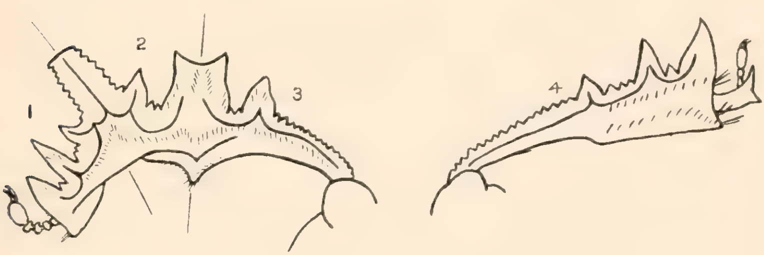

Fig. 1. Tibia number one of the abnormal tibia. 2. Tibia number two of the abnormal tibia. 3. Tibia number three of the abnormal tibia. 4. The left or normal tibia.

Length along the posterior face: Left or normal tibia—2.8 mm., right number one tibia—2.0 mm., right number two tibia—1.8 mm., right number three tibia—2.5 mm.

While occasional abnormalities are noticed as one studies large series of specimens, this is the most striking example to come to my attention and I know of no other such condition being previously recorded.

A New Geophiloid Centiped Taken at the Mexican Border

By Ralph V. Chamberlin

The new centiped here described was taken at quarantine on the bridge at Eagle Pass, Texas. The type is in the author's collection.

APUNGUIS new genus

A genus of Schendylidae related to *Escaryus* in having the coxal pores numerous. It differs from *Escaryus* in having the claws of the second maxillae entirely smooth instead of pectinate and in not having the labrum free. Labrum arcuate, with numerous teeth. First maxillae with well developed membranous lappets on the palpi. Coxae of second maxillae united at the middle. Prehensors toothed within, exposed from above. Anal legs with well developed claws. Last coxae with numerous small pores.

Generotype.—*Apunguis prosoicus* new species

Apunguis prosoicus new species

Head without frontal suture; surpassed by the prehensors. The claws of prehensors armed at base with a small conical, black tooth; femuroid armed at distal end, the tooth paler; prosternum also armed with two minute teeth or denticles.

Spiracles all circular, the first considerably larger than the second.

Dorsal plates bisulcate.

Last ventral plate narrow, sides strongly converging caudad. Coxal pores small and numerous.

Pairs of legs, 43.

Length, about 16 mm.

Locality.—Mexico. One female taken with fruit on the bridge at Eagle Pass, June 2, 1947.

Notes and News in Entomology

Under this heading we present, from time to time, notes, news, and comments. Contributions from readers are earnestly solicited and will be acknowledged when used.

Sterility in Insects: It is well known that interspecific crosses are almost always sterile. Usually no progeny are produced at all. Less commonly a hybrid generation is produced but is composed of sterile individuals. In only a few cases are fertile hybrids obtained.

Attempts to analyze the causes of sterility have not been more than partially successful. Cytogeneticists have presented good reasons to expect the failure of any except the closest of interspecific crosses. The failure of most "close crosses," however, is not well understood. Undoubtedly numerous factors enter in, even if we consider only those cases where copulation is readily obtained. General statements to the effect that more than a certain degree of genic unbalance is lethal, and that lesser degrees of unbalance may produce sterile individuals are reasonably well documented.[1] But one would like to know more of the mechanisms of how these disbalances operate.

The job of obtaining significant data on sterility has not been easy. Some cases of nutritional castration [2] and parasitic castration [3] have been partially elucidated but these do not answer questions about the nature of interspecific sterility. Stern [4] built up an intraspecific "sterility model" in *Drosophila melanogaster* but the artificiality of this case precludes its general applicability. Another intraspecific sterility case in *D. melanogaster* is the result of action of a mutant gene series called "lozenge." [5] This set of alleles affects the development of the female accessory reproductive ducts, and variation in the development of the reproductive organs coupled with the fate of

[1] Dobzhansky, T. Genetics and the Origin of Species. 1941.

[2] Pepper, J. H. and E. Hastings. Tech. Bull. 413, Montana Agric. Exp. Sta. 1943.

[3] Wigglesworth, V. B. The Principles of Insect Physiology. 1939.

[4] Stern, C. Amer. Nat., 70: 123-142. 1936.

[5] Oliver, C. P. and R. C. Anderson. Amer. Nat., 79: 89–94. 1945. Anderson, R. C. Genetics, 20: 280–296. 1945.

introduced sperm allows a partial analysis of the functioning of these structures. The dorsal spermatheca is necessary for high and extended fertility, whereas the presence or absence of the parovaria is of little significance; sperm are normally stored in the female in the ventral receptacle but remain viable only when the spermatheca is active. These data give us some good information about the physiology of the female reproductive tract; but it does not automatically follow that similar disturbances are involved in interspecific sterility. It would be helpful to know whether similar phenomena occur in partially fertile hybrids.

Recently a naturally occurring sterilizing mechanism has been found operative in many species of the genus *Drosophila*.[6] This has been termed the "insemination reaction." Examination of 35 species showed it normally present in 28 of these. It is likewise present but in exaggerated form in those cases where interspecific mating can be induced. In a normal intraspecific mating in a species showing this reaction, the addition of semen at copulation induces within a few minutes an enlargement of the vagina to 3–4 times the size in virgins. The enlargement is due to the secretion of fluid by the lining epithelium; an edematous, slightly opaque condition results. In these intraspecific matings the vagina returns to normal within a few hours. This recovery is correlated with the sperm leaving the vagina, either by entering the ventral receptacle where they are stored or (the remainder) being expelled. By ingenious use of sterile male hybrids of *D. arizonensis* x *D. mojavensis* which produce no sperm but do copulate and inject a sperm-free semen, it was possible to show that the insemination reaction is due to a substance, presumably protein, in the seminal fluid and not or not only to the sperm. This places the phenomenon in the general field of immunochemistry where known techniques should permit pushing the analysis further.

Concerning the absence of the insemination reaction in some species, a correlation was noted between the presence of a reac-

[6] Patterson, J. L. Proc. Natl. Acad. Sci., 32: 202–208. 1946. Univ. of Texas Publ.; no. 4720. 1947.

tion and the frequency of mating. Species which normally mate frequently (e.g. *D. melanogaster*) show no reaction; species which mate occasionally show a weak reaction, and species which normally mate only once show a strong reaction. Among common N. A. species the reaction is shown by *D. virilis* and *D. funebris.*

When an interspecific mating can be induced with a female of a species giving the insemination reaction, the same series of events take place except for the recovery phase. The sperm are usually inactivated or expelled, seldom do any enter the ventral receptacle, and the vagina becomes brownish or even black due to the reaction-mass containing the sperm. The mass may be expelled, but subsequently a sperm that was lucky enough to get into the ventral receptacle may function to fertilize an egg. Usually, however, there are no active sperm left for fertilization. Therefore, hybrids would not have a significant chance to become sufficiently numerous for establishment.

Obviously, this newly discovered isolating mechanism cannot answer all of the questions of interspecific sterility, and it remains to be seen whether or not comparable reactions will be found in other insect groups. However, this is a clear-cut and demonstrably effective mechanism *that occurs naturally.* As such it is a valuable new discovery in the field of interspecific sterility.

A. G. RICHARDS

Entomological Departments

In accordance with its policy of including news of interest to entomologists, ENTOMOLOGICAL NEWS is inaugurating a series of articles on entomological groups throughout the country that will be continued as material is received. The editorial board invites material similar to that given in this first note from universities and colleges, the Bureau of Entomology and Plant Quarantine, museums, the U. S. Public Health Service, entomological societies and any other official or semi-official groups of entomologists.

University of Minnesota

The Division of Entomology and Economic Zoology has undergone considerable change in recent years. Dr. Wm. A. Riley, medical entomologist and former chief, and Prof. A. G. Ruggles, economic entomologist and State Entomologist, have retired. Dr. M. C. Tanquary, apiculturist, died. Dr. Gustav Swanson, economic zoologist, and Dr. H. H. Shepard, insecticide specialist, have resigned to accept positions elsewhere. The above losses, not all at the same time, left Dr. C. E. Mickel in taxonomy, Dr. A. A. Granovsky in economic entomology and insect vectors of plant diseases, Dr. A. C. Hodson in ecology, and Dr. M. H. Haydak in apiculture.

Dr. Mickel became Chief of the Division in 1944. In 1945, Dr. W. H. Marshall (formerly with the U. S. Fish & Wildlife Service) was brought in for economic vertebrate zoology; Dr. A. G. Richards (Univ. of Pennsylvania) for insect physiology and insecticide toxicology, and Dr. R. H. Daggy (U. S. Public Health Service) for economic entomology. A new laboratory was constructed and equipped for inaugurating work in insect physiology. This laboratory is adjacent to the ecology laboratory and shares some of the same facilities. In 1946, Dr. L. L. Smith, Jr. (Minnesota State Conservation Dept.) was brought in, at first on a part time cooperative basis, to handle teaching and research in fisheries; Dr. A. L. Burroughs (Hooper Foundation, Univ. of California) for medical entomology, and Mr. Thor Aamodt, who replaced Prof. Ruggles as State Entomologist with part time faculty status, began teaching an advanced course in Quarantine and Regulatory Entomology. In 1947, Dr. Daggy accepted a position with the Saudi Arabia Oil Company and was replaced with Dr. L. K. Cutkomp (TVA) who took over teaching and research in insecticides, with a new laboratory now being constructed for this purpose; Dr. H. E. Milliron (Bureau of Entomology) was added to handle taxonomy and the insect collection; and with the aid of a grant from the U. S. Public Health Service a new laboratory is now being built for experimental work in medical entomology.

The divisional set-up then stands at present:

Prof. Mickel, Chief, general entomology and taxonomy,
Prof. Granovsky, insect vectors of plant diseases,
Prof. Hodson, ecology, forest entomology, and elementary economic entomology,
Assoc. Prof. Haydak, apiculture,
Assoc. Prof. Marshall, conservation and mammalogy,
Assoc. Prof. Richards, physiology, histology and embryology,
Assoc. Prof. Smith, fish and fisheries,
Asst. Prof. Aamodt, legislative entomology,
Asst. Prof. Burroughs, medical entomology and parasitology,
Asst. Prof. Cutkomp, insecticides, advanced principles of economic entomology,
Asst. Prof. Milliron, taxonomy, elementary economic entomology,

plus various non-permanent teaching and research assistants.

Despite changes in staff and the introduction of some new lines of research, the program and philosophy of entomology at Minnesota remains much as it used to be. Except for a few "service courses," entomology here is still primarily a graduate field of study with emphasis on principles, procedures and a broad background. Undergraduates who major in entomology devote almost all of their time to obtaining a broad general background in basic science plus a curriculum of zoology and elementary entomology. As a rule there is no concentration in entomology until the years of graduate study. Close relationships are maintained with the Zoology Department, with four members of the entomology staff holding titles in the Zoology Department also, and the courses in General Entomology, Insect Physiology, Medical Entomology, Parasitology and Ecology being given under joint sponsorship of the two departments.

Space in the Division is at a premium—all kinds of space. The Division has plans for a new building to take care of this but when it will become available is not known. In the meanwhile entomology continues to rub elbows with the library and administration in one building.

Current Entomological Literature

COMPILED BY EDWIN T. MOUL AND RAYMOND Q. BLISS.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, 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.

This list gives references of the current or preceding year unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

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 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. The number of the volume, and in some cases, the part, heft, &c is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

GENERAL—Annand, P. N.—Preventive entomology. [37] 40: 461–68. **Anonymous**—Obituary of the Reverend Father Leopold, O.C.R., D.S.A. [23] 79: 61. **Bentley, G. M.**—Obituary of Franklin Sherman. [37] 40: 610–11. **Berger, L.**—L'Etiquetage des insectes. [Lambillionea, Bruxelles] 45: 5–8. **Carpenter, F. M.**—Early insect life. [73] 54: 65–85. **Coppel and House**—A description of cages used for the large-scale breeding of Sturmia sp., a tachinid parasite of sawflies. [23] 79: 74–80. **Denier, P. C. L.**—Lista de los artropodos dañinos o útiles a los algodonales argentinos. [Physis] 17: 553–67. **Frost, S. W.**—Obituary of Vernon Raymond Haber. [37] 40: 613–14. **Griffiths, J. T.**—A further account of the effects of DDT when used on citrus trees in Fla. [31] 30: 1–8. **Guyton, F. E.**—Bee sting therapy for arthritis and neuritis. [37] 40: 469–72. **Kiriakoff, S.**—L'Espece et ses subdivisions [Lambillionea, Bruxelles]. 45: 43–45, 53–55, 60–63. **Linduska and Morton**—Determining the repellency of solid chemicals to mosquitoes. [37] 40: 562–64. **Nagel and Granovsky**—A turntable light-trap for taking insects over regulated periods. [37] 40: 583–86. **Parks, T. H.**—Obituary of John Samuel Houser. [37] 40: 611–13. **Smith, R. C.**—Is entomology zoology? [37] 40: 608–09. **Snyder and Morton**—Benzyl benzoate-dibutyl phthalate mixture for impregation of clothing. [37] 40: 586–87.

ANATOMY, PHYSIOLOGY, MEDICAL—Bonnemaison, L.—Remarques sur la symbiose chez les Pentatomidae. [108] 51: 40–42. **Burkenroad, M. D.**—Reproductive activities of decapod crustacea. [3] 81: 392–98. **Christensen, J. R.**—Estudios anatómicos tubo digestivo de algunos insectos argentinos (Orthop.). [Physis] 17: 265–73. **Harnly, M. H.**—Quinine and cinchonine effects on growth, differentiation and lethal temperature of D. melanogaster. [3] 81: 330–39. **Hervey and Schroeder**—Life cycle of Macrosteles divisus in relation to carrot yellows in western New York. [37] 40: 505–08. **Iablokoff, A. K.**—Contribution à l'étude du role du facteur hygrometrique dans l'ecologie et la biologie des insectes xylophages. [108] 52: 88–95, ill. **Judd, W. W.**—The proventriculus of a ground beetle, Chlaenius sp. (Carab.). [23] 79: 58–60. **Kosswig and Shengün**—Intraindividual varibility of chromosome IV of Chironomus. [42] 38: 235–39. **Kozhantshikov, V.**—Nutritional value of proteins in the growth of the blow-fly larva. [Rev. d'Entom. de L'urss] 28: 57–63. **Merrell, D. J.**—A mutant in D. melanogaster affecting fertility and eye color. [3] 81: 399–400. **Miller, R. H.**—The toxicity of the venom of the tarantula (A. cryptethus) upon certain invertebrates and cold-blooded and warm-blooded vertebrates. [39] 39: 45–55. **Mulnard, J.**—Le développement embryonnaire d'Acanthoscelides obtectus. [Arch. de Biol.] 58: 289–314, ill. **Saez, F. A.**—Estado de las investigaciones sobre Citologia de las variedades de Shistocerca paranensis. [Physis] 17: 253–59, ill. **Simmonds, F. J.**—Improvement of the sex-ratio of a parasite by selection. [23] 79: 41–44. **Welsh and Gordon**—The mode of action of certain insecticides on the arthropod nerve axon. [105] 30: 147–71. **Wishart, G.**—Further observations on the changes taking place in the corn borer population in western Ontario. [23] 79: 81–83.

ARACHNIDA AND MYRIOPODA—Anastos, G.—Hosts of certain New York ticks. [73] 54: 178–80. **Banks, N.**—On some Acarina from North Carolina. [73] 54: 110–41 (k*). **Bryant, E. B.**—A list of spiders from Mona Island, with descriptions of new and little known species. [73] 54: 86–99.—Notes on spiders from Puerto Rico. *Ibid.* 183–93 (*). **Mello-Leitão, C. de**—Une araignée argentine type d'une sous famille nouvelle (Corinoctenus anomalostomus, n. sp.). [Physis] 17: 137–43, ill.—A propos d'un nouveau Oonopide myrmecophile d'Argentine. *Ibid.* 143–46, ill.—Les Arachnides et la zoogeógraphie de Argentine. [Physis] 17: 601–30. **Miller, R. H.**—(See under Anatomy.) **Thurman and Mulrennan**—Occurrence of the brown dog tick on Florida rats. [37] 40: 566–67.—Sarcoptoid mites on rats in Florida. *Ibid.* 591–92. **Tragardh, I.**—Diarthrophallina, a new group of mesostigmata, found on Passalid beetles. [Entom. Meddelelser, Kopenhavn] 24: 369–94 ill. (k*).

SMALLER ORDERS—Arlé, R.—Quelques Collémboles de l'Etat d'Espirito Santo (Brésil). [Physis] 17: 125–32, ill. (*). **Crawford, J. C.**—The N. A. species of the genus Megalothrips (Thysanoptera). [65] 49: 197–99 (k*). **Carpenter, F. M.**—Taxonomic notes on the Dilaridae (Neuroptera). [73] 54: 100–09 (*). **Denning, D. G.**—New species and records of N. A. Hydroptilidae (Trichoptera). [73] 54: 170–77. **Del Ponte y Riesel**—Notas sobre Siphonaptera argentinos. [Physis] 17: 543–51. **dos Santos, N. D.**—Descrição do alótipo macho de Dasythemis essequiba Ris, 1919 e notas sôbre a fêmea (Odonata). [111] 7: 289–91, ill. (S). **Gurney, A. B.**—Notes on Dilaridae and Berothidae, with special reference to the immature stages of the nearctic genera (Neuroptera). [73] 54: 145–69. **Walker, E. M.**—Further notes on the subarctic Odonata of N. A. [23] 79: 62–67.

ORTHOPTERA—Chagnon, G.—The cockroaches of the Province of Quebec. [23] 79: 57–58 (k). **Christensen, J. R.**—(See under Anatomy.) **Laing, F.**—The cockroach, its life history. [Brit. Mus. Econ. Ser.] 12: 1–28, ill. **Lieberman, J.**—Las Tropidacrini de la Región neotropical (Acridid). [Physis] 17: 589–600, ill. (k).—Nuevos materiales acridicos de la coleccion del Instituto Oswaldo Cruz, con algunas observaciones sobre Episcopotettix Rehn, 1902. [111] 7: 391–94. **Mello-Leitao, C. de**—Nuevo Listrocelido argentino. [Rev. de la Soc. Ent. Argentina] 13: 147–49, ill. **Rehn, J. A. G.**—A new genus and two new species of neotropical Pseuodophyllinae (Tettigoniidae). [109] 198: 1–12, ill. **Saez, F. A.**—(See under Anatomy.) **Toledo Piza Junior, S. de**—Phasmidas do Museu Argentino de Sciencias Naturaes. [Physis] 17: 113–16.

HEMIPTERA—Blanchard, E. E.—Estudio sistemático de los Afidoideos argentinos (Aphididae). [Physis] 17: 857–1003, ill. (k*). **Bonnemaison, L.**—(See under Anatomy.) **Barber, H. G.**—Revision of the genus Nysius in the U. S. and Canada (Lygaeidae). [48] 37: 354–66, ill. (k*). **Clancy and Pollard**—Further experiments in the parasitization of mealybugs. [37] 40: 578–79. **Drake and Poor**—Some Tingitidae from the Republic of Argentina. [Physis] 17: 95–98, ill. **Fennah, R. G.**—Notes on West Indian Flatidae. [63] 60: 107–17, ill. (S*). **Gonçalves, C. R.**—Biologiá de uma Pseudiastata depredadora de Pseudococcus brevipes (Diastatid). [Physis] 17: 103–12, ill. **Grundemann, A. W.**—Studies on the biology of Triatoma sanguisuga in Kansas (Reduviidae). [43] 20: 77–85. **Hervey and Schroeder**—(See under Anatomy.) **Hill, R. E.**—An unusual weather sequence accompanying the severe potato psyllid outbreak of 1938 in Nebraska. [43] 20: 88–92. **Hoberlandt, L.**—A new species of Phymata from South America. [111] 7: 323–26, ill. **Hungerford, H. B.**—A new genus of Corixidae. [43] 20: 93. **Lent and Wygodzinsky**—Contribuição ao conhecimento dos Reduviinae Americanos. [111] 7: 341–68, ill. (k*). **Lizer y Trelles, C.**—Catálogo sistemático razonado de los Cóccidos (Hom. Sternor) vernaculos de la Argentina. [Physis] 17: 157–210. **Mazza y Jörg**—Las nervaduras hemielitrales de los Triatomidae. [Physis] 17: 245–53, ill. **Milliron, H. E.**—(See under Hymenoptera.) **Wygodzinsky, P.**—Sôbre un novo gênero e una nova espécie de Ectrichodiinae do Brasil. [111] 7: 301–05.

LEPIDOPTERA—Beirne, B. P.—The origin and history of the British Macrolepidoptera. [88] 98: 273–72, ill. **Bourquin, F.**—Metamorfosis de Racheospila gerularia (Geometrid). [Physis] 17: 385–98, ill.—Metamorfosis de Cerura annulifera (Notodontid). *Ibid.* 399–408, ill.—Metamorfosis de Plutella maculipennis (Plutellid). *Ibid.* 409-13, ill.—Metamorfosis de Pholisora (Staphylus) similis (Hesperiid). *Ibid.* 415–18, ill.—Metamorfosis de Pilocrocis leucoplagalis (Pyralid). *Ibid.* 419–22, ill.—Metamorfosis de Laphygma frugiperda (Noctuid). *Ibid.* 423–30, ill.—Metamorfosis de Podalia nigricostata (Megalopygid). *Ibid.* 431–41, ill. **Breyer, A.**—Los representantes argentinos de la familia Brassolidae. [Physis] 17: 496–502.—Los representantes argentinos de la familia Morphidae. *Ibid.* 503–508.—Lepidopterilogia argentina. Consideraciones zoogeográficas. *Ibid.* 509–24, map. **Chermock, R. L.**—A new subspecies of Limenitis archippus. [2] 1365: 1–2. **Clarke, J. F. G.**—A new Dichomeris from easttern U. S. (Gelech.). [65] 49: 187–89, ill. **Hayward, K. J.**—Hesperoidea argentina. III. Especies nuevas o poco conocidas de la Fauna argentina. [Physis] 17: 279–301, ill.—Las especies argentinos del genéro Butleria Kirby. Con descripción de dos nuevos por el general W. H. Evans (Hesperiid). *Ibid.* 303–310, ill. (k).—Descripción de una nueva especie de Speocropia Hampson (Acronyctinae). *Ibid.* 311–16.—Contribución al conociemento de las Riodinidae argentinas. *Ibid.* 317–74 (k).—Ropaloceros de las Yungas de Bolivia Coleccionadas en 1931 por P. C. L. Denier. *Ibid.* 374–84. **Kiriakoff, S.**—Position systématique des Lepidoptères et les divisions primaires de l'ordre. [Lambillionea, Bruxelles] 46: 21–26.—Principes generaux et criteres de la classification des Lepidoptères. *Ibid.* 51–64. **Koehler,**

P.—Especies nuevas de Satyridae y complemento a mi Prodromus. [Physis] 17: 443–47.—Contribucion al estudio de los Noctuidae argentinos. *Ibid.* 449–55 (s*).—Notas sobre Psychidae argentinos. *Ibid.* 457–71 (k to chrysalids of Zamopsyche).—Parásitos de Psychidae argentinos. *Ibid.* 474–94, ill. **Lemche, H.**—The longitudinal design in the wing-pattern of Lepidoptera, especially in the fore-wing of Ephestia kühniella (Pyral.). [Entom. meddelelser, Kobenhavn] 24: 305–47, ill.—Some hypotheses concerning the reactions of the wing-pattern of Ephestia kühniella to temperature treatment. *Ibid.* 347–60. **May, Eduardo**—Notes on the lepidopterous fauna of the northern region of the State of Espirito Santo, Brasil. [Physis] 17: 133–36. **Miner, F. D.**—Life history of the diamond-back moth. [37] 40: 581–83. **Munroe, E. G.**—Four new Pieridae from the West Indies. [2] 1362: 1–5. **Stallings and Turner**—Notes on Kansas butterflies with description of a new subspecies. [43] 20: 93–94. **Travassos Filho, L.**—Estudo atual dos generos Methysia Butler, 1876 e Metamya, novo nome para Paramya Druce 1898 (Ctenuchidae). [Papeis Avulsos Dept. Zool. S. Paulo] 7: 257–66. **Travassos, L.**—Contribuição ao conhecimento dos Arctiidae XIII. [111] 7: 335–40, ill. (S). **Vázquez, L.**—Papilios nuevos de Mexico. [8] 18: 249–56, ill. **Wester and St. George**—Life history and control of the webworm Homadaula albizziae. [37] 40: 546–53. **Wishart, G.**—(See under Anatomy.)

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Reviews

INSECTS AND HUMAN WELFARE. An account of the more important relations of insects to the health of man, to agriculture, and to forestry. By Charles T. Brues. Harvard University Press, Cambridge, Massachusetts, revised edition, 1947. Pp. xiii + 154, 14 figures. Price, $2.50.

The five chapters of this book deal with the relation of insects to public health and in relation to the food supply, with forest insects and with household insects and with a brief account of the outlook for the future. Considering the modest size of the volume, the amount of information included is really amazing. Dr. Brues writes in such a readable style and uses such disarmingly straightforward and completely non-technical language that the average reader will probably never realize the great amount of careful preparation that must have gone into this book, or how comprehensive it is, how scientifically accurate and up-to-the-minute.—R. G. SCHMIEDER.

SEXUAL BEHAVIOR IN THE HUMAN MALE. By Alfred C. Kinsey, Wardell B. Pomeroy, and Clyde E. Martin. W. B. Saunders, Philadelphia and London, 1948. Pp. xv + 787. Price, $6.50.

It is the author's name rather than the subject that brings this notice into ENTOMOLOGICAL NEWS. Entomologists that are familiar with the work of Professor Kinsey of Indiana University on gall-wasps will doubtless be astonished at the subject-matter of his latest publication but they will not, however, be unprepared to find that he has done an exceedingly good job. Indeed, Professor Kinsey's long preoccupation with the rigorous procedures he followed in his population studies in the genus Cynips probably provided a better training than would an equal amount of time as a sociologist. The study of human behavior patterns, often complexly combined in single individuals and varying from individual to individual and varying also at different social levels presents problems very different from but in many ways analagous to the study of variation in a group of morphological characters in an insect species in different parts of its range.

From 1920 to 1938, Dr. Kinsey had published well over 1000 pages on the gall-wasps, including his monograph on Cynips (1930) in which he traced the phylogeny of the various eastern species through chains of species spreading from the southwest. Later, in "Origin of Higher Categories in Cynips" (1936) he traced the origins of these down through Mexico and Guatamala and found that practically all forms were brought together in two or three continuous chains. From these studies he developed the idea of an infrequently dividing chain of existing species rather than the traditional evolutionary "tree." The higher categories are then sections of the chain rather than groups of twigs whose parent branches are hypothetical and extinct. Kinsey's conclusions were built up on a foundation of a thorough and exacting study of individual variation over the entire range of each species.

The present book is "a fact-finding survey in which an attempt is being made to discover what people do sexually and what factors account for differences in behavior among individuals and among various segments of the population." In it Dr. Kinsey's thoroughness and method are again evident. The data are based on 5300 individual histories and are presented in the form of 173 graphs, 151 tables, 48 pages of clinical tables and 27 pages of tables and computations on sample size. The work was supported by the Rockefeller Foundation and by Indiana University. Without doubt the book will arouse much comment both pro and con; its subject matter has never before been dealt with in such a comprehensive way and people will have to get used to being better informed.—R. G. SCHMIEDER.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

Chrysididae—Wanted for determination in preparation of revision. Wm. G. Bodenstein, Galesville, Maryland.

Wanted—Ataenius and allied Aphodiinae from all parts of the world, especially Mexico, Central and South America. O. L. Cartwright, Clemson, S. C.

Wanted—Reprints and unpublished mss. on biological control of mosquitoes; for preparing annotated bibliographies for publication. J. B. Gerberich, Michigan State College, East Lansing, Mich.

Wanted—Hesperid genus Megathymus for exchange or purchase. P. S. Remington, 5570 Etzel Ave., St. Louis 12, Missouri.

Wanted—Psychodidae of North America for revisional purposes. Wm. F. Rapp, Jr., 203 Harker Hall, Urbana, Ill.

Diptera—Tachinidae-Dexiidae wanted, No. Amer. and exotic. Will collect most orders in exchange or will purchase. P. H. Arnaud, 60 Woodrow St., Redwood City, Calif.

Will collect—Zoological and entomological specimens in tropical and subtropical parts of Peru. Jose M. Schunke, Pucallpa, Peru.

Wanted—Diplotaxis; will buy or exchange. E. W. Mange, 307 W. Walnut St., Hanover, Pa.

Hymenoptera-Aculeata (except ants and bees) for exchange. Will collect other orders in exchange. N. F. de Andrade, Casal Novo, S. João do Estoril, Portugal.

Meliponidae—Wanted, information on the bionomics, culture, and economic importance of the stingless bees, particularly of the Old World. P. Nogueira Neto, Av Cicade Jardim 170, S. Paulo, Brasil.

Wasps (Vespoidea, Sphecoidea, Chrysidoidea) of the world by exchange or purchase. Will collect other orders in exchange. D. G. Shappirio, 4811 17th St., N.W., Washington 11, D. C.

Lepidoptera—Large quantities of Plexippus, Colias, Cardui, Vanillae wanted for cash or exchange for tropical butterflies. G. MacBean, 710 Miller Rd., Sea Island, Vancouver, B. C.

Ants of the tribe Dacetini (*Strumigenys, Rhopalothrix* and related genera) wanted for world revision. W. L. Brown, Jr., Harvard University Biological Laboratories, Cambridge 38, Mass.

Mallophaga (on which immediate determination is not necessary) wanted for study and determination. R. L. Edwards, Dept. Biology, Harvard University, Cambridge 38, Mass.

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Some Neotropical Species of Syrphids

By F. M. Hull, University of Mississippi

Recent material submitted to the author for study discloses a number of undescribed neotropical flies belonging to the genus *Baccha*. This paper presents the descriptions of these species.

Baccha estrelita n. sp.

A small species without tubercle, the pterostigma without a brown basal spot. Related to *gracilis* Williston. Length 6 mm.

Male. *Head:* vertex and front bright brassy in color, the vertex with several black hairs in front and several yellow hairs behind. The frontal pile is light brownish red. There is a small faintly roughened ridge in the middle of the front and some sparse, yellowish brown pollen on either side. The face is brassy, narrow, barely more narrow below than across the antennae, without tubercle and is sparsely yellowish white pollinose with short yellowish white pile. The antennae are brownish orange, blackish on the dosal third of the third segment; arista blackish. The posterior margin of the occiput lacks a lateral central indentation. *Thorax:* mesonotum, scutellum and pleura deep, bright brassy to golden brown in color, the pile erect and pale yellow, brownish red on the mesopleura, though pale, and on the margin of the scutellum there is a pair of long slender bristles. The mesonotum is quite convex and non-vittate; the squamae and halteres are reddish brown. *Abdomen:* first segment brassy, the second long, slender, subcylindrical, brassy on the sides, rather dull and nearly opaque along the entire dorsal surface except on either side of the base of this segment. This subopaque color is also faintly brassy. Upon the third segment the basal fourth is light yellowish brown and subtranslucent; the remainder of the segment is dark sepia. Fourth segment with the basal third light yellowish brown and with a quite short, medial, posterior, rounded production from this light colored basal fascia. Remainder of segment brassy sepia. The pile along the sides of the first and second segments is quite long and reddish golden; the pile on the third and fourth segments is shorter, appressed, black on the black areas, yellow on the basal fascia. *Legs:* first two legs entirely brownish yellow. Hind femora elongated and gradually dilated apically, yellowish on the basal half becoming slightly and faintly more brownish apically and with a definite though pale brown subapical annulate band. The hind tibiae are brown, the base, middle and apex light reddish or yellowish brown, the intervening areas scarcely darker; hind tarsi medium brown. *Wings:* uniformly tinged with pale brown; pterostigma dark brown without basal brown spots; alulae narrow but distinct.

Female. In general similar to the male but the front and vertex are bluish in reflection, the sides of the front quite widely pollinose; the stripes of pollen are sharply delimited and clear; face metallic black in ground color. The mesonotum and especially the scutellum are bright, shining blue black; the posterior half of the mesopleura and the anterior half of sternopleura are brownish yellow; remainder of pleura metallic black, perhaps faintly brassy. First and second segments of abdomen bright steel blue, third and fourth segments with basal yellowish brown fascia rather similar to those in the male. The fourth segment of the female does not have any trace of a pale median vitta.

Holotype: a male, Buenos Aires, Trinidad Mts., CUBA, June 1939, C. T. Parsons. *Allotype:* a female and *paratypes* with the same data. Type in the Museum of Comparative Zoology.

Baccha plutonia n. sp.

Related to *trinidadensis* Curran. The pattern and proportions of the abdominal segments are different. Length 8 mm.

Female. *Head:* vertex steel bluish with a single row of black hairs. The front is steel blue in the middle and below, quite polished and somewhat purplish on the upper half with a semicircular spot of white pollen on either side on the eye margins; just in front of the antennal callus there is a deep, transverse, slightly arched crease; the callus is yellowish brown. The face is somewhat bluish black in the middle and faintly and obscurely yellowish brown beside each eye margin just below the prominent tubercle. The antennae and arista are sepia, the third segment a little reddish below. *Thorax:* the mesonotum is dark sepia brown with a pair of scarcely discernible blackish stripes on either side and a short, rather wide, widely separated reddish brown pollinose stripe also on either side of the anterior margin which does not appear to reach even to the transverse suture. The notopleura are sparsely whitish pollinose and the same sparse pollen is continued broadly down the dark reddish brown pleura. The mesonotal pile is erect but sparse and there is perhaps a sparse white collar of pile anteriorly along the mesonotum which is evanescent or denuded in the middle. It appears to be considerably longer than the adjacent pile. The pleural pile is sparse but rather long and light yellow. The scutellum is shining dark sepia brown, the pile on the disk quite sparse but whitish and rather long and erect; the ventral fringe consists of about four long pale hairs. Squamae brownish white with dark brown fringe; halteres with opaque whitish knob. *Abdomen:* quite slender and subcylindrical on the second segment, the first segment and the sides of the second segment sepia with a bluish reflection. The apical fifth of the second segment is reddish sepia with an opaque blackish band just in front and there is an elongate opaque blackish spot in the middle of the segment a short distance from the base. The third segment is considerably expanded apically, dark brown, the basal corners pale brownish yellow scarcely visible except from the sides; the third segment has a large, central, posteriorly, medially indented, opaque brown triangle; fourth segment with a large somewhat oval opaque brown spot on either side in the middle of the segment; fifth and sixth segments dark shining sepia. *Legs:* anterior and middle legs light brown, the base, apex and a narrow band across the middle of their femora obscurely yellowish, their tibiae brown in the middle, narrowly and obscurely yellow at base and apex, their tarsi yellow. The hind femora is also light brown except at the base, apex and upon a narrow middle band, where it is diffusely yellowish. Hind tibiae widely brown in the middle, the base and apex narrowly yellowish. The hind basitarsi are pale reddish brown on the basal half; remainder of the hind tarsi pale yellow with yellowish pile. The pile of the hind femora and tibiae is almost entirely blackish. *Wings:* with the basal third diffusely tinged with pale brown, the remainder of the wing nearly or quite hyaline; pterostigma pale brownish yellow; alulae well-developed, tinged with brown.

Holotype: a female, Covendo, BOLIVIA, W. N. Mann, 1921. *Paratype:* a female with the same data. *Holotype* in the U. S. National Museum.

Baccha asthenia n. sp.

A small, slender species related to *gracilis* Williston. Pterostigma with a large, dark brown spot at the base, the yellow band of fourth segment without continuing vittae. Length 6 mm.

Male. *Head:* vertex brassy black, the front quite brassy with a minute, medial ridge and a small, low black, tuberculate spot above the antennae. The sides of the front are yellowish grey pollinose, the pile quite long and reddish yellow; the face is without tubercle, is very short and scarcely noticeable in profile and quite brassy in color; it is thinly brownish yellow pollinose with short pale yellow pile. The antennae are short, light brownish orange, the upper third of the third segment dark brown, the arista light brown. *Thorax:* mesonotum very convex, the entire thorax and scutellum very strongly brassy, and non-vittate, the mesonotal pile rather long, erect and reddish yellow. The margin of scutellum has several quite long, fine, reddish hairs; squamae and fringe brown; knob of halteres brown. *Abdomen:* slender on the basal half, the second segment long, slender and quite cylindrical, its sides nearly parallel, the apex barely wider than the middle of the segment and the immediate base a little wider. The second segment is twelve times as long as its narrowest width. The first segment is brassy black, the second one black and faintly brassy becoming a little more shining on the sides and faintly greenish basally. The third segment has a fascia of brownish yellow occupying the basal fifth of the segment which is complete and entire. Third segment over twice as wide at the apex as at the base; fourth segment rounded, elongate oval, the third and fourth together forming an expanded structure of convex club-shaped appearance. The base of the fourth segment has a wide, complete, brownish yellow fascia occupying nearly a third the length of the segment. The pile upon the sides of the second segment and the first segment is very long and reddish yellow; on the remainder of the abdomen it is short and mostly blackish but yellow upon the light colored fascia. *Legs:* first two pairs of legs entirely yellow, the hind femora long, slender, and brownish yellow and slightly expanded apically and subapically with a wide dark sepia band. The hind tibiae are brownish yellow and brown upon the middle third, the hind tarsi entirely brown. *Wings:* distinctly tinged with brown throughout with a diffuse infuscated spot upon the anterior cross vein and upon the mediocubital cross vein; pterostigma brown with elongate sepia brown spot at its base; alulae present but narrow.

Holotype: a male, Nova Teutonia, BRAZIL, collected by Fritz Plaumann. *Paratypes:* ten males with the same data and collector. The holotype is in the collection of Dr. C. L. Fluke; paratypes in the collections of Dr. Fluke and the author.

Baccha leucopoda n. sp.

A slender, spatulate species with a large brown triangle in the middle of the wing and the base of the wings anteriorly brown. Hind legs black, the hind tarsi white apically. Related to *clarapex* Wiedemann. Length 12 mm.

Female. *Head:* sides of the face broadly and sides of the front narrowly pale yellow. The middle of the face is blackish, the edges diffuse, the tubercle prominent, the sides of the face strongly narrowed from below in front. The front is widely black with dark brown pollen across the middle on the upper half but white pollinose only on the linear lateral margin. The antennal callus is large, yellowish brown with a large, polished, round, black central spot. The pile of the front and vertex is black, the antennae are black, the arista dark brown. *Thorax:* mesonotum dark sepia brown with strong, brassy reflection sublaterally in which there is a diffuse, obscure, violaceous stripe along the edge; the scutellum is dark brown, a little lighter than the mesonotum and not brassy. The scutellar pile is exceedingly short and sparse, whitish over most of the disc with perhaps a few black hairs, all of it so short as to be scarcely discernible; the ventral fringe consists of about ten pairs of short yellow hairs. *Abdomen:* slender, elongate and spatulate, the first two segments are dark sepia; the second segment has a distinct, elongate black triangle in the middle which is anteriorly truncate. The third segment is sepia brown, very dark, the basal corners laterally yellowish, the large, central, opaque black triangle contains a pair of rather distinct yet diffuse yellowish vittate spots. The fourth segment is similar but a little shorter. The fifth segment is similar but much shorter, and about half as long as the third segment. This segment has scarcely any trace of the yellowish brown in the basal corners. Sixth segment dorso-ventrally flattened, about as long as its width at the base; seventh segment visible and quite short. *Legs:* all of the femora dark brown, nearly black outwardly upon the hind pair; the anterior tibiae are pale yellow on the basal half, diffusely dark brown outwardly; the middle tibiae are similar but only the apical third is dark. The hind tibiae are black and wholly black pilose; anterior basitarsi blackish, the remaining segments light brown; middle tarsi similar, the basal two-thirds of the hind basitarsi black and black pilose, the remainder of these tarsi white and white pilose. *Wings:* nearly hyaline; the apices of the submarginal and marginal cells are faintly smoky. The middle of the wing has a large, sepia brown triangle which is fully as dark as the pterostigma; it includes the end of the anal cell but there are light streaks running towards the base in the middle of the marginal, first posterior and discal cells which probably represent an aberration. The basal half of the wing is sepia in front but the wing is hyaline behind and there is a nearly hyaline streak in the middle of the second basal cell which is rather wide and which runs almost the full length of the cell.

Holotype: a female, Goyas, BRAZIL. Type in the collection of the author.

Baccha vampyra n. sp.

An ochraceous yellow species, related to *livida* Schiner but the abdomen is wider and has a different pattern. Length about 10 mm.

Female. *Head:* the ocellarium is bicolored; there is a large black oval in front upon which anteriorly lies an ocellus. The posterior part is brownish golden pollinose and the narrow lateral margins of the vertex along the eye and immediately in front of the ocellarium are also golden pollinose. The pile of the vertex is black and lies in a single row. There is a narrow, transverse, brown band on the upper part of the front and a slightly bluish or greenish, prominent, medial, metallic stripe down the upper two-thirds of the front; the remainder of the front except for a protuberant, polished band below lying in front of the callus and set off by a crease, is otherwise ochraceous yellow and subopaque; antennal callus and the lower protuberant area is brownish yellow; the callus has a large, circular, black spot in the middle. The face and cheeks are yellow; the sparse pile is dark reddish brown, the frontal pile is erect, fine and black and not very long. The antennae are a little longer than usual and light orange, the third segment brownish dorsally, the arista orange. The posterior margin of the eye is shallowly concave but is scarcely indented; the occiput is yellow pollinose, the pile long, reddish golden, but not scalose, in a single row with additional irregular pile in the middle at the expanded portion; the upper occipital pile is also yellow. *Thorax:* mesonotum densely brownish ochraceous pollinose; the lateral margins including the humeri and postcalli and the scutellum are widely ochraceous orange but the ground color of the disc and mesonotum beneath the thick pale pollen is metallic blackish; on the disc there are four slender, metallic black, somewhat brassy vittae, their margins linearly light yellow pollinose; the medial pair are narrowly separated with a slender metallic stripe between which extends to the scutellum. The mesonotal pile is short, fine and yellow; there is a well developed anterior collar of yellow pile; the pleura are polished, reddish ochraceous, becoming paler behind, the lower part of the sternopleura, hypopleura and extreme posterior part of the metapleura are metallic brownish black. The squamae and the stalk of the halteres are light ochraceous, the knob of the latter reddish brown. The scutellar pile is quite sparse but evenly distributed; it is fine and erect and black, the ventral margin with three or four pairs of fine yellow hairs. *Abdomen:* brownish black with numerous, prominent, ochraceous, yellow vittae; the first segment is sepia brown in the middle, yellow laterally with reddish brown pile on the sides; the second segment is much wider posteriorly than basally, the posterior width approximately equal to the length or perhaps slightly greater; this second segment is sepia brown with prominent, slightly arched, transverse band beginning about the middle of the segment, this band does not quite reach the side margin and is bordered with opaque sepia anteriorly and posteriorly. The third segment has three narrowly separated, medial vittae which are slightly wider posteriorly and a still wider sublateral pair which begins to attenuate at the middle of the segment and does not reach the posterior margin; all five vittae are separated at the base of the segment. The fourth segment is similar; the sublateral vittae attenuate posteriorly but reaching the posterior margin; fifth segment with five complete vittae reaching the end of the segment the medial one quite narrow, the two outer vittae on each side gradually and slightly narrowing posteriorly. The abdominal pile is black. *Legs:* first four legs light yellow; the hind femora are yellow with distinct, rather wide, sepia brown band subapically; the pile upon this band and in the middle is brown, the remainder of the femoral pile golden. The hind tibiae are blackish sepia with similar colored pile on all except the basal fourth which is light yellowish orange and orange pilose. The hind tarsi are wholly light yellowish orange with light golden pile. *Wings:* nearly hyaline at the apex, dilutely yellowish brown in the middle upon the base and the costa and the large alulae; pterostigma yellowish brown.

Holotype: a female, Sao Paulo, BRAZIL, J. Lane. In the collection of the author.

Baccha carmelita n. sp.

A small species with steel bluish thorax, non-tuberculate face and reddish vittae and fascia on the fourth abdominal segment. Related to *gracilis* Williston but with bicolored pterostigma. Length 6.5 mm.

Female. *Head:* vertex and front shining with bluish to bluish green reflections; there is a deep, linear crease on the upper half of the front and on the lower half a slender, somewhat transversely striate, wedge-like triangle; the sides of the front are densely yellowish white pollinose. The face is slightly greenish black, densely yellowish white pollinose with very short white pile. The profile of the face is perfectly straight without tubercle; the pile of front and vertex pale yellow. The antennae are pale orange, narrowly blackish on the dorsal fourth, the third segment flattened and considerably larger than the first and second; arista brownish black. *Thorax:* mesonotum shining, somewhat greenish black but with, on either side, widely separated, there are faintly discernible two bluish vittae; the lateral margins and the notopleura are more brassy; the pleura are slightly brassy. The greater posterior part of the mesopleura, the anterior part of the pteropleura and the wing base are brownish yellow; the pleural pile is yellowish white, the pollen similar. Scutellum strongly shining bluish black with short pale yellow pile and two long marginal bristles. *Abdomen:* the first segment brassy black, the second shining black, long, slender and cylindrical; the third segment is shining brownish black with a small, triangular, yellowish brown spot at the base up on either side; posteriorly this segment is much wider than it is at the base. The fourth segment has a prominent basal fascia of light orange brown which is connected with an almost equally prominent medial vittae of the same color; this vitta is barely wider posteriorly but narrows a little just before it reaches the posterior margin. Fifth segment with a tiny yellowish brown spot on each side at the base. *Legs:* first two pairs pale yellow, the hind femora much longer, rather dilated apically, with wide but pale subapical brown bands; hind tibiae light brown and their tarsi the same color. *Wings:* lightly tinged with brown and distinctly but diffusely more brownish along the apical margin including the margin of the marginal cell and the edge of the wing adjacent to the subapical cross vein. The pterostigma is medium brown with a distinctly darker brown somewhat trapezoidal spot at the base. The anterior cross vein is faintly infuscated on each side; the lower angles of the subapical and lower cross veins are without spurs, the third vein is very gently and slightly curved throughout but not sinuous.

Holotype: a female, La Visite vic La Selle Range, 5–7000 ft., Sept. 16, 1923, HAITI, 1934, M. Bates collector. *Paratype:* a female with the same data. Type in the Museum of Comparative Zoology.

Baccha harlequina n. sp.

A slender, delicate species with hyaline wings, brown pterostigma and bands or pairs of yellow spots upon the abdomen. Length 9.5 mm. Related to *argentina* Curran, but different in pattern.

Female. *Head:* the vertex is polished black, unusually convex, its black pile in two rows; the convexity ends in a little crease around the anterior margin of the ocelli. The front is shining black, prominently, transversely striate, the eye margins banded with sparse, white pubescence, the frontal pile erect and fine and white and short, the vertical pile black. The preantennal callus is yellow with a small cordate, black spot. The face and cheeks are light yellow with prominent tubercle, the facial pile white. The antennae are short, the first two segments pale brownish orange, the second rather considerably produced along the inner surface of the third although not in the form of a strap or spur. The third segment is orange below, dark brown above, the arista blackish. The posterior eye margin is moderately indented in the middle, the pile of the occiput on the lower two-thirds is composed of unusually wide, flattened, scalose pile which is silvery white with a faint yellowish tinge. *Thorax:* the mesonotum is shining black, brassy to reddish in reflection along the sides and especially above the post calli; the lateral margins are light yellow. There are a pair of yellowish grey pollinose vittae and a slender median line of similar pollen on the black part of the mesonotum; the outer vittae are expanded in front of the scutellum into a rather wide quadrangle of pale brownish pollen, divided by a bare line in the middle. The scutellum is a pale subtranslucent brown; the margin is quite linearly yellowish brown pollinose; the pile on the surface is very minute, sparse and black and there is no ventral fringe. The pleura are subtranslucent and light yellow; the lower part of the sternopleura and the extreme posterior part of the metapleura are metallic blackish; the squamae are extremely short and light yellowish, the fringe reduced to three or four yellow hairs quite in the middle of the margin, the halteres pale yellow with dark brown knob, the mesonotum is covered with exceedingly short, sparse, black pile, the anterior margin without collar. *Abdomen:* slender, elongate and petiolate, the first segment shining brownish black, the anterior lateral corners narrowly light yellow with a tuft of long, fine yellow hairs. The second segment is ten to twelve times as long as its least width; it is brownish black and polished with a brownish yellow triangle on each side of the base and a narrow, complete yellow annulus just beyond the middle which expands laterally; also the lateral portion of the apical margin is narrowly yellow. The third segment is shorter; it is equally narrow on the basal half, expanding considerably posteriorly with a complete, pale yellow band at the base, a pair of narrowly separated, subquadrangular, pale yellow spots beginning just at the middle, the remainder of the segment black and shining. The fourth segment is shining black with a pair of quite large, subquadrate, narrowly separated pale yellow spots on the base of the segment; these spots extend almost to the middle of the segment. Fifth segment with a pair of subtriangular, subbasal and sublateral, rather large, brownish yellow spots on the base of the segment; these spots are indented in the middle posteriorly and the outer section is produced somewhat posteriorly. Sixth segment entirely shining black. *Legs:* first four legs and the hind femora except for a wide, conspicuous sepia brown, post median band, all pale yellow. The hind tibiae are light yellow at base and apex, light brown in the middle, the brown area gathered into two slightly darker, narrow, submedial annulae; the hind tarsi dark brown on the dorsal surface with similarly colored pile; the pile of the hind tibiae and femora is extremely short and brownish to black. *Wings*: hyaline, the pterostigma is rather dark brown. The alula is absent on the basal portion of the wing, is narrow but quite short and lies opposite the costal cross vein and is confined to the area adjacent to the base of the anal vein.

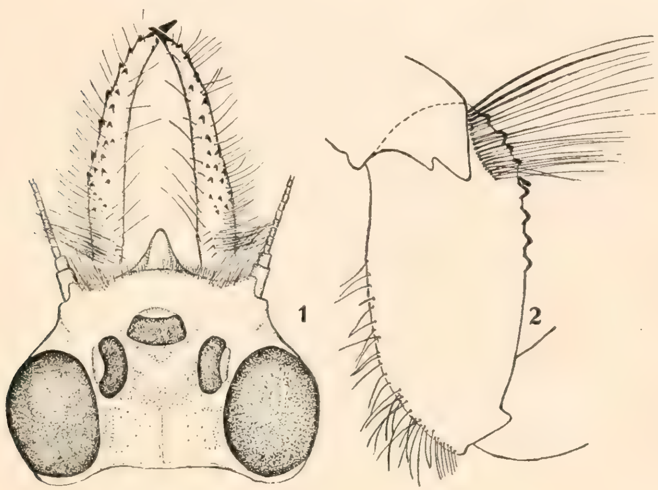
Holotype: a female, Natal, BRAZIL, Oct. 8–20, 1943, F. M. Snyder. In the collection of Dr. C. L. Fluke. One paratype, Natal, Feb. 5–24.

The Nymph of Ephoron album (Ephemeroptera)

By GEORGE F. EDMUNDS, JR., University of Utah

Two species of the mayfly genus *Ephoron* have been reported from North America, *E. leukon* Williamson and *E. album* (Say). Needham and Christenson (1927: 16) briefly described the nymph of *album* but the description is inadequate and will not serve to distinguish *album* from *leukon,* the nymph of which was described in detail by Ide (1935: 114). On August 20, 1947 the author and A. R. Gaufin obtained a series of forty nymphs of *album* from Jordan Canal near Sandy, Utah, many of which were in the last instar. For purposes of comparison the writer has samples of *leukon* from which Ide described the nymphs (Credit River, near Erindale, Ontario) and many specimens from Maryland and Virginia which were borrowed from Cornell University. In view of the inadequacy of the previous description of the nymph of *album,* a redescription is given below together with a diagnosis of the characters which distinguish nymphs of *album* and *leukon.*

Nymph.—Size: male, body 17 mm., lateral tails 11, median tail 6; female, body 17, lateral tails 5, median tail 6. General color dull milky white with light purplish gray markings.



EPHORON ALBUM (Say)

Fig. 1. Dorsal view of head of last instar male nymph.

Fig. 2. Posterior view of front left femur of same.

Frontal process of head conical, hind margin concave or sinuate (fig. 1). Eyes and ocelli black. Mandibular tusks slightly longer than head capsule with about 21–25 golden brown tubercles and numerous long hairs on the dorso-lateral surface. Mesothorax milky white with gray wing pads in the last instar. Forelegs stout with several distinct rows of long hairs. Femur with a row of tubercles along the basal 50 per cent or more of the ventral edge (fig. 2). Middle and hind legs small and weak. Abdomen milky white with a black dot at the base of each gill. First gill small and narrowly triangular. Main tracheal trunk in gills 2–7 purplish gray, all other branches pale and indistinct.

Outer tails purplish gray, median one pale. Other characters as in the genus.

Diagnosis.—The following characteristics distinguish the late instar nymphs of *album* from those of *leukon.* About 21–25 tubercles on the mandibular tusks of *album,* about 28–34 in *leukon.* Tubercles on the fore-femur extend along the basal 50 per cent of the ventral edge in *album,* but only along the basal 40 per cent in *leukon.* The gills of *album* have only the main tracheal trunks pigmented while in *leukon* the branches as well as the tracheal trunk are pigmented.

Habitat.—Ide (op. cit.: 113) found that nymphs of *leukon* live in burrows of fine silt associated with rocks in the rapids of streams. The nymphs are apparently nocturnal and remain in the burrows during the day and feed at night. Nymphs of *album* were found at a depth of three to four feet in water carrying silt and fine clay. In the center of the stream the current had removed the clay and left a coarse sand bottom but along the edge where there is little current a fine lightly compacted clay-sand mixture had been deposited. The burrows which were one and one-half to two inches deep were abundant in this sediment. No rocks were found associated with the burrows. Collections were made with an Ekman dredge about 5:30 P. M. at which time the nymphs were found in the bottoms of the burrows with their heads toward the opening.

Literature Cited

Ide, F. P. 1935. Life history notes on Ephoron, Potomanthus, Leptophlebia and Blasturus with descriptions (Ephemeroptera). Canad. Ent., 67: 113–124, pls. 4–5.

Needham, J. G., and R. O. Christenson. 1927. Economic insects in some streams of northern Utah. Utah Agric. Exp. Sta. Bull., 201: 1–36, 44 text figs.

Coreidae of South Carolina in Comparison with North Carolina (Hemiptera) *

By FRANKLIN SHERMAN, Clemson College, Clemson, S. C.

In our faunal studies this family has been given some attention; our state list shows 32 species as compared with 31 listed by Brimley in Insects of North Carolina and Supplement. Four species in the North Carolina list are not (yet) recorded in South Carolina while five are listed for South Carolina but not (yet) in North Carolina; 27 species are in both lists indicating close similarity in the faunas so far as this family is concerned.

We give the combined list: the four species not found in South Carolina are indicated by an asterisk. The more difficult species have been identified by such specialists as Messrs. Heideman, Barber, Sailer, Knight and Harris.

So far as observed by us, all of the species are herbivorous.

Merocoris typhaeus (Fabr.). Three scattered localities suggest statewide distribution; late-May to late-October.

M. t. var. *distinctus* (Dall.). Four localities suggest statewide; early-June to late-August.

Acanthocephala declivis (Say). Three localities in coastal plain; early-May, late-May, December.

A. femorata (Fabr.). Most of state, not yet taken in actual mountains; mid-April to mid-November.

A. confraterna (Uhl.). One coastal locality; late-October. (Not in the North Carolina list.)

A. terminalis (Dall.). Most of state, not yet from actual coast; late-March to December.

Leptoglossus phyllopus (Linn.). Statewide; late-March to December.

L. corculus (Say). Clemson only; mid-June, at light, probably through most of state.

* Technical Contribution No. 146 from the South Carolina Agricultural Experiment Station, Clemson, South Carolina.

The manuscript for this paper was found in Professor Sherman's desk after his death on June 23, 1947. It probably represents his last entomological contribution.—O. L. CARTWRIGHT.

L. oppositus (Say). Four localities suggesting statewide; early-March to December.

L. fulvicornis (Westw.). Two localities in coastal plain; late-May, early-November.

Mozena obesa Montandon. One locality in coastal plain; mid-April. (Not in the North Carolina list.)

Archimerus calcarator (Fabr.). Clemson and one coastal locality; mid-April and mid-August.

A. alternatus (Say). Statewide; although only two easterly localities, it is common in west; mid-April to mid-October.

Euthoctha galeator (Fabr.). Statewide; early-April to late-October.

* (*Corecorus diffusus* (Say). Listed for North Carolina; not yet recorded for South Carolina.)

Chariesterus antennator (Fabr.). Western two-thirds of state; early-April to December.

Chelinidea vittiger Uhl. Eastern half of state, associated with the wild prickly-pear cactus; mid-July to late-October.

Margus obscurator (Fabr.). One coastal-plain locality; late-May. (Not in the North Carolina list.)

Catorhintha guttula (Fabr.). One coastal locality (in North Carolina lists one locality in coastal plain); late-July.

Cimolus obscurus Stal. Van Duzee Catalogue credits it to South Carolina, no other record. (Not in North Carolina list.)

Anasa tristis (DeG.). Common squash bug, a pest. Statewide though no records from actual mountains; present throughout the year.

A. armigera (Say). Apparently statewide though not yet recorded from actual mountains; mid-June to mid-October.

Leptocorisa tipuloides (DeG.). Clemson; mid-July. (Not in North Carolina list.)

Megalotomus 5-spinosus (Say). Western part of state; early-June to mid-October.

Alydus eurinus (Say). Western two-thirds of state, records fewer to eastward; mid-May to late-October.

A. pilosulus H. S. Statewide; late-May to mid-November.

Stachyocnemis apicalis (Dall.). Only two localities but probably statewide; late-April to late-November.

* (*Coraleptus americanus* Stal. North Carolina. Not yet recorded from South Carolina.)

Harmostes reflexulus (Say). Western three-fourths of state; early-April to early-November, January.

* (*H. fraterculus* (Say). North Carolina. Not yet taken in South Carolina.)

Corizus hyalinus (Fabr.). Most of state, but not yet taken in actual mountains; late-August to late-November.

C. sidae (Fabr.). Most of state, chiefly eastward, not yet taken in mountains; mid-May to early-November.

C. lateralis (Say). Several scattered localities but not (yet) on coast; late-May to mid-November.

C. bohemanii Sign. Scattered localities in western half of state; early-April to mid-September.

Leptocoris trivittatus (Say). Box-elder bug. Western third of state; spring and autumn, often abundant invading houses in late season.

* (*Jadera haematoloma* (H. S.). North Carolina, not yet recorded in South Carolina.)

Notice

The Herbert H. Smith collection of South American Chalcidoidea containing the **Ashmead types** (Ashmead, W. H., *Memoirs of the Carnegie Museum,* Vol. I, No. 4, pt. 2, 1904) has been acquired from the Carnegie Museum by the United States National Museum.

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Current Entomological Literature

COMPILED BY EDWIN T. MOUL AND RAYMOND Q. BLISS.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, 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.

This list gives references of the current or preceding year unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

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 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. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

List of Titles of Publications Referred to by Numbers in Entomological Literature in Entomological News.

1. American Midland Naturalist. Notre Dame, Indiana.
2. American Museum Novitates. New York, N. Y.
3. American Naturalist. Garrison-on-Hudson, New York.
4. Annals of Applied Biology. London.
5. Annals of the Entomological Society of America. Columbus, Ohio.
6. Annals and Magazine of Natural History. London.
7. Annales Academia Brasileira Sciencias. Rio de Janeiro.
8. Anales del Instituto de Biologia Mexico. Mexico City.
9. Anatomical Record. Philadelphia.
10. Arkiv för Zoologie. K. Svenska Vetenkapsakademien i. Stockholm.
11. Arquivos de Higiene e Saude Publica. São Paulo.
12. Biological Bulletin. Woods Hole, Massachusetts.
13. Bios, Rivista Biol. Geneva.
14. Boletin de Entomologia Venezolana. Caracas.
15. Boletin del Museo de Historia Natural "Javier Prado." Lima, Peru.
16. Boletin do Museu Nacional do Rio de Janeiro. Brasil.
17. Bull. Acad. Sci. (Izvestia Akad. nauk) U R S S (S. biol.).
18. Bulletin of the Brooklyn Entomological Society. New York.
19. Bulletin of Entomological Research. London.
20. Bulletin of the Museum of Comparative Zoology. Cambridge, Mass.
21. Bulletin of the Southern California Acad. of Sciences. Los Angeles.
22. C. r. Acad. Sci. (Doklady Akad. nauk) U R S S. Leningrad.
23. Canadian Entomologist. Guelph, Canada.
24. Canadian Journal of Research. Ottawa, Canada.
25. Ecological Monographs. Durham, North Carolina.
26. Ecology. Brooklyn, New York.
27. Entomologica Americana. Brooklyn Ent. Society, New York.
28. Entomological Monthly Magazine. London.
29. Entomological Record and Journal of Variations. London.
30. The Entomologist. London.
31. Florida Entomologist. Gainesville, Florida.
32. Frontiers. Philadelphia, Pennsylvania.
33. Great Basin Naturalist. Provo, Utah.
34. Iowa State College Journal of Science. Ames, Iowa.
35. Journal of Agricultural Research. Washington, D. C.
36. Journal of Animal Ecology. London.
37. Journal of Economic Entomology. Geneva, New York.
38. Journal of the Elisha Mitchell Science Society. Chapel Hill, N. C.
39. Journal of Entomology and Zoology. Claremont, California.
40. Journal of Experimental Biology. London.
41. Journal of Experimental Zoology. Philadelphia, Pennsylvania.
42. Journal of Heredity. Baltimore, Maryland.
43. Journal of the Kansas Entomological Society. Lawrence, Kansas.
44. Journal of Morphology. Philadelphia, Pennsylvania.
45. Journal of the New York Entomological Society. New York.
46. Journal of Parasitology. New York.
47. Journal of the Tennessee Academy of Sciences. Nashville, Tenn.
48. Journal of the Washington Academy of Sciences. Washington, D. C.
49. Memorias do Instituto Oswaldo Cruz. Rio de Janeiro.
50. Microentomology. Stanford University, California.
51. The Microscope and Entomological Monthly. London.
52. Mosquito News. Albany, New York.
53. Nature. London.
54. Nature. Washington, D. C.
55. La Naturaliste Canadien. Quebec.

56. Natural History. New York.
57. Occasional Papers, Mus. of Zool., Univ. of Michigan. Ann Arbor.
58. Ohio Journal of Science. Columbus, Ohio.
59. Opinions and Declarations. Intern. Com. Zool. Nomencl. London.
60. Pan-Pacific Entomologist. San Francisco, California.
61. Parasitology. London.
62. Proceedings of the Academy of Natural Sciences. Philadelphia.
63. Proceedings of the Biol. Soc. of Washington. Washington, D. C.
64. Proceedings of the California Academy of Sciences. San Francisco.
65. Proceedings of the Entom. Soc. of Washington. Washington, D. C.
66. Proceedings of the Hawaiian Entomological Society. Honolulu.
67. Proceedings of the National Acad. of Sciences. Washington, D. C.
68. Proceedings of the Royal Entomological Society of London. Ser. A.
69. Proceedings of the Royal Entomological Society of London. Ser. B.
70. Proceedings of the Royal Entomological Society of London. Ser. C.
71. Proceedings of the U. S. National Museum. Washington, D. C.
72. Proceedings of the Zoological Society of London. London.
73. Psyche, A Journal of Entomology. Boston, Massachusetts.
74. Quarterly Journal of Microscopical Science. London.
75. Quarterly Review of Biology. Baltimore, Maryland.
76. Revista Academia Columbiana de Cien. Exact. Fis. y Nat. Bogotá.
77. Revista Chilena de Historia Natural. Valparaiso, Chile.
78. Revista Instituto Salubridad y Enfermedades Tropicales. Mexico.
79. Revista Sociedad Mexicana de Historia Natural. Mexico City.
80. Science. Washington, D. C.
81. Scientific Monthly. New York.
82. Smithsonian Miscellaneous Collections. Washington, D. C.
83. Transactions of the American Entomological Society. Philadelphia.
84. Transactions of the Amer. Microsc. Soc. Menasha, Wisconsin.
85. Transactions of the Illinois State Academy of Sciences. Springfield.
86. Transactions of the Kansas Acad. of Sci. Manhattan, Kansas.
87. Transactions of the Royal Canadian Institute. Toronto.
88. Transactions of the Royal Entomological Society. London.
89. U. S. Dept. of Agric., Farmer's Bulletins. Washington, D. C.
90. U. S. Dept. of Agric., Technical Bulletins. Washington, D. C.
91. University of California Publications in Entomology. Berkeley.
92. University of California Publications in Zoology. Berkeley.
93. University of Kansas, Science Bulletins. Lawrence, Kansas.
94. Ward's Natural Science Bulletin. Rochester, New York.
95. Zoologica. New York.
96. American Journal of Public Health. Boston.
97. American Journal of Tropical Medicine. Baltimore.
98. Annals of Tropical Medicine and Parasitology. Liverpool.
99. Canadian Journal of Research. Section E, Medical Sciences, Ottawa.
100. Evolution. New York.
101. Mitteilungen der schweitzerischen entomologischen Gesellschaft, Bern.
102. Revue de Entomologie. Rio de Janeiro, Brasil.
103. Proceedings of the Royal Society of London.
104. Anales de la Escuela Nacional de Ciencias Biologicas. Mexico.
105. Journal of Cellular and Comparative Physiology. Philadelphia.
106. Redia. Florence, Italy.
107. Annales de la Société Entomologique de France. Paris.
108. Bulletin de la Société Entomologique de France. Paris.
109. Notulae Naturae. Philadelphia.
110. L'Entomologiste. Paris.
111. Revista Brasiliera de Biologie. Rio de Janeiro.
112. Eos, Revista Española de Entomologia. Madrid.
113. Minist. de Agri. de la Nación, Inst. Sanidad Vegetal, Buenos Aires.

GENERAL—Frear, D. E. H.—Catalogue of insecticides and fungicides. v. I. Chemical insecticides. [Chronica Botanica Co., Waltham, Mass.] 1947. 1–203. **Hemming, F.**—Notice of receipt of applications for suspension of *Règles Internationales*. [80] 106: 584–85. **Hubbs and Walker**—Abundance of desert animals indicated by capture in fresh road tar. [26] 28: 464–66. **Muesebeck, C. F. W.**—Common names of insects of medical importance approved by the Amer. Assoc. of Econ. Entomologists. [52] 7: 70–72. **Van Dyke, E. C.**—Biography of Frank E. Blaisdell, Sr. [60] 23: 49–58, ill.

ANATOMY, PHYSIOLOGY, MEDICAL—Bailey, W. S.—Observations on the rôle of Tenebrio molitor as an intermediate host for Hymenolepis nana var. fraterna (tapeworm). [46] 36: 433–34. **Bauer, H.**—Gekoppelte Vererbung bei Phryne fenestralis und die Beziehung zwischen Faktorenaustausch und Chiasmabildung (Dipt.). [Biol. Zentralblatt] 65: 108–15 (1946). **Beck and Miles**—Some theoretical and experimental relationships between infrared absorption and olfaction. (Nat. Acad. Sci., abstract.) [80] 106: 511. **Bock, E.**—Wechselbeziehungen Zwischen den Keimblättern bei der Organbildung von Chrysopa perla (L.). I. Die Entwicklung des Ektoderms in Mesodermdefekten Keimteilen. [Roux' Arch. Entwicklungsmech.] 141: 159–247 (1941). **Brundin, L.**—Zur Kenntnis einiger in die Atheta-untergattung Metaxya M. & R. gestellten Arten (Staphylinidae). [Lunds Universitets Arsskrift. N. F.] Avd. 2, Bd. 39, Nr. 4: 1–38, ill. **Buck and Keister**—Physiological studies on the mechanism of action of DDT in insects. [12] 93: 189–90. **Burbanck, W. D., Edwards, J. P., and Burbanck, M. P.**—Toleration of lowered oxygen tension by cave and stream crayfish. [12] 93: 190. **Butenandt, Karlson and Hannes**—Über den "Anti-Bar-Stoff," einen genabhängigen, morphogenetischen Wirkstoff bei D. melanogaster. [Biol. Zentralbl.] 65: 41–51 (1946). **Campana, Y.**—Schizomelies spontanées et expérimentales chez les Ixodoidea. [Annales de Parasit.] 22: 53–62. **Danneel, R.**—Melaninbildende Fermente bei Drosophila melanogaster. II. Nachweiss einer Dehydrase Neuformulierung der Tyrosinase-Tyrosin Reaktion. [Biol. Zentralbl.] 65: 115–19 (1946). **Dowdy, W. W.**—An ecological study of the Arthropoda of an oak-hickory forest with reference to stratification. [26] 28: 418–39. **Ferris, G. F.**—The contradictions of the insect head. [50] 12: 59–64. **Finney, Flanders and Smith**—Mass culture of

Macrocentrus ancylivorus and its host, the potato tuber moth. [Hilgardia] 17: 437–83. **Ford, E. B.**—A murexide test for the recognition of pterins in intact insects. [68] 22: 72–76.—Studies on the chemistry of pigments in the Lepidoptera with reference to their bearing on systematics. 5. P. paradoxa. *Ibid.*: 77–78. **Ford, R. L. E.**—The use of common salt for keeping down vegetable and other moulds during breeding experiments. [68] 22: 86–88. **Galliard, H.**—Evolution de Wuchereria bancrofti et W. malayi chez Aëdes (Stegomyia) aegypti et A. (S.) albopictus. [Annales de Parasit.] 22: 30–35. **Hadorn and Zeller**—Fertilitätsstudien an D. melanogaster. I. Untersuchungen zum alters bedingten Fertilitätsabfall. [Roux' Arch. Entwicklungsmech.] 142: 276–300 (1942). **Hartung, E. W.**—Some effects of temperature on tumor incidence in several strains of D. melanogaster. [41] 106: 223–32. **Hayes, W. P. and Liu, Yu-Su**—Tarsal chemoreceptors of the housefly and their possible relation to DDT toxicity. [5] 40: 401–16. **Henke, K.**—Über die Verschiedenen Zellteilungsvorgänge in der Entwicklung des beschuppten Flügelepithels der Mehlmotte Ephestia kühriella. [Biol. Zentralbl.] 65: 120–35 (1946). **Henry, L. M.**—The nervous system and the segmentation of the head in the Annulata. [50] 12: 65–82. **Herbst, C.**—Die Bedeutung der Salzversuche für die Frage nach der Wirkungsart der Gene. Zusammensehau einer Hydratations-bzw. Mikrolaboratorien—bautheorie der Genwirkungen. [Roux' Arch. Entwicklungsmech.] 142: 319–781 (1942). **Homann, H.**—Über die Jugendform von Micrommata viridissima (Araneae). [Biol. Zentralblatt] 65: 82–83 (1946). **Judd, W. W.**—The proventricular region of Machilis variabilis (Thysanura). [24] 25 (D): 135–38, ill.—The proventriculus of Macrobasis unicolor (Meloid). [5] 40: 518–21. **Kühn and An (*nee* Engelhardt)**—Elektronenoptische Untersuchungen über den Bau von Schmetterlings-schuppen. [Biol. Zentralbl.] 65: 30–40 (1946). **Leclercq, J.**—Influence de l'humidité sur la survie de quelques coleoptères adultes. [Annales de la Societé Royale Zool. Belgique] 77: 48–55. **Leone, C. A.**—A serological study of some Orthoptera. [5] 40: 417–33. **Mendes, M. V.**—Glandulas endocrinas e hormonio nos Insetos. [Anais da Acad. Bras. de Ciencias] 19: 259–75. **Miles and Beck**—Infrared absorption in field studies of olfaction in bees. (Nat. Acad. Sci., abstract.) [80] 106: 512. **Munson and Yeager**—The relation between poison concentration and survival time of roaches injected with sodium and potassium cyanides and potassium ferricyanide. [5] 40: 475–88. **Needham, A. E.**—Sensitivity of regenerating limbs of an aquatic crustacean to variations in the concentration of hydrogen and phosphate ions in the external medium. [41] 106: 181–95. **Palm, N. B.**—Structure and physiology of the stink glands in Tribolium destructor. [Opuscula Entom., Lund] 11: 119–32, ill. **Piepho, H.**—Untersuchungen zur Entwicklungs physiologie der Insekten metamorphose. Über die Puppenhäutung der Wachsmotte Galleria mellonella. [Roux' Arch. Entwicklungsmech.] 141: 500–583, ill. (1941).—Versuche über die Rolle von Wirkstoffen in der Metamorphose der Schmetterlinge. [Biol. Zentralblatt] 65: 141–48 (1946). **Possompes, B.**—Les glandes endocrines post-cerebrals des Diptères. II. Etude sommaire des corpora allata et des corpora cardiaca chez la larva de Tipula sp. [Bull. Soc. Zool. France] 72: 57–62, ill. **Sanford, K. K.**—The effect of temperature on the intersex character of Daphnia longispina. [Physiol. Zool.] 20: 325–32. **Stone, F. L.**—The problem of differences of offspring in reciprocal crosses of Drosophila. [12] 93: 102–11. **Sung-Yün Ma**—Experimentelle Untersuchungen über Hitzemodificationen des Flügels von Drosophila melanogaster. [Roux' Arch. Entwicklungsmech.] 142: 508–618, ill. (1943) **Villee, C. A.**—Studies of the metabolism of normal and mutant imaginal discs of Drosophila. [12] 93: 228. **Villee, C. A. and Bissell, H. B.**—Nucleic acids as growth factors in Drosophila. [12] 93: 213. **Vogt, M.**—Induktion von Metamorphose prozessen durch implantierte Ringdrüsen bei Drosophila. [Roux' Arch. Entwicklungsmech.] 142: 121–30 (1942).—Weiteres zur Frage der Artspezifität gonadotroper Hormone. Untersuchungen an Drosophila-Arten. *Ibid.:* 141: 424–554, ill. (1941). **Waterhouse, D. F.**—Studies of the physiology and toxicology of blowflies. [Comm. of Australia, Council for Sci. and Ind. Research] Bull. 218: 1–30. **Weber, N. A.**—Binary anterior ocelli in ants. [12] 93: 112–13. **Whiting, P. W.**—Spermatogenesis in sphecoid wasps. [12] 93: 218. **Wigglesworth, V. B.**—The site of action of inert dusts on certain beetles infesting stored products. [68] 22: 65–69. **Williams, C. M.**—Physiology of insect diapause. II. Interaction between the pupal brain and prothoracic glands in the metamorphosis of the giant silkworm, Platysamia cecropia. [12] 93: 89–98.

ARACHNIDA AND MYRIOPODA—Campana, Y.—(See under Anatomy.) **Chamberlin, R. V.**—A new myrmecophilous milliped from Mexico. [60] 23: 101–2, ill. **Chamberlin, J. C.**—Three new species of false scorpions from the island of Guam (Chelonethida). [Occasional Papers of Bishop Mus.] 18: 305–16, ill. **Chickering, A. M.**—The Mimetidae (Araneae) of Panama. [84] 66: 221–48, ill. (k*). **Demange, J-M.**—Un myriapode chilopode, Orphnaeus brasilianus nigropictus de l'oreille humaine en équateur. [Annales de Parasit.] 22: 65–67. **Fox, I.**—Notes on ectoparasites from Venezuela (Siphon. and Acarina). [95] 32: 117–19 (*). **Homann, H.**—(See under Anatomy.) **Jameson, E. W., Jr.**—A new mite E. crowei from the grasshopper mouse O. leucogaster arcticeps. [46] 33: 391–92. **Mello-Leitão, C. de**—Aranas de Misiones, Corrientes y Entre Rios. [Rev. Museo de la Plata] 4: 213–302 (*).—Solifugos de Argentina. [Anales Mus. Argent. de Cien. Nat.] 50: 1–32, ill. (k*). **Schiapelli and Gerschman**—Aranas Argentinas. [Anales del museo Argentino de Cien. Nat] 50: 317–32, ill. (*).

SMALLER ORDERS—Bailey, S. F.—The genus Erythrothrips Moulton (Thysanoptera). [60] 23: 103–9, ill. (k). **Bock, E.**—Neuroptera. (See under Anatomy.) **Crawford, J. C.**—A new species of the genus Metriothrips (Thysanoptera). [65] 49: 229–30 (S). **Fox, I.**—Siphonaptera. (See under Arachnida.) **Judd, W. W.**—Thysanura. (See under Anatomy.)

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REVIEW

The Blowflies of North America, by David G. Hall. Pages v + 477, 5 color plates, 46 plates, 9 text figures. Published by the Thomas Say Foundation of the Entomological Society of America. Printed by the Monumental Printing Co., Baltimore, Md., January, 1948. Price, $6.50. Obtainable from Prof. J. J. Davis, Purdue University, Lafayette, Ind.

This attractively bound, monographic revision of the North American blowflies is a work of such comprehensive treatment that it will be a standard and necessary manual for workers in the fields of medical and veterinary entomology and public health, as well as for general entomologists and biologists. The current interest in the potential role of these common flies in the epidemiology of poliomyelitis further enhances the timeliness and value of the book.

This is the fourth of a series of important entomological books sponsored by the Thomas Say Foundation. Earlier volumes appeared in 1916, 1925, and 1931.

The introductory portion occupies approximately forty pages in which the author discusses, in an easily readable style, the history of the classification of blowflies, their importance to man (with particular attention to disease relationships and myiasis), control methods, techniques for collecting and studying blowflies, terminology, and variation. The remainder of the volume is an unusually complete taxonomic revision, with a detailed and illustrated account of both external and internal anatomy of male and female genitalia, and of the larval anatomy, keys to the adults and to the mature larvae as far as known, detailed descriptions of the 27 genera and 83 species recognized from North America, fully documented synonymy, descriptions of all known immature stages, and comments under each species on distribution, taxonomic relationship, biology, and economic importance. The section on "Literature Cited," which contains biological references cited in the text, lists slightly over 300 titles. The completely cross referenced index of eleven pages should enable one to locate any generic or specific name or combination that has been used for North American flies of this family.

One feature of this volume which will certainly insure the work a permanent place in entomological literature is the wealth of illustrations. All plates, figures, and photographs are the work of the author himself. They are a monument to his industry and ability. Opinions may differ on generic classification or on the validity of some of the differentiating characters, but the tremendous labor involved in preparing so many excellent illustrations of both adults and larvae must command admiration.

Attention should particularly be called to three important and far-reaching changes in familiar names: (1) the explanation of the adoption for the American screwworm flies of the generic name *Callitroga* instead of *Cochliomyia* (cf. "Common Names of Insects Approved by the American Association of Economic Entomologists," Jour. Econ. Ent. 39: 435, 439, 1946), (2) the proposal of a new generic name (*Apaulina*) for the American bird nest screwworm flies that have hitherto been called *Protocalliphora,* (3) the use of *Phaenicia* for most of the greenbottle flies usually called *Lucilia,* the latter name being restricted in this country to a single species, *L. illustris,* and (4) the use of *Calliphora vicina* R.D. for the common bluebottle fly that has long been known as *Calliphora erythrocephala* (Meigen). *Lucilia caesar,* one of the commonest species cited in the American literature, is said not to be known to occur in North America.—CURTIS W. SABROSKY.

NOTICE. The December 1947 issue of ENTOMOLOGICAL NEWS was mailed at the Post Office at Lancaster, Pa. on February 10, 1948.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

Chrysididae—Wanted for determination in preparation of revision. Wm. G. Bodenstein, Galesville, Maryland.

Wanted—Ataenius and allied Aphodiinae from all parts of the world, especially Mexico, Central and South America. O. L. Cartwright, Clemson, S. C.

Wanted—Reprints and unpublished mss. on biological control of mosquitoes; for preparing annotated bibliographies for publication. J. B. Gerberich, Michigan State College, East Lansing, Mich.

Wanted—Hesperid genus Megathymus for exchange or purchase. P. S. Remington, 5570 Etzel Ave., St. Louis 12, Missouri.

Wanted—Psychodidae of North America for revisional purposes. Wm. F. Rapp, Jr., 203 Harker Hall, Urbana, Ill.

Diptera—Tachinidae-Dexiidae wanted, No. Amer. and exotic. Will collect most orders in exchange or will purchase. P. H. Arnaud, 60 Woodrow St., Redwood City, Calif.

Will collect—Zoological and entomological specimens in tropical and subtropical parts of Peru. Jose M. Schunke, Pucallpa, Peru.

Wanted—Diplotaxis; will buy or exchange. E. W. Mange, 307 W. Walnut St., Hanover, Pa.

Hymenoptera-Aculeata (except ants and bees) for exchange. Will collect other orders in exchange. N. F. de Andrade, Casal Novo, S. João do Estoril, Portugal.

Meliponidae—Wanted, information on the bionomics, culture, and economic importance of the stingless bees, particularly of the Old World. P. Nogueira Neto, Av Cicade Jardim 170, S. Paulo, Brasil.

Wasps (Vespoidea, Sphecoidea, Chrysidoidea) of the world by exchange or purchase. Will collect other orders in exchange. D. G. Shappirio, 4811 17th St., N.W., Washington 11, D. C.

Lepidoptera—Large quantities of Plexippus, Colias, Cardui, Vanillae wanted for cash or exchange for tropical butterflies. G. MacBean, 710 Miller Rd., Sea Island, Vancouver, B. C.

Ants of the tribe Dacetini (*Strumigenys, Rhopalothrix* and related genera) wanted for world revision. W. L. Brown, Jr., Harvard University Biological Laboratories, Cambridge 38, Mass.

Mallophaga (on which immediate determination is not necessary) wanted for study and determination. R. L. Edwards, Dept. Biology, Harvard University, Cambridge 38, Mass.

Tingidae (Heteroptera) of the world wanted, in alcohol, with host and other ecological data. Will collect other orders in exchange. N. S. Bailey, 16 Neponset Ave., Hyde Park 36, Mass.

Bombidae, nearctic and neotropical, wanted for exchange, identification, or purchase. Will exchange in other groups for bumblebees. Barth Maina, Dept. Zool., Univ. of Chicago, Chicago 37, Ill.

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ENTOMOLOGICAL NEWS

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Rudolf William Glaser, 1888–1947

On September 4, 1947, at Princeton, N. J., Dr. R. W. Glaser, an associate member of the Rockefeller Institute for Medical Research in the Department of Animal and Plant Pathology for 27 years, died suddenly from a heart attack. Dr. Glaser was born at Catonsville, Maryland in 1888. While a student at the University of Michigan he was employed during the summers of 1909 and 1910 as assistant biologist by the Maryland Shell-Fish Commission. After receiving his A.B. degree from the University of Michigan in 1911, he was assistant entomologist at Harvard from 1911 to 1913 and entomologist of the Bureau of Entomology, U. S. Department of Agriculture, from 1912 to 1920. In 1914 he received his Sc.D. degree from Harvard University and in 1920 he joined the Rockefeller Institute.

His studies dealt with such subjects as the wilt disease of the gipsy moth and other insects, bacterial diseases of caterpillars, the nature of polyhedral bodies found in insects, growth of insect blood cells in vitro, intracellular bacteria, the effect of food on the longevity and reproduction of flies, the cultivation of bacteriocytes in the German roach, methods for the sterile culture of houseflies, the culture of *Neoaplectana glaseri*, a nematode parasite of the Japanese beetle, biochemical studies on the virus and the inclusive bodies of silkworm jaundice, etc., etc. His early papers appeared in Psyche, Journal of Economic Entomology, and Biological Bulletin and his later ones in the Journal of Experimental Zoology, Journal of Experimental Medicine, Journal of Parasitology, Journal of Agricultural Research, Journal of Immunology, etc. Some of his work on *Neoaplectana glaseri* was published by the New Jersey

Department of Agriculture, and in the Journal of the New York Entomological Society. In Edward A. Steinhaus' recent book on "Insect Microbiology" (1946), a partial bibliography of Dr. Glaser's titles includes 25 from 1918 to 1943. Additional titles may be found in "Insect Dietary" (1946) by Charles T. Brues, and in "Entomology with Special Reference to its Ecological Aspects" by J. W. Folsom, revised by R. A. Wardle in 1934.

The nematode parasite of the Japanese beetle was discovered in New Jersey during May, 1929 while Dr. Glaser and Dr. Henry Fox were investigating the mortality of grubs. Later Dr. Gotthold Steiner described the nematode as a new genus and species. Because of the possibilities for beetle control in this parasite Dr. Glaser was employed as a consultant by the New Jersey Department of Agriculture on September 1, 1930 and by 1931 he had succeeded in cultivating the nematode on an artificial medium. For the next few years Dr. Glaser planned and directed experimental field introductions. This early work that was conducted at and from the Instiute opened up a new field of insect control and led to the establishment at White Horse, N. J., in the spring of 1934, of a parasite laboratory by the New Jersey Department of Agriculture. This laboratory cultured the nematodes on a large scale and made introductions in various parts of the state. When the nematode introductions were finished work was started with other insect parasites, and Dr. Glaser was retained as consultant until his death.

Dr. Glaser was a member of the American Society of Parasitologists, the Washington Academy, the Cambridge Entomological Club, the Michigan Chapter of Sigma Xi, and a fellow of the Entomological Society of America and the American Association for the Advancement of Science. Interment was at Baltimore, Maryland.

Dr. Glaser was a careful, well-informed, active investigator, and an agreeable, intellectual companion whose opinions, judgment, and research work always merited the respect and consideration of his co-workers.

H. B. Weiss

Termite-Eating Pheidole Larvae (Hymenoptera: Formicidae)

By NEAL A. WEBER, Swarthmore College, Swarthmore, Pennsylvania

The greatest enemies of termites are often said to be ants and among the common ants within the geographical range of termites are those belonging to the genus Pheidole. While most of the species are carnivorous, feeding largely on insects, others are granivorous and store seeds. The maxima worker has an exceptionally large head and is referred to as a soldier caste.

The larvae of most ants are fed by regurgitation of liquid food from the workers. Among the primitive ants of the subfamily Ponerinae, however, it is not uncommon for the workers to bring parts of insects to the larvae and permit the latter to feed directly on them. The habit is rare among the Myrmicinae (to which Pheidole belongs), Dolichoderinae and Formicinae, subfamilies containing most of the species of ants and by far the most individuals. Wheeler records it in two other myrmicines and in one formicine (1933). It has not apparently been hitherto recorded in nature in the cosmopolitan genus Pheidole.

The nature of larval food is of particular interest in view of the reports by Goetsch (1937, 1947) that the development of the soldier caste depends upon the larvae being fed insect food at a particular time. He has extracted his vitamin "T", supposed to be an essential factor, from termites among other insects. The species of Pheidole are particularly noteworthy in possessing a soldier caste well differentiated from the ordinary worker.

It is accordingly of interest to note the finding in nature of an African species of Pheidole whose larvae were fed fragments of termites. The regularity of associations between these two is further attested by the additional records in which the nature of the larval food could not be determined. Neither Arnold (1915–1926) nor Wheeler (1922) in their monographs on African ants records insect-eating Pheidole larvae nor, indeed, any larval food habits. The African records are from my 1939 expedition to Central Africa and the others are from personal collecting in the Neotropical Region. I am indebted to Professor A. E. Emerson for identifying the termites.

On the great plains surrounding Nairobi, Kenya, several degrees south of the Equator, one of the commonest trees is an Acacia (?*A. stenocarpa* Hochst of Allaud and Jeannel) with conspicuous hollow swellings at the bases of the long thorns. These have often been referred to as ant-galls from the circumstance that they are regularly inhabited by ants but the evidence appears to be that they develop independently of these insects. In the "galls" are found lycaenid and other lepidopterous larvae, dipterous larvae and scale insects which may be tended by the ants. The common ants appear to be *Crematogaster vulcania* Santschi and Pheidole of several species. The Crematogaster are regular inhabitants of the Acacia "galls" while the Pheidole nest under rocks in soil nearby and forage over the Acacia. The Crematogaster have their brood and myrmecophiles in the "galls"; only soldier and worker Pheidole were found in these and they foraged over the Crematogaster-inhabited "galls." In the soil are termites (? Macrotermes sp.) and they doubtless feed on Acacia dead wood as well.

Under a small rock four feet from an Acacia a *Pheidole punctulata* Mayr colony had its brood. To the lower surface of the rock the ant larvae were attached by their long dorsal hairs. Many of the larvae were holding pieces of termites, sufficiently held that they stayed on the larvae when the rock carrying them was roughly overturned. In the vial of alcohol in which all were placed the fragments did not remain with the larvae but it was first determined that they were held on the ventral surface next to the mouthparts. I asked my companion, Dr. G. van Someren, to corroborate my finding under a 10 and 20 × hand lens which he kindly did. Later study showed that the larvae were held to the rock by a few long dorsal hairs, each terminating in a pair of hooks. The hairs grew directly from the body at right angles, then made a complete, irregular loop before proceeding by several irregular curves to their bifurcated apices. In addition there were much shorter and finer dorsal hairs, also bifurcated apically. The termite fragments were held in place by the bent head against the body, assisted by a few simple hairs on the ventral surface.

In the vicinity of *Pheidole punctulata* and near the Acacia was a colony of *Pheidole sculpturata* Mayr, subspecies, or a closely related species. This species is much larger in the solder caste. The ants had stored small brown seeds in chambers in the soil under an irregular crater. The workers also foraged over the Acacia.

Pheidole punctulata Mayr is sometimes considered a distinct species, sometimes a subspecies of the cosmopolitan *megacephala* of Fabricius. They are at the least closely related species and both are common African ants. Wheeler (1922, p. 132) quotes Lang's notes on the native Belgian Congo name, "Tuegeke," and nesting "in mushroom-shaped termitaria in swamps" and "in the tops of termite mounds" as well as "under heaps of decomposed, moist grass." Arnold (1915–26, p. 424) speaks of it as being "very partial to sugar and other provisions and is therefore a frequent pest in houses. It nests in the ground, and often under the shelter of stones and decayed logs, also occasionally in hollow trunks of trees. Usually many fertile queens are found in each nest." The Nairobi specimens are much darker and somewhat larger than Belgian Congo and Uganda specimens identified by the above authorities but well within the range given by Arnold. My Imatong Mountains Pheidole listed as *P. megacephala* subsp. 1384 (1943, p. 305) consisted of two colonies nesting a distance of 46 cm. apart. The colony noted as being "distinctly smaller in both worker and soldier castes" appears close to the species *P. megacephala* while the larger form taken nearby agrees fairly well with *P. punctulata* except that it is much smaller than the Nairobi form. The ants of both colonies mingled together in capturing live termites (*Ceratotermes rhinoceros* (Sjöstedt)). Both *P. punctulata* and *P. megacephala* are highly variable species in Africa and considerable work would be necessary before their relationships to one another and to the numerous described forms of them could be satisfactorily determined.

Since both termites and Pheidole ants are common insects of the tropics it is to be expected that they would often be found nesting in the vicinity of one another. This is substantiated by the following sample records which demonstrate also the opportunity the ants have to prey upon the more helpless insects.

At Er Renk on the White Nile River, Anglo-Egyptian Sudan, a colony of a subspecies of *Pheidole megacephala* occupied runways interdigitating with those of *Microtermes thoracalis* Sjöstedt under a rock in dark, wet soil on the river bank. When I lifted the rock the ants attacked the termites and carried off a number. The soldier termites were not seen to defend the colony. A similar association was seen about 40 feet away although the chambers of the insects were not so close to one another.

Upstream at Shambe on the west bank of the White Nile, here called the Bahr-el-Jebel, large earth mounds of *Macrotermes natalensis* (Haviland) were numerous. *Pheidole megacephala* nested in peripheral chambers of one nest about six and one half feet high. Alates of the termites were taken close to the surface at a height of five feet. The termite mound was surrounded either by shallow water or by very wet soil since the region had had two days of rain. It was a swampy region in any event and the Pheidole must have been largely confined to the vicinity of the mound. Piles of sand grains from their excavatings were noted on the slopes at all heights. Workers of the same ant species foraged in the nearby native village. The termite mound was in addition the site for a nest of *Camponotus* (*Orthonotomyrmex*) *sericeus* Fabr. whose workers were much larger than those of the Pheidole. They seized termites when chambers of both were exposed and attacked me as well.

In the same Imatong Mountains of the Sudan above noted, another form of *Pheidole megacephala* also close to *punctulata* was taken nesting under a rock with termite runways nearby. The Pheidole brood was again clinging to the under side of the rock (30 × 30 × 20 cm., 15 cm. high). The ants seized the termites (*Anoplotermes* sp.) when the nests were exposed but temperatures were cool at the elevation of 7,570 feet above sea level and neither insect was particularly active.

Other African observations indicated more versatility in food habits of Pheidole. A worker at Mombasa on the Indian Ocean Coast was carrying a dead worker of the common ant, *Euponera* (*Brachyponera*) *sennaarensis* Mayr. At Nairobi they were lapping nectar of the petiolar glands of *Albizzia gummifera*. At Kagelu near the Nile-Congo watershed several colonies were tending membracids and related homopterous insects on vines and trees.

Similar habits were observed in the Neotropical Region.

Literature Cited

Arnold, G. 1915–26. Monograph of the Formicidae of South Africa. Ann. S. Afr. Mus. 14: 1–766 and 23: 191–295.

Goetsch, W. 1937. Die Entstehung der "Soldaten" im Ameisenstaat. Naturwiss. 50: 803–808.

——. 1946. Vitamin "T," ein neuartiger Wirkstoff (Vorlaüfige Mitteilung). Osterr. Zool. Zeitschr. 1: 49–57.

Weber, N. A. 1943. The ants of the Imatong Mountains, Anglo-Egyptian Sudan. Bull. Mus. Comp. Zool., Harvard 93: 263–389.

Wheeler, W. M. 1922. The ants of the Belgian Congo. Bull. Amer. Mus. Nat. Hist. 45: xi + 1139.

——. 1933. Colony founding among ants. Harvard Univ. Press, viii + 179.

A New Species of Anaides from Peru (Scarabaeidae: Coleoptera)

By Mark Robinson, Springfield, Pennsylvania

Anaides rugosa new species

From *fossulatus* Westwood this species differs in lacking the four more or less parallel ridges on the pronotum and in the fact that the anterior tibial teeth of *fossulatus* are more approximate. From *simplicicollis* Bates this species can be distinguished by the pronotal sculpturing which is punctured on the disk in the older species. The mentum of *rugosa* resembles that of *simplicicollis* in being emarginate anteriorly, but in addition to the characters already mentioned the elytral ridges are higher and sharper and the anterior tibiae between the teeth are crenate.

Ovate; opaque; dark brown with the ridges and legs dark reddish.

Clypeus produced forwards, anterior edge truncate, the angles on either side well rounded. There is a longitudinal raised mound running from the frons to just within the clypeal edge. Entire surface of head rugose.

Side margins of thorax converging from hind angles to the anterior angles with little curvature, crenate. Hind margin emarginate inside the hind angles, produced to the rear, medially. Running from near the hind angle towards the disk diagonally is a low carina. Entire surface of pronotum very rugose except the low ridges.

Elytra with the usual raised costae running from the humeral umbo to the apical umbo. One-third of the distance from the suture to the humeral costa is another raised, sharp costa which is broken up into a series of tubercules in the posterior half, two-thirds of the distance from the suture to the humeral costa is a row of tubercules in the posterior half. Between each costa or row of tubercules are two rows of irregular, circular, raised lines and between these and the costa is a series of wavy, raised lines running the length of the elytra.

Anterior tibiae tridentate, crenate between the teeth and above the third tooth. Anterior edge of mentum emarginate and crenate; under surface rugose. Under surface of prosternal episternum, mesosternum, metasternum, ventral segments and femura rugose.

Length, 9.5 mm.; breadth, 5.6 mm.

Type.—♂?; Iquitos, Peru, April 1938 (J. Hocking). [In the collection of the author.]

A New Species of Canthon from Venezuela

By Mark Robinson, Springfield, Pennsylvania

Canthon bifurcatus new species

By the female having a forked anterior tibial spur this species agrees with *rugosus* Blanchard. This character is usually reserved for the male sex in the genus *Canthon*. Aside from the unusual tibial spur the present form is probably nearest to *diabolicus* Harold but the latter species is hairy on the dorsal side.

Ovate; black; not very shining; the surface of the head, pronotum, elytra and pygidium is finely granulate.

Clypeus broadly emarginate medially. On either side of this wide emargination is a narrow, reflexed tooth. Between these teeth and the oblique clypeal sutures the edge is broadly rounded. The genae are also well rounded.

The thorax is widest at the middle where it is produced into a rather sharp angle. On the underside the transverse carina does not quite meet the lateral margin. Between this median angle and the sharp anterior angle there is a small tooth on the lower side of the margin.

The elytral striae are very faintly indicated. The intervals have a few transverse wrinkles scattered over the surface. The pygidium is uniformly rounded.

The anterior tibia is curved on the inside; the outer edge is tridentate and crenate between the teeth and above the third tooth. The anterior tibial spur gradually widens towards the apex and the distal end is sharply, deeply and triangularly incised. The underside is even more finely granulate than the upper side. The middle and posterior femora are finely and sparsely punctured. The posterior tibia has but one spur on the distal end.

Length, 8.0 mm.; breadth, 5.3 mm.

Type.—♀; Merida, Venezuela. *Paratype*.—♀; Merida, Venezuela. Both type specimens are in the collection of the author.

New Records of Pennsylvania Caddis Flies (Trichoptera)

By Kerwin Hyland, Jr., Department of Tropical Medicine and Public Health, Tulane University, New Orleans, La.

As a senior student of zoology and entomology at The Pennsylvania State College I undertook the problem of classifying the caddis flies (Trichoptera) from Pennslyvania represented in my own collections and in those of the college. The decision to publish the findings came as a result of the discovery that numerous species collected established extension of their known ranges. However, this list comprises only a small percentage of those that occur and can be expected to occur in Pennsylvania. Two families, Hydropsychidae and Hydroptilidae, have been purposely neglected in this list because at the end of the semester additional work was required before reporting them.

The family divisions, genera, species, and distribution data are those set forth by Dr. Herbert H. Ross in his "Caddis Files, or Trichoptera of Illinois" (1944), with the exception of distribution data of a few species. Those species marked with an asterisk (*) have not been previously reported from Pennsylvania.

The collecting area at Bear Meadows, Centre County, deserves special mention. Bear Meadows is situated about twelve miles from the campus of The Pennsylvania State College in a boreal area and consists of a sphagnum bog on a plateau between two mountains. This area is known to harbor many plants and some insects peculiar to Pennsylvania. Consequently, one may expect to find here caddis flies of special interest. Numerous species not heretofore recorded for Pennsylvania have been collected here, as *Banksiola dossuaria* (Say), *Platycentropus radiatus* (Say), *Pycnopsyche antica* (Walker), *Molanna tryphena* Betten, *Athripsodes dilutus* (Hagen), and *Goera calcarata* Banks.

Most of the specimens were collected by light, a few by bait and by net. The collection covers a period of years from 1939 to 1947. Two-thirds of the locality records are credited to Dr. S. W. Frost, one is by W .L. Brown, and the remainder are my own.

Following is a list of the species collected:

Rhyacophilidae

**Ryacophila nigrita* Banks. Penn Roosevelt Dam, Centre Co.; June 9, 1946.

Philopotamidae

**Dolophilus moestus* (Banks). North Point, Indiana Co.; May 15, 1947.

Chimarra aterrima Hagen. Camp 62, Huntingdon Co.; June 21, 1941. Penn Roosevelt Dam, Centre Co.; June 9, 1946.

C. obscura (Walker). East Berlin, Adams Co.; July 20, 1946.

Psychomyiidae

**Phylocentropus placidus* (Banks). Presque Isle, Erie Co.; July 15, 1940. Poe Paddy, Centre Co.; Aug. 16, 1940. Whipple Dam, Huntingdon Co.; July 27, 1945.

**Nyctiophylax vestitus* (Hagen). Bear Meadows, Centre Co.; June 11, 1939, June 28, 1939, July 3, 1939, July 10, 1939, July 21, 1939. Canton, Bradford Co.; July 17, 1941.

Hydropsychidae

Macronemum zebratum (Hagen). East Berlin, Adams Co.; July 27, 1946.

Phryganeidae

**Banksiola dossuaria* (Say). Bear Meadows, Centre Co.; June 28, 1939, Aug. 13, 1946.

Ptilostomis ocellifera (Walker). Bear Meadows, Centre Co.; June 28, 1939, July 3, 1939, July 29, 1939, Aug. 21, 1940.

Limnephilidae

**Platycentropus radiatus* (Say). Bear Meadows, Centre Co.; July 21, 1939, July 29, 1939, Aug. 12, 1939.

**Pycnopsyche antica* (Walker). Bear Meadows, Centre Co.; Sept. 2, 1939.

**P. guttifer* (Walker). Whipple Dam, Huntingdon Co.; Sept. 16, 1945.

**Caborius punctatissimus* (Walker). Greenwood Furnace, Huntingdon Co.; Sept. 3, 1945.

Molannidae

**Molanna tryphena* Betten. Bear Meadows, Centre Co.; June 3, 1939, June 28, 1939, July 21, 1939, Aug. 12, 1939, Sept. 2, 1939.

Odontoceridae

**Psilotreta frontalis* Banks. Liberty, Tioga Co.; May 29, 1939.

Leptoceridae

Anthripsodes flavus (Banks). Jersey Shore, Lycoming Co.; July 16, 1941. Charter Oak, Huntingdon Co.; Aug. 14, 1946.
**A. dilutus* (Hagen). Bear Meadows, Centre Co.; July 3, 1939.
A. transversus (Hagen). Charter Oak, Huntingdon Co.; Aug. 14, 1946.
A. cancellatus (Betten). East Berlin, Adams Co.; July 27, 1946.
Oecetis inconspicua (Walker). Camp 62, Huntingdon Co.; Aug. 4, 1940. Bear Meadows, Centre Co.; July 29, 1939, Aug. 12, 1939, Sept. 2, 1939. Spring Creek, Centre Co.; Aug. 12, 1939. Stone Creek, Huntingdon Co.; Aug. 14, 1939. Jersey Shore, Lycoming Co.; July 16, 1941. Presque Isle, Erie Co.; June 27, 1942. East Berlin, Adams Co.; July 27, 1946. Charter Oak, Huntingdon Co.; Aug. 14, 1946.
Oecetis avara (Banks). Charter Oak, Huntingdon Co.; Aug. 14, 1946. East Berlin, Adams Co.; July 27, 1946.
O. cinerascens (Hagen). Presque Isle, Erie Co.; June 27, 1942.
**O. osteni* Milne. Presque Isle, Erie Co.; June 27, 1942.
Triaenodes trada Milne. Presque Isle, Erie Co.; June 27, 1942.
**T. baris* Ross? Stone Creek, Huntingdon Co.; Aug. 14, 1939.
Mystacides sepulchralis (Walker). Poe Paddy, Centre Co.; June 10, 1944. Stone Creek, Huntingdon Co.; Aug. 14, 1943.
**Setodes incerta* (Walker). Charter Oak, Huntingdon Co.; Aug. 14, 1946.

Goeridae

**Goera calcarata* Banks. Bear Meadows, Centre Co.; June 11, 1939.

Helicopsychidae

Helicopsyche borealis (Hagen). Charter Oak, Huntingdon Co.; Aug. 14, 1946.

A Minute on Chyphotes Blake, 1886 (Hymenoptera: Mutillidae)

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

Blake proposed the generic name *Chyphotes* in 1886 (Trans. Amer. Ent. Soc., XIII, p. 276) for his peculiar new species *elevatus* from the southwestern states. In 1835, however, Burmeister used the same name—*Cyphotes*—for a genus of Neotropical Membracidae (Handbuch Ent., II, 1, p. 143). According to the present rules of zoological nomenclature, Blake's *Chyphotes* is a homonym of *Cyphotes* Burmeister since both have the same etymology (*κυφότης*). Consequently, for *Chyphotes* Blake, 1886 nec *Cyphotes* Burmeister, 1835, I propose here the new generic name *Blaketa* with *Chyphotes elevatus* Blake, 1886, as type.

Utah Buprestidae

By G. F. Knowlton and S. L. Wood, Utah State Agricultural College, Logan

The writers are indebted to J. N. Knull and W. S. Fisher for identification of the material here reported. Unless otherwise specifically indicated, collections were made in Utah. The collector's names are given for the less frequently recorded species.

Acmaeodera bowditchi Fall. Zion National Park, May 10, 1940 (W. P. Nye).

A. inyoensis Edz. Logan Canyon, June 16, 1940 (Nye).

A. liberta Fall. Logan Card Canyon, July 24, 1939 (G. F. Knowlton-Nye); Oak Creek Canyon, July 24, 1939 (G. S. Stains).

A. sparsa Horn. Logan, August 21, 1943; Bountiful, August 10, 1941; Mt. Nebo, August 14, 1943; Mt. Timpanogos, August 26, 1943.

A. vandykei Fall. Smithfield, July 18, 1937 (Nye); Logan Canyon, July 17, 1938 (D. E. Hardy).

A. variegata Lec. Logan Canyon, June 26, 1938; Logan Card Canyon, July 9, 1939; Emigration Canyon, May 26, 1940; Ogden, August 1, 1940; Kanosh Canyon, May 24, 1939; Provo Canyon, June 25, 1939; Mt. Nebo, July 12, 1942; Salt Lake City, September 14, 1940; Uinta, May 20, 1939.

Agrilus anxius Gory. Logan Canyon, July 3, 1938 (Hardy).

A. politus (Say). Altonah, June 19, 1940; Delta, July 5, 1938; Fairview, August 10, 1942; Heber, May 29, 1941; Kanab, August 9, 1942; Oak Creek, July 7, 1942; Riverton, June 1939; Vernon, July 18, 1943.

A. pulchellus Bland. Leeds, May 5, 1939 (Knowlton-Harmston).

A. walsinghami Cr. Logan Canyon, August 24, 1938 (Nye).

Anthaxia aeneogaster Cast. Logan Canyon, June 9, 1938; Logan Card Canyon, July 27, 1938; Altonah, June 19, 1940; Provo Canyon, June 23, 1939; Springdale, May 11, 1940; South Fork of Ogden Canyon, July 3, 1941.

A. pseudotsugae Chamb. Logan Card Canyon, July 9, 1939 (Knowlton-Nye); Beaver, July 10, 1939 (Knowlton-Harmston).

A. viridifrons Gory. Logan Canyon, June 9, 1938 (Knowlton-Nye).

Buprestis aurulenta L. Logan, July 4, 1941 (H. F. Thornley); Roosevelt, August 14, 1936 (Harmston); Salt Lake City, August 16, 1936 (Harmston).

B. confluenta Say. Vernal, June 15, 1941 (B. A. Haws); Wellsville, April 15, 1940 (Maughan).

B. langi (Mann.). Logan Canyon, July 24, 1940; Logan, August 17, 1941; Myton, September 10, 1939; Ogden, August 19, 1941.

B. maculativentris var. *rusticorum* (Kby.). Logan Canyon, July 28, 1940 (Nye); Bountiful, September 12, 1941 (Ashdown).

B. nuttalli (Kby.). Logan Canyon, June 18, 1939 (Knowlton).

Chalcophora angulicollis (Lec.). Neola, July 10, 1935 (Harmston).

Chrysobothris caurina Horn. Logan Canyon, June 20, 1935 (Nye).

C. femorata (Oliv.). Logan Canyon, June 20, 1935 (Nye); Ogden, July 11, 1941 (Maddock).

C. mali Horn. Logan Canyon, June 20, 1934 (T. O. Thatcher).

C. pseudotsugae Van D. Logan Canyon, June 20, 1935 (Nye).

C. serripes Schffr. Salt Lake County, August 16, 1935 (W. W. Henderson).

Dicerca divaricata (Say). Provo, June 14, 1939 (Knowlton-Nye).

D. hesperoborealis H. & B. Logan Canyon, June 4, 1941 (R. S. Roberts-E. R. Simmons).

D. pectorosa Lec. Logan Canyon, June 27, 1937 (Nye).

D. prolongata Lec. Logan Canyon, July 3, 1938 (Hardy).

D. tenebrica (Kby.). Logan, October 17, 1942; Ioka, June 26, 1939; Mt. Timpanogos, July 12, 1941; Ogden, August 1, 1941; Salt Lake City, September 23, 1942; Spanish Fork, June 11, 1941; Taylorsville, May 14, 1940.

D. tenebrosa (Kby.). Logan Canyon, June 26, 1939; Emery County, July 30, 1938; Ogden, August 14, 1940; Roosevelt, September 5, 1935; Tooele, August 20, 1937.

Hippomelas obliterata (Lec.) Grand County, July 26, 1938; Pleasant Valley, July 21, 1939; Wayne County, July 28, 1938; Myton, September 10, 1939; Vernal, July, 13, 1938.

Melanophila acuminata (De G.). Logan, September 12, 1936 (Nye).

M. atropurpurea (Say). Logan, June 25, 1940 (Nye).

M. drummondi (Kby.). Logan, May 28, 1934 (Thatcher); Logan Canyon, July 29, 1940 (Nye).

The Mayfly Genus Lachlania in Utah

By George F. Edmunds, Jr., University of Utah

On August 9, 1947, the writer collected a single female imago and several nymphs of the Mayfly genus *Lachlania* from the Green River at Hideout Canyon, Daggett County, Utah. On September 3, 1947, the writer returned and was able to rear the species and collect additional nymphs and many imagoes of both sexes. These specimens apparently represent the first record of the occurrence of this genus in the United States. With the exception of *L. saskatchewanensis* Ide which was described from a single specimen taken near Humboldt, Saskatchewan, the described species of this genus are Neotropical.

Strumigenys karawajewi, New Name for a Sumatran Ant

By WILLIAM L. BROWN, JR., Harvard University
Biological Laboratories

Strumigenys (Trichoscapa) karawajewi, new name for *Strumigenys* (*Cephaloxys*) *emeryi* Karawajew 1935: preoccupied by Mann 1922 as *Strumigenys* (*Strumigenys*) *emeryi.*

Karawajew described the ant in question as (*Cephaloxys*) in subgeneric assignment. Smith has shown (1947) that the name *Trichoscapa* must be revived for the forms with short, triangular, serially dentate or denticulate mandibles. The writer of this note is at present working on a generic and subgeneric revision of the *Dacetini* of the world in which *Trichoscapa* will be accorded generic rank and strictly limited to a few forms with strong, transverse superior mandibular borders and other distinguishing characteristics. *Cephaloxys* is shown by Smith to be preoccupied as a name, so the remaining short-mandibulate forms will have to fall into a group, more probably *groups,* with a new name or names, probably of generic rank. *Karawajewi* will at that point gain a new generic name. Mann's *emeryi* is from Central America, *karawajewi* from Sumatra. References given below.

1922. MANN, W. M. Proc. U. S. Nat'l Mus. *61* (13): 37–38, fig. 18. Worker and female of *S. emeryi* described.
1935. KARAWAJEW. Treubia *15:* 106–108, fig. 25. Female of *S.* (*C.*) *emeryi* described.
1947. SMITH, M. R. Amer. Midl. Nat. *37:* 585. *S.* (*Trichoscapa*) Emery (= *Cephaloxys*) F. Smith.

International Meetings

A preliminary program has been issued for the **VIII International Congress of Entomology** to be held at Stockholm, August 9th–14th. The first day is to be given over to the formal opening, scheduled addresses, and a general reception in the evening. General sessions and sectional meetings are planned for the other days except Wednesday which is set aside for a trip to Uppsala and to Linné's Hammarby and a viewing of the collections of Linné and Thunberg. On Friday there will be a trip to Freskati and visits to the Imperial Museum, Forest Experiment Station and Plant Protection Station. Other features are: A gathering at Lund the day before the opening with visits to the museum and, after the close of the Congress, one day excursions to the islands of the Stockholm archipelago, a six-day journey to Lappland or, for forest entomologists, a trip to middle Sweden.

The **VII Congrès Séricicole International** will be held in Alès (Gard), June 7th to 13th. This is the first meeting in 70 years, the 6th Congress having been held in 1878, and honors the 50th anniversary of the research institute at Alès. It is planned to review in a comprehensive manner the present state of knowledge and technical developments relating to silk production and the silkworm. Under Section II, there is listed a series of commissions on the anatomy, physiology, reproduction, development, endocrinology, behavior, genetics and cytology of the silkworms and a report on other silk-producing arthropods. Another series of commissions will deal with the various diseases of the silkworm. A number of excursions have been planned and, following this congress, there will be the Congrès International de la Soie in Lyon and Paris.

Current Entomological Literature

COMPILED BY EDWIN T. MOUL AND RAYMOND Q. BLISS.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, 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.

This list gives references of the current or preceding year unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

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 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. The number of the volume, and in some cases, the part, heft, &c is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

GENERAL—Anon.—A list and index of the publications of the U. S. Nat. Museum (1875–1946). [U. S. Nat. Mus., Bull. 193] 1–306. **Beatty, H. A.**—The insects of St. Croix, V. I. [Jour. Agric., Univ. of Puerto Rico] 28: 114–72. **Carpenter and Hale**—The writings of I. Portschinsky on warning colours and eyespots. [68] 22: 103–13. **Dansereau, P.**—Zonation et succession sur la restinga de Rio de Janeiro—I. Halosère. [Rev. Canad. Biol.] 6: 448–84. **Hoffmann, W. E.**—Insects on human food. [65] 49: 233–37. **Mayr, E.**—Ecological factors in speciation. [100] 1: 263–88. **Newell, N. D.**—Infraspecific catagories in invertebrate paleontology. [100] 1: 163–71. **Ramos, J. A.**—The insects of Mona Island (West Indies). [Jour. Agric., Univ. Puerto Rico] 30: 1–74, ill. (*). **Wetzel, C. M.**—Emergence tables. [Pa. Angler] 17: 11.

ANATOMY, PHYSIOLOGY, MEDICAL—Albuquerque, D. de O.—Contribuicao ao conhecimento de charaduella malacophaga Lopes (Muscidae). [Rev. de Ent., Rio de Janeiro] 18: 101–12. **Balduf, W. V.**—The weights of Phymata pennsylvanica americana (Phymatid). [5] 40: 576–87.—The weights of Sinea diadema (Reduviid). *Ibid.* 588–97. **Beirne, B.**—A consideration of the cephalic structures and spiracles of the final instar larvae of the Ichneumonidae. [Trans. Soc. British Ent.] 7: 123–90, ill. **Bonet, F.**—Un notable caso tetralologico. Falta bilateral de antenas en un colembolo con consideraciones sobre las areas cephalicas de los cephalicas de los Poduromorpha. [104]: 413–18, ill. **Carson and Stalker**—Gene arrangements in natural populations of Drosophila robusta. [100] 1: 113–33.—Morphological variation in natural populations of D. robusta. *Ibid.* 237–48. **Cheng and Richards**—The temperature coefficients of DDT action in insects. [Physiol. Zool.] 21: 48–59. **Crombie and Darrah**—The chemoreceptors of the wireworm (Agriotes spp.) and the relation of activity to chemical constitution. [40] 24: 95–109. **DeMeillon and Goldberg**—Preliminary studies on the nutritional requirements of the bedbug (Cimex lectularius) and the tick Ornithodoros moubata. [40] 24: 41–63. **Dethier, V. G.**—The role of the antennae in the orientation of carrion beetles to odors. [45] 55: 285–93. **Dobzhansky, Th.**—Adaptive changes induced by natural selection in wild populations of Drosophila. [100] 1: 1–16. **Dobzhansky and Spassky**—Evolutionary changes in laboratory cultures of Drosophila pseudoobscura [100] 1: 191–216. **Eastham and Segrove**—The influence of temperature and humidity on instar length in Calandra granaria. [40] 24: 79–94. **Edney, E. B.**—Laboratory studies on the bionomics of the rat fleas Xenopsylla braziliensis and X. cheopis. [19] 38: 389–404. **Federley, H.**—Die Konjugation der Chromosomen bei den Lepidopteren. [Soc. Sci. Fennica; Comm. Biol.] IX, 13: 1–12, ill.; Polyploidie und Non-disjunction in der Gametogenese einiger Lepidopteren. *Ibid.* 17: 1–9, ill. **Ferris, G. F.**—The contradictions of the insect head. [50] 12: 59–64. **Fish, W. A.**—Embryology of Lucilia sericata (Calliphor.). [5] 40: 677–87. **Hammon, Reeves, Cunha, Espana and Sather**—Isolation from wild bird mites (Liponyssus sylviarum) of a virus or mixture of viruses from which St. Louis and Western equine encephalitis viruses have been obtained. [80] 107: 92–93. **Hayes, W. P.**—An undescribed eversible gland in the larvae of Chlaenius (Carabidae). [43] 20: 142–45, ill. **Herskowitz, I. H.**—A new method of treating Drosophila gametes with chemicals. [100] 1: 111–12. **Hinton, H. E.**—On the reduction of functional spiracles in the aquatic larvae of the holometabola, with notes on the moulting process of spiracles. [88] 98: 449–73, ill. **Ives, P. T.**—Second chromosome inversions in wild populations of Drosophila melanogaster. [100] 1: 42–47. **Kaufmann and Gay**—The influence of x-ray and near infra-red rays on recessive lethals in Drosophila melanogaster. [67] 33: 366–72. **King, J. C.**—A comparative analysis of the chromosomes of the guarani group of Drosophila. [100] 1: 48–62.—Interspecific relationships within the guarani group of Drosophila. *Ibid.* 143–53. **Kullenberg, B.**—Über Morphologie und Funktion des Kopulationsapparats der Capsiden und Nabiden. [Zool. Bidrag, Uppsala] 24: 217–418, ill. **Lane and Neghme**—Sobre el Anopheles (Nycsorhynchus) pictipennis Philippi. [Biologica, Santiago de Chile] 4: 83–93, ill. **Leonard, J. W.**—Differences in the occurrence of nymphs of two species of burrowing mayflies in fish stomachs. [5] 40: 688–91. **Miller, R. H.**—The toxicity of the venom of tarantula (Aphonopelma), Part II. [39] 39: 57–67. **Moody, P. A.**—A simple model of 'drift' in small populations. [100] 1: 217–18. **Packard, C. E.**—Fun with the fire brat. [Turtox News] 25: 196–97. **Pardi, L.**—Dominance order in Polistes wasps. [Physiol. Zool.] 21: 1–13. **Pasquier, R.**—Semeiologie de l'intoxication de Schistocerca gregaria Forsk. par γ-hexachlorohexanone. [Bull. Semestrial l'Office Nat. Anti-Acridien, Algiers] 1946: 5–22, ill. **Ramírez L. R.**—Datos preliminares fisicos y quimicos del veneno de alacrán. [104] 4: 379–82.—Obtencion de veneno de alacrán por estimulación electrica. *Ibid.* 383–85. **Rao,**

T. R.—Visual responses of mosquitoes artificially rendered flightless. [40] 40: 64–78. **Rapp, J. L. C.**—Insect hemolymph, a review. [45] 55: 295–308. **Sawaya, M. P.**—Nymphopsis melidae, sp. n. e observações sôbre a respiração nos Pantopoda. [Zoologia, Univ. São Paulo] 12: 83–97. **Shrader, F.**—The role of the kinetochore in the chromosomal evolution of the Heteroptera and Homoptera. [100] 1: 134–42. **Slifer and Shulow**—Sporadic polyembryony in grasshopper eggs. [5] 40: 652–55. **Spencer, W. P.**—Genetic drift in a population of Drosophila immigrans. [100] 1: 103–10. **Spieth, H. T.**—Sexual behavior and isolation in Drosophila. I. The mating behavior of species of the willisoni group. [100] 1: 17–31. **Stalker and Carson**—Morphological variation in natural populations of Drosophila robusta Stur. [100] 1: 237–48, ill. **Vanderplank, F. L.**—Some observations on the hunger-cycle of the tse-tse flies Glossina swynnertoni and G. pallidipes in the field. [19] 38: 431–38. **Van Leeuwen, E. R.**—Increasing production of codling moth eggs in an oviposition chamber. [37] 40: 744–45. **Vasconcellos, A. C. eS. de.**—O "Crossingover" nos machos da Drosophila melanogaster induzido pelos raios X. [Bol. da Soc. Port. de Ciencias naturais] 13: Supp. III: 693–98. **Weiss, H. B.**—The death-feints of Idiobates castaneous and Boletotherus bifurcus (Tenebr.). [45] 55: 275–79. **Wiesmann, R.**—Untersuchungen über das physiologische Verhalten von Musca domestica verschiedener Provenienzen. [Mitteil. schweiz. Ent. Gesellschaft] 20: 484–504.

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SMALLER ORDERS—Ahrens, C.—The mayflies. [Pa. Angler] 17: 16. **Bailey, S. F.**—The works of J. R. Watson on Thysanoptera. [31] 30: 17–24. **Bohart, R. M.**—Strepsiptera, an insect oddity. [94] 21: 24–29, ill. **Bonet, F.**—Un nuevo género de colémbolos de Argentina. [104] 4: 405–11 (k).—(See also under Anatomy.) **Crawford, J. C.**—A new species of the genus Haplothrips subg. Hadothrips (Thysanoptera). [65] 49: 250–51. **Denning, D. G.**—New Trichoptera from Puerto Rico. [5] 40: 656–61. **Edney, E. B.**—Siphonaptera. (See under Anatomy.) **Eichler, W.**—Notulae Mallophagalogicae. XVIII. Über einige Heptapsogastridae. [Rev. de Ent., Rio de Janeiro] 18: 167–72, ill. (*). **Fraser, F. C.**—Notes on the Selysian types of Epigomphus paludosus (Odonata). [5] 40: 672–76. **Gisin, H.**—Le groupe Entomobrya nivalis (Collembola). [Mitteil. schweiz. Ent. Gesell.] 20: 541–50, ill. **Hopkins, G. H. E.**—Stray notes on Mallophaga. [6] 14: 98–112 [1947]. **Kennedy, C. H.**—Isoptera (See under General). **Leonard, J. W.**—(See under Anatomy.) **Miles, P. M.**—An introduction to the study of Collembola. [Proc. and Trans. of S. London Ent. and Nat. Hist. Soc.] 1946–47: 85–102, ill. **Moulton, D.**—New Thysanoptera from Mexico. [104] 4: 419–21.——Thysanoptera from New Guinea, the Philippine Islands and the Malay Peninsula. [60] 23: 172–80 (*). **Needham, J. G.**—Studies on the N. Amer. species of the genus Gomphus (Odonata). [83] 73: 307–39, ill. **Packard, C. E.**—Thysanura (See under Anatomy.) **Pence, R. J.**—A photomicrographic study of a parasite of the greenhouse thrips. [Turtox News] 26: 64–65. **Tissot, A. H.**—A new cattle louse in Florida. [31] 30: 40. **Traver, J. R.**—Notes on neotropical mayflies. Part II, family Baetidae, subfamily Leptophlebiinae. [Rev. de Ent., Rio de Janeiro] 18: 149–60, ill. (*). **Williner, G. J.**—Corrodentidos del Brasil. [Acta Zoologica Lilloana] 3: 231–34, ill.

ORTHOPTERA—Beier, M.—Neue und seltene Mantodeen aus deutschen Museen. [Ann. des naturhist. Mus., Wien] 52: 126–54, ill. (S). **Breland and Dobson**—Specificity of mantid oothecae. [5] 40: 557–75. **Gurney, A. B.**—Homonymy in Mantidae of the Canary Islands. [65] 49: 251.—A new species of Pristoceutophilus from Oregon, and remarks on certain special glands of Orthoptera (Gryllacridid: Rhaphidophorinae). [48] 37: 430–35, ill. **Leao, A.**—Vida e amores da Louva-a-Deus (Mantis religiosa). [Bol. da Soc. Port. de Cien. Nat.] 13, Supp. III: 628–36. **Liebermann, L.**—Sobre una coleccion de Acridios. [Acta Zoologica Lilloana] 3: 235–38. **Nabours, R. K.**—The grouse locusts. [43] 20: 127–41, ill. **Pasquier, R.**—(See under Anatomy.) **Pletsch, D. J.**—The alpine rock crawler, Grylloblatta campodeiformis in Montana. [Proc. Montana Acad. Sci.] 5 & 6: 17–20. **Rehn, J. A. G.**—Notes on the phasmid genus Isagoras, with the description of six new species. [62] 99: 1–19, ill.—African and Malagasy Blattidae. *Ibid.* 59–92, ill. **Roberts, H. R.**—Revision of the Mexican Melanoplini. [62] 99: 201–30, ill. (k*). **Shane, P.**—A new species of Teinophaus (Cyrtacanthacridinae) from Mexico. [109] 201: 1–3, ill. **Slifer and Shulow**—(See under Anatomy.) **Tinkham, E. R.**—New species, records and faunistic notes concerning Orthoptera in Arizona. [1] 38: 127–49 (k). **Uvarov, B. P.**—The grasshopper problem in N. Amer. [53] 160: 857–59.

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Münchener Ent. Ges.] 32: 149–62, ill. **Lent and Wygodzinsky**—Notes on some assassin bugs of the genus Zelurus from the collections of the U. S. Nat. Mus. [71]: 343–49 (S*). **Mason, P. W.**—A new pear aphid. [65] 49: 252–54. **Metcalf, Z. P.**—Fulgoroidea: Fulgoridae. [Gen. Catalogue of Hemiptera] Fasc. IV, Pt. 9: 3–276, Smith College, 1947.—A new genus of Lophidae from Brazil. [65] 49: 238–40. **Richter, L.**—Membracidae Colombianae. [76] 7: 382–403, ill. **Russell, L. M.**—A classification of the whiteflies of the new tribe Trialeurodini. [Rev. de Ent., Rio de Janeiro] 18: 1–44, ill. (k*). **Schrader, F.**—(See under Anatomy.) **Squire, F. A.**—On the economic importance of the Capsidae in the Guinean Region. [Rev. de Ent., Rio de Janeiro] 18: 219–47, ill.

LEPIDOPTERA—Bourquin, F.—Metamorfosis de Erebus odoratus (Noctuid). [Acta Zoologica Lilloana] 3: 239–47, ill.—Metamorfosis de Aglossa caprealis. *Ibid.* 248–52, ill.—Metamorphosis de Androcharta rubricincta. *Ibid.* 257–62, ill. **Federley, H.**—(See under Anatomy.) **Goodson, F. W.**—Notes on the genus Eumaeus (Lycaenidae). [30] 80: 273–76 (S*). **Hayward, K. J.**—Hesperioidea argentina XV. [Acta Zoologica Lilloana] 3: 215–30.—Una especie y forma nuevas de Hesperidos argentinos. *Ibid.* 253–55, ill.—Especies argentinas de los generos mylon y Carrhenes. *Ibid.* 307–12, ill. **Kiriakuff, S. G.**—Les papillons mimetiques. Lambillionea, Bruxelles] 47: 46–53. **Siverly, R. E.**—A morphological study of the male and female genitalia of Heliothis armigera (Noctuid). [1] 38: 712–24. **Valle, K. J.**—Mittarit, Geometrae. [Suomen Elaimet Animalia Fennica. 5, Suurperhoset, Macrolepidoptera IV] Helsinki, pp. 11–370—Sphinges, Bombyces. *Ibid.* 3, II: 9–213—Diurna. *Ibid.* 2, I: 9–174, ill. **Van Leeuwen, E. R.**—(See under Anatomy.) **Wind, R. G.**—A new subspecies of Melitaea. [60] 23: 171. **Wogtkowski, F.**—Las Catastictas del Peru (Pieridae). [15] 10: 91–98.

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Diptera. [43] 20: 117–26, ill. **Rozeboom, L. E.**—The identity of the Phlebotomus associated with bartonellosis in Colombia. [5] 40: 705–14. **Sabrosky, C. W.**—The identity of Winthemia tibialis (Larvaevor.). [65] 49: 249.—A synopsis of the Larvaevorid flies of the genus Eudejeania. [71] 97: 141–56 (Sk*). **Shaw, F. R.**—Some observations on the variation in wing venation in the Mycetophilidae. [1] 38: 708–11. **Spieth, H. T.**—(See under Anatomy.) **Stalker and Carson**—(See under Anatomy.) **Vanderplank, F. L.**—(See under Anatomy.) **Wiesmann, R.**—(See under Anatomy.) **Wirth, W. W.**—Notes on the mosquitoes of Louisiana. [37] 40: 742–44.

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Reviews

A CATALOGUE OF INSECTICIDES AND FUNGICIDES. VOLUME I: CHEMICAL INSECTICIDES. By Donald E. H. Frear. Pp. xii–203, super roy. oct., Waltham, Mass. 1947: the Chronica Botanica Co.; New York City: Stechert-Hafner, Inc. Price, $6.50.

This is a compilation begun at the Pennsylvania Agricultural Experiment Station during the war as a part of the effort to discover new insecticides. In it are listed over 10,000 chemicals and miscellaneous insecticides that have been tested for the control of insects. Each substance is listed separately with its name, synonyms, and chemical formula. In addition, the insects against which it has been tested are given and the results of the tests as well as references to the literature listed in the author's index. Patents are also indicated and are listed numerically, by country and by patentee. To workers in insecticide research this volume will be a great convenience and save much laborious searching of the literature.—R. G. Schmieder.

BASIC BOTANY, An introduction to the science of botany. By Fred W. Emerson. Pp. ii–372, the Blakiston Co., Philadelphia and Toronto. Price, $4.00.

Entomologists usually have to have some acquaintance with plants even if only to be able to add the name of the host to the label on the pin. Many are led to deepen this acquaintance and soon find that each collecting trip then becomes a richer and more enjoyable experience and that even when the collecting is poor there is still much to enjoy and that no trip is ever a failure. When one comes to understand the plant life that is the insects home one will also come to know the insects themselves more completely—as living things rather than only as dried specimens. This text-book, intended for colleges, can be recommended for helping one to become really acquainted with plants. It considers plants primarily as living things and discusses their structures and specializations from this point of view. The result is something more appealing than the older dull and formal botany texts. The book is a departure in other ways, from the cover representing a landscape, in full color, and the double column page for economy and ease of reading, to the arrangement of the subject matter itself.—R. G. Schmieder.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

Chrysididae—Wanted for determination in preparation of revision. Wm. G. Bodenstein, Galesville, Maryland.

Wanted—Ataenius and allied Aphodiinae from all parts of the world, especially Mexico, Central and South America. O. L. Cartwright, Clemson, S. C.

Wanted—Reprints and unpublished mss. on biological control of mosquitoes; for preparing annotated bibliographies for publication. J. B. Gerberich, Michigan State College, East Lansing, Mich.

Wanted—Hesperid genus Megathymus for exchange or purchase. P. S. Remington, 5570 Etzel Ave., St. Louis 12, Missouri.

Wanted—Psychodidae of North America for revisional purposes. Wm. F. Rapp, Jr., 203 Harker Hall, Urbana, Ill.

Diptera—Tachinidae-Dexiidae wanted, No. Amer. and exotic. Will collect most orders in exchange or will purchase. P. H. Arnaud, 60 Woodrow St., Redwood City, Calif.

Will collect—Zoological and entomological specimens in tropical and subtropical parts of Peru. Jose M. Schunke, Pucallpa, Peru.

Wanted—Diplotaxis; will buy or exchange. E. W. Mange, 307 W. Walnut St., Hanover, Pa.

Hymenoptera-Aculeata (except ants and bees) for exchange. Will collect other orders in exchange. N. F. de Andrade, Casal Novo, S. João do Estoril, Portugal.

Meliponidae—Wanted, information on the bionomics, culture, and economic importance of the stingless bees, particularly of the Old World. P. Nogueira Neto, Av Cicade Jardim 170, S. Paulo, Brasil.

Wasps (Vespoidea, Sphecoidea, Chrysidoidea) of the world by exchange or purchase. Will collect other orders in exchange. D. G. Shappirio, 4811 17th St., N.W., Washington 11, D. C.

Lepidoptera—Large quantities of Plexippus, Colias, Cardui, Vanillae wanted for cash or exchange for tropical butterflies. G. MacBean, 710 Miller Rd., Sea Island, Vancouver, B. C.

Ants of the tribe Dacetini (*Strumigenys, Rhopalothrix* and related genera) wanted for world revision. W. L. Brown, Jr., Harvard University Biological Laboratories, Cambridge 38, Mass.

Mallophaga (on which immediate determination is not necessary) wanted for study and determination. R. L. Edwards, Dept. Biology, Harvard University, Cambridge 38, Mass.

Tingidae (Heteroptera) of the world wanted, in alcohol, with host and other ecological data. Will collect other orders in exchange. N. S. Bailey, 16 Neponset Ave., Hyde Park 36, Mass.

Bombidae, nearctic and neotropical, wanted for exchange, identification, or purchase. Will exchange in other groups for bumblebees. Barth Maina, Dept. Zool., Univ. of Chicago, Chicago 37, Ill.

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Morgan Hebard

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Morgan Hebard
(1887–1946)

Morgan Hebard was born in Cleveland, Ohio, February 23, 1887, the only child of Charles Samuel and Hannah Morgan Hebard. On the paternal side his forebears were old pre-Revolutionary Connecticut stock, and one of his ancestors was Brigadier General Ebenezer Learned, Commander of the Connecticut Brigade at Valley Forge. His great grandfather, Learned Hebard, was a Congressman about one hundred years ago, and Chairman of the first Republican convention held in the state of Connecticut. His mother's father, David Morgan, was born in Wales, came to America as a young man, and settled in Cleveland, Ohio, where over the years in the iron and steel industry he built a considerable fortune.

Charles Hebard, the paternal grandfather of Morgan, was a successful lumberman, first in the Pocono country of Pennsylvania, and subsequently in the northern peninsula of Michigan. To this business his activities, and those of his two sons, Charles Samuel and Daniel Learned, were largely devoted during their lives. Gradually the business expanded so that they ultimately acquired from a land drainage company almost the entire area of the Okefinokee Swamp in southeastern Georgia. This great tract of almost five hundred square miles, originally containing an enormous stand of cypress, was ultimately acquired from the Hebard family by the United States Government as a wild life reserve.

While Charles S. Hebard and Daniel L. Hebard, like their father Charles Hebard, regarded Philadelphia as their home city, and maintained residences in suburban Chestnut Hill, all three families, in Morgan's younger years, had winter homes at Thomasville, Georgia, and summer homes at Pequaming, Michigan, the site of the family lumber mills, on the southern shore of Lake Superior. In addition in winters at the turn of the century, Morgan's family spent periods of some weeks each at Miami, Florida, a community then in relative infancy, and on these visits he formed an acquaintance with the life of the now largely vanished or despoiled hammocks of southern Florida, which proved of value to him in studies of after years. An early interest in Lepidoptera was established largely by these visits to Thomasville and Miami, and his then-acquired knowledge of many of the moths and butterflies of those areas remained undimmed through his later life, which was largely devoted to critical work with other insects. His life-long interest in comparative faunistics was early nurtured by the opportunity for contrasting the Lepidoptera of these areas with those forms to be found about his Chestnut Hill home.

Morgan Hebard's interest in nature was inherent, and the collector's instinct also was early developed. In his youth his education was acquired from governesses or tutors, who moved with the family from Philadelphia to their other seasonal homes. In 1904 he entered Asheville School at Acton, North Carolina, and on graduating there followed the family precedent and entered Yale University, emerging with the Bachelor of Arts degree in 1910.

His boyhood collections covered a wide range, from historical relics to postage stamps, but the interest in nature was always paramount, accompanied as it was by the determination to find out as much as he could about a matter of particular interest, even if this entailed wading in swamps (without boots!) or excavating gopher holes. One characteristic early developed was a meticulous exactness and neatness in labelling his possessions, an appreciation of orderly arrangement which remained a marked trait throughout his life.

My first meeting with Morgan Hebard was in 1903, when as a young man of sixteen he came to the Academy of Natural Sciences in Philadelphia to determine some of his Lepidoptera captures. Dr. Skinner, then Curator of Insects, had met him previously and encouraged his interest. As a student then, some five years older, I gave him such assistance as was in my power and the acquaintance then formed ripened into a friendship and association which lasted through the years until his death, becoming to each of us a very vital part of our lives. Gradually he became interested in the Orthoptera, with which I had been working for some few years, and as he realized there was a very great deal to be learned about the insects of that order, and that he was fully capable of bringing to light much previously unknown concerning them, even of species from nearby areas, his native enthusiasm and energy turned toward the Orthoptera. In March, 1904, at the invitation of his parents, I spent a month with him at Thomasville, and daily we ransacked the country roundabout for Orthoptera. I encouraged him to put his observations in writing, and the results of this month of work appeared in 1905 as our first joint paper.

In the autumn of 1904 Morgan went to school at Acton and school terms were spent there for nearly two years, but all spare time in potential collecting seasons was occupied in climbing ridges and combing valleys, laying the foundations for a most comprehensive knowledge of the Orthoptera of the Southern Appalachians, which field always remained one of great interest to him. One summer of his school years was spent with his family in the Yellowstone and parts of the Colorado Rockies, while in part of another (1905) we were working together in northern Florida, with yellow fever rampant in New Orleans, as well as present in Pensacola, and quarantine regulations in force on every hand, which required us to have daily railroad station stampings placed on our Philadelphia health certificates, without which we could not enter the state of Florida. During his college years two summers were spent in Europe with his family, collecting Orthoptera on all possible occasions, while those of 1907, 1909 and 1910 we spent together in the field in the western states, in the inaugural work on a project which had slowly crystallized in our minds—a comprehensive series of Orthopteran field studies covering all the major areas of the United States, except for the few sections which were fairly well known, with as a future objective the preparation and publication of a monographic work on the Orthoptera of North America. For forty years this remained the incentive behind the seasons of field work which have been carried out, largely working together in the field and in the laboratory. It is the hope of the surviving member of this rather unusual partnership that he may be able to carry this work forward to its completion, if for no other reason than as a tribute and memorial to the one who gave so much of his life, effort and resources to pave the way. A large number of joint papers, based in greater part on collections secured on the numerous field investigations, have been published preliminary to the projected larger work, and many others of the same type were brought out individually by Hebard in the last twenty-five years.

Following the completion of his college work, and in accordance with his father's wishes, Morgan spent a year in a banking office in Philadelphia, familiarizing himself with certain phases of business operations and the handling of investments and securities. In 1911 he was able to realize what had been for some years his greatest desire—that of devoting his time uninterruptedly, in both the field and laboratory, to his beloved Orthoptera. From that time until the late nineteen thirties, when physical limitations became restricting factors, he was seldom absent from his work desk for more than a short time, except when in the field. His plan for the formation of the Hebard Collection developed even before he was able to give unrestricted time to research, and the carefully planned seasonal field explorations, which occupied most of our summers from 1907 to 1928, had already been worked out in conferences and put into effect before his college years were ended. At a desk adjoining that of his colleague the days largely were spent in the preparation of the many important studies which came from his pen. He maintained a very extensive correspondence, studied numerous collections for institutions and colleagues elsewhere, and arranged important exchanges, usually of paratypic material, with other institutions, the majority of these abroad.

The physical arrangement of the Hebard Collection was entirely a personal task, to which he gave greatly of time and energy, providing the entire housing in which this extensive series was quartered. The collection was physically deposited at the Academy from its inception, and bequeathed to that institution from the same early period. However, it was formally presented in toto, with its entire housing, in 1945, somewhat over a year before Mr. Hebard's death. During the twenty-five most active years of his work at the Academy he provided financially at various times for artists and preparators, and assisted in meeting the publication costs of a considerable number of the contributions of which he was sole or joint author.

The field investigations in the United States which Mr. Hebard planned and financed virtually in their entirety, were carried out by the two associates over fifteen seasons extending from 1905 to 1928, from six weeks to three months being spent each year. In addition in 1920 the two worked in Jamaica, Panama and the Santa Marta region of Colombia, while in 1913 Hebard visited and actively collected in Cuba, the Bahamas, Jamaica and Panama. As already mentioned, as a young man abroad with his parents in 1906 and 1908, he worked actively in the field in parts of England, France and Switzerland, and in a later year was able to do certain field work in parts of Italy and in Algeria. In London he early made the personal acquaintance of the late Dr. W. F. Kirby, and on subsequent visits met Dr. B. P. Uvarov, Dr. H. Karny and Dr. Lucien Chopard, with all of whom he long corresponded.

In the field Hebard was an indefatigable worker, endowed with superb hearing, which was of exceptional value in locating nocturnal stridulating forms. In addition he had that essential of the mountain worker, a splendid pair of lungs, and a physique which, while never massive, was a reservoir of energy, that could be galvanized into sustained action when time or fickle weather made the effort to reach and examine a certain peak or ridge a gruelling drive. Many high mountain summits, seldom visited by entomologists, where little known and often distinctive Orthoptera had been taken or were suspected to occur, were climbed and examined—Mt. Whitney, San Gorgonio Peak, San Francisco Peaks, Mt. Livermore in the Davis Mountains of

Texas, the high peaks of the Chisos Range in the same state, the Ruby Range, Charleston Peak and Mt. Wheeler in Nevada, Santa Fé Baldy in New Mexico, the summits of the Tushars in Utah, the edge of the ice on Mts. Rainier, Hood and Shasta, the Steen Mountains of Oregon, the Warners in California, and the Quinn Canyon Range in central Nevada, the Tetons of Wyoming and numerous others. Similarly the low hot deserts were as carefully examined, not once but frequently in several different seasons spent in the same general area. Death Valley was visited in the best Orthoptera season, which was in August, with a shade temperature of 120°, as well as many localities in the Yuma, Colorado, Mohave and Amargosa deserts in the best collecting, but physically trying, months of July, August and September. The Florida peninsula, as well as the Keys, the coastal plain of the southeastern states and the Gulf Coast region were areas in which portions of a number of seasons were spent, while all or part of five seasons were spent in the state of Texas alone.

The total number of localities examined in this work reached some thousands, and these extended from Virginia to the Florida Keys, westward to California and Washington. Extensive areas where considerable work had already been done by resident entomologists were usually omitted, and efforts were concentrated on those either little or very imperfectly known as far as the Orthoptera were concerned.

The plan of work varied from that first used of following railroad lines and stopping at points roughly fifty miles apart or with sharply contrasted physiography, and then striking out for promising environments, to the final development of using a motor truck, with full camp equipment, on individual circuitous trips of quite a few thousand miles each, with a number of specific areas as objectives. Saddle horses and pack animals were sometimes used, but most actual climbing in high places was accomplished only by using one's own feet, and sometimes hands as well.

The number of Orthoptera specimens taken in the course of this field work, extending from 1905 to 1928, totalled well over one hundred thousand, supplemented to an exceptional degree by many hundreds of pages of critical field observations, always written up daily, and as yet only in part utilized in print. These notes always represented the observations and conclusions of the two workers, and were generally written up by Hebard in the evening sessions when the day's catch was being prepared. It sometimes happened that after a full day in desert sun, when as much as twenty miles had been covered on foot, the work of eviscerating and packing the material secured would take from five to seven hours more, or until the wee hours of the next morning. In several cases the day's catch reached a thousand specimens, but collecting always had objectives and there was no indiscriminate accumulation of numbers alone. Back of all the work was a studied effort to find and examine natural and, as far as possible, unaltered conditions. Cultivated land was largely by-passed, as the original orthopterous fauna was always the objective, and not the alterations brought about by cultivation or the clearing of native vegetation. In the earlier years four hand-carried fiber telescopes held all needed equipment for two, camp as well as collecting, an army "doggie" or shelter tent, nest of simple cooking utensils, mess kits, flash-lights and blankets. Often the bed was no more than a single blanket in a sand draw. When truck work became practicable, army cots and gasoline pressure lights became standard equipment, an era of luxury compared with the earlier days.

In addition to the long-range North American project, and the studies based in part on the results of the same, Mr. Hebard was steadily augmenting the breadth and coverage of the Hebard Collection by the purchase of unstudied Orthoptera material from various parts of the world, as well as that taken by certain reputable collectors in especially desirable sections of the United States. Unstudied series were purchased from Mexico, British Honduras, Guatemala, Costa Rica, Panama, Colombia, Venezuela, Trinidad, Amazonia, southern and eastern Brazil, Paraguay, Spain, the Balkans, Uganda, Kenya, the Belgian Congo, Natal, Rhodesia, Liberia, Madagascar, India, southern and interior China, Java, the Moluccas and Queensland, while the great Boettcher series of Philippine Orthoptera was acquired almost in its entirety. Two famous and classic collections, assembled by outstanding investigators, were purchased in toto, i.e., the Lawrence Bruner collection of North and Central American Orthoptera, including hundreds of types of that author, many of these of species published in the section of the Biologia Centrali-Americana which came from his pen, and the J. L. Hancock collection of Tetrigidae of the world, the largest single collection of that group in existence, and also including some hundreds of that author's types. When all of these series were added to the representation of Orthoptera and Dermaptera previously owned by the Academy of Natural Sciences, as they now have been, there is found in one collection in Philadelphia, the largest and most comprehensive collection of Orthoptera in the world, even surpassing those in London, Paris and Berlin.

For many years Mr. Hebard carried on important exchanges with European institutions, and in consequence paratypic material of hundreds of species described from those collections were added to the Philadelphia series, in return for paratypes of species described by the Philadelphia group.

The original contributions to our knowledge of the Orthoptera and Dermaptera which came from the pen of Morgan Hebard, either individually or jointly with the present biographer, totalled 197 titles, with a pagination in excess of five thousand. The North American fauna always held a preeminent position in his mind and work, and among his contributions to that fauna were faunistic studies on the Dermaptera and Orthoptera of a number of specific states or provinces, as Alberta, North Dakota, South Dakota, Montana, Minnesota, Colorado, Arizona, Kansas, Oklahoma and Illinois, while his death left unfinished an extensive one on those elements of the Texas fauna. The purely systematic studies on the genera and species of the same orders were broad in coverage, including, among many others, comprehensive monographic works on the North American Blattidae or cockroaches, on the North American crickets of the subfamilies Nemobiinae and Mogoplistinae, and of the katydid group Pterophyllae, on many elements of the locusts of the group Melanopli, and, with this biographer, a considerable number of papers on sections of the North American Tettigoniidae or katydids, the crickets of the genus *Gryllus* as found in North America, and the locusts of the Eumastacinae of the same area.

Hebard's studies on the Dermaptera and Orthoptera of other lands covered a very broad range, both systematically and faunistically. He was particularly interested in the cockroaches, and his various contributions to our knowledge of the Blattidae are probably more basic and fundamental for future systematic workers in that field than those of any other student since the days of Brunner and de Saussure, in the nineteenth century. His exotic faunistic work, which covered some scores of papers, was particularly important in connection with the Orthoptera of Baja California, Mexico, the West Indies, Panama, Colombia, Ecuador, Brazil, Malaya, southern India, Australia (chiefly on the Blattidae), and the Philippine, Hawaiian, Society, Marquesas and Galapagos Islands. His comprehensive studies of the Orthoptera of Panama, and of the Society, Marquesas and Hawaiian groups, are works which will long remain basic in their particular fields.

In the laboratory Morgan Hebard was completely absorbed in his work. He possessed to a high degree the ability to concentrate so completely on the subject in hand that he was almost oblivious to what went on about him. He could make his minutes count to a degree few possess, and also exclude from his mind or attention matters which he considered irrelevant to the work before him. With a keen, incisive mind he was able to grasp far more rapidly than most scholars the implications of a set of facts, and promptly to coordinate his conclusions. His rough manuscripts grew rapidly, set down in pencil in an almost cabalistic system of abbreviations, which he alone could follow with complete assurance. In consequence he preferred to type his own manuscripts, which he did at home, largely at night or over weekends. Similarly he personally assembled and mounted the original drawings for all the illustrations of his many papers, while the arrangement of the scores of thousands of determined specimens contained in the Hebard Collection always received his personal attention. While he had one or more skillful preparators constantly available, he often preferred personally to handle repair work on particularly valuable or historic specimens, and his technique always was of the highest order. As an independent investigator, without routine responsibilities except such as he might care to assume, he was able to complete a relatively large amount of critical study in a relatively short time, and he moved from project to project with a celerity evidencing the dynamic energy which was so characteristic of him until his later years.

In 1913 Mr. Hebard married Margaret Champlin Perry Claxton of Philadelphia, a grand-daughter of the artist, John La Farge, and whose family ties also included one of the city's most distinguished medical families. Of their three children, two sons and a daughter, the younger son (Morgan, Jr.) and the daughter (now Mrs. Richard Lloyd), with Mrs. Hebard, survive their father.

From boyhood Morgan Hebard had loved the out-of-doors—hunting, trap-shooting, angling, golf and tennis—encouraged by his father who was an all-round sportsman of sterling qualities. To Morgan tennis and golf were good sports, but his favorite ones were angling—both trout and tarpon—and shooting. He was an exceptional shotgun shot, both at game and at the traps, and while a student at Yale, where he captained the trap-shooting team, was intercollegiate high gun, and for years he was exceedingly proficient with both rifle and revolver.

During the First World War he was commissioned a lieutenant, serving first with the Cinematographic Section of the Signal Corps, but later was transferred to the Military Intelligence Division. Released from duty shortly after the signing of the Armistice, he at once returned to and plunged again into his research work. While in the service he had hoped to be sent overseas, and there assigned to field intelligence work, but his duties in the Intelligence, and in which he immersed himself as deeply and as completely as he did when engaged with scientific problems, were concerned with a very vital phase of Army security in the camps in the United States, and in consequence he was held on this side of the Atlantic.

While as a child Morgan Hebard had been a sufferer from a bronchial affection, in his mature years he was seldom ill, until in the thirties there became evident a progressive arthritic condition, which from being merely restrictive developed to a point where movements became painful and circumscribed. Long periods were spent under treatment in Philadelphia, New York and Boston, some single hospitalizations extending over almost a year, with fluctuating results. During these long absences from his usual haunts, he kept alive his interest in the Orthoptera, and in those periods, sometimes a number of months in length, when a periodic betterment would permit him to be brought to the Academy, he completed some of his last published papers, taking the same keen pleasure, as in earlier years, in finishing any piece of work. Arthritic distortions had seriously crippled his hands, but twice he virtually learned to write anew. In the last few years unable to hazard the rather long trip from his home to the Academy, he assembled pages of data from certain series which were taken to him for tabulation, and also virtually completed an important piece of revisionary work which will be published posthumously.

At Christmas time December 1946 I had a very cheery telephone conversation with him. It was full of the expectation of a sufficient betterment to be able to resume his trips to the Academy. A few days later, on December 28, 1946, a sudden heart attack ended the years of struggle against his insidious enemy arthritis.

Two of the outstanding personal characteristics of Morgan Hebard were an ability to push to completion, regardless of the obstacles physical or otherwise, a project with which he was engaged, and second, the determination to round out, to develop and to complete as far as possible, the great collection which he was responsible for assembling. Quick tempered and outspoken when confronted with injustice or incompetence, he was innately kind and sympathetic to those with whom he worked, regardless of their station. Although accustomed to a life of relative luxury, he was perfectly at home in the most rugged situations and with people in all walks of life. An excellent scholar in French and German, in both of which he had been tutored for years before his college days, and also with a good knowledge of Spanish and Greek, he was often consulted by colleagues on difficult translations or interpretations. Possessed of an infectious humor, he was generally able to draw some amusement from situations which most people would regard as downright calamities. He possessed no false pride, and had no hesitation in asking for, accepting and acknowledging help in solving a problem before him. Similarly he was happy to be able to help others, and did so countless times. On outfit trips his personality soon won the friendship, respect and cooperation of those who cooked the meals and wrangled the horses or drove the truck. During a friendship and association covering forty-three years the biographer had many occasions to learn how deeply apparently trivial and passing things would impress themselves indelibly upon the mind and thoughts of his friend and colleague, sometimes recalled with an amused chuckle or grave retrospection a decade later.

To Morgan Hebard the attendance at formal meetings of any character was a sheer waste of valuable time. Except for those of the Scientific Council of the Academy of Natural Sciences of Philadelphia, of which he was a member for over twenty years, he rarely attended any such gatherings, either in Philadelphia or elsewhere. He was elected a Fellow of the Entomological Society of America some decades before his death, and was long a member, and for a time Treasurer, of the American Entomological Society. While elected a Life Member when a minor, at the time of his death he was a Benefactor of the Academy of Natural Sciences of Philadelphia, this conferred in recognition of his gift of the Hebard Collection in 1945. He was Curator of Insects of the Academy for a number of years, but accepted no salary for this service, and also held the title of Research Associate of the Academy, and later Research Fellow, for over twenty years. He was an honorary member of the Entomological Society of France, and also of the Colombian Natural Science Society, the latter conferred in recognition of his numerous papers on the Orthoptera of that country.

In 1945 the Hebard Collection of Dermaptera and Orthoptera was unrestrictedly presented to the Academy, where it had long been desposited. The collection comprised approximately 250,-000 specimens, representing in the North American field alone almost all known members of those orders in that fauna, in a number of cases the representation of the species being all known to exist in any collection. The number of species from the whole world represented by single types was 1369, with in addition approximately 2000 species by paratypes. The whole series filled 2400 Academy standard glass-top cabinet drawers, contained in 147 metal cases, all of which, originally supplied by Mr. Hebard, were presented with the collection.

As forty-three years constitutes by far the greater part of an adult life, the personal friendship of, and association with, Morgan Hebard formed a very vital and inseparable segment of my own days during the years which have passed. The memories of the many days spent together in the laboratory across adjoining desks, in desert heat or on mountain slopes, will always remain fresh, inspiring and treasured. All those who knew him well have lost a charming, kindly and brilliant associate. The loss to American entomology is also great, for there has gone from us a keen, logical and penetrating mind, a gentleman and a scholar, whose years in the field and in the laboratory brought high position in his field of work to his name and to his intellectual home, in which, as his work drew to a close, he placed the results of his labors.

James A. G. Rehn

A New Genus and Species of Buprestidae from Southern California (Coleoptera) *

By William F. Barr, University of Idaho

The apparently new genus and species of the family Buprestidae, tribe Buprestini described below, has been in the writer's collection for several years, having been represented by only a single specimen. Attempts have been made on several occasions to secure additional material, but with little success. It is now

* Published with the approval of the Director of the Idaho Agricultural Experiment Station as Research Paper no. 276.

felt that this new genus and species should be made known, in view of the fact that Knull[1] has recently described a remarkable new genus which also belongs in the Buprestini. Thus, these new genera becoming known at approximately the same time may help to throw new light on the relationships of the genera of North American Buprestidae.

Appreciation is expressed to J. N. Knull who has been most helpful by comparing specimens with material in his collection and to R. G. Dahl who presented the specimen, here described, to the writer.

Genus TRICHINORHIPIS new

Small, rather broad, somewhat convex. *Head* of moderate size; eyes widely separated, rather large, elliptical and vertical; antennae eleven-segmented, attaining hind margin of pronotum, rather densely clothed with fine, short, erect pale hairs, first and second segments feebly swollen, clavate, third segment narrowly elongate, clavate, segments four to ten flabellate, rami increasing in length to sixth segment, then slightly decreasing in length, rami arising from near apex of fourth and fifth segments, at apex of remaining segments, eleventh segment elongate, slender; maxillary palpus with last segment rather elongate, conical, apex pointed; mentum corneous, narrowly rounded in front. *Pronotum* much broader than long, convex, without evident lateral margins; sides widest slightly behind middle, evenly rounded, feebly sinuate at base; surface reticulate. *Scutellum* small, triangular. *Elytra* as broad as pronotum, covering abdomen except for pygidium, sides feebly sinuate; apices separately rounded; surface of each elytron with nine rows of rather coarse punctures forming striae which are somewhat sinuate, roughened at base and apex. *Undersurface* with the sides of metasternum nearly convex, lacking a large hairy depression; hind coxae triangular, posterior margin strongly oblique, somewhat arcuate, basal segment of hind tarsus as long as the three following segments.

Genotype: *Trichinorhipis knulli* new species.

[1] Knull, J. N. 1947. Ohio Journal of Science, 47 (2): 69.

This genus belongs in the peculiar *Xenorhipis* group of the tribe Buprestini, which in the United States has contained, until the present, but two genera, *Xenorhipis* and *Hesperorhipis*. *Trichinorhipis* is apparently more closely related to the latter, but may be readily separated from both by being broader, having the pronotum broadly and evenly rounded at the sides and lacking lateral margins, having the sides of the metasternum nearly convex, having the last segment of the maxillary palpus distinctly pointed at the apex and by having the pubescent male antennae flabellate from the fourth segment.

Trichinorhipis knulli new species

Male: Form rather robust; black with large, conspicuous ivory elytral markings, feebly shining. *Head* convex, rather coarsely and shallowly reticulate, sparsely clothed with short, semi-recumbent silvery hairs, antennae flabellate from fourth segment, testaceous at base, gradually becoming darker towards apex, rami dark; clypeus narrow, broadly and shallowly emarginate in front. *Pronotum* convex, wider in front than at base, surface coarsely, shallowly reticulate, moderately clothed with short, semi-recumbent silvery hairs; front margin feebly bisinuate, median lobe broadly rounded; sides broadly and evenly rounded, widest slightly behind middle, feebly sinuate at hind angles which are somewhat angulate; hind margin very slightly bisinuate. *Scutellum* finely punctured, glabrous. *Elytra* broadly bilobed in front, not broader than pronotum, covering abdomen except for pygidium; humeri obsolete, humeral angles obtusely rounded; sides feebly sinuate to apical fourth, then abruptly and arcuately rounded to apices which are separately rounded and serrate; sutural margins slightly divergent behind middle; surface with a broad ivory band extending from in front of basal fourth to apical fourth of elytra, narrowly interrupted at suture, front margin broadly bilobed, hind margin irregularly truncate, basal and apical black areas feebly tumid; striae consisting of sinuate rows of deep, moderate-sized punctures, most conspicuous on ivory band, interstrial spaces rather finely and irregularly punctured on basal and apical black areas giving these areas a roughened appearance, interstrial spaces of ivory band not conspicuously punctured, pubescence sparse, consisting of rows of very short, erect silvery hairs. *Undersurface* with prosternum irregularly reticulate, very sparsely pubescent, front margin nearly truncate; metasternum irregularly reticulate, convex, with a small feeble depression along the sides at outer margin of hind coxae, glabrous; abdomen swollen, finely, sparsely, asperately punctured, rather sparsely clothed with short, semi-recumbent silvery hairs, hind margin of last sternite broadly rounded. Length: 3.8 mm. Width: 1.3 mm.

Holotype, male from Painted Canyon, Riverside County California, June 21, 1940, collected by R. G. Dahl, who swept it from a small, dead, unidentified desert shrub at night. Type in the writer's collection.

This species is named after J. N. Knull as a slight token of appreciation for the many favors offered and the valuable assistance given to the writer during this and previous studies on Buprestidae.

No difficulty should be encountered in separating *T. knulli* from other species in the *Xenorhipis* group. Its shape and markings plus the generic characteristics already mentioned should be amply sufficient to prevent its being confused with any known species which it may superficially resemble.

New Species of Agrilus with Notes (Buprestidae and Eucnemidae)

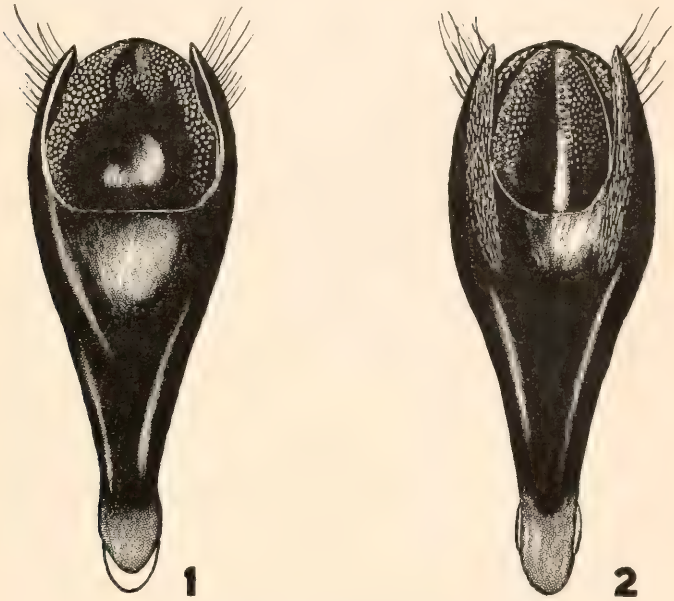
By J. N. Knull, Department of Zoology and Entomology, The Ohio State University

Agrilus cochisei n. sp. Figs. 1 and 2

Male. Form, size and color of *A. malvastri* Fishr., color bronze above and beneath; each elytron with distinct pubescent stripe near suture.

Head convex, slight depression on vertex; surface finely punctate, front densely pubescent; antennae short, when laid along side, extending little beyond anterior angles of pronotum, serrate from fifth segment.

Pronotum wider than long, wider in front than at rear, widest in middle; anterior margin sinuate, median lobe prominent; basal margin sinuate; sides subparallel anteriorly, sinuate near base. When viewed from side, marginal and submarginal carinae separated in front, joined at base; disk very convex, slight median depression at base, lateral depression each side, carina on hind angle rather indistinct; surface coarsely densely scabrous, sides with recumbent white pubescence. Scutellum transversely carinate.



Male genitalia of *Agrilus cochisei* n. sp.
1. Dorsal view. 2. Ventral view.

Elytra wider than base of pronotum, sides subparallel near base, constricted in front of middle, broadly rounded back of middle, obliquely narrowed to rounded, serrulate apices; disk convex, each elytron with basal depression and elongate one in middle near suture.

Abdomen beneath sparsely, finely punctate, clothed with recumbent, white pubescence which is more conspicuous along sides of last three segments; first segment longitudinally flattened, clothed with longer pubescence which extends to prosternal lobe; pygidium without projecting carina. Prosternal lobe broadly rounded. Tibiae with anterior and middle pairs mucronate on inner margin at apex. Tarsal claws similar on all feet, cleft, inner tooth shorter than outer one, not turned inward.

Length 5.4 mm.; width 1.2 mm.

Female. With first ventral abdominal segment not flattened; ventral median line of pubescence lacking; tibiae not mucronate.

Holotype male, *allotype* and one *paratype* labeled Dragoon Mts., Ariz., Sept. 10, 1947, another *paratype* Chiricahua Mts., Ariz., Sept. 12, 1947, all collected by D. J. & J. N. Knull and in collection of author.

This species would run to *A. malvastri* Fishr. in Fisher's key.[1] It can be separated by form of male genitalia.

Juniperella mirabilis Knull

1947. *Ohio Jour. Sci.,* 47: 69.

Reared specimens have confirmed my supposition that this is the species infesting junipers in the Santa Rosa Mountains, California.

Pachyschelus oculatus Schffr.

This species was present on foliage of *Desmodium batocaulon* Gray[2] in Chiricahua Mountains, Sept. 1–18, 1947. The larvae are leaf miners on this plant.

Pachyschelus uvaldei Knull

1941. *Ohio Jour. Sci.,* 41: 387.

Sexes in original description of this species should be reversed. This would make holotype a female instead of male.

Pachyschelus purpureus (Say)

Adults were collected in various parts of Ohio in May and June on foliage of wild crane's-bill (*Geranium maculatum* L.). Also collected on *Geranium* sp. foliage in Oak Creek Canyon, Arizona, Aug. 11.

[1] W. S. Fisher, U.S.N.M. Bul. 145, pp. 1–347, 1928.

[2] Determination by Dr. F. W. Pennell.

Deltometopus ereptus Bonvouloir

1870. *Ann. Soc. Ent. Fr.*, 185.

The writer is of the opinion that Dr. Horn [3] was in error when he stated that above species was same as *D. amoenicornis* (Say).

Males of what I consider *ereptus* Bonv. from Gainesville, Fla., Brownsville, Tex., Opelousas, La., and Vienna, Ill., have antennae ramous starting with sixth segment. Fifth segment over half again as wide as long, fourth segment about as wide as long. In *amoenicornis* (Say) antennae are ramous starting with fifth segment. Fourth segment wider than long.

Notes and News in Entomology

Under this heading we present, from time to time, notes, news, and comments. Contributions from readers are earnestly solicited and will be acknowledged when used.

Czechoslovakian Insect Pins are Now Available. For about a year, I and others have been buying insect pins from Czechoslovakia and I have found them satisfactory. One can get japanned steel pins with brass heads at the present price per thousand, according to the size of the order, of $3.50, up to 11,000; $3.00, up to 20,000; $2.80, up to 50,000; and $2.50 per thousand for orders over 50,000 pins. Duty (collected on arrival) is 30% and parcel post, export license, and insurance usually runs to about $4.00 for a lot of about 25,000 pins. Payment may be made by cashier's check and should accompany the order. If wanted, a price quotation may be had by air mail in about two weeks. An order sent by air mail is received usually in about six weeks.

In comparison with the only insect pins being manufactured in the United States, those from Czechoslovakia have heads that are better formed and stay on as well, and points and japanning that are definitely superior. Their steel is inferior, being not quite so stiff. Sizes run smaller than those made in America, so that a Czechoslovakian no. 3 is a trifle smaller in diameter than an American no. 2. All the Czechoslovakian pins are 39 mm. long. The address is: Yran, Praha 1., Dlouhá 14, Czechoslovakia.

[3] G. H. Horn, Trans. Amer. Ent. Soc. 13, p. 16, 1886.

Recent political changes prompted me to inquire of this company whether orders could still be placed. The following reply from Dr. Frant. Klimeš was dated March 18, 1948: "Please note that the political changes in our country are of no influence regarding to the business relations between the United States and Czechoslovakia. You may pay by check as well as ever before. (I am reading USA-newspapers too and regret to say that the reports are not quite true.) However, it is possible that the foreign trade of our country will be reorganized, but no details are known as today."

This note is written in the hope that by the time it is published, it will still be practical to get insect pins from Czechoslovakia.—Henry Townes, McLean, Virginia.

Obituary

Ezra T. Cresson, Jr., for many years Associate Editor of "Entomological News," and for thirty-nine years, until his retirement on account of ill health in 1947, Assistant, and later Associate, Curator of Insects at the Academy of Natural Sciences of Philadelphia, died April 8, 1948. One of the outstanding dipterists of the country, Mr. Cresson was our leading authority on the Ephydridae, and his contributions to our knowledge of that group numbered many score. A biographical sketch will appear in a later issue of this Journal.

Current Entomological Literature

COMPILED BY EDWIN T. MOUL AND RAYMOND Q. BLISS.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, 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.

This list gives references of the current or preceding year unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

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 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. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in Entomological News are not listed.

GENERAL—**Allen, T. C.**—Suppression of insect damage by means of plant hormones. [37] 40: 814–17. **Anon.**—Rearing aquatic insects. [Turtox News] 25: 166. **Bayard, A.**—A propos l'étiquetage. [110] 3: 230–32. **Benson, R. B.**—Theodore D. A. Cockerell (Obit.). [53] 161: 229–30. **Chapin, Knight and Miller**—Proposed changes in Article 25 (the law of priority) of the International Rules of Zoological Nomenclature. [80] 107 (2772): 166–67. **Dorsey, C. K.**—Population and control studies of the Palau gnat on Peleliu, western Caroline Islands. [37] 40: 805–13. **George and Mitchell**—The effects of feeding DDT-treated insects to nestling birds. [37] 40: 782–89. **Horton, Karel and Chadwick**—Toxicity of γ-benzene hexachloride in clothing. [80] 107: 246. **Merrill, E. D.**—On the control of destructive insects in the herbarium. [Jour. Arnold Arboretum] 29: 103–10. **Noury, E.-M.**—Pour suppléer ou remplacer le bocal à cyanure. [110] 3: 219–22. **Olberg, G.**—Blüte und Insekt. [Kosmos] July 1946: 9–12, ill. **Philip and Fournier**—Technique for the detection of insect moulting. [Ann. Rpt. Ent. Soc. Ontario] 75: 10–13, ill. **Tiegs, O. W.**—The development and affinities of the Pauropoda based on a study of Pauropus silvaticus. [74] 88: 275–336, ill. **Trager, W.**—Rudolf W. Glaser, 1888–1947. (Obituary.) [80] 107: 131–32. **Verdcourt, B.**—The sectioning of beetle elytra. [51] 6: 305–6.

ANATOMY, PHYSIOLOGY, MEDICAL—**Allen, T. C.**—(See under General.) **Armitage, H. M.**—The Mexican bean beetle in California (Coccinellid). [37] 40: 865–69. **Arvy et Gabe**—Contribution à l'étude cytologique et histochimique des formations endocrines rétrocérébrales de la larva de Chironomus plumosus. [Rev. Canadien de Biol.] 6: 777–96. **Beall, G.**—The fat content of a butterfly, Danaus plexippus, as affected by migration. [26] 29: 80–94. **Berry, P. A.**—Anthonomus vestitus and its natural enemies in Peru and their importation into the United States (Curcul.). [37] 40: 801–4. **Bonnet, P.**—Remarques sur la changement de couleur des cocons d'Araignees. [110] 3: 218–19. **Browning, H. C.**—Mechanical disturbance and light as factors influencing the pullulation of Calandra granaria. [72] 117: 675–91. **Chadwick, L. E.**—The respiratory quotient of Drosophila in flight. [12] 93: 229–39. **Coppel, H. C.**—The collection of spruce budworm parasites in British Columbia with notes on their overwintering habits. [Ann. Report Ent. Soc. Ontario] 75: 38–39. **Cowan and Shipman**—Quantity of food consumed by mormon crickets. [37] 40: 825–28. **Dahms, R. G.**—Oviposition and longevity of chinch bugs on seedlings growing in nutrient solutions (Lygaeid). [37] 40: 841–45. **Davis and Landis**—Overwintering of potato flea beetles in the Yakima Valley (Chrysom.). [37] 40: 821–24. **Dexter, R. W.**—A checker-spot butterfly (E. editha) with three antennae. [Turtox News] 25: 145. **Donnelly, U.**—Seasonal breeding and migrations of the desert locust Schistocerca gregaria in western and north-western Africa. [Anti-locust Memoirs, British Museum] 3: 1–43. **Ellinger, Fraenkel and Kader**—The utilization of nicotinamide derivatives and related compounds by mammals, insects and bacteria. [Biochemical Jour.] 41: 559–68. **Flanders, S. E.**—A host-parasite community to demonstrate balance. [26] 29: 123. **Hafez, M.**—The biology and life-history of Apanteles ruficrus (Braconid). [Bull. Soc. Fouad I D'Ent., Cairo] 31: 225–49, ill. **Hanna, A. D.**—Studies on the Mediterranean fruit-fly Ceratitis capitata (Trypaneid): II. Biology and control. [Bull. Fouad I D'Ent., Cairo] 31: 251–85, ill. **Henry, L. M.**—The nervous system and the segmentation of the head in the Annulata. [50] 12: 83–110. **Hovanitz, W.**—A graphic method of illustrating ecological and geographical distributions. [26] 29: 121–22. **Huntsman, A. G.**—Method in ecology—biapocrisis. [26] 29: 30–42. **Hutchinson, R. N.**—Influence of winter night temperatures on the California red scale (Coccid). [37] 40: 921–22. **Lumsden, W. H. R.**—Observations on the effect of microclimate on the biting of Aëdes aegypti (Culic.). [40] 24: 361–73. **MacGill, E. I.**—The anatomy of the head and mouth parts of Dysdercus intermedius. [72] 117: 115–28, ill. **Mackensen and Roberts**—A manual for the artificial insemination of queen bees. U. S. Dept. of Agric., Agric. Research Adm., Bur. Ent. and Plant Quarantine. Feb. 1948. 33p. mimeogr., ill. **Michener, C. D.**—A character analysis of a solitary bee, Hoplitus albifrons (Megachilid). [100] 1: 172–85. **Parry, D. A.**—The function of the insect ocellus. [40] 24: 211–19. **Rayment, T.**—Biology and taxonomy of the solitary bee Parasphecodes fulviventris. [Australian Zoologist] 2: 76–95, ill. **Richards, O. W.**—Observations on grain-weevils, Calandra. General biology and oviposition. [72] 117: 1–43. **Rosenstiel, R. G.**—Dispersion and feeding habits of Anopheles freeborni. [37] 40: 795–800. **Roveda, R.**—Bombyx mori y Nosema bombycis. [Rev. Fac. Agron. y Vet., Buenos Aires] 11: 334–42. **Slifer, E. H.**—A simplified method for breaking diapause in grasshopper eggs. [80] 107: 152. **Siverly, R. E.**—A morphological study of the male and female genitalia of

H. armigera. [1] 38: 712–24. **Šulc, K.**—Äussere Morphologie, Metamorphose und Lebenslauf von Phenacoccus aceris Sign. (Coccoidea). [Acta Soc. Scient. Nat. Moravicae, Brno] 15 (12): 1–52. 1943. **Thorpe and Crisp**—Studies on plastron respiration. I. The biology of Aphelocheirus (Hemi., Aphelocheir.) and the mechanism of plastron retention. [40] 24: 227–69. II. The respiratory efficiency of the plastron in Aphelocheirus. *Ibid.:* 270–303.—III. The orientation responses of Aphelocheirus in relation to plastron respiration, together with an account of specialized pressure receptors in aquatic insects. *Ibid.:* 310–28, Pl. 6 and 7.—A metal micro-respirator of the Barcroft type suitable for small insects and other animals. *Ibid.:* 304–09. **Walshe, B. M.**—On the function of haemoglobin in Chironomus after oxygen lack. [40] 24: 329–42.—The function of haemoglobin in Tanytarsus (Chironom.). *Ibid.:* 343–51. **Weiss, C. M.**—Observations on the abnormal development and growth of barnacles as related to surface toxicity. [26] 29: 116–19. **White, M. J. D.**—The cytology of the Cecidomyidae. IV. The salivary-gland chromosomes of several species. [44] 82: 53–58. **White, R. T.**—Milky disease infecting Cyclocephala larvae in the field. [37] 40: 912–14. **Willis, E. R.**—The olfactory responses of female mosquitoes. [37] 40: 769–78.

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THE STINGLESS BEES (MELIPONIDAE) OF THE WESTERN HEMISPHERE. *Lestrimelitta* and the following subgenera of Trigona: Trigona, Paratrigona, Schwarziana, Parapartamona, Cephalotrigona, Oxytrigona, Scaura, and Mourella. By Herbert F. Schwarz. Bull. Amer. Mus. Nat. Hist., vol. 90, pp. i–xviii + 546, figs. 1–87, pls. 1–8. Price $7.00.

This magnificent monograph, consisting in all of 564 pages, and constituting volume 90 of the Bulletin of the American Museum of Natural History, is in a sense the second part of Mr. Schwarz' monograph of the stingless bees of this hemisphere. Part one, the genus *Melipona*, appeared in 1932 (Bull. Amer. Mus. Nat. Hist., vol. 63, pp. 231–460). The present volume covers the genus *Lestrimelitta* and about half of the subgenera of the large genus *Trigona*. It is hoped that Mr. Schwarz will find opportunity to complete this important project by publishing a third part on the remaining subgenera of *Trigona*.

One of the most important aspects of this volume is the introduction, consisting of the first 166 pages. This portion of the monograph concerns principally the biology of the stingless bees, not only of those treated systematically in this book but of the entire group, including the genus *Melipona*, and from the standpoint not merely of the western hemisphere, but of the entire world. This section is an extraordinarily complete survey of the much scattered literature pertaining to the biology of these bees. It makes readily available in the English language all that is known on this subject, so that a student desiring to make further investigations in this interesting field can, from this one work, obtain all the information he needs concerning previous studies. Much space is also devoted to man's utilization of the wax and honey of stingless bees.

The systematic section of this book contains keys and full descriptions of all the forms treated, with figures of important structures, especially the heads, posterior legs, and male genitalia. All infraspecific categories are treated as varieties, with the statement that some are no doubt subspecies, while others appear to be merely color forms. Probably some are sibling species. Locality data are so fully given that it is possible for anyone studying this work to form his own conclusions concerning the probable status of the forms concerned. Of the eight subgenera of *Trigona* discussed, one has 17 species, one 7, one 2, while the remaining five have only one each. A bibliography of nearly 800 titles completes this work.—CHARLES D. MICHENER.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

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Will collect—Zoological and entomological specimens in tropical and subtropical parts of Peru. Jose M. Schunke, Pucallpa, Peru.

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Mallophaga (on which immediate determination is not necessary) wanted for study and determination. R. L. Edwards, Dept. Biology, Harvard University, Cambridge 38, Mass.

Tingidae (Heteroptera) of the world wanted, in alcohol, with host and other ecological data. Will collect other orders in exchange. N. S. Bailey, 16 Neponset Ave., Hyde Park 36, Mass.

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Theodore D. A. Cockerell

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Theodore D. A. Cockerell

In the death at San Diego, California, on January 26, 1948, of Professor T. D. A. Cockerell at the advanced age of 81 the biological world lost one of its most enterprising and indefatigable workers. In an age of specialization, when so many are almost compelled to wear intellectual blinders lest their interest stray beyond imposed limits, Cockerell succeeded in being a specialist in various fields. To the botanists he was known for his systematic work on plants, both recent and fossil, and for his experiments with the red-rayed sunflower, undertaken with Mrs. Cockerell, herself an interested student of biology. Conchologists recognized him as one of their brotherhood, for his childhood interest in snails and slugs was an abiding one through all his adult life and, wherever snails were part of the native fauna, whether in the mountains of New Mexico, where he was stationed for an extended time, or in the Madeira Islands, Siberia, Japan, Siam, New Caledonia, and the Lake Kivu region of Africa—to mention a few of the localities of conchological interest that he and his wife reached in the course of their world-ranging travels—he made note of these invertebrates and industriously collected them. Either singly or in collaboration with other workers like his friend, Dr. Pilsbry, he added significantly to the literature of the Mollusca. His studies of fish scales as an aid in the classification of the fishes won the attention of ichthyologists. To students of the fossils he ranked both as an invertebrate paleontologist and as a paleobotanist. And amid all these varied interests, not to mention his keen concern for sociological problems, an interest in art and poetry (he was himself endowed with the poetic gift), and the exacting labors of teaching, he yet found time to work so prodigiously in the field of entomology that had he achieved nothing else, his studies of insects, more particularly the bees, would still be viewed as an Herculean accomplishment.

In his work on the insects he had the advantage of an early start. Born at Norwood, England, August 22, 1866, his interest in natural history, according to his own statement, was linked with his earliest memories. As a boy he amused himself by drawing up little descriptions of the insects he collected and, when he was unable to name them, he devised scientific names for them. He was still in his early teens when he found and reported on the caterpillar of the Madeiran butterfly, *Pyrameis indica occidentalis.* Lang took cognizance of the find in his book on European butterflies. Thus, having won his spurs at a very early age, it is not surprising that he donned his armor for further adventures in the field of entomology when in 1891 he was appointed curator of the Public Museum at Kingston, Jamaica. It was the Coccidae that particularly challenged his interest in this new environment, both because of their importance from the economic standpoint and because of the light they threw on evolutionary processes thanks to the "reduction and suppression, as well as the modification of, parts." In a few months' time he recorded 34 species of Coccidae from Jamaica alone, more than had previously been recorded from all the West Indies.

Cockerell had been in Jamaica only two years when there was a recurrence of an ailment from which he had believed himself cured. A change to a more favorable environment became imperative. It is strange, looking back over the life span of men of note, how often a thing that seems a disaster at the time of its occurrence may be pregnant with new possibilities and, through the exercise of a resolute will, may even be converted into a triumph. So it was with Cockerell. His transfer of domicile from Jamaica to New Mexico (where he served successively in the New Mexico Agricultural College and in the Normal University) was to open a vista of opportunity that could not have been foreseen when he sought the recovery of his health in an alien environment.

In New Mexico he found a country where Coccidae were abundant, and where nearly every species taken proved to be new. As so often happens when a man acquires the status of an expert in a given field, people started sending him specimens of Coccidae from all over the world and he thus acquired a familiarity with scale-insects and mealy bugs from regions very remote from the scenes of his activity. Some of his discoveries, like the cochineal insect *Doctylopius opuntiae,* have proved of great economic importance. In Madras this insect, it is reported, has cleared 40,000 square miles of cacti and it has been used successfully in other areas as well where the prickly-pear is an agricultural obstacle.

When reference was made in a previous paragraph to the achievements in entomology that transfer to New Mexico would bring in its train, it was not the extension of Cockerell's studies on the Coccidae, important as these were, that this writer had primarily in mind. What he envisioned was the tremendous field of unexplored opportunity presented by the native bees of the Rocky Mountain region that were waiting, as though they had been placed under a spell, for the magic touch of a keen student to reveal their many points of interest. Cockerell flung himself into this task with zeal. He was first attracted by the little bee *Perdita luteola,* which in the summer and early fall of southern New Mexico was visiting in numbers the yellow Compositae that it resembled in color. This prompted him to investigate the genus to which the little bee belonged. At the time he began his studies only 17 species had been described and only 15 of these were valid. In a year's time he had brought this total up to 70, and 49 of his new species were based on specimens collected in New Mexico. "From this time onward," wrote Cockerell, "I have never ceased to work on bees, and have published 5,480 new names for species, subspecies, and varieties, and 146 names for genera and subgenera."

The lines just quoted were written ten years ago. Since then Professor Cockerell has not been idle, as his publishing record reveals. Even up to the end and under severe handicap he was working on the bees of Honduras, hoping to make known the interesting forms he collected in that country. But even if one does not add to the 5,480 bees described up to 1938 the residue of the last decade, the total is stupendous. No other student of the bees from the earliest days of classification to the present can offer a comparable total.

Some of the forms Cockerell described other workers have from time to time seen fit to place in the synonymy and it is likely that over the years some of the remaining species and subspecies he erected will be challenged by those who adopt a different interpretation. However, even after allowance is made for possible casualties, there will still remain, it is safe to predict, an awesome total of valid forms as a monument to the tireless industry and discernment of this devoted student of the bees.

In all of this dedication of effort to the study of natural forms Professor Cockerell had not only the sympathetic interest, but the active support of his wife, who participated in his expeditions to far places, engaged in collecting, and was helpful in many ways. She was co-author of some of his papers and frequently shared the lecture platform with him in presenting subjects in which they were both interested. The number of species that have been named *wilmattae* further testify to this partnership of joint interests, which extended through a married life that nearly attained its Golden Anniversary. During nearly this entire span Professor Cockerell's vocational activities were carried on at the University of Colorado, with which he became associated in 1903, achieving the rank of professor three years later and that of emeritus professor in 1934.

The vast number of papers and longer works, like his *Zoology,* which Cockerell published in the course of his life span, might seem to leave little time for more informal writing. Yet he revealed his warm-hearted interest in friends and co-workers, distant and near, by letters that were treasured by the recipients not only for their scientific and personal content, but for the sprightly little drawings with which they were often embellished. Here his sense of humor and playfulness found one of its delightful outlets. He was always interested in what the other person was doing and, if there was any way in which he could further a piece of research, he aided generously. The breadth of his achievement gave him a comprehending viewpoint regarding life. One was aware in his presence not only of mental keenness, but also of mental calm and poised judgment and kindliness withal. He never seemed hurried, but he never wasted time. His personality will be remembered vividly by all who knew him. As for his scientific publication, one likes to apply the imagery that he conjured up to express the influence of the printed word: "Like the light of the stars, it will arrive as if new, when perhaps the original source is no longer luminous."

HERBERT F. SCHWARZ,
American Museum of Natural History

Dr. Alfonso Dampf Tenson (1884–1948)

It is with profound shock and regret that we have learned of the death of Dr. Alfonso Dampf, distinguished entomologist in Mexico. Dampf passed away in Mexico City on March 17, 1948, from cancer of the liver.

Dampf was born on the Baltic island of Dagö, in the village of Kertell, Esthonia, on December 3, 1884 (Old Calendar November 20), the son of Michael Dampf and Maria Tenson. He studied at the University of Königsberg between 1904 and 1909, receiving therefrom the Doctor's degree. Between 1907 and 1912 he served as assistant in the Zoological Museum and Institute of the University of Königsberg, in the latter year being appointed 1st Assistant in the same Institute. Between 1913 and 1919 he served as Government Entomologist of the then German East Africa. Between 1920 and 1923 he resumed his position as 1st Assistant at the Zoological Museum and Institute, lecturing in Applied Entomology.

It was in 1923 that he arrived in Mexico, where he was to spend the remainder of his life, becoming a naturalized citizen of the Republic in October 1941. Dampf's various high positions in Mexico included Chief Entomologist, Mexican

Department of Agriculture; Head of the Entomological Laboratory, Mexican Public Health Service; and Professor of Entomology and Head of the Department, under the Secretary of Education. In August 1928 he was delegate from Mexico to the IVth International Congress of Entomology, while in 1935 and 1936 he was a Guggenheim Fellow to the United States.

Dampf's influence on the entomology of Mexico was profound. The present writer has enjoyed a long and unbroken friendship with him, beginning shortly after his arrival in Mexico and ending only with his death. Only on February 9th, approximately five weeks before his death, he posted a letter from Cuernavaca, where he was convalescing from a serious abdominal operation which had been explained to him as being cirrhosis of the liver. In this letter he writes "This is my first vacation in many, many years. . . . As I was recently appointed research professor, without obligations to lecture, I can stay at home for a week more and at least put my correspondence in order. . . . Must close now, as lunch time approaches. A few white clouds are sailing through the pale blue sky. Everything is quiet, only the bees are busy."

It is difficult to conceive how one person could have accomplished the vast amount of work that Dampf has done. His collections of Mexican insects, generously distributed to many specialists throughout the World, probably ran to more than a million specimens, and perhaps several millions. I have estimated the Tipulidae that he sent to me at more than 75,000 specimens, representing many species and giving us our first idea of the richness of the Mexican crane-fly fauna.

Dampf will long be remembered from his splendid papers covering many subjects and branches of entomology. In 1906 and 1907 he was working on the Siphonaptera and at that time described the first fossil flea as *Palaeopsylla klebsiana* (1910). Before leaving Europe he published a major work on the Esthonian moor fauna. In Mexico, he investigated various problems of economic interest, including work on the migratory locust, the black fly problem in Chiapas, and several others. On all these trips, covering virtually all of Mexico as well as parts of British

Honduras and Guatemala, he spent long hours collecting and papering the insects for his *Mexican Fauna* and *Mexican Biocenosis* studies. He will probably be best known from this vast work which, it is hoped, will eventually be published by his friends and co-workers in Mexico. During recent years, Dampf was able to devote more time to his research on blood-sucking insects, placing particular stress on the Simuliidae and *Phlebotomus*.

Dampf remained single until December 8, 1934, when he was married, in Mexico City, to Herminia Torres de Alva, who survives him. Dr. and Mrs. Dampf were a most devoted couple and it is certain that he derived vast encouragement and help from his loyal wife during their married life. Many honors came to Dampf, among the more recent being election as Corresponding Member to the Sociedad Argentina de Entomologia and as a life member of the Societas Entomologica Rossica. He was likewise a member of the American Association for the Advancement of Science and the Entomological Society of America.

I, personally, feel the loss of a very dear and esteemed colleague, and unite with a host of other friends and fellow entomologists in sending an expression of profound regret to Mrs. Dampf at the passing of her distinguished husband.

Charles P. Alexander,
Amherst, Mass.

OBITUARY

Mr. J. R. de la Torre-Bueno, editor of the Bulletin of the Brooklyn Entomological Society for more than 30 years, died on May 2, 1948.

The Occurrence of Anthoxanthins in the Wing Pigments of some Nearctic Oeneis (Rhopalocera: Satyridae)

By Cyril Franklin dos Passos, Research Associate, The American Museum of Natural History

Since 1941 five very interesting and extremely valuable papers have been published by Ford on the chemistry of pigments in the scales of the Lepidoptera, with reference to their bearing on systematics. They deal with the anthoxanthins (Ford, 1941), the red pigments in the genus *Delias* Hübner (Ford, 1942), the red pigments of the Papilionidae (Ford, 1944a), the classification of the Papilionidae (Ford, 1944b), and that rare and unique butterfly, *Pseudopontia paradoxa* Felder (Ford, 1947b). These papers do not seem to have received the consideration by American lepidopterists that they so richly deserve, probably because they are not readily accessible. The present paper is published with a view to drawing the attention of American students to the subject, and especially to demonstrating the value of its application to the classification of one genus of Rhopalocera.

In so far as may be necessary for the present purpose, some of the conclusions reached by Ford (1941, p. 88) are quoted or summarized as follows:

1. "Anthoxanthins are plant pigments responsible for a series of colours from white to yellow. In general, they are very rare in animals, which cannot manufacture them but derive them from their food."

2. Until the publication of Ford's papers they had ". . . been reported in the Lepidoptera in one or two instances only, for the white and yellow pigments of this Order are usually of a different nature."

3. Nevertheless, ". . . though uncommon, anthoxanthins are widely spread in the Lepidoptera. When they occur, they are generally not alone responsible for white and yellow colours, other pigments being present in addition."

4. "Their existence has been demonstrated by the tests described on p. 68." One of these is explained hereinafter.

In the papers mentioned, Ford reports the results of his studies in PIERIDAE and PAPILIONIDAE, which he examined in detail, also in other families, which were less thoroughly surveyed, and in a number of families of moths. The papers contain tables of many of the genera and species studied, and lists of references to the works cited. Ford (1941, p. 85) found in SATYRIDAE that out of forty-six genera examined seven showed the presence of anthoxanthins, being fifteen per cent of the total. In the genus *Oeneis,* with which the present paper is concerned, he examined eight Palaearctic species and found anthoxanthins present in two, or twenty-five per cent.

Intrigued by Ford's conclusions wherein he established, among other things, that a number of genera and species of the Lepidoptera are incorrectly classified today, and convinced of the value of his methods as an additional aid in the systematic study of the Rhopalocera, the author determined to try one of the tests, recommended by Ford, to the Nearctic species of *Oeneis.* This was done with some very interesting results.

The Nearctic *Oeneis* may be divided into several groups by reason of the difference in the shape of the clasps. For the purpose of this paper only two groups need be considered, one the *uhleri* group, having a simple, triangular clasp without any teeth or projection on the costa, and the other the *taygete* group, having a clasp with one prominent tooth or projection on the costa near the middle. No species in any of the other groups of Nearctic *Oeneis* showed any sign of having anthoxanthins in the scales. The results obtained in testing the *uhleri* and *taygete* groups follow.

In the *uhleri* group it was found that all the species and subspecies reacted positively to the test. These are *uhleri* (Reakirt) (1866, p. 143), *varuna* (Edwards) (1882, p. 2), *nahanni* Dyar (1904, p. 142), and *cairnesi* Gibson (1920, p. 15i). The female type of *nahanni,* however, did not show any reaction.

In the latest catalogue of Nearctic SATYRIDAE (dos Passos, 1939), *Oeneis uhleri* and *varuna* are listed as one species with one synonym each, i.e., *obscura* (Edwards) (1892, p. [294]), and *dennisi* Gunder (1927, p. 285), so no change is involved in their arrangement. *Oeneis nahanni* is listed as a distinct species, with *cairnesi* as a synonym, but *nahanni* is separated from *uhleri* by *taygete* Geyer ([1830], pl. [17]) and *hanburyi* Watkins (1928, p. 617). The test shows that *nahanni* and *cairnesi,* if in fact a synonym, should be placed either as an additional subspecies of *uhleri* or next to it. This arrangement was already indicated by the fact that both of these insects have the simple, triangular clasp similar to *uhleri.*

In the *taygete* group the only species that reacted to the test was *ivallda* (Mead) (1878, p. 196). This insect has been considered heretofore a subspecies of *chryxus* (Doubleday) (1851, p. 383), although this classification was believed doubtful by the present author by reason of the superficial appearances of the insects. Its erroneous position now becomes a certainty, it being the only "subspecies" of *chryxus* showing the presence of anthoxanthins.

It is, therefore, apparent that *ivallda* now should be given specific standing in the *taygete* group, and listed next to the *uhleri* group, *ivallda* forming the connecting link between those two groups.

As a result of the present study, it is clear that the chemistry of the pigments in the wings of Nearctic *Oeneis* assists greatly in their systematic arrangement without, in any way, conflicting with the result obtained by an examination of the genital armature of these insects. In a new arrangement of the *uhleri* and *taygete* groups in check list order, all of the species found to have anthoxanthins, however arbitrarily placed, should be removed from the middle of the genus where they are found at present, and listed at the beginning or end thereof, preferably the former.

Two techniques were used originally by Ford (1941, p. 68) in making his tests to ascertain the existence of anthoxanthins. The present author found it necessary to try only the first, whereby some of the white pigments on the under side of the secondaries of the species of *Oeneis* mentioned turn more or less yellow on fuming them with strong ammonia. Ammonium hydroxide (28% NH_3) was employed for this purpose. It is used simply by removing the cork from the bottle and holding the insect in the escaping fumes. "This is due to the fact that the flavones and flavonols [which are chemically distinct types of anthoxanthins] combine with ammonia to form coloured salts. In the Lepidoptera these are very unstable, so that the specimen speedily returns to its original condition after treatment. Consequently, it is uninjured by the process. This reaction is a highly diagnostic and sensitive one. It suffices to detect traces of anthoxanthins when present in a single specimen" (Ford, *loc. cit.*). There is another test, not necessary to consider here, ". . . when the flavone concerned is itself deep yellow, or when it is obscured by other pigments" (Ford, *loc. cit.*). That test, when applied to the wing pigments of insects, necessitates the destruction of the specimens and, hence, is not available in studying rare Lepidoptera. Ford has studied the relation of other pigments, besides the anthoxanthins, to the classification of the Lepidoptera, and has lately (Ford, 1947a) devised a more sensitive test for uric acid derivatives than the ordinary murexide reaction used in his work on *Delias* (Ford, *loc. cit.*).

The author wishes to record his appreciation to Dr. A. H. Clark, Curator of Echinoderms, and Mr. W. D. Field, Associate Curator, Division of Insects, United States National Museum, for fuming the types of *nahanni* in the collection of that institution, and to Dr. T. N. Freeman, Division of Systematic Entomology, Department of Agriculture, Ottawa, for fuming the types of *cairnesi* in the Canadian National Collection. These rare species are found in very few collections, and this study could not have been completed fully without the cooperation of those individuals.

Finally, the author desires to express his most grateful thanks to Dr. E. B. Ford, Reader in Genetics in the University of Oxford, for calling his attention to this most interesting subject, for generously presenting him with his papers relative thereto, and

encouraging him in this study. With his kind permission parts of one of those papers have been quoted. It is a real pleasure to acknowledge Dr. Ford's personal assistance and record the inspiration of his friendship.

Bibliography

DOS PASSOS, C. F. 1939. A catalogue of the original descriptions of the Rhopalocera found north of the Mexican border. Part 2. The Satyridae. Bull. Cheyenne Mt. Mus., 1, pt. 2: S-1–S-13.

FORD, E. B. 1941. Studies on the chemistry of pigments in the Lepidoptera, with reference to their bearing on systematics. 1. The anthoxanthins. Proc. Roy. Ent. Soc. London, ser. A, 16: 65–90.

——. 1942. *Id.* 2. Red pigments in the genus *Delias* Hübner. *Ibid.* 17: 87–92.

——. 1944a. *Id.* 3. The red pigments of the Papilionidae. *Ibid.* 19: 92–106.

——. 1944b. *Id.* 4. The classification of the Papilionidae. *Ibid.* 94: 201–223.

——. 1947a. A murexide test for the recognition of pterins in intact insects. *Ibid.* 22: 72–76.

——. 1947b. Studies on the chemistry of pigments in the Lepidoptera, with reference to their bearing on systematics. 5. *Pseudopontia paradoxa* Felder. *Ibid.* 22: 77–78.

Notes on the Eleodini (Coleoptera: Tenebrionidae)

By IRA LA RIVERS, University of California, Berkeley

I

In the first comprehensive treatment of the Tenebrionidae of the United States, George Horn (1870) placed *Eleodes, Discogenia* and *Embaphion* in the tribe *Blaptini.* Thirteen years later, in their monumental "Classification," Le Conte and Horn listed *Eleodes, Embaphion, Blaps* and *Trogloderus* in *Blaptini,* there having been, in the interim, an introduced species of *Blaps* discovered on the Atlantic Coast, the very distinctive *Trogloderus costatus* Le Conte 1879 described from the far West and *Discogenia* submerged in *Eleodes.* A good many years afterward, the late Dr. F. E. Blaisdell, Sr., established the tribe

Eleodiini for the American components of the *Blaptini* as defined by Le Conte and Horn, having shown good reason for tribally separating *Eleodes* and its relatives from the European *Blaps.* Blaisdell's *Eleodiini* contained *Eleodes, Embaphion, Trogloderus* and his newly-discovered *Eleodimorpha bolcan* from southern California (1909). In 1925, Blaisdell added *Neobaphion,* the type being *Eleodes planipennis* Le Conte 1866. In 1939, Dr. Blaisdell's concept of higher categories, after fifty-odd years of work in the family, was presented in a short resumé based principally on key genital characters; in this paper, he also described the new genus and species *Eleodopsis subvestita,* an insular species off the California coast, which he made the type of a subfamily. *Eleodini* was similarly treated as a subfamily.

In a posthumous paper published in 1947, a year after his death, Dr. Blaisdell described the new genus and species *Lariversius tibialis* from western Nevada, without comparison or assignment to any larger subdivision. In order to clarify the exact status of the genus, the following characters, omitted from the original description, should be noted:

Hind margin of ventral abdominal segments 3–4 coriaceous; front entirely corneous; only anterior tibiae dilated; penultimate segment of tarsus entire; hind coxae transverse; epipleura attaining the sutural angle; tarsi setose beneath; elytra broadly embracing body................................BLAPTINAE

These characters, used with the original description, will place the genus in *Eleodini* (Bradley, 1930). Its smooth dorsum will separate it from the costate elytral condition of *Trogloderus* in Bradley's generic key. It might be well here to note some comparative characters with *Trogloderus,* apparently its nearest relative:

Trogloderus—form long, slender, entire dorsum rough (elytra costate, pronotum tuberculate-to-reticulate), posterior pronotal angles acuminate, antennae decidedly longer than head is wide, abdominal intercoxal process subquadrate (nearly as long as wide), prothoracic sides sparsely beset with short setae.

Lariversius—form stout, robust, entire dorsum smooth, posterior pronotal angles lacking, antennae not longer than head is wide, abdominal intercoxal process much wider than long, prothoracic sides thickly furred with long, golden pile.

The third antennal segment in *Trogloderus* is subequal to the first two combined, a typical *Eleodini* character, while the 2nd and 3rd are nearly equal-sized in *Lariversius*. It is possible the new genus may represent a distinct tribe in itself, but I am satisfied, with our present knowledge, to widen the *Eleodini* somewhat for its reception. As used here, *Eleodini* is equal to Blaisdell's Eleodinae, and consists of three distinct units; (1) *Eleodes, Embaphion* and *Eleodimorpha,* (2) *Trogloderus* and (3) *Lariversius*. I consider *Neobaphion* a subgenus of *Eleodes*. The present status of the genera comprising the *Eleodini* may be reflected in the following key:

1. Third antennal segment subequal to 2nd (epistomal margins dilated; dorsum smooth) (*Subtribe Lariversiina*) *Lariversius*
   Third segment subequal to 1st and 2nd combined........2
2. Epistomal sides dilated, front margin arcuate (elytra dorsally-costate, pronotum reticulate-to-tuberculate) (*Subtribe Trogloderina*) *Trogloderus*
   Epistomal sides not dilated, front margin straight or sinuate (*Subtribe Eleodina*)..................................3
3. Epipleura occupying entire inflexed portion of elytra *Eleodimorpha*
   Epipleura not occupying entire inflexed portion of elytra....4
4. Elytral and pronotal margins reflexed; epipleura narrow, distinct only near elytral apex....................*Embaphion*
   Pronotal margins occasionally weakly-reflexed, elytral margins never reflexed; epipleura wide-to-narrow, distinct along entire length....................................*Eleodes*

This subtribal segregation on the basis of morphology is further reflected in the habits of the units involved. The *Eleodina* are wanderers, *Trogloderus* semi-fossorial and *Lariversius* markedly fossorial and restricted to arenaceous areas.

II

Considerably more distributional data has accumulated on *Lariversius* since Blaisdell's paper. The types were from a large series taken by Thomas J. Trelease and myself from NEVADA: Washoe County (*Pyramid Lake South Dunes* 16–24 (VIII)41, 1(IX)41, el. 3850 ft. LaR & Trelease). The war prevented further search for the species in other arenaceous regions of the State, but by the end of the summer of 1946, combined efforts had added to its range, and enough data are now on hand to draw some initial conclusions as to the probable total range of the unique animal. Additional Nevada localities are:

Churchill County (*Fallon* (Sheckler District) 1(VII) 42, el. 4000 ft. Trelease & G. C. Christensen; *Sand Spring* 28(VI)42, el. 4500 ft. Christensen & Trelease; *Rawhide Sands* 28(VIII) 46, el. 4200 ft. LaR.); Mineral County (*Thorne Dune* 26(VIII) 46, el. 4600 ft. LaR.).

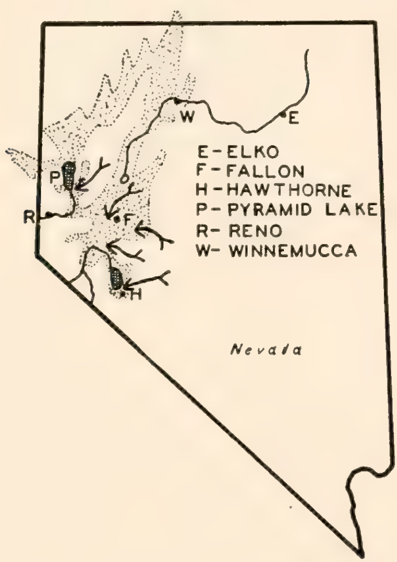

Fig. 1. The greatest extent of Pleistocene Lake Lahontan is indicated by the stippled area. Walker Lake is shown just north of Hawthorne. The three principle tributaries of the Lahontan Basin are (1) Humboldt River, passing through Elko and Winnemucca, (2) Truckee River, flowing into Pyramid Lake, and (3) Walker River into Walker Lake. Arrows indicate the known occurrences of *Lariversius tibialis*.

The accompanying plate shows that the known localities for the genus correspond with the southern outlines of extinct Pleistocene Lake Lahontan. In this connexion, the now largely-empty lake basin seems the probable agent responsible for the later formation of the many prominent sand areas now scattered within its confines, on many of which the new genus is the dominant nocturnal animal. In all cases known to me, these residual sands have formed active dunes only in the vicinity of the ancient lake shores—not too important when it is realized, however, that nowhere was the lake a broad expanse of water, but merely lay as connecting embayments and long fingers of water confined between generally north-south striking narrow desert ranges, so that subsequent wind action would not require much time to concentrate such sands according to prevailing aerial currents. Each inundation of these dune areas by rising Lahontan and pre-Lahontan waters would redistribute them somewhat over their respective valleys, but they would be quickly localized by wind action upon the periodic retreat of the lakes as waters receded in response to increased aridity, as has demonstrably occurred during the life of Lahontan itself.

At the Pyramid Lake locality, the species is most prolific on aeolian dunes at the southeast edge of the lake, dunes which were under water thirty years ago. Considerable loose sand lies over low ridges adjacent to the lake. At the Thorne locality, the southeast shores of Walker Lake are some five miles removed from the dune; Sand Springs and the Rawhide Sands localities have not been near lake shores since Lahontan inundated them.

The periodicity of *L. tibialis,* plus its nocturnal habits, accounts for its being overlooked until the present time. F. W. Nunenmacher, the coccinellidist, made an extensive collecting trip through southwestern Nevada in 1908, and worked about the Thorne sand dune, but did not see the species. H. F. Wickham spent some time about the south end of Walker Lake in the early 1900's, finding some rare items, but again overlooking the present species. Numerous collections have been made about Pyramid Lake and the Sand Spring area southeast of Fallon by entomologists, some in the early days of western collecting, without discovering the animal. Utah, which has been searched entomologically more thoroughly than has Nevada, has failed to produce the species, and it may be reasonably questioned whether it occurs beyond the limits of the Lahontan basin.

Little is known of the species' biology, except that it is herbivorous, a common tenebrionid characteristic, is apparently a mid-summer to late fall species, and exhibits considerable sporadicism in its annual cycle, thriving most prolifically on aeolian sand dunes. Specimens collected in season failed to live through the winter under favorable conditions, although feeding readily at all times on the same materials used to keep various species of *Eleodes* alive in captivity for several years. The animals burrow readily in the loose dune sand, disappearing quickly from sight, and are strictly nocturnal. They seem to feed on a variety of dune vegetation, being found on more than one occasion feeding above ground on green Russian thistle (*Salsola kali tenuifolia*) and *Dalea polyadenia*. Associated animals represent the typical nocturnal dune fauna: *Trogloderus costatus, Eleodes armata, E. grandicollis, Blapstinus crassicornis* and *Niptus ventriculus.*

BIBLIOGRAPHY

Blaisdell, F. E., Sr. 1909. A monographic revision of the Coleoptera belonging to the Tenebrionide tribe Eleodiini inhabiting the United States, Lower California and adjacent islands. Bull. U.S.N.M. 63: xi + 524.

——. 1925. Studies in the Tenebrionidae, No. 2. Proc. Calif. Acad. Sci. 4th Ser. 14 (16): 369–390.

——. 1939. Studies in the relationships of the subfamilies and tribes of the Tenebrionidae based on the primary genital characters, also descriptions of new species (Coleoptera). Trans. Amer. Ent. Soc. 65: 43–60.

——. 1942. Miscellaneous studies in the Coleoptera—6. Trans. Amer. Ent. Soc. 68: 129–149.

——. 1947. A new genus and species of the coleopterous family Tenebrionidae. Pan-Pac. Ent. 23 (2): 59–62.

Horn, G. H. 1870. Revision of the Tenebrionidae of America. Trans. Amer. Phil. Soc. N.S. 14: 253–404.

La Rivers, I. 1942. A relict insect. Nev. Acad. Nat. Sci. News Letter 2 (1): 1.

Le Conte, J. L. and G. H. Horn. 1883. Classification of the Coleoptera of North America. Smiths. Misc. Coll. 507: xxxviii + 567.

The Status of the Genus Hercynia J. Enzmann (Hymenoptera: Formicidae)

By William L. Brown, Jr., The Biological Laboratories, Harvard University

The genus *Hercynia* was described by J. Enzmann (Jour. New York Ent. Soc. 1947, 55: 43–44) on the basis of workers and a female specimen from Panama. *H. panamana* was described on pages 44 to 47 with figures and as a new species, with the designation inherent as genotype of *Hercynia*. The types, however, were recently examined by the present writer and prove to be identical with specimens of *Wasmannia auropunctata* (Roger) determined by Wheeler and other myrmecologists and deposited in the Wheeler Collection at the Museum of Comparative Zoology.

Roger described *auropunctata* as *Tetramorium auropunctatum* in 1863 (Berlin. Ent. Zeitschr. 7: 182); Forel described *Wasmannia* as a new genus in 1893 (Trans. London Ent. Soc., p. 383). Wheeler designated *Tetramorium auropunctatum* Roger as genotype for *Wasmannia* in 1911. Thus *Wasmannia* as a genus and *W. auropunctata* as a species take precedence over *Hercynia* and *H. panamana* respectively, the latter names being relegated to synonymy.

The differentiation of the new genus was based partly on the supposed two-jointed club of the antenna, *Wasmannia* being described in the literature as having a three-jointed club. It is extremely doubtful, however, whether the most proximal of the three terminal funicular joints may be considered as part of the club, since this joint appears very slightly larger than the middle joints preceding it and much smaller than its distal neighbor. The term "two-jointed" would seem to be more accurate in describing the club of at least the genotype of *Wasmannia*.

Notes and News in Entomology

Under this heading we present, from time to time, notes, news, and comments. Contributions from readers are earnestly solicited and will be acknowledged when used.

Destruction of the Musea de La Salle at Bogotá, Colombia. Advice has reached us that in the riots at Bogotá, on April 10, 1948, the Museo de La Salle and most of the attached school buildings were entirely destroyed by fire. The collections in the Museo which were lost were among the most important zoological series in South America, largely accumulated through the labors of the brothers Apolinar Maria and Nicéforo Maria, which extended over many years. The deep sympathy of scientific scholars all over the world will, we know, go to these colleagues, who have lost much that cannot be replaced.

The Wasmann Collector, formerly the journal of the Wasmann Biological Society, has announced that it is henceforth to be published jointly by Loyola University and the University of San Francisco. Wasmann Society membership is no longer required of contributors and manuscripts on original biological research are solicited for publication in accordance with the policy of establishing the journal on a quarterly basis. The managing editor is Edward L. Kessel of the University of San Francisco.

Current Entomological Literature

COMPILED BY RAYMOND Q. BLISS AND THEODORE M. TELSCH.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, pertaining to the Entomology of the Americas (North and South), included 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.

This list gives references of the year 1948 unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

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 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. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

GENERAL—Anon.—Bibliography of Agriculture (Entomology items 9957–10726). [U. S. Dept. Agric. Library] 12 (2): items 6197–13536. **Chamberlain, K. F.**—On the use of diethylene glycol in the preparation of balsam mounts of the male genitalia of certain Coleoptera. [18] 42: 126–30, 1947. **Dexter and Kuehnle**—Fairy shrimp populations of northeastern Ohio in the seasons of 1945 and 1946. [58] 48: 15–26. **Hagan, H. R.**—A brief analysis of viviparity in insects. [45] 56: 63–68. **Hodson and Chiang**—A new method for rearing Drosophila. [80] 107: 176–77. **Knight, R. L.**—The rôle of major genes in the evolution of economic characters. [Jour. Genetics] 48: 370–87. **Roonwal, M. L.**—Studies in intraspecific variation. I. On the existence of two colour-types in the adults and hoppers of the solitary phase in the desert locust, Schistocerca gregaria (Acridid.). [Records of the Indian Mus.] 44: 369–74, 1947. **Schilder, F. A.**—Probleme und Methoden der Biostatistik II (Quantitative Zoogeographie). [Biolog. Zentralblatt] 66: 201–10, 1947. **VanCleve, H. J.**—Expanding horizons in the recognition of a phylum. [46] 34: 1–20. **Varley, G. C.**—The natural control of population balance in the knapweed gall-fly (Urophora jaceana), (Chalcid., Tortricoid). [36] 16: 139–87, ill., 1947.

ANATOMY, PHYSIOLOGY, MEDICAL—Agrell, I.—Some experiments concerning thermal adjustment and respiratory metabolism in insects (Hym. Col. Orth. Dip. Lepid.). [10] 39: 1–48, ill., 1947.—The effect of the physiological state of insects (Carabides) on their thermal preference. [Opuscula Entomologica, Lund] 12: 127–37, 1947. **Beadle, L. C.**—Note sullo sviluppo dell' Anopheles sacharovi sulla costa del Veneto. [Riv. di Parassit.] 8: 197–203, 1947. **Bolwig, N.**—Senses and sense organs of the anterior end of the house fly larvae. [Videnskabelige Meddelelser fra Dansk Naturhist. Forening i København] 109: 81–217, ill., 1946. **Buzzati-Traverso, A.**—Genetica di popolazioni in Drosophila. Parts VI–IX. [Mem. dell'Inst. Ital. di Idrobiol. Dott. Marco De Marchi] 4: 1–116.—Su alcuni casi di evoluzione in bottiglia. *Ibid.* 117–20, 1947. **Carson and Stalker**—Reproductive diapause in Drosophila robusta. [67] 34: 124–29. **Chase, Schryver and Stern**—Exploratory electrophoretic experiments on luciferase preparations (Crust., Cypridina). [105] 31: 25–33. **Chopard, L.**—La parthénogenèse chez les orthoptéroides. [L'Annee Biologique] 24: 15–22. **Deboutteville, C. D.**—Sur la morphologie thoracique des insectes Zoraptères. [C. r. Acad. Sci. Paris] 226: 599–601. **DeLong and Severin**—Characters, distribution and food plants of newly discovered vectors of California aster-yellows virus. [Hilgardia] 17: 527–38, 1947. **Domato and Aramayo**—(See under Diptera.) **Doutt, R. L.**—Polyembryony in Copidosoma koehleri. [3] 81: 435–53, 1947. **Duncan, J.**—Le facteur humidité vs. migration des larves de la pyrale du maïs au printemps. [Ann. de L'Acfas, Montreal] 13: 110.—Influence de l'enfouissement et faculté d'adaptation de la pyrale du maïs au moment de la nymphose. *Ibid.* 110–11, 1947. **Gier, H. T.**—Intracellular bacteroids in the cockroach (Periplaneta americana Linn.). [Jour Bacteriol.] 53: 173–89, 1947. **Gloor, H.**—Phänokopie–Versuche mit Äther an Drosophila. [Rev. Suisse de Zool.] 54: 637–712, ill., 1947. **Goldschmidt, R. B.**—A note on industrial melanism in relation to some recent work with Drosophila. [3] 81: 474–76, 1947. **Grassner and James**—The biology and control of the fox maggot Wohlfahrtia opaca. [46] 34: 44–50. **Gupta, P. D.**—On the structure and formation of spermatophore in the cockroach, Periplaneta americana. [Indian Jour. Ent.] 8: 79–84, ill., 1947. **Hanström, B.**—The brain, the sense organs, and the incretory organs of the head in the Crustacea Malacostraca. [Lunds Univ. Årsskrift] 43 (9): 1–45, 1945. **Harries and Douglass**—Bionomic studies on the beet leafhopper. [25] 18: 45–79. **Hartung, E. W.**—Some observations on the larval growth rate and viability of two tumor strains of D. melanogaster. [80] 107: 296–97. **Heisch and Garnham**—The transmission of Spirochaeta duttoni by Pediculus humanus corporis. [61] 38: 247–52. **Hewlett, P. S.**—The toxicities of three petroleum oils to the grain weevils. [4] 34: 575–85, 1947. **Hodson and Chiang**—A new method for rearing Drosophila. [80] 107: 176–77. **Homann, H.**—Beiträge zur Physiologie der Spinnenaugen. V. Der Lichtsinn von Aranea seypunctata (Argiopidae). [Biol. Zentralblatt] 66: 251–61, 1947. **Hsu, T. C.**—The relations between heteropycnosis, spiralization and lampbrush formation of the chromosomes in the spermatogenesis of the Acrididae. [Jour. Genetics, England] 48: 311–15. **Jones and Jones**—Wireworms and the sugarbeet crop: field trials and observations. [4] 34: 562–74, 1947. **Klotz, Schlesinger and Tietze**—Comparison of the binding ability of hemocyanin and serum albumin for organic ions (Limulus polyphemus). [12] 94: 40–44. **La Greca, M.**—La forma del pronoto degli Ortotteri Saltatori e la tua funzione nei movimenti di apertura e chiusura delle tegmine. [Boll. Soc. Nat. Napoli] 56: 3–7, 1947—Morfologia funzionale dell'articolazione alare degli Ortotteri. [Arch. Zool. Italiano, Torino] 33: 271–327, 1947.—Su una particolare maniera di deambulazione di un Acridide: Tropidopola cylindrica (Marsch.). [Boll. Zool., Torino] 14: 83–104. **Lilly, A. H. R.**—Investigations on the gout fly (Chlorops pumilionis) in Devon and Cornwall. [4] 34: 551–61, 1947. **Lindquist and Wilson**—Development of a strain of houseflies resistant to DDT. [80] 107: 276. **Maple, J. D.**—The eggs and first instar larvae of Encyrtidae and their morphological adaptations for respiration. [91] 8: 25–122, ill., 1947. **McIntosh, A. H.**—Relation between particle size and shape of insecticidal suspensions and their contact toxicity. [4] 34: 586–610. **Milum, V. G.**—Grooming dance and associated activities of the honeybee colony. [85] 40: 194–96, 1947. **Misra, S. D.**—Studies on the somatic musculature of the desert locust, Shistocerca gregaria. Part II, the neck and the prothorax. [Indian Jour. Ent.] 8: 1–29, ill., 1947. **Patt, D. I.**—Some cytological observations on the Nährboden of Polyphemus pediculus (Crusta). [84] 66: 344–53, 1947. **Pflugfelder, O.**—Über die Ventraldrüsen und einige andere inkretorische Organe der Insektenkopfes. [Biol. Zentralblatt] 66: 211–35, 1947. **Raignier, A.**—L'economie thermique d'une colonie polycalique de la fourmi des bois. (Formica rufa polyctena). [La Cellule] 51: 281–368 and Pls. I–III. **Rakshpal, R.**—Notes on the structure and development of the male genital organs in Carpophilus sp. (Nitidulid). [Indian Jour. Ent.] 8: 59–69, 1947. **de Robertis and Schmitt**—An electron microscope analysis of certain nerve axon constituents (Homarus americanus and Limulus polyphemus). [105] 31: 1–24. **Roonwal, M. L.**—On the variation in the number of ovarioles and its probable origin in the desert locust, Shistocerca gregaria. *Ibid.* 375–82, ill., 1947. **Satchell, G. H.**—The ecology of the British species of Psychoda. [4] 34: 611–21, 1947. **Schallek and Wiersma**—The influence of various drugs on a crustacean synapse. [105] 31: 35–47. **Schwartz, H. F.**—Stingless bees (Meliponidae) of the Western Hemisphere. [Bull. Amer. Mus. Nat. Hist.] 90: xvii + 1–546. **Severin, H. H. P.**—Newly discovered leafhopper vectors of California aster-yellow virus. [Hilgardia] 17: 511–19.—Longevity of noninfective and infective leafhoppers on a plant nonsusceptible to a virus. *Ibid.* 541–43.—Location of curly-top virus in the beet leafhopper Eutettix tenellus. *Ibid.* 545–51, 1947. **Sharif, M.**—Nutritional requirements of flea larvae and their bearing in the specific distribution and host preferences of the three Indian species of Xenopsylla (Siphonap). [61] 38: 253–63. **Smith, F. G. W.**—Surface illumination and barnacle attachment. [12] 94: 33–39. **Stehr, G.**—Beziehungen zwischen der Blutzirkulation im Puppenflügel und dem Zeichnungsmuster von Ephestia kühniella. [Rev. Suisse de Zool.] 54: 573–608, ill., 1947. **Tate, P.**—The sex ratio and the occurrence of mutations in cultures of the blow-fly Calliphora erythrocephala. [Jour. Genetics] 48: 333–42. **Williams, C. M.**—Physiology of insect diapause. III. The prothroacic glands in the Cecropia silkworm, with special reference to their significance in embryonic and postembryonic development. [12] 94: 60–65. **Wilson, M. C.**—A preliminary study of the effect of DDT on Aphis maidis and its insect enemies with particular reference to Aphidius (Lysiphlebus) testaceipes. [58] 48: 30–40. **Wilson and Gahan**—Susceptibility of DDT-resistant houseflies to other insectidal sprays. [80] 107: 276–77.

ARACHNIDA AND MYRIOPODA—Anantaraman, M.—Oribatid mites and their economic importance. [53] 161: 409–10. **Baker, E. W.**—A new trichadenid mite which further indicates a phylogenetic relationship between the Tetranychidae and Eriophyidae. [65] 50: 59–60. **Bequaert, J.**—A breeding focus of Dermacentor variabilis, the American dog tick, in New Hampshire. [18] 42: 141, 1947. **Chamberlin, R. V.**—The genera of N. Amer. Dictynidae. [Bull. Univ. Utah] 38: 5–31, ill. **Chamberlin, R. V.**—Seven new American millipeds [63] 60: 9–16.—Two new species of Trichomorpha from Panama. *Ibid.* 63–66. **Crane, J.**—Comparative biology of salticid spiders at Rancho Grande, Venezuela. Pt. I. Systematics and life histories in Corythalia. [95] 33: 1–38 (k*). **Ewing, H. E.**—Notes on some parasitic mites of the superfamily Parasitoidea, with a key to the American genera of the Liponyssinae. [63] 60: 83–90 (*), 1947. **Farrell and Wharton**—A successful method for shipping larval trombiculids (chiggers). [46] 34: 71. **Hoffman, R. L.**—The status of the milliped Lasiolathus virginicus, with notes on Scytonotus granulatus. [63] 60: 139–40, 1947. **Homann, H.**—(See under Anatomy.) **Newell, I. M.**—The rediscovery and clarification of Siro acaroides (Opiliones, Cyphophthalmi, Sironidae). [84] 66: 354–65, 1947. **Ringuelet, R.**—La supuesta presencia de Ixodes brunneus Koch en la Argentina y descripcion de una neuva Garrapata, I. neuquensis. [Notas del Mus. de la Plata] 12: 207–16, ill. (*) (S) (1947). **Self and McMurry**—Porocephalus crotali (Pentastomida) in Oklahoma. [46] 34: 21–23. **Turk, F. A.**—On two new species of tick. [61] 38: 243–46.

SMALLER ORDERS—Banks, N.—Some characters in the Perlidae. [73] 54: 266–91 (k*), 1947. **Crawford, J. C.**—A new genus of Urothripidae from Guatemala (Thysanoptera). [65] 50: 39–40.—On the Neotropical species of the genus Taeniothrips (Thysan., Thrip.). *Ibid.* 53–57 (k*). **Christansen, K. A.**—A new genus and species of damsel fly from southern Haiti. [73] 54: 256–62, 1947. **Conde, B.**—Un proture remarquable du Danemark. [Ent. Meddelelser] 25: 161–64, ill., 1947. **Debouttevi1le, C. D.**—Zoraptera. (See under Anatomy.) **Denning, D. G.**—New species and records of nearctic Hydroptilidae (Trichoptera). [18] 42: 145–58, 1947. **Grant, C.**—Typhlops and termites. [39] 40: 14. **Heisch and Garnham**—(See under Anatomy.) **Levy, H. A.**—The male genitalia of Ephemerida. [45] 56: 25–41. **Needham, J. G.**—Studies on the North American species of the genus Gomphus. [83] 73: 307–39, Pl. XV (k), 1947. **Pflugfelder, O.**—(See under Anatomy.) **Ricker, W. E.**—Stoneflies of the Maritime Provinces and Newfoundland. [87] 26: 401–14, ill. (*), 1947. **Sharif, M.**—(See under Anatomy.) **Silvestri, F.**—On some Japygidae in the Museum of Comparative Zoology (Dicellura). [73] 54: 209–29 (*). **Thompson, G. B.**—A list of the type-hosts of the Mallophaga and the lice described from them. [6] 14: 373–88.

ORTHOPTERA—Chopard, L.—(See under Anatomy.) **Gier, H. T.**—(See under Anatomy.) **Gupta, P. D.**—(See under Anatomy.) **Hsu, T. C.**—(See under Anatomy.) **Knowlton, G. F.**—Pigmy grasshopper notes. [18] 42: 130. —Snowy tree cricket eats pea aphids. *Ibid.* 142, 1947. **La Greca, M.**—(See under Anatomy.) **Mathur, R. N.**—Notes on the biology of some Mantidae. [Indian Jour. Ent.] 8: 89–106, 1947. **Misra, S. D.**—(See under Anatomy.) **Pflugfelder, O.**—(See under Anatomy.) **Roonwal, M. L.**—On variation in the number of hind-tibial spines in the desert locust Shistocerca gregaria. [Indian J. Ent.] 8: 71–77, ill., 1947.—(See also under General and under Anatomy.)

HEMIPTERA—DeLong and Hershberger—A new genus, Neodonus, and species of Mexican leafhopper (Homo., Cicadell.) related to Idiodonus. [18] 42: 159–61, 1947.—The genus Flexamia (Homo. Cicadell.) in Mexico. *Ibid.* 136–39 (*). **DeLong and Severin**—(See under Anatomy.) **Esselbaugh, C. O.**—Some remarks on the genus Chlorochroa (Hemi., Pentatom.) and a new species. [18] 42: 164–69, 1947. **Essig, E. O.**—Aphids feeding on violaceous plants in California. [Hilgardia] 17: 597–617, 1947. **Fennah, R. G.**—Two exotic new Fulgoroidea from the New World. [63] 60: 91–94.—Notes on West Indian Flatidae (Fulgoroidea). *Ibid.* 107–18, 1947. **Harries and Douglass**—(See under Anatomy.) **Hemmingson, A. M.**—Plant bug guarding eggs and offspring and shooting anal jets (Coreid). [Ent. Meddelelser, Copenhagen] 25: 200, 1947. **Knowlton, G. F.**

—Note on six aphis species. [18] 42: 155.—Procipilus aphid notes. *Ibid.* 161.—Leafhopper 'bites' man. *Ibid.* 169. —Phymatid kills honeybees. *Ibid.* 175, 1947.—(See also under Orthoptera.) **Larsen, O.**—Ranatra linearis in Schweden (Biology). [Opuscula Ent., Lund] 12: 144–50, 1947. **Oman, P. W.**—Distribution of Balaulus maidis (Cicadell.). [65] 50: 34. **Severin, H. H. P.**—(See under Anatomy.) **Wilson, M. C.**—(See under Anatomy.)

LEPIDOPTERA—Doutt, R. L.—(See under Anatomy.) **Duncan, J.**—(See under Anatomy.) **Flemming, H.**—A new genus and species of Orneodidae (moths) from Rancho Grande, north-central Venezuela. [95] 33: 39–42 and Pl. **Forbes, Wm. T. M.**—A second review of Melinaea and Mechanitis (Ithomi.). [45] 56: 1–24 (k*). **Hemmingsen, A. M.**—A chrysalis stridulating by means of instrument on inside of cocoon (Noctuid). [Ent. Meddelelser, Copenhagen] 25: 165–73, ill., 1947. **Judd, W. W.**—Acentropus niveus (Pyralid) at Hamilton, Ontario. [23] 79: 119, 1947. **Malkin, G. F.**—The story of a butterfly (Danaus archippus). [Canad. Nature] 10: 4–8, ill. (popular). **McDunnough, J.**—A new Californian Apamea (Phalaen.). [45] 56: 51–52. **McGuffin, W. C.**—New descriptions of larvae of forest insects: Semiothisa, Dysmigia (Geometr.). [23] 79: 113–16, 1947. **Munroe, E. G.**—Further North American records of Acentropus niveus (Pyral.). [23] 79: 120, 1947. **Needham, J. G.**—A bucculatricid gall maker and its hypermetamorphosis. [45] 56: 43–50. **dos Passos, C. F.**—The eye colors of some Colias collected in New Jersey (Pieridae). [65] 50: 35–38. **Rawson, G. W.**—A new subspecies of Lycaena epixanthe with comments on the identity of typical epixanthe (Lycaen.). [45] 56: 55–62. **Rindge, F. H.**—Contribution towards a knowledge of the insect fauna of Lower California. No. 8. Lepidoptera, Rhopalocera. [64] 24: 289–312. **Stehr, G.**—(See under Anatomy.) **Varley, G. C.**—(See under General.) **Williams, C. M.**—(See under Anatomy.) **Worm-Hansen and Larsson**—Semasia krygeri Rebel (Tortr.) morphology and biology. [Ent. Meddelelser, Copenhagen] 25: 174–95, ill., 1947.

DIPTERA—Alex, A. H.—Notes on robber flies (Asilidae) preying on honeybees in the San Antonio area during 1946. [18] 42: 170–72, 1947. **Alexander, C. P.**—New or insufficiently-known crane-flies from the neartic region (Tipul.). [18] 42: 131–35.—Records and descriptions of N. Amer. crane-flies. VII. The Tipulidae of Utah. [1] 39: 1–82. **Anduze, P. J.**—Fauna hematofoga del Distrito Maturin (Est. Monagas, Venezuela): Los Culicidos. [Rev.

de Med. Vet. y Paras., Caracas, Ven.] 6: 121–26, 1947. **Beadle L. C.**—(See under Anatomy.) **Bolwig, N.**—(See under Anatomy.) **Breland, O. P.**—(See under Hymenoptera.) **Brues, C. T.**—The habitat of Aenigmatias (Phor.). [73] 54: 265, 1947. **Buzzati-Traverso, A.**—(See under Anatomy.) **Carson and Stalker**—(See under Anatomy.) **Domato and Aramayo**—Contribucion al estudio de la moscas de las frutas en Tucuman. [Bull. de la Estacion Exp. Agricola de Tucuman] No. 60: 1–27, ill. (S) (1947). **Fox, I.**—Hoffmania, a new subgenus in Culicoides (Ceratopogon.). [63] 61: 21–28 (k), 1947. **Gloor, H.**—(See under Anatomy.) **Goldschmidt, R. B.**—(See under Anatomy.) **Grassner and James**—(See under Anatomy.) **Hodson and Chiang**—(See under Anatomy.) **Hartung, E. W.**—(See under Anatomy.) **Huckett, H. C.**—The subgenus Phorbia in North America, genus Hylemyia sens. lat. (Musc.). [18] 42: 109–25 (k*), 1947. **Hull, F. M.**—Some American syrphid flies. [73] 54: 230–40, 1947. **Krumholz, L. A.**—Reproduction in the western mosquitofish Gambusia affinis and its use in mosquito control. [25] 18: 1–43. **Lilly, A. H. R.**—(See under Anatomy.) **Lindquist and Wilson**—(See under Anatomy.) **Pallister, J. C.**—Giant fly (Pantophthalamus). [56] 57: 131. **Rings and Hill**—The taxonomic status of Aedes mathesoni. [65] 50: 41–49. **Sabrowsky, C. W.**—Winthemia citheroniae, new species, with notes on the correct name of W. cecropia (Larvaevor.). [65] 50: 63–67. **Satchell, G. H.**—(See under Anatomy.) **Tate, P.**—(See under Anatomy.) **Trehan, K. N.**—Biological observations on Trypanea amoena. [Indian Jour. Ent.] 8: 107–09, 1947. **Wilson and Gahan**—(See under Anatomy.)

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EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

Diptera—Tachinidae-Dexiidae wanted, No. Amer. and exotic. Will collect most orders in exchange or will purchase. P. H. Arnaud, 60 Woodrow St., Redwood City, Calif.

Will collect—Zoological and entomological specimens in tropical and subtropical parts of Peru. Jose M. Schunke, Pucallpa, Peru.

Wanted—Diplotaxis; will buy or exchange. E. W. Mange, 307 W. Walnut St., Hanover, Pa.

Hymenoptera-Aculeata (except ants and bees) for exchange. Will collect other orders in exchange. N. F. de Andrade, Casal Novo, S. João do Estoril, Portugal.

Meliponidae—Wanted, information on the bionomics, culture, and economic importance of the stingless bees, particularly of the Old World. P. Nogueira Neto, Av Cicade Jardim 170, S. Paulo, Brasil.

Wasps (Vespoidea, Sphecoidea, Chrysidoidea) of the world by exchange or purchase. Will collect other orders in exchange. D. G. Shappirio, 4811 17th St., N.W., Washington 11, D. C.

Lepidoptera—Large quantities of Plexippus, Colias, Cardui, Vanillae wanted for cash or exchange for tropical butterflies. G. MacBean, 710 Miller Rd., Sea Island, Vancouver, B. C.

Ants of the tribe Dacetini (*Strumigenys, Rhopalothrix* and related genera) wanted for world revision. W. L. Brown, Jr., Harvard University Biological Laboratories, Cambridge 38, Mass.

Mallophaga (on which immediate determination is not necessary) wanted for study and determination. R. L. Edwards, Dept. Biology, Harvard University, Cambridge 38, Mass.

Tingidae (Heteroptera) of the world wanted, in alcohol, with host and other ecological data. Will collect other orders in exchange. N. S. Bailey, 16 Neponset Ave., Hyde Park 36, Mass.

Bombidae, nearctic and neotropical, wanted for exchange, identification, or purchase. Will exchange in other groups for bumblebees. Barth Maina, Dept. Zool., Univ. of Chicago, Chicago 37, Ill.

Saturnidae of the world. Will purchase individual specimens or cocoons. F. E. Rutkowski, St. Bede College, Peru, Illinois, U. S. A.

Butterflies of New England, principally from New Haven, Conn., for exchange. Louis Clarke, 28 W. Elm St., New Haven 15, Conn.

RECENT LITERATURE

DIPTERA

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ENTOMOLOGICAL NEWS

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A New Species of Aphodius with Notes on Others (Coleoptera: Scarabaeidae)

By Mark Robinson, Springfield, Pennsylvania

Unless otherwise noted, the specimens used as the basis of this paper are in the collection of the author.

Aphodius (Platyderides) yukonensis new species

This species is allied to *phaeopterus* Leconte but is larger in size. Also in the older species the middle and posterior femora have many hairs on the posterior side. The greatest difference between the two species is in the secondary sexual characters of the anterior and middle tibial spurs. The spur on the anterior tibia of *phaeopterus* is not as long nor as stout and is less strongly curved than the corresponding, spur on *yukonensis.* In male specimens of the older species, the short spur of the middle tibia is one-third the length of the long spur and is abruptly turned inwards at the apex.

Elongate, parallel, moderately convex; disk of the head and thorax blackish, the rest of the body is dark reddish, setae yellowish; shining.

Clypeus shallowly emarginate, the angles on each side subacute. Genae moderately prominent, well rounded, fimbriate. The surface of the head is moderately coarsely and rather evenly punctured. The punctures are separated from one to three times their diameter. Frons with three ill-defined tubercles placed transversely.

Thoracic side margins slightly explanate, fimbriate. The anterior angles are well rounded while the posterior ones are very broadly rounded. The side margins are parallel and the posterior margin has the marginal line entire. The disk is moderately convex. The punctures are of two sizes, the finer series is evenly distributed over the disk; the coarser punctures are denser posteriorly and especially so laterally. These punctures are separated by about one-half their own diameter near the lateral margin.

Humeri of elytra obtuse. Sides weakly arcuate; fimbriate in anterior two-thirds. Striae well marked, deeply, crenately punctured. Intervals slightly convex, biseriately, finely punctured. The striae and intervals towards the side margins are a little more coarsely punctured.

Prosternum with a well rounded, densely hairy lobe. Mesosternum not carinate. Metasternum finely punctured, medially. Sides of metasternum coarsely, setigerously punctured. Abdominal segments alutaceous, finely punctured. Each of these abdominal punctures bears a decumbent hair.

The anterior tibia is tridentate, not crenate above the third tooth; these teeth are broad and blunt. Middle and posterior femur finely and sparsely punctured with a few hair-bearing, coarser punctures scattered between the finer ones. The apices of the middle and posterior tibiae are fimbriate with unequal spinules. The first joint of the posterior tarsi is subequal in length to the next three joints.

Male. Spur of anterior tibia longer than the first three tarsal joints. This spur is parallel in its basal part and widens as it curves inwards at right angles to an acute apex. The short spur of the middle tibia is a little over half as long as the long spur, curved inwards in distal one-third to an acute apex. Metasternum slightly concave in the center.

Length, 7.2 mm.; breadth, 3.0 mm.

Type. ♂; Whitehorse, Yukon, Canada, May 20, 1916 (J. A. Kusche). *Paratype.* ♂; with the same data as the type.

Aphodius aleutus Eschscholtz

1822. *Aphodius aleutus* Eschscholtz, Entomographien, Berlin, p. 27.

1907. *Aphodius plutonicus* Fall, Trans. Amer. Ent. Soc., XXXIII, p. 245.

Fall described *plutonicus* from a male example collected at south Fork Eagle Creek, White Mountains, New Mexico. This specimen has been examined but not dissected. Other examples agreeing with the type from New Mexico and Arizona have been dissected and the form of the male genitalia found to agree with specimens of *aleutus* from Alaska, Alberta and Quebec in Canada, and from Wyoming, Colorado, Pennsylvania, Maryland and North Carolina in the United States. Externally all of the above examples agree expect for a variation in color; the more northern specimens tend to be lighter in color with dark maculations on the elytra while specimens from Arizona, New Mexico, Colorado, Maryland and North Carolina are darker in color with the elytral maculations very vague.

Aphodius aleutus is described as having the spinules on the middle and posterior tibial apices even in length while in the type of *plutonicus* they are slightly uneven in length. This is a good example of a case in which the length of the tibial spinules is a misleading character as over the large series of specimens examined all variations of this character were noticed without any correlation as to locality or sex.

In view of the above information I feel it is best to drop the name *plutonicus* in favor of the older species *aleutus*.

Aphodius (Platyderides) leptotarsis Brown

1928. *Aphodius* (*Platyderides*) *leptotarsis* Brown, Can. Ent., LX, p. 15.
1938. *Aphodius* (*Platyderides*) *leptotarsis* Robinson not Brown, Ent. News, XLIX, p. 103.

A second specimen of this rare species was taken by the writer at Broomall, Pennsylvania on October 15, 1947 (flying in the afternoon). This specimen proves to be a female and as this sex has not previously been described the following remarks will help to separate it from the male.

Anterior tibial spur slender, gently down-curved to the acute apex. Short spur of the middle tibia straight, about half as long as the long spur, acute at the apex. The patches of hairs on the posterior margin of the middle and posterior tibia obsolete.

Length, 4.8 mm.; breadth, 2.2 mm.

The above specimen is designated the allotype of the species.

Aphodius (Platyderides) haldemani Horn

1870. *Aphodius politus* Horn, Tran. Amer. Ent. Soc., III, p. 128.
1887. *Aphodius haldemani* Horn, Tran. Amer. Ent. Soc., XIV, p. 33.
1928. *Aphodius* (*Platyderides*) *haldemani* Brown not Horn, Can. Ent., LX, p. 39.
1940. *Aphodius* (*Platyderides*) *magnificens* Robinson, Tran. Amer. Ent. Soc., LXVI, p. 144.

The type of Horn's species is represented in the collection of the Academy of Natural Sciences by a unique. At the time I described *magnificens* I stated, "I believe this species to be distinct from *haldemani* Horn because of its different color, coarse punctures on the pronotum denser, male anterior tibial spur is truncate and not oblique and the short spur of the middle tibia is prolonged inward and not rounded." Since this description was written I have examined two more males and a female of *haldemani* collected at College Station, Texas in the nest of *Geomys breviceps*. These male specimens agree with the type of *haldemani* in all characters noted by this author. In addition another character to separate the two species that has been overlooked is the lack of a tuft of hair on the middle and posterior trochanters of *haldemani*. The short spur of the female's middle tibia in *haldemani* is about half as long as the long spur while in female *magnificens* this spur is two-thirds as long as the longer spur.

Aphodius granarius Linnaeus

1758. *Scarabaeus granarius* Linnaeus, Systema Naturae, ed. 10, Holmiae I, p. 457.
1887. *Aphodius inutilis* Horn, Tran. Amer. Ent. Soc., XIV, p. 50.

An examination of the type of Horn's *inutilis* reveals it to be a small, light colored example of *Aphodius granarius*. The sutural elytral interval is as wide as the second interval which is one of the striking characters of Linnaeus's species. Dr. Horn placed *inutilis* in the group of *Aphodius* with long uneven spinules on the apex of the hind tibia while *granarius* he placed with the group having short, even spinules. The length of the spinules is a very confusing character and *granarius* is another species that might be placed in either group. The spinules on the specimens of *granarius* now before me vary so that some specimens could be referred to the group with long uneven spinules while others, probably due to wear, would be placed in the group with short equal spinules.

A New Species of Mayfly from Tennessee

By LEWIS BERNER, Department of Biology, University of Florida

While operating insect light traps on the campus of Tusculum College, Dr. Mike Wright collected males of a species of mayfly which he sent to me for identification. These specimens proved to be the new species described below. Subsequent collecting by Dr. Wright at another locality yielded additional males and a few females. Nymphs collected from a creek at Tusculum College were also sent for identification. Since at least two species were included in the nymphal series, it is not possible to assign a nymph to the adults with certainty; therefore, the description of the immature form is not presented in this paper.

Isonychia tusculanensis n. sp.

Adult males of *Isonychia tusculanensis* may be distinguished from those of other species by the brown coloration of the distal third of the mesothoracic wings. This new species appears to be most closely related to *Isonychia matilda* Traver from which it can be separated by the very strong coloration of the apical portion of its fore wings and its larger size. Traver states in her description of *I. matilda*,[1] "The apical third of the fore

[1] TRAVER, J. R. 1934. New North American species of mayflies (Ephemerida). Jour. Elisha Mitchell Sci. Soc. 50 (1 and 2): 248.

wing faintly tinged with brown, most noticeably on the outer margin." In *I. tusculanensis,* the coloration is very uniform and deep with a particularly heavy concentration in the stigmatic area (fig. 1).

Male imago: Body length 14.5 mm.; length of mesothoracic wings 13.4 mm.; length of caudal filaments 32 mm.

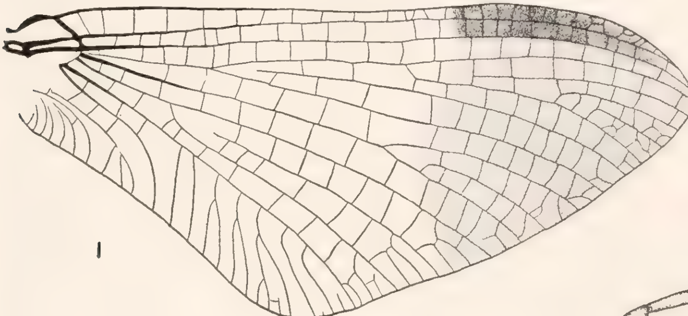
HEAD: Deep reddish-brown dorsally; rings at base of ocelli almost black. Large blackish-brown spot between antennal base and compound eye, and another ventral to antennal base. Basal segments and proximal half of flagellum of antenna reddish-brown; outer half of flagellum pale. Compound eyes almost contiguous dorsally; gray in color.

THORAX: Blackish-brown in color. No distinctive markings. Mesothoracic wings hyaline; distal third brown, clearly demarked from colorless basal two-thirds; stigmatic area somewhat darker brown. Venation light brown; stigmatic cross veins numerous, tending to anastomose (fig. 1). Metathoracic wings hyaline, colorless. Legs: Fore femur and tibia very dark black-brown; tarsal segments considerably lighter in color; tarsus slightly longer than tibia. Middle and hind legs yellowish-white; tarsal segments tinged with brown distally, with brown becoming more extensive on fifth tarsal segment; claws brown.

ABDOMEN: Mostly deep red-brown dorsally and ventrally. Segments 2–6 with a narrow translucent band girdling each segment anteriorly producing an annulate appearance. Dorsally, each segment with a narrow black band at posterior border. Segment 1 blackish-brown dorsally and ventrally. Tergites 7–9 slightly paler in mid-dorsal region and sternites 7 and 8 slightly paler than more anterior sternites. Sternite 9 rather pale due to chalky area in median portion of segment. Genitalia blackish-brown; forceps base deeply excavated apically with a tubercle at the base of the excavation; penes of the *albomanicata* type (fig. 2). Caudal filaments blackish-brown, paler apically; segments lighter in color at the joints.

Female imago: Body length 15.7 mm.; length of mesothoracic wings 16 mm.; length of caudal filaments 27 mm.

HEAD: Pale brown except for median stripe of reddish-brown. Postero-lateral angles of occiput black-brown; a pair of blackish-brown, submedian spots just anterior to occipital margin. Vertex with a narrow line of black-brown at lateral margins; band continues forward in front of compound eye expanding to form a wide bar between antennal base and compound eye. Antennae as in male.



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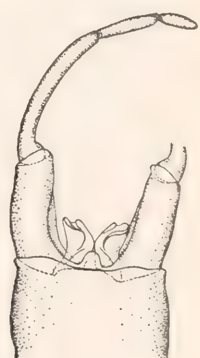

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ISONYCHIA TUSCULANENSIS n. sp.

Fig. 1. Fore wing of male.
Fig. 2. Male genitalia.
Fig. 3. Subanal plate of female.

THORAX: Pro- and mesonotum brown, except postscutellum which is fuscous. Metanotum fuscous. Thoracic sternites fuscous. Wings, hyaline, clear without coloration except stigmatic area; latter tinged with brown. Venation similar to that of male. Legs: Femur of fore leg brown in basal fourth, shading into black-brown in outer three-fourths; tibia black-brown; tarsus as in male. Middle and hind legs as in male.

ABDOMEN: Markings and color similar to those of male. Subanal plate deeply excavated (Fig. 3). Caudal filaments as in male.

Holotype: Male imago preserved in alcohol. Greene Co., TENNESSEE, Camp Creek. June 4, 1947. Collected by M. Wright. In collection of Museum of Zoology, University of Michigan. *Allotype:* Female imago preserved in alcohol. Same locality as holotype. June 10, 1947. In collection of Museum of Zoology, University of Michigan. *Paratypes:* 16 males, 6 females (many specimens imperfect). 8 males, 3 females in collection of Museum of Zoology, University of Michigan, other in author's collection. Greene Co., Tenn., Camp Creek. (2 males, 3 females, May 28, 1946; 3 males, June 4, 1947; 7 males, 2 females, June 10, 1947); Greene Co., Tenn. Tusculum College (1 male, April 23, 1946; 1 male, June 24, 1946; 1 male, July 15, 1946).

Announcement

The Academy of Natural Sciences of Philadelphia announces the addition to the honorary membership of the staff of its Department of insects, with the title of Research Associate, of the following entomologists of the Philadelphia areas: Mr. Mark Robinson, President of the American Entomological Society, a coleopterist well known for his systematic studies of the Scarabaeidae; Dr. Rudolf G. Schmieder, Assistant Professor of Zoology at the University of Pennsylvania, past-President of the American Entomological Society, and Editor of "Entomological News," whose experimental work with certain parasitic Hymenoptera is well known; and Dr. Charles Hodge, 4th, Associate Professor of Zoology at Temple University, whose entomological researches have been chiefly along anatomical lines.

Undescribed Species of Crane-Flies from the Western United States and Canada (Dipt.: Tipulidae). Part IX

By Charles P. Alexander, University of Massachusetts, Amherst, Massachusetts

The preceding part under this general title was published in Entomological News 58: 205–209, 1947. The flies described herewith are from Colorado, derived from various sources, as discussed under the individual species.

Prionocera fulvicauda new species

Allied to *proxima;* mesonotal praescutum with four entire brown stripes, the intermediate pair separated by a pale line, only on the cephalic portion this more blackened; male hypopygium with the posterior border of tergite having three pairs of lobes, the lateral pair short, microscopically setulose; submedian lobes directed mesad, pointed at tips; third set of lobes small, provided with coarse setiferous tubercles; inner dististyle with the rostrum relatively stout, with from 10 to 12 blackened peglike spines on lower margin near base.

♂. Length about 12 mm.; wing 13–14 mm.; antenna about 4 mm.

♀. Length about 17 mm.; wing 15 mm.

Frontal prolongation of head above black, including the nasus; ventral half yellow, becoming even clearer along the oral margin; mouthparts, including palpi, black. Antennae black, the apex of pedicel and base of first flagellar segment a trifle more reddened; proximal four flagellar segments with the lower apical angle slightly produced to give a serrate appearance; succeeding segments less evidently serrate. Head in front with a light silvery gray pruinosity, the pattern ending abruptly on the anterior vertex; dorsal portion of head with the central area of vertex infuscated, more intense medially and in the depressed areas behind the antennal bases; posterior orbits light gray, in cases more broadly so.

Pronotum gray, variegated medially with brown. Mesonotal praescutum gray, with four entire brown stripes, the intermediate pair separated by a short blackish line on the cephalic portion; on the posterior half or more the median vitta brownish gray, paler than the stripes; posterior sclerites of notum gray pruinose, scutal lobes vaguely patterned with brown; parascutella, posterior lateral portions of scutal lobes and the katapleurotergite yellow, remainder of pleurotergite and the pleura light gray; dorsopleural membrane buffy yellow. Halteres with stem obscure yellow, knob infuscated. Legs with the coxae light gray pruinose, paling to yellow at tips; trochanters yellow; femora obscure yellow, the tips narrowly but conspicuously brownish black or black, less clearly delimited on the fore legs; tibiae light brown, the tips darker; tarsi passing into black; claws (male) toothed. Wings with a weak brownish tinge, the costal border, and especially cell *Sc*, more yellowed; stigma medium brown; obliterative streak before cord relatively conspicuous, extending from before the stigma almost to the posterior margin in cell M_3; veins dark brown, more brownish yellow in the brightened fields. Venation: *Rs* relatively long, nearly four times *m-cu;* basal section of vein M_4 elongate, perpendicular.

Abdominal tergites dark gray, with a broad dark brown median stripe, interrupted by the very narrow yellow posterior borders of the segments; lateral tergal borders much more broadly yellow; sternites dark gray, the posterior margins of the outer segments more broadly yellow; hypopygium chiefly fulvous, including the styli, outer tergal lobes and much of the sternite. Ovipositor with the elongate cerci slightly decurved. Male hypopygium with the ninth tergite transversely rectangular, the posterior margin generally truncate but conspicuously lobed; lateral lobes small, obtuse at tips, densely microscopically setulose; submedian lobes much longer, narrowed to acute points, on slide mounts directed mesad, enclosing a broadly transverse median notch; immediately behind these lobes a slightly smaller pair of darkened lobes, more obtuse at tips, similarly directed mesad, their surface with coarse setiferous tubercles. Outer dististyle broadly expanded on proximal half or more, thence narrowed to the obtuse tip, the style broader in some specimens than in others. Inner dististyle with the rostrum elongate, a little expanded on outer portion; lower margin at the constricted part with about 10 to 12 small blackened peglike spines, just basad of this point with a small pale blade.

Habitat.—COLORADO. *Holotype:* ♂, Dream Lake, Rocky Mountain National Park, altitude 10,000 feet, July 18, 1941 (C. P. Alexander); not uncommon in a swale at outlet of lake. *Allotopotype:* ♀, pinned with type. *Paratopotypes:* 4♂♂.

The two species that require comparison are *Prionocera proxima* Lackschewitz and *P. unimicra* Alexander. The former occurs from northern and central Germany eastward to northern Korea, Amurland and Kamtchatka. It agrees with the present fly in the presence of blackened peglike spines on the inner dististyle, differing in all details of lobing of the ninth tergite, the more slender prolongation of the inner dististyle and in various colorational details. The Nearctic *unimicra* differs in the coloration of the head, antennae and other parts of the body, and in the structure of the male hypopygium. I am indebted to Dr. Henry K. Townes for a figure of the type of this species, showing the dorsal aspect of the ninth tergite. While the conformation of the lobes is somewhat the same, especially the lateral and submedian pairs, the third pair is much larger and directed caudad so as to appear on the profile of the posterior border.

Tipula (Trichotipula) mulaiki new species

Allied to *dorsolineata;* macrotrichia in cells of wing reduced to five or six in outer end of cell R_5; male hypopygium with the lateral lobes of the ninth tergite broad, the retrorse spinous setae not including the tips of the lobes; apex of inner dististyle only slightly produced; aedeagus of unusual length and stoutness, virtually as wide as the inner dististyle.

♂. Length about 12 mm.; wing 12.5 mm.
♀. Length about 14 mm.; wing 13 mm.

Described from alcoholic specimens. Frontal prolongation of head short, obscure yellow; nasus elongate; palpi brownish black. Antennae with basal two segments yellow; basal flagellar segments black, the remainder broken. Head above testaceous, the posterior vertex on either side with a major brownish spot.

Thorax chiefly brown, the dorsum with a conspicuous pale central stripe that extends the entire length of the mesonotum, a little narrowed on the scutum and mediotergite. Pleura obscure yellow, more or less variegated with brown. Halteres with stem pale, base of knob darker. Legs with the coxae brown; trochanters obscure yellow; femora yellow, the tips rather narrowly but conspicuously brownish black; tibiae obscure yellow, the tips even more narrowly darkened; tarsi obscure yellow basally, passing into black. Wings with a weak brownish tinge; stigma dark brown, conspicuous; cells *Sc* and Cu_1 paler brown but darker than the ground; a conspicuous whitish obliterative band across cell *1st* M_2, connecting with two narrow longitudinal streaks in cells *R* and *M* on either side of vein *M*, continued into cell M_3 almost to the outer margin, divided into two branches in the latter cell; similar double pale streaks in cells R_3, R_5, M_1, *2nd* M_2, M_4 and *1st A;* antestigmal and poststigmal brightenings present, the latter less distinct; veins brown. Five or six macrotrichia in outer end of cell R_5, lacking in the other cells; no stigmal trichia; no trichia on squama. Venation: Sc_1 preserved, erect; *Rs* shorter than the oblique *m-cu,* the latter connecting with vein M_4 beyond the base.

Abdominal segments brown, conspicuously variegated with paler, the bases of the segments broadly pale yellow, the posterior borders broadly brown, the latter color increasing in amount on the outer segments; in the male the pale color includes most of the mid-dorsum, continuing the pale median thoracic line; sternites more darkened on the sides. Male hypopygium having the caudal margin of the ninth tergite with a broad V-shaped notch, the margin with small blackened setae, those on the lobes stouter and retrorse, not reaching the apex, as in *dorsolineata*. Inner dististyle nearly parallel-sided, gently narrowed outwardly, the beak only a little produced, slightly upturned; basal lobe large, oval, about one-half as long as the style. Aedeagus of unusual length and stoutness, at its widest point virtually as broad as the inner dististyle; in *dorsolineata* the aedeagus is much narrower, less than one-half as wide as the inner dististyle. The apex of the outer dististyle of the type male is broken and its full size and shape is still unknown.

Habitat.—COLORADO. *Holotype:* alcoholic ♂, Eggers, Poudre Canyon, Larimer Co., August 7, 1941 (S. & D. Mulaik). *Allotopotype:* alcoholic ♀, presumably taken while mating.

I am pleased to name this interesting species for Professor Stanley B. Mulaik, to whom I am indebted for several interesting western Tipulidae. The most similar species is *Tipula* (*Trichotipula*) *dorsolineata* Doane, which differs most evidently in the structure of the male hypopygium, especially the ninth tergite, inner dististyle, and aedeagus.

Tipula (Lunatipula) sagittifera new species

Belongs to the *unicincta* group; general coloration of body light gray, the praescutum with four narrow reddish brown stripes; femora obscure yellow, the tips brownish black, preceded by a more or less distinct clearer yellow ring; wings with a weak brownish tinge, restrictedly patterned with darker brown, including the stigma; obliterative areas before stigma and across the cord conspicuous; abdominal tergites light brown, the fourth tergite conspicuously darker; male hypopygium with the appendage of the ninth sternite a simple depressed cushion; phallosome with two pairs of rods and an additional unpaired median structure, the latter stout, sagittate, the triangular apex subtended on either side by a slender spine; eighth sternite with a single major fasciculate bristle, the inner median group of setae only slightly modified, their tips produced into long filaments.

♂. Length about 17 mm.; wing 18.5 mm.; antenna about 4.1 mm.

Frontal prolongation of head yellow, light gray pruinose at base above; nasus small; palpi brownish black, the incisures restrictedly whitened. Antennae with scape and pedicel yellow, the latter somewhat paler; flagellum brownish black, the segments moderately incised; longest verticils exceeding the segments in length. Head above very light gray, the vertex with a capillary brown median vitta; setae of vertex black and very conspicuous against the ground, rising from slightly darkened punctures.

Pronotum gray, vaguely patterned with darker. Mesonotum light gray; praescutum with four narrow reddish brown stripes, the intermediate pair longer, somewhat constricted to nearly interrupted at near midlength; pseudosutural foveae pale; each scutal lobe with a major reddish area. Pleura and pleurotergite light gray, the ventral sternopleurite slightly darker; dorsopleural membrane yellow. Halteres with stem pale yellow, especially at base; knob infuscated, the apex narrowly whitened. Legs with the coxae light gray; trochanters yellow; femora obscure yellow, the tips brownish black, the amount subequal on all legs, on the fore pair including about the outer tenth, the black tips preceded by a vaguely clearer yellow ring; tibiae brownish yellow, the tips narrowly brownish black; tarsi light brown, the outer segments darker; claws (male) toothed. Wings with a weak brownish tinge; stigma darker brown; small and inconspicuous brown spots at end of vein *Sc* and over the anterior cord; *m-cu* and distal section of vein *Cu* vaguely seamed with brown; obliterative areas before stigma, before cord and across cell *1st* M_2 into base of cell M_3 conspicuous; no post-stigmal brightening; vague pale areas in the centers of cells M_1, *2nd* M_2, M_3 and M_4, near outer end of cell *1st A* adjoining vein *2nd A* and as a more extensive brightening beyond arculus in cells *R* to *1st A;* veins brown. Venation: *Rs* about twice *m-cu;* R_{1+2} entire; cell *1st* M_2 relatively small.

Abdominal tergites light brown, variegated with paler, the fourth tergite conspicuously darker brown, as in this subgroup of species; sternites clearer yellow; hypopygium chiefly brownish yellow. Male hypopygium with the lateral lobes of the ninth tergite relatively narrow, the subacute tips gently divergent; outer third of lobe without setae, transversely wrinkled. Ninth sternite with its appendage appearing as a large but low and compact cushion, the entire lower face appressed to the sternite; all but the dorsal end of the cushion provided with abundant long yellow setae but with no spinous points. Basistyle immediately above the appendage of the ninth sternite produced into a sclerotized flattened blade, densely provided with microscopic setulae; a lateral flange provided with a short row of long conspicuous setae. Outer dististyle with the blade very broad. Inner dististyle with the beak slender; lower beak an obtusely rounded blackened head; posterior crest of style long-extended, its margin hyaline, microscopically toothed. Phallosome including two pairs of rods and an additional unpaired element; largest paired blades unusually broad, the outer apical angle further produced into a long reddish spine, the inner apical angle obtusely rounded; inner paired blades much smaller; unpaired phallosomic element distinctive, stout, terminating in a triangular head, the lateral region at base of head produced into a slender spine on either side. Eighth sternite with a single major lateral seta, this from a short basal tubercle, completely fasciculate but evidently comprised of several elements; at its base a very much smaller fasciculate seta and two or three additional long normal ones; inner median group of bristles relatively numerous, flattened, their tips extended into long pale filaments; outer median cushion transverse, its outer edge very gently convex.

Habitat.—"Colorado and Montana." *Holotype:* ♂, without further geographical data and the state thus uncertain; July 6, 1926 (H. G. Dyar); United States National Museum. It is unfortunate that the type locality is not more certain.

The most similar described species of the *unicincta* group that have an unpaired median phallosomic element include *Tipula* (*Lunatipula*) *bigeminata* Alexander, *T.* (*L.*) *diacanthophora* Alexander, and *T.* (*L.*) *spatha* Doane. The present fly differs from these in the details of structure of the male hypopygium, including the tergite, appendage of the ninth sternite, phallosome, and the eighth sternite. In *diacanthophora*, the very modified inner group of setae of the eighth sternite are entirely different. Dr. Alan Stone has compared the present fly with the holotype specimen of *bigeminata* and indicates that the latter differs in the characters of the tergal lobes and their vestiture, the narrower outer dististyle, and the phallosome, including the longer paired rods, which are elongate and parallel to one another, and in the unpaired median element which is deeply forked.

Two Migrations of the Snout Butterfly, Libytheana bachmanii larvata (Strecker). (Lepidoptera: Libytheidae)

By Osmond P. Breland,[1] The University of Texas

The butterfly discussed in this paper has had the misfortune of having its name changed several times during the past few years. In fact, the family Libytheidae was for a long time considered as a subfamily of the Nymphalidae, although today most workers consider the group to be a separate family.

In older publications, before the species *bachmanii* was divided into subspecies, the species was referred to the genus *Hypatus*. From about 1934 until 1943, *bachmanii* was included in the genus *Libythea* (Michener 1943). In 1938, Field divided *Libythea bachmanii* Kirkland into two subspecies, *L. bachmanii bachmanii* Kirkland, and *L. bachmanii larvata* (Strecker).

Michener (1943) erected the genus *Libytheana* for the American species of *Libythea* which differ markedly from the European forms. The butterfly under discussion is at present recognized as *Libytheana bachmanii larvata* (Strecker). Its general distribution includes the southwestern United States and possibly parts of Mexico (Field 1938; Michener 1943). The general distribution of the other subspecies, *L. bachmanii bachmanii* Kirkland, is the eastern United States.

[1] The writer greatly appreciates the determination of the butterfly by William D. Field.

A recent summary of information relative to the migration of several butterflies, including the present species, is given by Williams (1938). This writer did not distinguish between the subspecies of *bachmanii,* and it may well be that some of his records for migrations east of the Mississippi River were actually *L. b. bachmanii* rather than *L. b. larvata.* Most of Williams' records were from Texas, but also included migrations in Indiana, Illinois, Nebraska and California. Since the paper by Williams was published, Rau (1941) has recorded a migration of this butterfly (referred to as *Libythea bachmanii larvata* (Stkr.) between McAllen and Edinburg, Texas. Williams states that most of his records from Texas show the migrants flying south and southeast, the three exceptions being one to the northeast and two toward the north. He has no records of migrations with a westerly component. The majority of the migrants observed by Rau were flying eastward, with a few stragglers occasionally drifting backward with the wind.

The present migration was first observed at Austin, Texas, August 27, 1947 at 1:30 P.M. The flight continued intermittently until the afternoon of August 31, after which a few individuals were seen for several days. During this period, several observations were made. The butterflies did not come as a continuous stream, but in groups, so that at times a particular area would be entirely free from the insects, and a few minutes later would be filled with fluttering butterflies. The height of the migrating insects was from near the ground up to 30 or 40 feet, with the majority about 15 to 20 feet above the ground. A number of specimens were caught in an insect net, and it was noted that the wings were not noticeably frayed as has been reported for many other migrating butterflies. Most of the insects were in continuous flight, and aside from a few entrapped in buildings, only an occasional individual was observed to alight. Another entomologist, however, reported to the writer that he had seen a crepe myrtle bush almost covered with the butterflies. No mating was seen, although a few pairs were observed flying along together.

The direction of flight was checked with a compass in several places across the migrating front, and found to be west and northwest. This is, so far as could be determined, the first record of a westward migration for this species in Texas (Williams 1938). At 4:00 P.M. on August 27, the migrating front was approximately 6 miles wide in this area.

On September 14, 1947 at 1:00 P.M. another migration of this same species was first noticed. These butterflies were flying east and southeast, in opposite directions from those in the first migration, and they may have been the same insects returning from the west and northwest.

This second migration differed from the preceding one primarily in that it appeared to be more leisurely. More butterflies were seen to alight, and a few were flying west and northwest in an erratic manner. These apparently leisurely, and at times erratic flights, may have been caused by the rather strong southeast wind against which the insects were flying.

Insect galls were especially attractive to the butterflies, from which they possibly derived some nutrition. Large numbers of the insects were observed clustered about galls, both large and small, of *Disholcaspis* sp. (Cynipidae) on live oak (*Quercus virginiana*). Here the butterflies competed with wasps and other insects that were likewise attracted by the sticky exudate on the outer surfaces of the galls.

This second migration continued for approximately two weeks, with only a few insects flying toward the latter part of the period. The last butterflies were seen September 27.

Summary

1. Two migrations of the snout butterfly, *Libytheana bachmanii larvata* (Strecker) are discussed.

2. In the first flight, the insects were flying west and northwest, while in the second, some two weeks later, the butterflies were flying east and southeast. It is possible that the same insects participated in the two migrations.

3. This observaton is, so far as known, the first record of a western and northwestern migration of this butterfly in Texas. Other directions of flight have included south, southeast, northeast and north.

4. A brief resume is given of recent changes in the nomenclature of this butterfly.

Literature Cited

Field, W. D. 1938. New forms and subspecies of North American Libytheidae and Lycaenidae. Journ. Kans. Ent. Soc. 11: 124–133.

Michener, C. D. 1943. Some systematic notes on the Libytheidae. American Museum Novitates, Number 1232.

Rau, P. 1941. Migrating butterflies, *Libythea bachmanii larvata* Stkr. in Texas. Ent. News 52: 277–278.

Williams, C. B. 1938. Recent progress in the study of some North American migrant butterflies. Ann. Ent. Soc. Amer. 31: 211–239.

Roswellia, a New Genus of Ithomines (Lepidoptera)

By Richard M. Fox, Carnegie Museum and the University of Pittsburgh

ROSWELLIA new genus

Fore leg of the male with the femur longer than the coxa; the tibia intact, not fused with the tarsus, slightly longer than the femur; tarsus with two joints separated by a non-articulating constriction so placed that the proximal joint is about three times the length the distal joint. Fore leg of the female with the femur longer than the coxa; tibia the same length as the femur; tarsus with five evident joints, a pair of spurs each on the first three joints, the terminal joint armed with pulvillus and a pair of microscopic claws.

Fore wing with R_2 arising at or just beyond the end of the cell; 1d minute to absent; 2d angled, a recurrent vein arising at the apex of the angle; 3d curved and the same length as 2d; cubitus apparently two-branched. Hind wing with the humeral vein strongly forked; 1d present, very short; 2d angled, bearing the recurrent vein; 3d strongly curved, twice the length of 2d; cubitus apparently three-branched; Sc evenly curved, not strongly S-shaped. Males with the hair patch complete, extending along the top of the hind wing cell just below the radius from the base to the end of the cell.

Male genitalia: tegumen and uncus separated by a strong suture; tegumen hood-like, confluent with the vinculum; uncus prolonged to a strong projection terminating in a minute hook; valve suboval, armed at its apex on the inner face with a long fang-like projection which is recurved posteriorad; sacculus forming an irregular bulge without an even dorsal margin; saccus as long as the tegumen plus uncus; juxta narrow, deep, V-shaped; penis slender, a little more than twice the length of the tegumen plus uncus, up-angled at a point one fourth of its length from the posterior tip; foramen of the penis one-third of the length of the penis.

Genotype: Athesis acrisione Hewitson, 1869.

The species included in *Athesis* by Haensch, 1909 (In Seitz), actually belong to three different genera. The genus *Patricia* Fox, 1940, received *dercyllidas, hewitsonii, demylus* and *oligyrtis*, and is not closely related to *Athesis* proper. *Roswellia* is rather closer, but the differences are deep; it comprises only *R. acrisione acrisione* and *R. acrisione deflavata.* These actions delimit *Athesis* to monotypic proportions, to include only the genotype *A. clearista clearista* and *A. clearista bassleri.*

Retaining as it does the two joints of the male fore tarsus, *Roswellia* is one of the most primitive genera of the Ithomiinae, if not the most primitive; this is a character shared with no other genus in the subfamily. *Roswellia* is separated from *Athesis* by the following additional points: the valve of *Athesis* has the sacculus cleanly delimited, forming a distinct in-folding with a curved dorsal margin, while the apex of the valve is armed with a very slender projection pointing anteriorad, not recurved to point posteriorad; the penis of *Athesis* is nearly straight, not up-angled; Sc of the hind wing in *Athesis* is strongly S-shaped, while in *Roswellia* it is nearly straight—otherwise the venation of the two genera is similar.

Perhaps it would have been more appropriate to have reserved the name *Roswellia* for use in the Hesperiidae, but since the present author has no new genus in that family, but does have this one, he siezes the opportunity to dedicate the genus to the late Roswell C. Williams, Jr.

Current Entomological Literature

COMPILED BY RAYMOND Q. BLISS AND THEODORE M. TELSCH.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, pertaining to the Entomology of the Americas (North and South), included 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.

This list gives references of the year 1948 unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

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 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. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

GENERAL—Anon.—Entangling alliances (editorial). [37] 41: 127–28. **Cory, E. N.**—Totalitarian insects. [37] 41: 1–4. **Essig, E. O.**—Mounting aphids and other small insects on microscopic slides. [60] 24: 9–22, ill., 1948. **Gerberich, J. B.**—Rearing house-flies on common bacteriological media. [37] 41: 125–26. **Hovanitz, W.**—A method of filing butterflies for the study of geographical variation. [5] 41: 48–50. **Leach, E. R.**—Biography of F. W. Nunenmacher. [60] 24: 1–5, ill., 1948. **Lerner and Dempster**—Some aspects of evolutionary theory in the light of recent work on animal breeding. [100] 2: 19–28. **Mittler and Bartha**—Brilliant cresyl blue as a stain for chromosome smear preparations. [Stain Technology] 23: 27–28. **Nolte, D. J.**—A modified technic for salivary-gland chromosomes. [Stain Technology] 23: 21–25. **Rohwer, S. A.**—Theodore Dru Alison Cockerell (Obit.). [65] 50: 103–08. **Townes, H.**—Pyrex bottles for potassium or sodium hydroxide solutions. [65] 50: 85. **Wheeler, N. H.**—Contribution of the U. S. Naval Medical School to zoological science in World War II. [5] 41: 41–47. **Weigel and Baumhofer**—Handbook on insect enemies of flowers and shrubs. [U. S. Dept. of Agric. Misc. Publ.] No. 626, pp. 115.

ANATOMY, PHYSIOLOGY, MEDICAL—Abdel-Malek, A.—Plant hormones (Auxins) as a factor in the hatching of Aedes trivittatus eggs. [5] 41: 51–57. **Albaum and Kletzkin**—Adenosine triphosphate from Drosophila melanogaster. [Arch. of Biochemistry] 16: 333–37. **Balazuc,**

J.—La teratologie des coleopteres et experiences de transplantation chez Tenebrio molitor L. [Memoires du Mus. Nat. de Hist. Naturell] 25: 1–293, ill. **Berland, L.**—La reproduction chez les insectes Hyménoptères. [L'Année Biologique] 24: 105–17. **Bessière, C.**—La spermatogenèse de quelques myriapodes diplopodes. [Arch. de Zool. Expérimentale et Général] 85: 149–236 and Pls. III–VII. **Bodine and Fitzgerald**—Changes in riboflavin during embryonic development as functions of the embryo. [Physiol. Zool.] 21: 93–100. **Brunson, M. H.**—Secondary parasites of the oriental fruit moth through Macrocentrus ancylivorus. [37] 41: 119–20. **Burnett, T.**—Modal temperatures for the greenhouse white-fly, Trialeurodes vaporariorum (Aleurod.), and its parasite Encarsia formosa, Aphelin.). [26] 29: 181–89. **Buser, J.**—Aspect histologique des phénomènes de métamorphose chez Piophila casei (Cyclomorphe). [Arch. de Zool. Expérimentale et Général] 85: 109–19 and Pls. I and II. **Callet, J.**—La réaction de l'homme aux piqures de moustiques. [Annales de Parasit.] 22: 233–34, 1947. **Carlson and Hollaender**—Mitotic effects of ultraviolet radiation of the 2250 Å region, with special reference to the spindle and cleavage. [105] 31: 149–73. **Caspari and Stern**—The influence of chronic irradiation with gamma-rays at low dosages on the mutation rate in Drosophila melanogaster. [Genetics] 33: 75–95. **Cazal, P.**—Recherches sur les glandes endocrines retrocérébrales des insects. II Odonates. [Arch. de Zool. Expérimentale et Général] 85: 55–82. **Chabaud, A. G.**—Les Arthropodes vecteurs de la peste bubonique. [Annales de Parasit.] 22: 169–200, 1947. **Chase, A. M.**—Effects of hydrogen ion concentration and of buffer systems on the luminescence of the cypridina luciferin-luciferase reaction (Crust.). [105] 31: 175–92. **Cooper, K. W.**—A new theory of secondary non-disjunction in female Drosophila melanogaster. [67] 34: 179–87. **Davies, L.**—Laboratory studies on the egg of the blowfly Lucilia sericata. [40] 25: 71–85.—Observations on the development of Lucilia sericata eggs in sheep fleeces. *Ibid.:* 86–102. **Dobzhansky, T.**—Genetics of natural populations. XVI. Altitudinal and seasonal changes produced by natural selection in certain populations of Drosophila pseudoobscura and D. persimilis. [Genetics] 33: 158–76. **Dobzhansky and Epling**—The suppression of crossing over in inversion heterozygotes of Drosophila pseudoobscura. [67] 34: 137–41. **Dollfus and Carayon**—Larve de cestode chez un Hémiptère-Hétéroptère. [Annales de Parasit.]

22: 226, 1947. **Finkel, A. J.**—The lipid composition of Tenebrio molitor larvae. [Physiol. Zool.] 21: 111–33. **Henry, L. M.**—The nervous system and the segmentation of the head in the Annulata. (continued). [50] 13: 1–26. **Hovanitz, W.**—Differences in the field activity of two female color phases of Colias butterflies at various times of the day. [Contributions from the Laboratory of Vertebrate Biology, Univ. of Michigan.] No. 41: 1–37. **Hsu and Tiu**—Microgeographic analysis of chromosomal variation in a Chinese species of Chironomus. [100] 2: 49–57. **Huskins, C. L.**—The subdivisions of the chromosomes and their multiplication in non-dividing tissues: possible interpretations in terms of gene structure and gene action. [3] 81: 401–34, 1947. **Jung, W.**—Ernährungsversuche an Carabus-Arten. [Entomologische Blätter] 36: 117–24, 1940. **Kodani, M.**—The protein of the salivary gland secretion in Drosophila. [67] 34: 131–35. **Kugler and Birkner**—Histochemical observations of alkaline phosphatses in the integument, gastrolith sac, digestive gland, and nephridium of the crayfish. [Physiol. Zool.] 21: 105–10, ill. **Kuitert, L. C.**—Observations on Anopheles leucosphyrus at Shingbwiyang, Burma. [65] 50: 77–82. **Lühman, M.**—Beiträge zur biologie de Chrysomeliden. [Entomologische Blätter] 36: 8–11, ill., 1940. **Maas, W. K.**—Spectrophotometric and chromatographic absorption analysis of the red eye pigment of Drosophila melanogaster. [Genetics] 33: 177–90. **Madel, W.**—Zur kenntnis der biologie einiger Dermestes-arten. [Entomologische Blätter] 36: 145–48, ill., 1940. **Mason, H. C.**—Chremylus rubiginosus, a braconid parasite of the casemaking clothes moth. [5] 41: 28–40. **Newcomer, W. S.**—Embryological development of the mouth parts and related structures of the milkweed bug, Oncopeltus fasciatus (Hetero.). [44] 82: 365–411. **Palm, N.-B.**—Normal and pathological histology of the ovaries in Bombus, Latr. (Hymenopt.). [Opuscula Entomologica] Supp. VII: 1–101, ill. **Panouse, J. B.**—Les corrélations humorales chez les Crustacés. [L'Année Biol.] 23: 33–70, 1947. **Rapp, W. F.**—The number of gastric caeca in some larval Scarabaeoidae. [23] 79: 145–47, 1947. **Reed and Reed**—Morphological differences and problems of speciation in Drosophilia. [100] 2: 42–48. **Revell, S. H.**—Controlled X-segreation at meiosis in Tegenaria. [Heredity] 1: 335–47, ill., 1947. **Shull, A. F.**—Natural hybrids of subspecies of Hippodamia quinquesignata (Coccinell.). [100] 2: 10–18. **Spencer and Stern**—Experiments to test the validity of the linear r-dose/mutation frequency relation in Drosophila at low dosage. [Genetics] 33: 43–74. **Stern, C.**—Negative heterosis and decreased effectiveness of alleles in heterozygotes (D. melanogaster). [Genetics] 33: 213–19. **Timon-David, J.**—Pigments des insects. [L'Année Biol.] 23: 237–71, 1947. **Tobias, J. M.**—Potassium, sodium and water interchange in irritable tissues and haemolymph of an omnivorous insect, Periplaneta americana. [105] 31: 125–42.—The high potassium and low sodium in the body fluid and tissues of a phytophagous insect, the silkworm Bombyx mori, and the change before pupation. *Ibid.:* 143–48. **Uvarov, B. P.**—Recent advances in Acridology. Anatomy and physiology of Acrididae. [88] 99: 1–75, ill. **Villee, C. A.** Studies in biochemical genetics in Drosophila. [Jour. Gen. Phy.] 31: 337–45. **Wagner and Mitchell**—An enzymatic assay for studying the nutrition of Drosophila melanogaster. [Arch. of Biochemistry] 17: 87–96. **Walshe, B. M.**—The oxygen requirements and thermal resistance of chironomid larvae from flowing and from still waters. [40] 25: 35–43. **White, M. J. D.**—The chromosomes of the parthenogenetic mantid Brunneria borealis. [100] 2: 90–93. **Wigglesworth, V. B.**—The functions of the corpus allatum in Rhodnius prolixus (Hemi.). [40] 25: 1–14, ill.

ARACHNIDA AND MYRIOPODA—Bessière, C.—(See under Anatomy.) **Chamberlin, R. V.**—Some records and descriptions of Diplopods chiefly in the collection of the Academy (Nat. Sci. Phila.). [62] 49: 21–58, 1947. **Furman, D. P.**—Liponyssus pacificus, Ewing, a synonym of L. sylviarum (C. F.) (Dermanyssid.). [60] 24: 27–8, ill. **Kohls and Parker**—Occurrence of the brown dog tick in the western states. [37] 41: 102. **Loomis and Hoffman**—Synonymy of various Diplopods. [63] 61: 51–54. **Revell, S. H.**—(See under Anatomy.) **Thurman and Branch**—United States records of Typhlodromus mariposus from rats in Florida. [37] 41: 102.

SMALLER ORDERS—Cazal, P.—(See under Anatomy.) **Chabaud, A. G.**—(See under Anatomy.) **Crawford, J. C.**—A new species of Frankliniella on Hemerocallis (Thysan., Thrip.). [65] 50: 83–84. **Emerson, K. C.**—Notes on the Menoponidae of North America, I (Mallophaga). [23] 79: 135–41, 1947. **Fuller, H. S.**—Dr. C. Andersen Hubbard on fleas of western North America—A review, with critical notes (Siphon.). [18] 43: 1–17. **Montgomery, B. E.**—The distribution and relative seasonal abundance of Indiana species of five families of dragonflies (Calopterygidae, Petaluridae, Cordulegasidae, Gomphidae, Aeshmidae). [Proc. Indiana Acad. Sci.] 56: 163–69, 1947. **Ross, H. H.**—New nearctic Rhyacophilidae and Philopotamidae (Trich.). [5] 41: 17–26 (k).

ORTHOPTERA—Bodine and Fitzgerald—(See under Anatomy.) **Carlson and Hollaender**—(See under Anatomy.) **Gurney, A. B.**—The taxonomy and distribution of the Grylloblattidae. [65] 50: 86–102. **Knowlton, G. F.**—Vertebrate animals feeding on the Mormon cricket. [1] 39: 137–38.—Grasshoppers in turkey's crop. [18] 43: 29. **Rehn, J. A. G.**—Notes on the phasmid genus Isagoras (Phasmat., Pseudophasmat.) with the description of six new species. [62] 49: 1–19, 1947. **Roberts, H. R.**—Revision of the Mexican Melanoplini (Acrid., Cyrtacanthacrid.), Part I. [62] 49: 201–30, ill., 1947. **Tobias, J. M.**—(See under Anatomy.) **Uvarov, B. P.**—(See under Anatomy.) **White, M. J. D.**—(See under Anatomy.)

HEMIPTERA—Burnett, T.—(See under Anatomy.) **Dollfus and Carayon**—(See under Anatomy.) **Dupuis, C.**—Nouvelles données biologiques and morphologiques sur les Diptères Phasiinae parasites d'Hémiptères Hétèroptères. [Annales de Parasit.] 22: 201–32, 1947. **Hottes, F. C.**—Two new species of Aphiidae. [63] 61: 33–40.—Descriptions of the sexual forms of some species of Aphiidae. *Ibid.: 29–32.* **Knowlton, G. F.**—Boxelder bugs feeding on honeybees. [18] 43: 17. **Metcalf and Bruner**—Cuban Flatidae with new species from adjacent regions (Homo.). [5] 41: 63–118 (k). **Newcomer, W. S.**—(See under Anatomy.) **Wigglesworth, V. B.**—(See under Anatomy.) **Wilson, Kelsheimer, Griffiths and Tissot**—Preliminary report on the control of green peach aphid on shade grown tobacco in Florida. [31] 30: 45–56.

LEPIDOPTERA—Beck, E. W.—Status of the European corn borer, (Pyrausta nubilalus.), 1947. [U. S. Dept. of Agric. Insect Pest Survey] No. 4 Supp.: 1–16, ill., 1947. **Chermock, R. L. and O. D.**—Notes on the life history of three Flordian butterflies. [23] 79: 142–44, 1947. **Hovanitz, W.**—(See under Anatomy and General.) **Kiriakoff, S.**—Nomenclature of the specific complex. [Lepidopterist News] 2: 15–6, ill. **Mason, H. C.**—(See under Anatomy.) **Tilden, J. W.**—Aestivation in larvae of Arachnis picta picta P. (Arctiidae). [60] 24: 31, 1948. **Tobias, J. M.**—(See under Anatomy.)

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EXCHANGES

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These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

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A Re-Definition of the Tribe Edrotini (Coleoptera: Tenebrionidae)

By Ira La Rivers, University of California, Berkeley

Through the kindness of anthorities of the British Museum, I recently had an opportunity to see the type of Champion's *Pimeliopsis*. Since some recent additions have been made in *Edrotes*, this seems an opportune time to re-define the tribe.

In his major revision of 1870, Dr. George H. Horn listed *Edrotes* in the tribe *Epiphysini* with the type genus, *Epiphysa*, from south Africa. The same arrangement was followed in the Le Conte-and-Horn 1883 "Classification." In 1892, George C. Champion described the new genus and species *Pimeliopsis granulata* with the notation:

"The above generic name is proposed for a single species from Western Mexico, for the discovery of which we are indebted to Mr. H. H. Smith. *Pimeliopsis* belongs to the tribe 'Epiphysides' of Lacordaire, and is allied to the North-American genus *Edrotes*, from which it differs in the form of the head and other particulars. The single species has very much the facies of a small *Pimelia*." The two specimens came from "Mexico, Venta de Zopilote in Guerrero 2800 feet."

The first use of the tribe *Edrotini* to include only *Edrotes* and *Pimeliopsis* can be ascribed to Thomas L. Casey, who introduced the term in his comprehensive 1907 report. He characterized and keyed the two genera as well as 14 species of *Edrotes*, 10 of which he described as new, having once previously (1890) added two species to the basic two provided by Say and Le Conte; he wrote that *Pimeliopsis* was "unknown to me in nature." Perhaps this was fortunate. Hans Gebien catalogued the two genera in the subfamily Edrotinae in 1911, later returning to the more favored tribal concept for the two (1937).

The generic components of *Edrotini* may be modernly characterized as follows:

Anterior prothoracic angles attenuate-spinous (*Edrotes*) to blunt-spinose (*Pimeliopsis*), extending anteriad to leading margins of eyes (*Edrotes*) or not quite to middle of eyes (*Pimeliopsis*); prothoracic and elytral dorsa dissimilar (prothorax thickly-beset with sharply-defined pits, elytra with numerous, sharp tuberculations, more-or-less longitudinally-arranged = *Pimeliopsis*) to similar (*Edrotes*); vestiture of short, golden hairs, each arising posteriad of a tubercle (*Pimeliopsis*), or of either long flying hairs or short, flattened, scale-like hairs (*Edrotes*); antennae stout, short, not much more than attaining posterior prothoracic angles when stretched caudad (*Pimeliopsis*) to slender, long, and distinctly surpassing hind prothoracic angles when stretched caudad (*Edrotes*); viewed laterad, prothorax and elytra on the same plane (*Pimeliopsis*) or prothorax on a much lower plane than elytra (*Edrotes*); epistoma hanging down over labrum, terminating in a definite tooth situated on the median line, the entire epistomal shelf extending laterad and forming prominent shelves over the antennal insertions (*Pimeliopsis*) to epistoma not covering labrum, truncate (not toothed) in front, not forming a continuous shelf across front of head (*Edrotes*); form globose (*Edrotes*) to distinctly elongate (*Pimeliopsis*); viewed dorsad, general form subparallel, anterior end appearing abruptly truncate (*Pimeliopsis*) or general form distinctly attenuate cephalad, appearing to come to a point (*Edrotes*).

Specific components of the tribe are:

Pimeliopsis granulata Champion 1892—foretibial distal spines not extending beyond end of first tarsal segment

Edrotes—foretibial spines subequal to first two tarsal segments combined

arens La Rivers 1947—dorsal vestiture short, scale-like

—dorsal vestiture long (= 'flying hairs')

ventricosus Le Conte 1851—dorsum minutely-tuberculate, shining

rotundus (Say) 1824—dorsum coarsely-impunctate, dull.

Although the fifteen specific names Casey applied to *Edrotes* have been synonymized (La Rivers 1947), as well as the three erected by Blaisdell, it is certain some of these will have an application on the subspecific level when enough material is on hand to determine the extent and nature of geographic variability in the genus. Problems in polytypism are especially prevalent in such genera of my experience which inhabit the high, broken intermontane West; the area, particularly of the Great Basin, exhibits not only the normal horizontal gradients but multitudinous local vertical gradients which, by virtue of aridity, greatly multiply and localize microënvironments. Such terrestrial animals as *Eleodes, Edrotes, Trogloderus* and *Stenopelmatus* all exhibit, in our present stage of knowledge, an as yet bewildering array of unsegregated variants, about which not enough is known to produce any kind of recognizable distributional pattern; only the clines produced by latitudinal gradients are yet obvious. Both *Eleodes* and *Edrotes* have been the objects of an excessive amount of taxonomic refinement-of-detail, particularly the former, all emphasis being upon morphological minutiae with no attempt to evaluate populations so-limited in terms of ecologic response, limits of genetic variability or relations to adjacent populations.

Genus **PIMELIOPSIS** Champion

Pimeliopsis Champion 1892, Biol. Centr.-Amer. Coleop. 4(1): 477. Casey, 1907, Proc. Wash. Acad. Sci. 9:450. Gebien, 1937, Mus. Ent. "Pietra Rossi" 15(2): 144. Blackwelder, 1945, U.S.N.M. Bull. 185(3): 514.

Pimeliopsis granulata Champion

P. granulata Champion 1892, Biol. Centr.-Amer. Coleop. 4(1): 477. Casey, 1907, Proc. Wash. Acad. Sci. 9:450. Gebien, 1937, Mus. Ent. "Pietra Rossi" 15(2): 144. Blackwelder, 1945, U.S.N.M. Bull. 185(3): 514.

This little-known species is extremely rare in collections, due possibly to the exigencies of collecting, perhaps to a real scarcity in nature. At any rate, practically all citations to it in the literature since its description are merely catalog listings. To my knowledge, nothing is known of its biology. The Hoogstraal expeditions to Michoacan, adjacent to Guerrero, collected widely and successfully in the Tenebrionidae, but were never able to locate *Pimeliopsis,* although no specific efforts were made in its particular behalf. In fact, not enough is known of the species' habits to give a clue as to what type of specialized collecting would be most successful in locating it, if such collecting is needed.

Genus **EDROTES** Le Conte

Pimelia, Kirby, 1837, Fauna Boreali-Amer. 4: 232. Blaisdell, 1909, U.S.N.M. Bull. 63: 3.

Edrotes Le Conte 1851, Ann. Lyc. Nat. Hist. N. Y. 5: 140–141. Blaisdell, 1909, U.S.N.M. Bull. 63: 3. Leng, 1920, Cat. Coleop.: 222. Leng & Mutchler, 1927, Suppl. Cat. Coleop.: 34. Gebien, 1937, Mus. Ent. "Pietra Rossi" 15(2): 144. Blackwelder, 1945, U.S.N.M. Bull. 185(3): 514. La Rivers, 1947, Ann. Ent. Soc. Amer. 40(2): 318.

The generic and specific citations here given are additions to those I recently listed (1947).

Subgenus **Edrotes** Le Conte

Subg. *Edrotes,* La Rivers, 1947, Ann. Ent. Soc. Amer. 40(2): 321.

Edrotes ventricosus Le Conte

E. ventricosus Le Conte 1851, Ann. Lyc. Nat. Hist. N. Y. 5: 141. Leng, 1920, Cat. Coleop.: 222. Leng & Mutchler, 1927, Suppl. Cat. Coleop.: 34. Gebien, 1937, Mus. Ent. "Pietra Rossi" 15(2): 144. Blackwelder, 1945, U.S.N.M. Bull. 185(3): 514. La Rivers, 1947, Ann. Ent. Soc. Amer. 40(2): 321.

Since my synopsis (1947) I have seen a specimen of *E. ventricosus* from the Kenneth M. Fender collection, taken by Mr. Fender in eastern Oregon. While its presence in Oregon had been suspected, and possibly as far north as eastern Washington, this is the first specimen I have seen from the area.

Edrotes rotundus (Say)

Pimelia rotunda Say 1824, Jour. Acad. Nat. Sci. Phila. 3: 251–252. Kirby, 1837, Fauna Boreali-Amer. 4: 232. Blaisdell, 1909, U.S.N.M. Bull. 63: 3.

Edrotes rotundus, Leng, 1920, Cat. Coleop.: 222. Gebien, 1937, Mus. Ent. "Pietra Rossi" 15(2): 144. Blackwelder, 1945, U.S.N.M. Bull. 185(3): 514 (as the synonym *E. desertus* Blaisdell 1943). La Rivers, 1947, Ann. Ent. Soc. Amer. 40(2): 325.

Subgenus **Odrotes** La Rivers

Subg. *Odrotes* La Rivers 1947, Ann. Ent. Soc. Amer. 40(2): 320.

Edrotes arens La Rivers

E. arens La Rivers 1947, Ann. Ent. Soc. Amer. 40(2): 320.

Data on size of the species were omitted from the recent review (1947) in which it was described, and are here included: length 7 mm., width 5 mm.

References

Blackwelder, R. E. 1945. Checklist of the coleopterous insects of Mexico, Central America, the West Indies and South America. U.S.N.M. Bull. 185 (3): 343–550.

Blaisdell, F. E., Sr. 1909. A monographic revision of the Coleoptera belonging to the Tenebrionide tribe Eleodiini inhabiting the United States, Lower California and adjacent islands. U.S.N.M. Bull. 63: xi + 524.

Casey, T. L. 1907. A revision of the American components of the tenebrionid subfamily Tentyriinae. Proc. Wash. Acad. Sci. 9: 275–522.

Champion, G. C. 1892. Tenebrionidae. Biol. Cent.-Amer. Coleoptera 4 (1): xxxii + 572.

Gebien, H. 1937. Katalog der Tenebrioniden (Coleoptera Heteromera). Teil I. Museo Entomologico "Pietro Rossi," pp. 1–381.

La Rivers, I. 1947. A synopsis of the genus Edrotes (Coleoptera: Tenebrionidae). Ann. Ent. Soc. Amer. 40 (2): 318–328.

Contributions to the Knowledge of Chinese Coccinellidae. IX. On a New Serphid Parasite of the Larva of Epilachna admirabilis in Kunming [1]

By C. L. Liu, Division of Entomology, Institute of Agricultural Research, Tsing Hua University

The first specimen of this new parasite to come under observation emerged from a second or early third instar larva of *Epilachna admirabilis* Crotch fifteen days after its collection on August 23, 1941, in the environs of Kunming (Wang Chia Chiao, a village northwest of the city). The extraordinary position assumed by the parasite in relation to its host at once attracted attention, and subsequent search was made over a number of years for additional specimens. These are not rare if the collecting of parasitized hosts is made at the right season. When specimens were sent to Dr. C. F. W. Muesebeck for identification, the writer was informed that the parasite represented a new species of an apparently undescribed genus. Upon the request of the writer, Dr. Muesebeck kindly consented to prepare a description of the species to be published at a later date.

A parasitized host may be readily recognized by a slight bulge near the middle of the posterior half of the venter. This prominence continues to enlarge until the host integument is ruptured to let through the head and thorax of the parasite pupa. The protruding pupa is so oriented to the host that the dorsum of its abdomen is in contact with the interior of the dorsal integument of the host, while the exposed cephalothoracic region has its ventral side lying against the exterior of the host venter. The cephalothoracic portion is bent at an angle with the abdomen at the junction of these regions, so that the parasite head is directed toward that of its host. With further development, when the greater part of the parasite abdomen becomes exposed, its head may be directly over the hypognathous mouthparts of

[1] Paper No. 33 of the Division of Entomology.

the host. The long slender antennae extend in a graceful curve from the head along the sides to the posterior margin of the third abdominal segment. When the imago effects its departure, its pupal skin is left more or less intact within the emptied host.

The exceptional position assumed by this species, during its pupal development, in relation to its host is extraordinary but not unique, for other serphids (e.g., *Exallonyx philonthiphagous* Williams in Hawaii) have been observed to adopt a similar posture. In the present case, at least, a probable explanation of this situation is forthcoming from the fact that the parasite, in spite of its size which would lead one to expect a delay in its pupal transformation until the host larva has attained maturity, perfers the third instar and even, in some cases, the second. The slight differential between the size of the parasite and that of its host makes necessary the rupturing of the host integument to permit of further development. Also the fact that the mature larva directs its head caudad of the host may be viewed as an adaptation which obviates possible injury by the host mandibles and legs while the protruded pupa is still soft and vulnerable.

Slender and graceful, the adult parasite is very agile after eclosion from its pupal skin. It may be kept alive on a diet of honey and water, and in one case it lived from October 7 to November 24, 1945, a total of forty-eight days. It may be noted that in this particular case the sugar content of its food was considerably increased after October 21 when other adults began to show signs of not surviving November, which was also the experience in 1941.

Such is their oviposition urge that two parasites were observed to attempt oviposition in their dead hosts. So when several parasites had issued, experimental oviposition was tried with the view to working out the life history. Unfortunately *E.* admirabilis does not readily lend itself to laboratory rearing, and, as a consequence, four collected larvae were used. From these three parasites developed, but of course the possibility of previous oviposition was not excluded. Later seventeen laboratory bred larvae of *Epilachna vigintioctopunctata* F. (ten third and seven fourth instars) were exposed. In no case did any parasite develop, although one parasite was seen to insert her ovipositor for over ten minutes into a fourth instar larva and another followed with a brief stab into the same host. On the same food plant, *Clematis Peterae* H.-M., lives another species, *Epilachna hauseri* Mader, but from it no parasite of this species has been reared. This probably indicates a high specificity of this parasite, which may, in turn, account for its rather infrequent occurrence. It may be added that so far as our experience indicates, Wang Chia Chiao seems to be the only fruitful collecting ground, although a few have also been recovered from hosts collected from the village Luh Liang Hsiang.

The host shows first signs of parasitization by a considerable period of fasting, followed by a general darkening and shriveling of the body. At this time the bulge on its venter becomes discernible and soon the integument is ruptured by the protruding pupa. The host invariably dies and the solitary parasite issues in time. Since the beetle feeds on a plant of some slight value as a medicinal herb, this parasite may be considered beneficial from that point of view. The interesting point, however, is that this is one of the rarer cases in which the serphid attacks a phytophagous host.

Although the adult parasite was found to have emerged on February 5, 1945, our repeated experience definitely indicates that the wasps appear much later in the season. Emergence records both for the field and laboratory, covering a period from September 1 to October 23, show a maximum issuance during the forty days shared between these months. Although the epilachnine beetle can be collected throughout the year, a third instar larva was found in January, mating occurred in February and eggs were laid in March, the larvae are abundant only during the months of July to October. This may have something to do with the late appearance of the parasite. But whether it tides over the intervening period by utilizing an alternate host or is it able to locate the very scarce winter larvae must await future elucidation, as the present note must be concluded with the impending departure of the writer from Kunming.

Two New Species of Neotropical Scarabaeidae (Coleoptera)

By Mark Robinson, Springfield, Pennsylvania

Trichillum pilosus new species

This hairy species differs from *bradyporum* Boucomont by its larger size, differently shaped clypeus and by the closeness of the coarse punctures on the head and pronotum. It does not appear to be near any other species in this genus.

Orbicular; piceous, the legs dark reddish; shining. Each puncture on the head, pronotum and elytral intervals bears a rather long, yellowish-brown hair.

The clypeus is quadridentate, the two inner teeth are parallel-sided to the acute tip while the outer teeth are triangular in outline and not as long as the inner teeth. The edges of the clypeus and head are narrowly raised. The eyes are ovate in outline. Entire surface of clypeus and head coarsely punctured, the punctures being separated by about twice their diameter.

Thorax widest about the middle. Near the lateral margins is a raised, rounded knob that is black in color and not as closely punctured as the surrounding area. The coarse punctures of the pronotum are separated by about half their diameter laterally and about twice their diameter medially.

The elytral striae are narrow and shallow, with regularly spaced, crenate punctures. The intervals are barely convex with a row of coarse punctures alongside of each stria. The sixth interval is raised into a rounded ridge from the humeri to the apical edge. The other intervals are also raised into a rounded ridge near the apical edge.

The anterior tibia is triangular in outline, tridentate with the teeth becoming successively smaller from the anterior one. The middle and posterior femora and tibiae are coarsely, setigerously punctured. The ventral sutures are obliterated medially.

Length, 3.1 mm.; breadth, 2.1 mm.

Type.—? sex; Barro Colorado Island, Canal Zone, November 22–24, 1944 (R. H. Arnett, Jr.). In the collection of Cornell University, number 2409.

Paratype.—? sex; with the same data as the type. In the collection of the author.

Anomala chapini new species

This species is probably most closely allied to *popayana* Ohaus. The coarser and denser punctation throughout plus the difference in color should separate *chapini* from the older species.

I take a great deal of pleasure in naming this species after my good friend Dr. Edward A. Chapin who is always so helpful in furthering one's studies in Entomology.

Ovate; shining; black with a reddish tint on the head, thorax and underparts. The elytra are ferruginous with an irregular, transverse black band across the middle. The sutural costae, humeri, outer margin and the apical half of the first, second and third costae are black.

Clypeus truncate in front with the angles broadly rounded. The clypeal edge is well reflexed. The surface of the clypeus is scabrous with coarse punctures intermixed. The clypeal suture is scarcely evident. Near the clypeal suture the frons is coarsely sometimes confluently punctured. On the vertex the coarse punctures are separated from one to two times their diameter.

Thorax widest about the middle. The side margins converge rather strongly from this median area to the anterior angles. The side margins in the posterior half are gently converging to the well rounded hind angles. The posterior marginal line is interrupted medially. There are several long hairs arising along the pronotal side margins. The surface of the pronotum is coarsely punctured. These punctures are separated from half to once their own diameter laterally; on the disk they are separated from two to four times their diameter. Each puncture on the pronotum bears a very short, light colored hair.

The elytral puctures are coarse and shallow, each bearing a very short, light colored hair. The costae are practically impunctate. The sutural interval is confusedly punctured while the other intervals have a single row of punctures. The scutellum is punctured about the same as the thoracic disk.

The pygidium is very roughly, scabrously sculptured with a few light colored, short hairs scattered over the surface. The anterior tibia is bidentate. Metasternum is not protuberant. The abdominal segments have a band of hair-bearing, semi-areola shaped punctures. The large tarsal claws on the anterior and middle legs are cleft.

In the male the larger anterior tarsal claw is larger than in the female.

Length, 12.3 to 16.0 mm.; breadth, 6.5 to 9.0 mm.

Type.—♂; Lasmercedes, Santa Clara, Costa Rica. December 21 (F. Nevermann). In the collection of the United States National Museum, number 58770.

Allotype.—♀; Verres, Costa Rica (A. Alfaro). In the collection of the Academy of Natural Science, Philadelphia.

Paratypes.—1♂ with the same data as the type. 1♂; Hamburg Farm, Reventazon, Ebene Limon, Costa Rica. May 24 (F. Nevermann). 1♀ with the same data as the Allotype. 1♀; Costa Rica (F. Nevermann).

Paratypes are in the collections of the United States National Museum, of The Academy of Natural Science, Philadelphia, and of the author.

A New Species of the Genus Tachytes from Michigan (Hymenoptera: Larridae)

By R. R. Dreisbach, Midland, Michigan

In comparing a number of species of this family with the types at the Museum of Comparative Zoology at Cambridge, the species in question appeared to be new and is herewith described.

Tachytes quadrifasciatus n. sp.

Holotype male: Color, black with the following exceptions: mandibles, from base to the emargination, labial and maxillary palpi (except basal joint of each which is black), sockets and basal joint of antennae in front, tegulae, the tips of all the femora, the apical half of fore femur on front and about one-third of apical part of middle femur on anterior edge, all the tibiae and tarsi, golden yellow; the very large pulvillae of claws, much darker; tips of mandibles beyond notch, dark red. The head, thorax, first abdominal tergite, and first and second ventral segments covered with long, white hair, a few long hairs on lateral sides of tergites 3, 4 and 5 with those of the 5th extending across tergite, the 6th covered with long, mostly appressed, hair; front, face and clypeus with very heavy, white silvery, appressed pubescence from anterior ocellus forward; the last dorsal segment covered with similar white, appressed, silvery pubescence; tergites 1–4 with an apical fascia of white appressed hairs, slightly less than one-third the width of tergite, ventral segments 2 and 3 also with apical fascia but much less evident than those on tergites; ventral segment 2 with a few long hairs on apical edge across the whole width, an indication of a hair band on central part which covers a little less than one-half the width; the ventral segments 3–6 with short, heavy hair tufts, the 3rd slightly more than one-fourth length of segment, the 4th slightly less than one-half, the 5th about three quarters of length, and that on the 6th covers the whole visible portion when the segments are in normal position, but when it is extended, the hair band covers a little more than one-third of length; the fact that the hair band covers the whole of the 6th segment in the normal position gives the appearance of only three hair bands or tufts instead of the actual four; antennae short and with basal joints (3–5) rounded at base, third joint slightly longer than the fourth; a depression just behind lateral ocelli and a deep sulcus extending from this depression to just back of a line joining the posterior edges of eyes; propodeum granular with a deep sulcus extending from postscutellum to posterior edge of dorsal surface where it meets an elevated knob, a deep depression just behind this knob and a prominent sulcus reaching from this depression to near apex of propodeum; three transverse ridges in groove just behind postscutellum; wings hyaline, but slightly yellowish all over; last ventral segment with a deep notch and with a few long hairs apically. Length, head and thorax 6.6 mm., abdomen 6.6 mm., fore wing 8.2 mm., rear wing 5.3 mm. Genitalia, width at middle of base .93 mm., length 1.6 mm. Last ventral segment, width 1.0 mm., length 1.33 mm.

1 2 3

FIG. 1. *Tachytes validus* Banks. Paratype, ventral view, × 16.
FIG. 2. *Tachytes quadrifasciatus,* dorsal view, last ventral segment, × 38.
FIG. 3. *Tachytes quadrifasciatus* n. sp., ventral view, × 16.

Holotype male—Livingston Co., MICHIGAN. E. S. George Reserve, IX–2–40, George Steyskal. At present in the collection of the writer but will be deposited in the Museum of Comparative Zoology at Harvard College. This species belongs in the subgenus Tachyplena of Banks [1] and runs to first part of couplet 8 in his key to the genus in the males. This keys it with *T. validus* (Cr.) but it can easily be separated on the basis of the four hair bands instead of the one of *validus,* and further by the fact that the first three segments of the flagellum are slightly excavated at the base while in *validus* they are cylindrical and not at all excavated.

[1] BANKS, NATHAN. Bull. Mus. Comp. Zool., Harvard College, LXXXIX, No. 9, 1942, pp. 395–435.

Replacement of Two Preoccupied Names of Tetrigidae (Orthoptera: Acridoidea)

By James A. G. Rehn, Academy of Natural Sciences of Philadelphia

In a series of papers published within the last ten years Dr. Klaus Günther presented the first three portions [1] of a revision of the grouse-locusts, this group being referred to by him as the Acrydiinae, but which is now considered by most students to represent a valid family of the Acridoidea, for which the name Tetrigidae is used.

In these studies Günther has erected thirty new generic names, eleven of which contain from six to eight syllables. Six have six syllables, four have seven, and one (*Platygavialidium*) has eight. Dr. Jacobus Faure has recently protested [2] against the creation of overly-long generic names, and his comments deserve sympathetic consideration. Too frequently authors utilize the handiest "out," and merely add a prefix or suffix to an existing generic name, usually of a related genus, though occasionally of one in no way closely related to their new entity, but to which the latter has some superficial resemblance. When the previously established name is lengthy, the results are often far from happy, and our already overburdened taxonomic literature is further cluttered up with multisyllabic terms. The increas-

[1] "Revision der Acrydiinae, I. Sectiones Tripetalocerae, Discotettigiae, Lophotettigiae, Cleostratae, Bufonidae, Cladonotae, Scelimenae verae." Mitt. Zool. Mus. Berlin, XXIII, heft 2, pp. 299–437. November 15, 1938.

"Revision der Acrydiinae (Orth.), II. Scelimenae spuriae." Stett. Ent. Zeit., 99, heft II, pp. 117–148, 161–230. June 15, 1938 (pp. 117–148) and December 20, 1938 (pp. 161–230).

"Revision der Acrydiinae (Orthoptera), III. Sectio Amorphopi (Metrodorae Bol. 1887, aut.)." Abhandl. und Berichte Staatlichen Museum Tierk. und Völkerk., Dresden, 20, Reihe A: Zool., Neue Folge, Bd. I, heft I, pp. 16–335. December, 1939.

[2] "A Plea for Brevity—and Sanity—in Zoological Nomenclature." Journ. Entom. Soc. So. Africa, IX, pp. 39–44 (1946); Ann. and Mag. Nat. Hist., (11) XIII, pp. 595–601 (1946).

ing difficulty of locating available generic names is fully realized by all who are acquainted with systematics, but a moderate amount of effort usually produces an available name of reasonable length.

Unfortunately Dr. Günther does not seem to have made a search to determine possible preoccupation of some of his new generic names, as two which he has proposed were employed long prior to his work, and both of these are properly listed in Neave's Nomenclator Zoologicus, and Waterhouse's Index Zoologicus, 1880–1900. If the former was not available at the time Dr. Günther wrote, the latter certainly was, and the same degree of checking employed by most systematists would have prevented his use of preoccupied names.

The two names referred to are *Thymoites* (Günther, 1939, pp. 26, 224) and *Barytettix* (Günther, 1939, p. 317). The first was properly used for an arachnid genus by Keyserling (Die Spinnen Amerikas, Theridiidae, häfte 1, bd. 2, p. 161) in 1884, while *Barytettix* was employed in 1897 for an orthopterous genus by Scudder (Proc. Amer. Acad. Arts and Sci., XXXII, pp. 197, 204; Proc. U. S. Nat. Mus., XX, pp. 10, 27). To replace *Thymoites* Günther, 1939, not of Keyserling, 1884, I here propose *Moluccasia,* the sole species placed in the genus by Günther (*buruanus*) being from the island of Buru, in the Moluccas. In place of *Barytettix* Günther, 1939, not of Scudder, 1897, I propose *Marshallacris,* in honor of Sir Guy A. K. Marshall, the distinguished British entomologist, who collected the type specimen of the genotypic species (*africanus* Hancock) in the course of his extensive African entomological explorations.

Notes on Some Carnivorous Mosquito Larvae

By Osmond P. Breland, The University of Texas

The writer has been studying the biology and immature stages of the tree hole breeding mosquito, *Megarhinus septentrionalis* Dyar & Knab, for several years. It is well known that the larvae of this species are carnivorous, and that they feed upon the larvae of other mosquitoes with which they are associated. During some phases of a study of this species, sufficient mosquitoe larvae for rearing the *Megarhinus* could not be obtained, and consequently, larval and adult fruit flies or *Drosophila* were used as substitute food. It was found that the mosquito larvae would eat both larval and adult *Drosophila,* and that the late instars of the mosquito were more definitely attracted to adult fruit flies on the water surface than they were to the larvae of other mosquitoes. The food problem was thus solved for this particular species. The feeding process of the *Megarhinus* larvae was observed under a dissecting microscope, and the modified mouth brushes were never seen to be used, although it is commonly stated that these structures are employed for seizing and holding the prey. The mandibles alone were used in all cases observed. A detailed report of this and related work was made recently at a meeting of the American Entomological Society.

On May 13, 1948, three days after a heavy rain, the writer and his associates collected approximately 100 second and third instar larvae of two other carnivorous species, *Psorophora howardii* Coq. and *P. ciliata* (Fab.). The mosquitoes were found in several temporary pools in the vicinity of Luling, Texas. Very few larvae of other species were available, and consequently, larval and adult fruit flies were tried as substitute food. Both species of larvae totally disregarded the fruit flies. In the absence of other acceptable food, some of the carnivorous larvae ate their fellows, and as a result, only 11 adults were reared from the rather large number of larvae. These observations indicate that the rearing of large series of *P. howardii* and *P. ciliata* will be difficult in the absence of other mosquito larvae, but that if fruit flies are available, large numbers of *M. septentrionalis* may be reared without the use of mosquito larvae.

It was noted above that the writer has never seen larvae of *M. septentrionalis* make use of the mouth brushes for seizing the prey or for feeding. Direct observations under a dissecting microscope, however, have confirmed that larvae of *P. howardii* do use the brushes to some extent. The brushes aid the mandibles in catching the prey and in holding it for a time. As the struggles of the victim subside, the mouth brushes are folded against the sides of the head, and most of the actual eating process is accomplished by the mandibles alone. No satisfactory observations of this type have been made by the writer for *P. ciliata,* although other workers state that this species does use the mouth brushes.

Psorophora howardii is considered to be rare in some regions, and has previously been thought of as being rare in Texas. These collections indicate that after heavy rains young instar larvae of the species may be quite common in some areas. As indicated above, approximately 100 larvae were collected, and at least this many more could have been obtained with additional effort. A day or so later the number available would probably have been radically reduced because of cannibalism. The larvae of *P. ciliata* and *P. howardii* are very similar and difficult to distinguish while still alive. Consequently, no attempt was made to determine the exact number of each species represented in these collections. However, indications are that most of the specimens were *P. howardii.* Ten fourth instar larvae were selected at random and mounted on slides, and of this number 9 are *P. howardii.* Of the 11 adult specimens that emerged, 8 are *P. howardii* and only 3 are *P. ciliata.*

Current Entomological Literature

COMPILED BY RAYMOND Q. BLISS AND
THEODORE M. TELSCH.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, pertaining to the Entomology of the Americas (North and South), included 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.

This list gives references of the year 1948 unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

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 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. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

GENERAL—Bibliography of Agriculture, U. S. Dept. Agric. 12 (7) Entomological items no. 39447–40047, July 1948. **Beier, M.**—Phoresie und Phagophilie bei Pseudoscorpionen. [Österr. Zool. Zeitschr.] 1: 441–97. **Castellarnau, S. de**—Bionomía de los insectos zoófagos y xilófagos de museos, herbarios y bibliotecas. [Bol. Real Soc. Esp. de Hist. Nat.) 40: 361–90, ill., 1942. **Fairchild and Hertig**—An improved method for mounting small insects. [80] 108: 20. **Franz und Leitenberger—Biologischchemische Untersuchungen** über Humusbildung durch Bodentiere. [Österr. Zool. Zeitschr.] 1: 498–518. **Frings, H.**—Rearing houseflies and blowflies on dog biscuit. [80] 107: 629–30. **Heal, R. E.**—Rearing methods for German and American cockroaches. [37] 41: 329–30. **Laird, M.**—A method of securing living mosquitoes to mounts in studies of problems concerning flight. [80] 107: 656. **Marcus, H.**—De la evolucion de los organos respiratorios en los insectos holometabolicos. [Folia Universitaria, Cochabamba] 1: 83–96.—Los estados biologicos. *Ibid.:* 45–65, ill. **Martin, A., Jr.**—An introduction to the genetics of Habrobracon juglandis (Ashmead). xii + 205 pp. $3.50. The Hobson Book Press, New York, 1947. (Review: in Jour. Heredity 39: 116). **Martini, E.**—Lehrbuch der medizinischen Entomologie. 3rd rev. ed. Jena, 1946. Review in Biol. Zentralbl. 67: 211. **Pence, R. J.**—A simple attachment to increase depth of focus of microscope objectives for photomicrography. [80] 107:

631–32. **Schilder, F. A.**—Methoden und Probleme der Biostatistik. IV. [Biol. Zentralbl.] 67: 189–201. **Scott, A. J.**—An apparatus for removing tropical rat mites from large quantities of bedding materials. [46] 34: 132–33. **Stoll, N. R.**—In Memoriam: Rudolf W. Glasser (1888–1947). [46] 34: 165–68. **Torre-Bueno, J. R. de la**—Totalitarianism in science. [18] 43: 99–100. **Usinger, R. L.**—An all-purpose insect net made of nylon. [18] 43: 67–68.

ANATOMY, PHYSIOLOGY, MEDICAL—Anderson, J. M.—Changes in the distribution of nitrogen in the japanese beetle (Popillia japonica) during metamorphosis. [Physiol. Zool.] 21: 237–52. **Barber, G. W.**—The lethal lines of the house fly. [37] 41: 292–95. **Dethier and Chadwick**—Chemoreception in insects. [Physiological Reviews] 28: 220–54. **Fisher and Ford**—The spread of a gene in natural conditions in a colony of the moth Panaxia dominula. [Heredity] 1: 143–74, 1947. **Fring, Allen and Rudnick**—The physical effects of high intensity air-borne ultrasonic waves on animals. [105] 31: 339–58. **Gaul, A. T.**—Additions to vespine biology—V: The distribution of labor in the colonies of hornets and yellowjackets. [18] 43: 73–79. **Goldschmidt, R. B.**—New facts on sex determination in Drosophila melanogaster. [67] 34: 245–52. **Harvey, Anderson, Buck, Chase, Eyring and Johnson**—Bioluminescence. [Ann. New York Acad. Sci.] 49: 327–482. **Heller, J., A. Mokłowska-Heller i w. Swiechowska**—Bivoltinism and genetics (Sphingid.). [Biull. Ent. de la Pologne] 18: 81–94. **Heuts, M. J.**—Adaptive properties of carriers of certain gene arrangements in Drosophila pseudoobscura. [Heredity] 2: 63–75. **Kaplan, W. D.**—Formaldehyde as a mutagen in Drosophila. [80] 108: 43. **King, J. E.**—A study of the reproductive organs of the common marine shrimp, Penaeus setiferus. [12] 94: 244–62. **Koller, G.**—Rhythmische Bewegung und hormonale Steuerung bei den Malpighischen Gefässen der Insekten. [Biol. Zentralbl.] 67: 201–11. **Leech, H. B.**—Acetic acid odor from Stenolophus fidelis. [23] 79: 141, 1947. **Logothetis, C.**—Biological studies on the horse flies of New York. [37] 41: 335–36. **Ludwig, D.**—Relation between lipid content of cuticle, duration of diapause, and resistance to desiccation of pupae of the cynthia moth. [Physiol. Zool.] 21: 252–57. **Marcus, H.**—Un organo estridulacion en hormigas y termitas. [Folia Universitaria Cochabamba] 1: 39–44, ill.—Estructuras singulares de Dinjapyx marcusi. *Ibid.:* 66–72, ill.—La embriogenesis de Aethalion, termitas y hormigas con una comparacion de la anatomia de los insectos y vertebrados. *Ibid.:* 97–118. **Matthey, R.**—Données nouvelles sur la chromosomes des Tettigonides et la parthénogénèse de Saga pedo. [Rev. Suisse de Zool.] 55: 45–56, ill. **Mendes, M. V.**—Histology of the corpora allata of Melanoplus differentialis. [12] 94: 194–207. **Menusan, H.**—Comparative toxicity of insecticides administered in various ways to several species of insects. [37] 41: 302–13. **Mittler, S.**—Influence of genetic environment on the reduction of bristles by the dichaete gene in Drosophila melanogaster. [12] 94: 208–11. **Morley, D. W.**—Neurotic behavior in ants. [53] 162: 74–75. **Moscona, A.**—Utilization of mineral constituents of the egg-shell by the developing embryo of the stick insect. [53] 162: 62–63. **Mosna, E.**—Culex pipiens autogenicus DDT-resistenti e loro controllo con octa-klor e esaclorocicloesano. [Riv. di Parassit.] 9: 19–25. **Nájera, L.**—Sobre un caso de oftalmomiasis producida por larvas de Wohlfahrtia magnifica. [Bol. Real. Soc. Esp. de Nat. Hist.] 40: 493–95, ill., 1942.—La distribución geográfica de las especies de pulgas de interés epidemiológico (Siphonaptera). *Ibid.:* 497–502, 1942. **Pätau, K.**—X-segregation and heterochromasy in the spider Araner reaumuri. [Heredity] 2: 77–100. **Pearson, J. C.**—Fluctuations in the abundance of the blue crab in Chesapeake Bay. [Research Report 14, Fish and Wildlife Service, U. S. Dept. Interior.] **Reed, S. C. and E. W.**—Natural selection in laboratory populations of Drosophila. [100] 2: 176–86. **Ribeiro, B. L.**—Contribuição para o conhecimento da bionomia de Rothschildia aurota (Saturn.). [111] 8: 127–41. **Richards and Korda**—Studies on arthropod cuticle. II. Electron microscope studies of extracted cuticle. [12] 94: 212–35. **Ricks and Hoskins**—Toxicity and permeability. II. The entrance of arsenic into larvae of the flesh fly, Sarcophaga securifera. [Physiol. Zool.] 21: 258–72. **Roeder, K. D.**—The effect of potassium and calcium on the nervous system of the cockroach, Periplaneta americana. [105] 31: 327–38. **Sacktor, Hutchinson and Granett**—Biology of the lone star tick in the laboratory. [37] 41: 296–301. **Sequy, E.**—Introduction à l'étude des myiases. [111] 8: 93–111. **Schneirla, T. C.**—Army-ant life and behavior under dry-season conditions with special reference to reproductive functions. II. The appearance and fate of the males. [93] 33: 89-112, ill.

(s). **Smith and Lowe**—The black gnats of California (Ceratopogon.). [Hilgardia] 18: 157–83. **Streisinger, G.**—Experiments on sexual isolation in Drosophila. IX. Behavior of males with etherized females. [100] 2: 187–88. **Tuxen, S. L.**—En paedogenetisk cecidomyidelarve i Finland. [Memoranda Societatis pro Fauna et Flora Fennica] 23: 138–41, 1947. **Verolini, F.**—Sul meccanismo di azione del DDT sulle larve di culicine. [Riv. di Parassit.] 9: 31–37. **Waloff, N.**—Development of Ephestia elutella (Phycit.) on some natural foods. [19] 39: 117–30. **Way and Synge**—The effects of DDT and benzene hexachloride on bees. [4] 35: 94–109. **Weinstein and Pratt**—The laboratory infection of Triatoma neotomae with Trypanosoma cruzi and subsequent transmission to white mice. [46] 34: 231–36. **Whiting, P. W.**—Leg-like antennae in Habrobracon. [42] 39: 153–54.

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18. Bulletin of the Brooklyn Entomological Society. New York.
19. Bulletin of Entomological Research. London.
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25. Ecological Monographs. Durham, North Carolina.
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29. Entomological Record and Journal of Variations. London.
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31. Florida Entomologist. Gainesville, Florida.
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39. Journal of Entomology and Zoology. Claremont, California.
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106. Redia. Florence, Italy.
107. Annales de la Société Entomologique de France. Paris.
108. Bulletin de la Société Entomologique de France. Paris.
109. Notulae Naturae. Philadelphia.
110. L'Entomologiste. Paris.
111. Revista Brasiliera de Biologie. Rio de Janeiro.
112. Eos, Revista Española de Entomologia. Madrid.
113. Minist. de Agri. de la Nación, Inst. Sanidad Vegetal, Buenos Aires.

Review

A Textbook of Agricultural Entomology. By Kenneth M. Smith. D.Sc., Ph.D., F.R.S., Director, Plant Virus Research Station, Cambridge, at the University Press; New York, The Macmillan Company. Pp. xiii, 289, frontispiece plus 84 figs.—Price: $4.50.

The first edition was published in 1931 (Ent. News 43: 221). In this revision, numerous details have been brought up to date, the newer insecticides included, and the chapter on virus transmission rewritten. Compared with its American counterparts, one striking difference is that in this book the insects are taken up order after order in their usual taxonomic sequence rather than under their host plants. This more entomological approach may be worth considering; it should tend, for example, to place greater emphasis on a thorough understanding of the insects themselves—a point of view that might be, in the long run, more fruitful—than on mere recognition and the directions for control. Another difference is, of course, the entire absence of some of our own prominent pests such as the potato beetle, corn insects, etc., and the inclusion of some that are of little importance in America, such as the springtail (found on mangolds and other root crops) that adorns the jacket of the book, and the tipulid larvae or "leatherjackets" in pastures and on root crops. Finally, this sentence, from page six, will illustrate a difference in control practice: "The use of insecticides in the agricultural practice of the British Isles is very limited and is governed largely by the question of price, the profit on the average farm crop, especially at the present time, allowing small margin for expenditure on insecticides."—R. G. Schmieder.

A New Biological Journal

The first number of the Australian Journal of Scientific Research, Series B (Biological Sciences) has been recently issued by the Council of Scientific and Industrial Research with the approval and cooperation of the Australian National Research Council. Dr. N. S. Noble, D. Sci. Sgr. is the editor and this first number contains an article on the color preferences of the housefly by D. F. Waterhouse.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

Diptera—Tachinidae-Dexiidae wanted, No. Amer. and exotic. Will collect most orders in exchange or will purchase. P. H. Arnaud, 60 Woodrow St., Redwood City, Calif.

Will collect—Zoological and entomological specimens in tropical and subtropical parts of Peru. Jose M. Schunke, Pucallpa, Peru.

Wanted—Diplotaxis; will buy or exchange. E. W. Mange, 307 W. Walnut St., Hanover, Pa.

Hymenoptera-Aculeata (except ants and bees) for exchange. Will collect other orders in exchange. N. F. de Andrade, Casal Novo, S. João do Estoril, Portugal.

Meliponidae—Wanted, information on the bionomics, culture, and economic importance of the stingless bees, particularly of the Old World. P. Nogueira Neto, Av Cicade Jardim 170, S. Paulo, Brasil.

Wasps (Vespoidea, Sphecoidea, Chrysidoidea) of the world by exchange or purchase. Will collect other orders in exchange. D. G. Shappirio, 4811 17th St., N.W., Washington 11, D. C.

Lepidoptera—Large quantities of Plexippus, Colias, Cardui, Vanillae wanted for cash or exchange for tropical butterflies. G. MacBean, 710 Miller Rd., Sea Island, Vancouver, B. C.

Ants of the tribe Dacetini (*Strumigenys, Rhopalothrix* and related genera) wanted for world revision. W. L. Brown, Jr., Harvard University Biological Laboratories, Cambridge 38, Mass.

Mallophaga (on which immediate determination is not necessary) wanted for study and determination. R. L. Edwards, Dept. Biology, Harvard University, Cambridge 38, Mass.

Tingidae (Heteroptera) of the world wanted, in alcohol, with host and other ecological data. Will collect other orders in exchange. N. S. Bailey, 16 Neponset Ave., Hyde Park 36, Mass.

Bombidae, nearctic and neotropical, wanted for exchange, identification, or purchase. Will exchange in other groups for bumblebees. Barth Maina, Dept. Zool., Univ. of Chicago, Chicago 37, Ill.

Saturnidae of the world. Will purchase individual specimens or cocoons. F. E. Rutkowski, St. Bede College, Peru, Illinois, U. S. A.

Butterflies of New England, principally from New Haven, Conn., for exchange. Louis Clarke, 28 W. Elm St., New Haven 15, Conn.

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ENTOMOLOGICAL NEWS

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New Uropodinid Mites Associated with Rats in Puerto Rico

By Irving Fox, School of Tropical Medicine, San Juan, Puerto Rico

Not infrequently in the course of surveys for rat ectoparasites otherwise obscure mites come to hand. Although the epidemiological significance of this association is largely speculative at this time, such mites are of more than usual interest, and herein five new species are described. They belong to the Cohors Uropodina, a group containing members which have twice before at least been reported in rat ectoparasite surveys (Ludwig and Nicholson, 1947, and Nicholson and Gaines 1948, in both instances as *Uropoda* species). Types of the new species described below are in the entomological collections of the Department of Medical Zoology, School of Tropical Medicine, San Juan, Puerto Rico.

Fam. Uropodidae

Fuscuropoda ovata, new species (fig. 1)

Female.—Body smooth not well provided with setae, about .99 mm. long and about .75 mm. wide. Vertex as shown in fig. 1A, the setae very short. Genital plate (fig. 1B) more or less oval, truncate posteriorly, the plate proper anteriorly on a level slightly below the anterior border of coxa I, posteriorly on a level with the middle of coxa IV. Anterior peg-like prolongation of the plate about .023 mm. long. Setae of the intercoxal area very weak, hardly discernible. Stigmatal area prominent, peritreme extending to the lateral border and doubling back for about half its length. Anal pore located between two pairs of setae. Squama of femur I (fig. 1C) toothed, the tubercle prominent and close to it. Dorsal plate glabrous.

Male.—More or less the same dimensions as the female, more spindle-shaped. Genital pore as in fig. 1D. Other details as in the female.

Type material.—Female holotype, female paratype and male allotype from *Rattus norvegicus* collected at San Juan (Santurce), Puerto Rico, March 9, 1948.

Remarks.—This species is not typical of the genus in which it is placed particularly in that the female genital plate extends posteriorly far beyond coxa III. However, the shape of the body and the peg-like prolongation of the genital plate allows it to remain in *Fuscuropoda* until more is known of the specific variations in this genus.

Fuscuropoda marmorea, new species (fig. 2)

Female.—Body well provided with weak setae, about .80 mm. long and about .54 mm. wide. Vertex as shown in fig. 2B, the setae usually crossed basally, plumose distally. Genital plate (fig. 2C) conspicuously sculptured in the anterior half, posteriorly reaching slightly beyond coxa III, anterior prolongation massive, extending well beyond the edge of the sternum. Setae of the intercoxal area longer than usual, easily discernible. Stigma and peritreme more or less as in the previous species. Between the genital plate and anal pore are a number of thin setae and posterior to the pore is a pair of much larger ones. Squama of femur I (fig. 2A) toothed, the tubercle very close to it. Dorsal plate provided with many long setae.

Type material.—Female holotype and female paratype from *Rattus norvegicus* collected at San Juan (Santurce), Puerto Rico, March 19, 1948.

Remarks.—This species is distinguishable by details of the shape and the sculpturing of the genital plate.

Uroobovella cassida, new species (fig. 5)

Female.—Body with weak curved setae along the lateral edges, about .54 mm. long and about .45 mm. wide. Vertex as shown in fig. 5A, the setae bent outwards. Genital plate (fig. 5D), shield-shaped anteriorly on a level with the anterior border of coxa I, posteriorly on a level with the posterior border of coxa IV. Setae of the intercoxal area very weak, hardly discernible. Stigma not prominent, peritreme extending to the lateral border and doubling back for most of its length. Dividing line between the anal and ventral plates vestigial, discernible only laterally. Anterior to the anal pore is a pair of faint setae and posterior to it are three more prominent ones, the outer two of which are markedly curved. Squama of femur I (fig. 5C), not toothed, and a weak seta traverses it in the middle area. Dorsal plate glabrous.

Male.—About .55 mm. long and about .43 mm. wide. Genital pore as in fig. 5B, surrounded by weak setae. Between the genital and anal pores are two rows of about six weak setae. Body shape, vertex, peritreme and squama of femur I as in the female.

Type material.—Female holotype and male allotype from *Rattus norvegicus* collected at San Juan (Santurce), Puerto Rico, August 21, 1947.

Remarks.—This species is similar to *U. obovata* (C. & B.) from which it differs in that the dividing line between the ventral and anal plates is not distinct as in that species, as well as in other details.

Fam. Urodinychidae

Leiodinychus praeacutus, new species (fig. 3)

Female.—Body not well provided with setae, about .48 mm. long and about .40 mm. wide. Vertex as shown in fig. 3B, tectum provided with a pair of long plumose setae. Genital plate (fig. 3A) shield-shaped with a long acuminate anterior projection extending well beyond the edge of the sternum; the posterior margin of the plate on a level with the middle of coxa

IV. Setae of the intercoxal area weak, hardly discernible. Stigma not conspicuous, the peritreme more or less inverted V-shaped. Anal pore large. Dorsal plate without prominent setae. Minute setae arise laterally from the crenulate marginal plate.

Male.—About .46 mm. long and about .36 mm. wide. Genital pore as shown in fig. 3C. Squama of femur I (fig. 3D) not prominently toothed, interrupted by the tubercle and its seta. Other details as in the female.

Type material.—Female holotype and male allotype from *Rattus norvegicus* collected at San Juan (Santurce), Puerto Rico, during 1947.

Remarks.—This species is distinguished from others in its genus by the peculiar anterior projection of the genital plate and by details of the vertex.

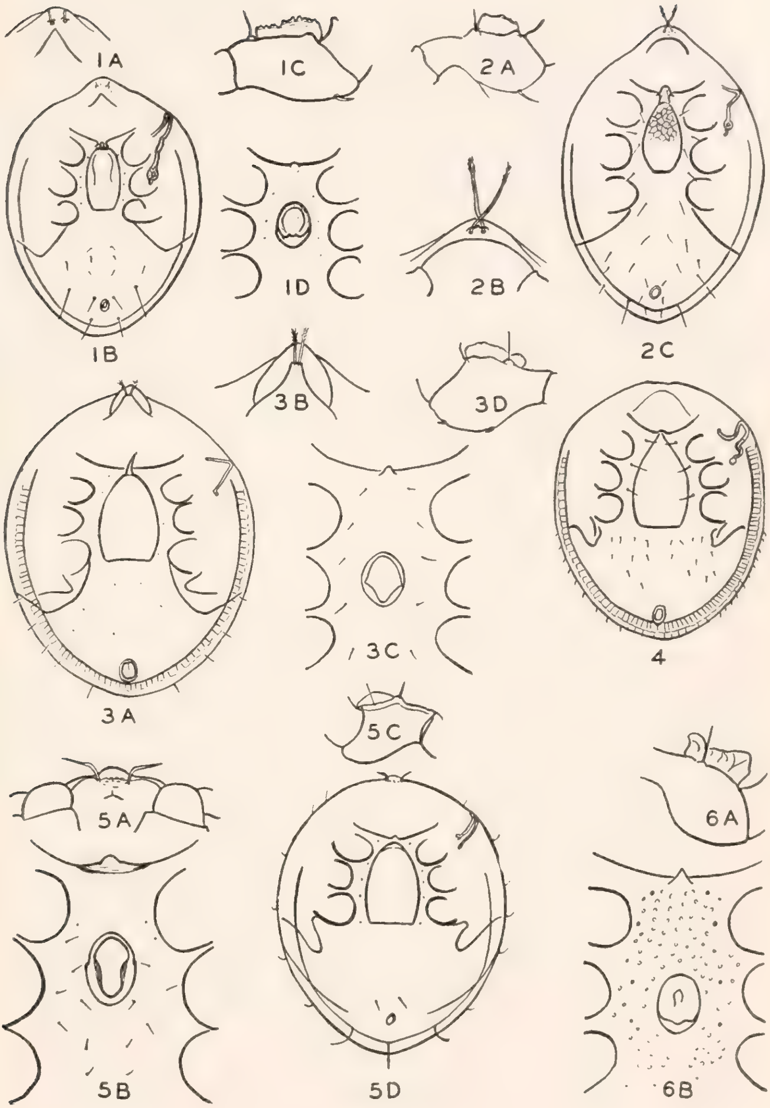
Leiodinychus simplus, new species (figs. 4 and 6)

Female.—Body with a fringe of setae around the lateral edges, about .53 mm. long and about .42 mm. wide. Vertex very simple, apparently without setae. Genital plate (fig. 4) shield-shaped, tapering anteriorly, posteriorly extending beyond coxa IV. Setae of the intercoxal area longer and more prominent than usual. Peritreme markedly tortuous. Many minute setae irregularly arranged between the gential plate and the anal pore, the latter large and prominent. Dorsal plate coarsely granulate, without setae.

Male.—About .46 mm. long and about .36 mm. wide. Genital pore as shown in fig. 6B; intercoxal area lightly sculptured.

Explanation of Plate

Fig. 1. *Fuscuropoda ovata,* n. sp. 1A. Female, vertex. 1B. Female, ventral plates. 1C. Female, squama of femur I. 1D. Male, intercoxal area. Fig. 2. *F. marmorea,* n. sp. 2A. Female, squama of femur I. 2B. Female, vertex. 2C. Female, ventral plates. Fig. 3. *Leiodinychus pracacutus,* n. sp. 3A. Female, ventral plates. 3B. Female, vertex. 3C. Male, intercoxal area. 3D. Male, squama of femur I. Fig. 4. *L. simplus,* n. sp., female, ventral plates. Fig. 5. *Uroobovella cassida,* n. sp. 5A. Female, vertex. 5B. Male, intercoxal area. 5C. Female, squama of femur I. 5D. Female, ventral plates. Fig. 6. *Leiodinychus simplus,* n. sp. 6A. Male, squama of femur I. 6B. Male, intercoxal area.


1A
1C
2A
1B
1D
2B
2C
3B
3D
3A
3C
4
5C
5A
5B
5D
6A
6B

Squama of femur I as shown in fig. 6A. Other details as in the female.

Type material.—Female holotype and male allotype from *Rattus norvegicus* collected at San Juan (Santurce), Puerto Rico, during 1947.

Remarks.—This species is similar to *L. krameri* (C. & B.) from which it differs particularly in the shape of the genital plate.

Literature Cited

Ludwig, R. G. and H. P. Nicholson, 1947. The control of rat ectoparasites with DDT. U. S. Pub. Health Serv. Rpts. 62: 77–84.

Nicholson, H. P. and T. B. Gaines, 1948. A comparison of the effectiveness of 5 and 10 per cent DDT dusts for the control of rat fleas. U. S. Public Health Serv. Rpts. 63: 129–136.

Personal

Doctor Charles D. Michener, formerly as Associate Curator at the American Museum of Natural History, has been appointed as Associate Professor of Entomology at the University of Kansas, Lawrence, Kansas. His duties include teaching in the Department of Entomology, and he expects to continue his morphological studies, taxonomic and evolutionary investigations on the saturniid moths and on bees, as well as certain studies on behavior in the social insects.

Remarks on a Few Scarabaeidae (Coleoptera)

By MARK ROBINSON, Springfield, Pennsylvania

The specimens studied during the writing of this paper are in the collection of the Academy of Natural Sciences of Philadelphia or in the collection of the author.

Phanaeus (Coprophanaeus) chiriquensis d'Olsoufieff

1924. *Phanaeus chiriquensis* d'Olsoufieff, Insecta Rennes, 13, p. 73.

A nice series of this species was collected by Raymond Bliss at Corozal, Canal Zone, in May 1937. This species was described from the female and as the male apparently has never been described the following remarks may help to distinguish this sex.

Male: Identical with the female externally, with the following exceptions: The transverse, raised, trituberculate process on the head has the median tubercle elongate. This tubercle is as high above the outer tubercles as they are above the surface of the head. The posterior edge of the median, smooth area on the thorax has a bituberculate process, pointing forward. On either side of the median smooth area is a smooth depression. The raised edge on the anterior margin of the thorax in the female is obsolete in the male.

The male sex of this species is probably most closely related to *milon* Blanchard. From the latter species it can be separated by the difference in shape of the thoracic process and the fact that the median tubercle on the head is not swelled to the rear as it is in *milon*. In addition, the wing-shaped process on the male genitalia tips is concave in *milon* and flat in *chiriquensis*.

The specimen used as the basis of this description is designated the allotype and is labeled Corozal, Canal Zone, May 14, 1937 (R. Bliss).

Onthophagus hopfneri Harold

1869. *Onthophagus hopfneri* Harold, Ann. Soc. Ent. Fr., p. 512.
1880. *Onthophagus landolti* Harold, Stett. Ent. Zeit., p. 34.
1909. *Onthophagus arizonensis* Schaeffer, Bull. Brook. Ins., p. 382.
1914. *Onthophagus texanus* Schaeffer, Journ. N. Y. Ent. Soc., XXII, p. 299.

The form *landolti* was described from material collected in Columbia and Venezuela while *hopfneri* was described from Vera Cruz, Mexico. The two forms described from the United States are from the respective states implied in their names.

This species of *Onthophagus* is extremely variable in size, color and various other characters used by the above authors to distinguish the various forms as specific. The form *landolti* seems to differ from *hopfneri* in no other character except in being larger and darker in color. Schaeffer in his remarks under the description of *arizonensis* states: "it differs (from *landolti*), however, by coloration, the much less elongated front tibiae of the male and the much less prominent genae.". Schaeffer continues by stating: "Judging from the description, *O. hopfneri* Har. from Mexico seems to resemble the above described species very closely in coloration but has the head of the male bicarinate as in the female and no median thoracic lobe. This is often the case in feebly developed males and it may be possible that *O. arizonensis* is the fully developed form of *O. hopfneri*."

Schaeffer's remarks after describing *texanus* are: "Judging from Bates' remarks in the Biologia *O. landolti* is a variable species in Mexico and Central America and it is possible that the above described form is only a color variation of *landolti*. However, my material shows no intermediate forms and the specimens are either referable to *landolti* or *texanus*."

My own series of specimens is quite large and includes material collected at El Valle, Canal Zone; Jalapa and Sonora, Mexico; Brownsville, Texas; Nogales and Baboquivaria Mountains, Arizona. Included in the series are cotypes of *texanus* and *arizonensis*. All the characters used by Harold and Schaeffer to distinguish their forms as specific intergrade in the series at hand and I cannot help but refer all these forms to one species. This intergradation is without regard to geographic location and, as *hopfneri* has priority over the other forms, it seems best to regard this as the name for this very variable insect.

Onthophagus depressus Harold

1938. *Onthophagus depressus* Cartwright (not Harold), Ent. News, XLIX, p. 114.

This species was first recorded in the United States by Cartwright from specimens collected by Fattig at Vidalia and Lyons, Georgia, in 1937.

Recently a male specimen of this species was examined that J. G. Needham collected at the Archbold Biological Station, Lake Placid, Florida, on April 26, 1947. This locality is nearly four hundred and fifty miles south of the original area in which this South African species was first recorded in the United States. The above specimen is in the collection of Cornell University.

Ataenius ovatulus Horn

1871. *Ataenius ovatulus* Horn, Tran. Amer. Ent. Soc., III, p. 286.
1874. *Ataenius lecontei* Harold, Col. Hefte, XII, p. 20.

Horn described his species from specimens that had the clypeus badly worn. The result of this worn condition was that the small denticles on either side of the clypeal emargination were obsolete. Harold had specimens in better condition when he described the form *lecontei* with the result that he noted the denticles. Aside from the denticles on the clypeus there seems to be no difference between the two forms and I feel they are conspecific.

A Species of Mallophaga from the Sanderling

By K. C. Emerson, Oklahoma A. and M. College, Stillwater, Oklahoma

Actornithophilus albus, new name for *Colpocephalum spinulosum minor* Kellogg and Chapman, 1899, New Mallophaga, III, p. 112, Pl. VII, f. 9: preoccupied by *Colpocephalum minus* Piaget, Les Pediculines, 1880, p. 539, Pl. 45, f. 1.

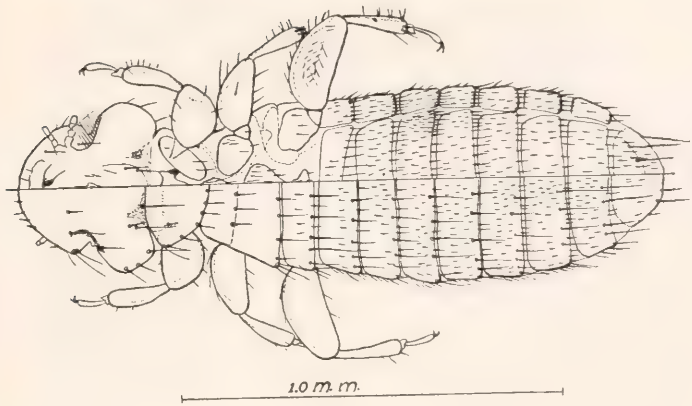
The original paper was without a description, with this form being separated only on measurements. The form under discussion has since been elevated to specific rank. Through the courtesy of Dr. G. F. Ferris, the type specimens were examined and used for this study.

Male (fig. 2) : Head of a shape typical of the genus. Temples prominent; ocular emarginations rather deep; eyes large and bipartite. Two long and two short setae on each lateral margin of the gular region. Thorax distinctly three-segmented, the mesothorax approximately one-half the length of the metathorax. Prothoracic sternal plate prominent and without setae. Metathoracic sternal plate very large, bearing numerous setae on the posterior margin. Four large setae on the posterior margin of the patch of spines on the venter of the hind femur—the the spines in the patch being progressively smaller anteriad. Patches of spines on the posterolateral angles of abdominal sternites four and five; the patch on sternite four being more prominent and more dense. Genitalia as shown in fig. 3.

Female (fig. 1) : Larger than the male and of essentially the same form, there being a minimum of sexual dimorphism. The prothorax is larger and the ventral patches of spines on the femora are smaller. The setae on the dorsum of the female are less numerous and all larger than on the male.

Type host: Crocethia alba (Pallas), the Sanderling.

Type material: Kellogg and Chapman figured a male as type, so the same specimen is designated as holotype.



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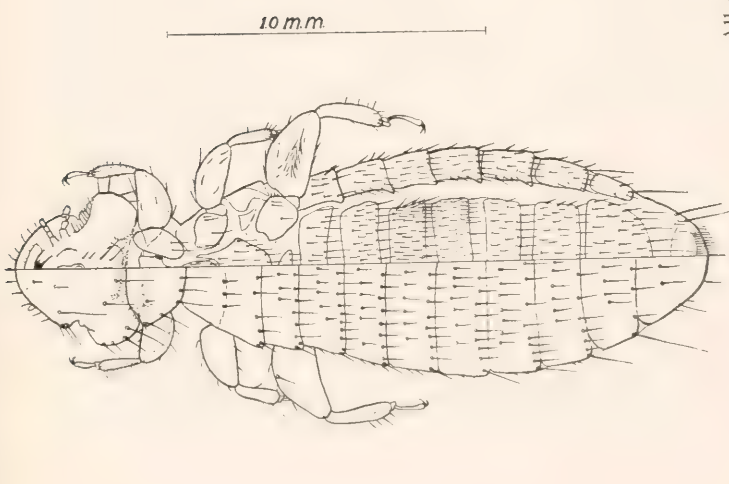

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EXPLANATION OF PLATE

All figures refer to *Actornithophilus albus*:

Fig. 1. Dorsal-ventral view of the female.
Fig. 2. Dorsal-ventral view of the male.
Fig. 3. Dorsal view of the male genitalia.

Biological Notes on Two Species of Anoplius (Hymenoptera: Pompilidae)

By Howard E. Evans, Cornell University, Ithaca, N. Y.

Virtually nothing has been added to our knowledge of the bionomics of the North American pompilid wasps since the classic works of the Peckhams (1898, Bull. Wisc. Geol. Nat. Hist. Survey, no. 2) and the Raus (1918, Wasp Studies Afield; Princeton Univ. Press). The European species are far better known than ours. Recently Richards and Hamm (1939, Trans. Soc. Brit. Ent. 6: 51–144) have presented an excellent summary of the biology of the British Pompilidae, based to a large extent on the work of several continental authors. The information that has so far been gathered is proving of inestimable value to taxonomists in this group, as well as to students of insect behavior. In order to learn more of the life histories of our native Pompilidae, I have made an effort in the past two summers to study these wasps in the field whenever possible, and to investigate their host preferences, both by field collections and by the study of pinned specimens in various museums. The following notes pertain to two species of the large genus *Anoplius;* it is hoped that it may be possible to treat of other forms in future papers. I am very much indebted to Dr. B. J. Kaston, of the Teachers College of Connecticut, New Britain, Conn., for determining numerous spiders for me. In all the original records of true spiders mentioned below, the determinations are his.

Anoplius (Anoplius) ithaca (Banks)

This curious little *Anoplius* seems to be rather poorly represented in most collections. Yet it is widely distributed, occurring from coast to coast in a broad belt of temperate North America, and is locally very common. The reasons for its escaping detection are doubtless its small size, rapid flight, and somewhat unconventional habitat for a spider wasp: it occurs along rocky stream-beds, running and flying over the stones, often below the high-water mark of the stream. This species possesses a structural modification very likely connected with its stone-loving habits. The claws of the female are unusually long, and the tooth slopes outward, rather than being erect as it usually is in this genus; moreover, each pair of claws is asymmetrical, the inner claw being considerably larger than the outer. Exactly how these claws function in helping the wasps over the stones of their habitat is not clear. But since this modification and this habitat are both restricted (in our fauna) to this one species, some connection between structure and function is clearly suggested.

In the Northeastern states *Anoplius ithaca* makes its appearance in early June, and may still be found in early September. There are probably several generations during this time, perhaps three, as the species seems to disappear and reappear periodically in the same locality. I have found it common along three different streams in the type locality, Ithaca, N. Y., and along the Westfield River in Hampshire Co., Mass. I have also found it plentifully in Limpia Canyon, in the Davis Mts. of Texas, in July, and in a mountain pass near Raton, New Mexico, in August. In every case the picture was the same: the wasps were "swarming" along the sides of the stream, flying or running rapidly over the stones. The males are much more slender than the females, and their flight more erratic; they are more abundant than the females during the first few days of the swarming, but later disappear completely. Mating, so far as observed, was very brief, and occurs during flight. The females are extremely industrious creatures, searching incessantly among the rocks and scanty vegetation for spiders.

Several spiders captured by *Anoplius ithaca,* both at Ithaca, N. Y., and Hampshire Co., Mass., proved without exception to belong to the Lycosid genus *Pardosa;* the specimens were mostly immature, but two adults, one taken at Enfield Glen, near Ithaca, 29 July 1947 (H. E. Evans) [author's coll.], and another at Coy Glen, near Ithaca, on 20 July 1912 [coll. Cornell Univ.], both were determined as females of *Pardosa lapidicina* Emerton. This would seem to indicate that *ithaca* exercises a high degree of selection of its prey. On the other hand, it may merely mean that this spider happens to be abundant in the same habitat as the wasp, and is therefore most frequently taken by chance.

Like most Pompilines, *Anoplius ithaca* walks backward when carrying her prey, holding the spider in her mandibles by the base of the legs. The difficulties encountered by a small wasp carrying a spider of about its own size, and proceeding backwards over a bed of rocks of varying sizes, can well be imagined. And yet *ithaca* manages to advance rather rapidly over the most difficult of obstacles, with only an occasional mishap. Sometimes she flies with her spider from the top of a rock to a lower point a foot or two beyond; landing head-forward, she immediately turns around and resumes her progress backward on foot. Occasionally the spider is deposited for a few moments in a temporary hiding-place, such as a niche between stones, or beneath a leaf, while the wasp scouts the terrain ahead. So far as I could determine, the nest was always prepared before the capture of the spider, a reversal of the more common pattern in the Pompilinae. The spider may be carried many feet over a tumult of rocks before, by some remarkable animal wisdom, the female wasp arrives at the hole she has prepared some time before.

The nest of *Anoplius ithaca* is a simple burrow from 3 to 6 inches in length, with an enlarged terminal cell. It is excavated either obliquely in gravel, or more often beneath a rock, the rock serving as a roof for the nest. The spider is placed in the cell without any visible mutilation, and an egg glued dorsolaterally near the base of the abdomen. The egg hatches in slightly over two days, and the larva remains attached for its whole development to the same spot to which the egg was fastened. In the examples studied, the spider was dead after only 3 days of larval feeding, the greater part of the spider's abdomen having been consumed by that time by the rapidly growing larval wasp. None of the larvae reared pupated, but judging from the rate of growth of those observed, the larval stage is probably quite short. The small, parchment-like pupal cases can occasionally be found by turning over rocks in places where *ithaca* is abundant.

Although this spider wasp lacks a tarsal "comb"—more appropriately called a "rake"—it is an efficient digger, using its front limbs dog-wise and throwing the sand and pebbles behind it. Frequently a pebble is encountered which is too large to handle in this manner. In this case it is carried out in the mandibles, or if larger still, it is dragged along by using both the mandibles and front legs in an awkward but often successful manner. The female, having completed the nest, returns to it occasionally during her forays after spiders, often enlarging it or removing sand which has rolled into the burrow. When nidification is completed, the nest is filled in much the same manner as it was dug. The final touch is provided by the wasp carrying in her mandibles small pebbles which she places over the top of the filled burrow with the care of a house-wife, in order to camouflage the sanctuary of her offspring.

A number of details are still lacking in our knowledge of the life history of *Anoplius ithaca;* it is hoped that further study may provide some of these details. Only occasionally are other spider wasps taken in the habitat of *ithaca,* and these chiefly as strays from sandy areas often adjacent to it. Nor does *ithaca* seem to stray far from its rocky stream-side; in a few cases I have taken it in gravel-banks removed from the stream, but never more than a stone's throw from it.

Anoplius (Pompilinus) marginatus (Say)

This species occurs over most of temperate North America east of the Rocky Mountains, and over much of its range is one of the commonest of Pompilidae. It is particularly common in sand dunes or along sandy, open roads; it is also common in gardens and waste places around human habitations, and in fact in almost any open area where the ground is soft enough to permit its excavations. That it so often goes unnoticed is a consequence of the indifference of man, and his preoccupation with more "important" matters. Even the entomologist is most often attracted by the large and the showy or, for better reasons, by those insects which compete with man for their food supply, or otherwise interfere with his own complex behavior patterns.

Anoplius marginatus did not, however, escape the attention of those intrepid students of wasp life, the Peckhams (*op. cit.*, pp. 144–152) and the Raus (*op. cit.*, pp. 58–63), both of whom provide some vivid details on the habits of this wasp, as has also Hartman (1905, Bull. Univ. Texas, no. 65, pp. 52–54). The Peckhams have noted that *marginatus* "is not troubled by the family connections of the spiders she takes;" they had taken the wasp with spiders belonging to five different families. One of the most interesting things about this wasp is its utter lack of selection of its prey, spiders of many different modes of life being taken indiscriminately. It seemed of interest to compile a list of the host-prey of this wasp, which I have done below. Several new records are included, bringing the total to seven families of spiders known to be utilized by *marginatus*. In addition, I have taken it with a harvestman or daddy-longlegs (Order Phalangida) ; this is one of the very few records of Pompilidae preying upon anything but true spiders.

The known prey of *Anoplius marginatus* is as follows: Order Phalangida. Family Phalangiidae: *Odiellus pictus* Wood, E. Hartford, Conn., 25 August 1946 (H. E. Evans) [author's coll.]. Order Araneae. Family Agelenidae: *Agelenopsis naevia* Walck. (Peckham and Peckham, p. 145) ; *Agelenopsis* sp. (immature), Ottawa, Ont., 3 August 1947 (W. R. M. Mason) [author's coll.]. Family Lycosidae: *Arctosa emertoni* Gertsch, male, Pelham, N. H., Sept. 1905 (J. C. Bridwell) [coll. U. S. Natl. Mus.] ; *Lycosa* sp. (immature), Lac Quenouville, Que., 11 Aug. 1936 (A. Loveridge) [coll. Mus. Compar. Zool.] ; *Geolycosa fatifera* Hentz (as *Lycosa domifex* Hancock) (Hancock, 1899; Ent. News, 10: 29) ; *Trochosa avara* Keys. (Rau and Rau, p. 60) ; *Trochosa pratensis* Emerton, Ithaca, N. Y., 1 Sept. 1929 [coll. Cornell Univ.]. Family Argiopidae: *Argiope aurantia* Lucas, female, Cummington, Mass., 22 Aug. 1947 (H. E. Evans) [author's coll.]. Family Thomisidae: *Xysticus* sp. (immature), Ithaca, N. Y., 23 Aug. 1929 [coll. Cornell Univ.] ; "A Thomisid" (Peckham and Peckham, p. 146). Family Gnaphosidae: "A *Drassus*" (Peckham and Peckham, p. 147). Family Clubionidae: *Clubiona mixta* Emerton, female, Ithaca, N. Y., Sept. 1929 [coll. Cornell Univ.]. Family Salticidae: *Phidippus audax* Hentz (as *P. tripunctatus* Hentz) (Peckham and Peckham, p. 147) ; *Phidippus* sp. (immature), (Rau and Rau, p. 60) ; *Habronattus* sp. (immature), Ithaca, N. Y., Sept. 1929 [coll. Cornell Univ.].

A New Isodontia from Cuba (Hymenoptera: Sphecidae: Chlorionini)

By V. S. L. Pate, Ithaca, N. Y.

In material sent me by Dr. S. C. Bruner of the Estacion Experimental Agronomica at Santiago de las Vegas, Cuba, are specimens of an exquisite metallic blue *Isodontia* which superficially resembles our common blue mud-dauber, *Chalybion californicum*. Metallic blue *Isodontiae* are rather unusual: only one other such form is known in the New World—the northern South American *Isodontia nigrocoerulea* (Taschenberg)[1] which is undoubtedly closely related to the present interesting Cuban species.

To Dr. Bruner I wish to extend my sincere thanks for the opportunity of studying this unusual material.

Isodontia poeyi[2] new species

The bright cyaneous coloration of *poeyi* immediately distinguishes it from all other Antillean species of Chlorionines.

The general habitus and the finely papillate flagellar articles indicate that *poeyi* is closely allied to Taschenberg's South American form *nigrocoerulea*. But unlike that species, *poeyi* is uniformly bright cyaneous in color, without trace of red or brown anywhere on the head, thorax, abdomen, or legs; the wings are clear to very lightly tinged with fuscous basally and discally to infumated apically, whereas those of *nigrocoerulea* are uniformly dark fusco-violaceous throughout. Furthermore, the head and thorax of *poeyi* lack the stiff, black, seta-like hairs so characteristic of *nigrocoerulea;* and the hair fringes on the abdominal sternites of the present species are black and much denser and shorter than the corresponding light and sparse

[1] The Panamanian *Isodontia bipunctata* Rohwer, 1913, is very probably a synonym of *I. nigrocoerulea* (Taschenberg, 1869).

[2] It is very fitting that this elegant and distinctive species be dedicated to one of Cuba's most celebrated and distinguished naturalists, Professor Felipe Poey.

structures found in *nigrocoerulea*. Finally, *pocyi* is a slim and delicate form, with the abdominal petiole very slender and fully as long as the hind metatarsi, in sharp contrast to the larger and stockier *nigrocoerulea,* the petiole of which is comparatively stout and less than three-fourths the length of the hind metatarsi.

Type.—♂; Sierra Cristal, Oriente Province, CUBA. February 16–20, 1948. (F. de Zayas and J. Ferrás.)

Male. Length 18 mm. Head and thorax uniform bright cyaneous; abdomen darker cyaneous, tinged with green. Legs dark cyaneous to knees; the tibiae, tarsi, calcaria, spines, claws, and pulvilli black. Antennae, tegulae, axillary sclerites, and abdominal petiole, black. Wings hyaline, the base and disc faintly tinged with fuscous, the apices, particularly beyond the cells, distinctly infumated; veins and stigma black.

Head with a moderately heavy vestiture of long, erect, silvery hair, thickest below antennae, and with a moderate, appressed, silvery sericeous pile on lower part of face and along inner and posterior orbits. Upper front and vertex with moderate, well separated punctures; a polite, impunctate area surrounding ocellar triangle, and also a similar broad band from posterior ocelli to upper inner orbits; postocellar line and ocellocular distance subequal. Antennae inserted above clypeus one-sixth the vertical eye length; scape strongly incrassate, one-third the vertical eye length; flagellar articles three to eight inclusive minutely papillate anteriorly and below; relative lengths: scape 15, pedicel 3, flagellar article one 11, two 10, three 12, four 20, five 20, six 20, seven 16, eight 14, nine 10, ten 8, eleven 8. Supraclypeal triangle impunctate, finely granulose. Clypeus strongly tumid, bisected by a weak keel; median length five-eighths the vertical eye length; apex truncate. Mandibles bidentate at apex.

Thorax and propodeum clothed with long, erect, silvery white hair. Mesonotum polite, with moderate, well separated punctures; notauli and parapsidal furrows faintly indicated. Scutellum and postscutellum more sparsely punctate than mesonotum. Mesopleura and metapleura more closely punctate than mesonotum. Propodeum with punctures close, semiconfluent, becoming very finely striato-punctate; no trace of stigmatal grooves.

Legs with coxae, trochanters, and femora clothed with long, jubate, silvery white hair. Tibiae and tarsi moderately spinose.

Abdomen with petiole slender, equal in length to the hind metatarsi, and clothed with long, erect, silvery hair. Tergites almost impunctate, with a very thin, fine, puberulent, appressed silvery pubescence. Second sternite discally with a patch of pale jubate hair; third to seventh sternites with a transverse, preapical band of moderately long, erect, black, stiff hairs or setae; seventh and eighth sternites strongly hirsute throughout. Apical margin of fifth sternite broadly, shallowly emarginate; sixth and seventh progressively more deeply emarginate, the eighth distinctly so.

Female. Unknown.

Paratype.—♂; Siboney, Oriente Province, CUBA. July 29, 1947. (Pastor Alayo.) [Estacion Experimental Agronomica, Santiago de las Vegas, Cuba.]

Dr. Bruner informs me that in 1939 he saw another specimen of what is probably this species, taken by A. R. Otero at light on the Isle of Pines.

The Identity of the Male of Pseudomethoca simillima (Smith). (Hymenoptera: Mutillidae)

By KARL V. KROMBEIN, Bureau of Entomology and Plant Quarantine, Agricultural Research Administration, U. S. Department of Agriculture

During the past two years evidence has accumulated which proves beyond reasonable doubt that the male formerly considered to be the male of *Pseudomethoca simillima* (Smith) has been incorrectly associated with the female. The original association of the two sexes was made by Mickel (1924, Proc. U. S. Natl. Mus. 64, Art. 15: 33) on the basis of a pair reported as being "discovered just at the conclusion of copulation on a clay bank at Jerseydale, Mo.," by Rau (1922, Trans. Acad. Sci. St. Louis 24: 3. Misidentified as *Bruesia sparsiformis* Ckll. and Roh.).

The reasons for disregarding the association of sexes based on Rau's observation and specimens are as follows: On August 14, 1946, both D. G. Shappirio (reported by Shappirio, 1947, Sci. Monthly 64: 358) and M. Vogel caught female *simillima* in copula with male *geryon* (Fox) in Rock Creek Park, Washington, D. C.; on September 5, 1946, P. W. Fattig collected a male *geryon* in copula with a female *simillima* at Atlanta, Ga.; and also on September 5, 1946, but in Rock Creek Park, M. Vogel collected a gynandromorph having a male head and female thorax and abdomen. In the Washington area the only species of *Pseudomethoca* are *frigida* (Smith) [collected in both sexes], *geryon* (Fox) [only males collected], *simillima* (Smith) [only females collected], and *sanbornii* (Blake) [collected in both sexes]. In the gynandromorph mentioned above the sculpture of the head (male) agrees with that of *geryon* better than with males of *frigida* or *sanbornii*. Likewise, the characters of the thorax and abdomen (female) agree better with *simillima* than with females of *frigida* or *sanbornii*. The fact that we (Vogel and Shappirio in Washington, and I in Arlington and Fairfax Counties, Va.) collected numerous males of *geryon* and females of *simillima*, and not even a single male of what was formerly thought to be *simillima*, also lends credence to this association of *geryon* and *simillima* as opposite sexes of the same species.

Therefore, *geryon* (Fox) and its synonyms *henshawi* (Melander) and *daeckei* (Rohwer) are to be entered in the synonymy of *simillima* (Smith) [New Synonymy].

I have examined the pair collected by Rau, which were mentioned earlier in this note. The female is definitely *simillima*, agreeing with that species in the character (lateral margins of propodeum dentate) used by Mickel (1935, Trans. Amer. Ent. Soc. 61: 387) to separate *simillima* from females of *aeetis* (Fox) and *oculata* (Banks), and it also differs from the last two species in the sculpture and conformation of the clypeus. The male is quite different from *geryon*. Apparently the copulation witnessed by Rau should be considered a case of mistaken identity on the part of the male.

The specific identity of the male formely associated with *simillima* is questionable; it is known from South Carolina, Florida, Missouri, Kansas and Nebraska. It is suggested that it may be the hitherto unknown male of *aeetis* (Fox); this species is known from Connecticut (locality questioned by Mickel, 1935), North Carolina, Georgia, Florida, Louisiana and Texas.

The Unexplored World

Where marshes deepen to the heron's breast—
Where inundated rushes suck the ooze—
There golden-bodied gnats deploy and quest
On highways, green-paved, limitless to choose.

And creatures ever smaller than a gnat!
A pinpoint snail, whose glass shell lays him bare—
Some larval mites, deep-eared (as in a ghat),
Whose muskrat-host holds thousands more in care.

O happy world, secure from jar and net!
Your margin, fringing open pond and shore,
Defends you while a hostile mountain yet
Repels the major figures who explore.

But look! those gnats and chiggers—for a shame—
Must soon adorn a pin and sport a name.

C. Brooke Worth

Current Entomological Literature

COMPILED BY RAYMOND Q. BLISS AND THEODORE M. TELSCH.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, pertaining to the Entomology of the Americas (North and South), included 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.

This list gives references of the year 1948 unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

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 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. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

GENERAL—Beatty, H. A.—The insects of St. Croix, Virgin Islands. [Journ. of Agric. Univ. of Puerto Rico] 28: 114–72, 1944. **Broadbent, Doncaster, Hull and Watson**—Equipment used for trapping and identifying alate aphides. [68] 23: 57–58, ill. **Chapin, Knight and Miller**—Proposed changes in Article 25 (the Law of Priority) of the international rules of Zool. Nom. [Science] 107: (2772): 166–67. **Grigg, F. C.**—The chromosome smear technique: A critical review and improvement of method. [Jour. Royal Micro. Soc.] 66: 25–34, ill., 1946 (Pub. 1948). **Hemming, F.**—Important advances in zoological nomenclature achieved at 13th International Congress of Zoology. [80] 108 (2798): 156–57. **Kennedy, C. H.**—Myrmecological technique II in collecting ants, the use of the coleopterists, the hemipterist and the economic entomologist with his light or bait trap. [58] 48: 27–29. **Kramer, S.**—A staining procedure for the study of insect musculature. [80] 108: 141–42. **Lillie, R. S.**—Randomness and directiveness in the evolution and activity of living organisms. [3] 82: 5–25. **Lindroth, C. H.**—Interglacial insect remains from Sweden. [Sveriges Geol. Undersökning] Årsbok 42: 1–30. **Smith and Dean**—Seventeenth or 1947 Annual Insect Population Summary of Kansas. [43] 21: 15–35, ill. **Taylor, E. W.**—The practical applications of phase-contrast to the biologist's microscope. [Jour. Royal Micro. Soc.] 66: 1–8, ill., 1946 (Pub. 1948). **Teale, E. W.**—The milkweed trap. [56] 57: 152–58, ill.

U. S. Dept. of Agriculture—Insect Pest Survey. Summary of insect conditions, 1947. [U.S.D.A.] 1–25, ill. **Weiss, A. B.**—The New York Entomological Club and "Papilio." [45] 56: 119–36. **Wishart and Stovell**—A portable light for a dissecting microscope. [80] 108: 46.

ANATOMY, PHYSIOLOGY, MEDICAL—Beams, H. W.—The effects of ultracentrifuging upon the meiotic chromosomes of the male grasshopper, Melanoplus differentialis. [44] 83: 87–103. **Brunpt and Chabaud**—L'infestation par des Ixodinés provoque-t-elle une immunité chez l'hote? I Note préliminaire. [Annales de Parasit.] 22: 348–56, 1947. **Bucher, Cameron, and Wilkes**—Studies on the housefly. II. The effects of low temperatures on laboratory reared puparia. [24] 26: 26–56, ill.—III. Effects of age, temperature, and light on the feeding of adults. *Ibid.:* 57–61. **Buser, J.**—Aspect histologique des phenomenes de metamorphose chez Piophila caseii L. [Arch. Zool. Experimentale] 85: 109–19, ill. **Calott, J.**—Étude sur quelques sonches de Culex pipens (sensu lato) et sur leurs hybridies. [Annales de Parasit.] 22: 380–93, 1947. **Carpentier, F.**—Quelques remarques concernant la morphologie thoracique des Collemboles. [Bull. et Ann. Soc. Ent. Belgique] 83: 297–303, 1947. **Cazal, P.**—Recherches sur les glandes endocrines retrocerebales des insectes (Odonata). [Arch. Zool. Experimentale] 85: 55–82, ill. **Chabaud, A. G.**—Les Arthropodes vecteurs de la peste bubonique. II. Cycle des rougeurs domestiques (Siphon.). [Annales de Parasit.] 22: 357–79, 1947. **Chagnon and Fournier**—Contribution a l'étude des Hemipteres aquatiques du Quebec. [55] 75: 49–68, ill. (k). **Chaudhuri and Bose**—Meiosis in diploid and teraploid spermatocytes of Attractomorpha, sp. (Acrid.). [Proc. Zoöl. Soc. Bengal] 1: 1–12, ill. **Clay, T.**—A new type of external organ found in the Mallophaga. [68] 23: 33–35, ill. **Cohic, F.**—Observation morphologiques et ecologiques sur Dorylus nigricans Ill. (Hymen.). [Revue Fran. d'Ent.] 14: 229–76, ill. **Cole and Jones**—A study of the weaver ant, Oecophylla smaraglina. [1] 39: 641–51 (k). **Dobzhansky and Epling**—The suppression of crossing over in inversion heterozygotes of Drosophila pseudoobscura. [67] 34: 137–41. **Dupuis, C.**—Nouvelles donnees biblogiques et morphologiques sur les Diptères Phasiinae parasites d'Hemiptères Hétéroptères. [Annales de Parasit.] 22: 397–441, 1947. **Dutt, M. K.**—Meiosis and chiasma formation in Tristria pulvinata Uv. (Acrid.). [Proc. Zoöl. Soc Bengal] 1: 49–57, ill. **Gaud, J.**—Larves d'anopheles a soies clypéales doublées. [Annales de Parasit.] 22: 394–96. 1947. **Hafez, M.**—A preliminary note on the influence of low temperature on number of Musca domestica vicina Macq. during the winter. [6] 14: 810–11. **Jahn and Wulff**—The spectral sensitivity of Dytiscus fasciventris. [45] 56: 109–17. **James, M. T.**—The flies that cause myiasis in man. [U. S. Dept. Agric. Misc. Publ.] No. 631, pp. 175, 95 figs. (Review in: [6] 14: 815–16.) **Jawlowski, H.**—Studies on the insects' brain. [Annales Univ. Mariae Curie, Lublin, Poland] III; 1: 1–37, ill. **Kerr, R. W.**—The effect of starvation on the susceptibility of houseflies to pyrethrum sprays. [Australian Jour. Sci. Res., Series B, Biol. Sci.] 1: 76–92. **Kodani, M.**—The protein of the salivary gland secretion in Drosophila. [67] 34: 131–35, ill. **Leclercq, J.**—Enquête parasitologique sur le ver de farine Tenebrio molitor. [Lambillionea] 48: 43–47. **Lees, A. D.**—The sensory physiology of the sheep tick, Ixodes ricinus. [40] 25: 145–207. **Manzelli, M. A.**—A survey of the Arthropod vectors of equine encephalomyelitis and encephalitis. [45] 56: 79–107. **Matthes, E.**—Weitere Beobachtungen zur Biologie der Psychiden. [Mem. Mus. Zool. da Coimbra, Portugal] 176: 1–51, ill., 1947. **Ogloblin, A.**—Las glandulas odoriferas de la langosta Shistocerca cancellata. [Arthropoda] 1: 54–77, ill., 1947. **Pavlov, P.**—Note critique sur la maladie denommée tick paralysis. [Annales de Parasit.] 22: 345–47, 1947. **Roeder, K. D.**—Organization of the ascending giant fiber system in the cockroach (Periplaneta americana). [41] 108: 243–61. **Sengün, A.**—Cytologische untersuchungen bei einer Culex- und einer Aëdes-Art. [Revue de la Faculté des Scs. Univ. d'Instanbul] XIII: 143–60, ill. **Teale, E. W.**—Wonder eggs of the insect world. [56] 57: 216–23, ill. **Uvarov, B. P.**—Recent advances in acridology, anatomy and physiology of Acrididae. [88] 99: 1–75, ill. **Villee and Bissell**—Nucleic acids as growth factors in Drosophila. [Jour. Biol. Chem.] 172: 59–66. **Waterhouse, D. F.**—The effect of color on the number of houseflies resting on painted surfaces. [Australian Jour. Sci. Res., Series B, Biol. Sci.] 1: 65–75. **Wigglesworth, V. B.**—The structure and deposition of the cuticle in the adult mealworm, Tenebrio molitor. [74] 89: 197–217, ill. **Wilkes, Bucher, Cameron, and West**—Studies on the housefly Musca domestica, I. Biology and large scale production of laboratory populations. [24] 26: 8–25.

ARACHNIDA AND MYRIOPODA—Beatty, H. A.—Arachnida of St. Croix, VI. [Journ. Agric. Univ. Puerto Rico] 28: 111–13, 1944. **Brunpt and Chabaud**—(See under Anatomy.) **Cloudsley-Thompson, J. L.**—Notes on Machnida. [6] 14: 808–10. **Curtin, C. B.**—The tardigrade fauna of the District of Columbia. [48] 38: 243–45. **Dupouy, W.**—Catalogo de las aranas de Venezuela. [Soc. de Ciencias Nat. la Salle] 20: 237–53, ill. (k), 1947. **Lees, A. D.**—(See under Anatomy.) **Pavlov, P.**—(See under Anatomy.) **Schubart, O.**—O elemento "synatrhapo" e estrangeiro entra os Diplopoda do Brasil. [Arthropoda] 1: 23–40, 1947. **Turk, F. A.**—Two new species of ticks. [61] 38: 243–46, ill. (S).

SMALLER ORDERS—Berner, L.—Records of stoneflies from Florida (Plecoptera). [Florida Ent.] 31: 21–23. **Carpentier, F.**—Collembola. (See under Anatomy.) **Carriker, M. A.**—Studies in neotropical Mallophaga (Ischnocera). [Arthropoda] I: 89–108, ill. (S*), 1947. **Cazal, P.**—Odonata. (See under Anatomy.) **Chabaud, A. G.**—(See under Anatomy.) **Clay, T.**—Mallophaga. (See under Anatomy.) **Fraser, F. C.**—A new interpretation of the course of the subcostal vein in the wings of Odonata, with remarks on Zalessky's notation. [68] 23: 44–50, ill. **Spencer, G. J.**—Some records of Mallophaga from Br. Columbia birds. [Proc. Ent. Soc. Br. Columbia] 44: 3–6. **Thompson, G. B.**—A list of the type-hosts of the Mallophaga and the lice described from them. [6] 14: 737–68. **Wygodzinsky, P.**—Redescription of Nesomachilis maoricus Tillyard, 1924, with notes on the family Machilidae (Thysanura). [Dominion Mus. Records Ent., Wellington, New Zealand] 1: 69–78.

ORTHOPTERA—Beams, H. W.—(See under Anatomy.) **Bruijning, C. F. A.**—Studies on Malayan Blattidae. [Zool. Mededeel., Leiden] 29: 1–174, ill. **Chaudhuri and Bose**—(See under Anatomy.) **Clark, L. R.**—Ecological observations on the small plague grasshopper Austroicetes cruciata in the Trangie district. [Bull. Council Sci. and Industr. Res.] 228: 5–26, 1947. **Dutt, M. K.**—(See under Anatomy.) **La Rivers, I.**—A synopsis of Nevada Orthoptera. [1] 39: 652–720 (k). **Lieberman, José**—Los Acridos de Sante Fe. (The general part includes a portrait and a bibliography of Lawrence Bruner.) [Rev. Soc. Ent. Arg.] 14: 51–55 (*). **Ogloblin, A.**—(See under Anatomy.) **Roeder, K. D.**—(See under Anatomy.) **Uvarov, B.**—(See under Anatomy.)

Willemse, C.—A new Cyphacris from the upper Amazon of eastern Peru. [Rev. Soc. Ent. Argent.] 14: 12–16, ill.

HEMIPTERA—Banfield, A. W. F.—A bedbug on a Little Brown Bat. [Canad. Field Nat.] 62: 126. **Beamer, R. H.**—Some new species of Delphacodes. [43] 21: 1–10, ill. **Broadbent et al.**—(See under General.) **Chagnon, and Fournier**—(See under Anatomy.) **De Long, D. M.**—The leafhoppers, or Cicadellidae, of Illinois (Eurymelinae—Balcluthinae). [Bull. Illinois Nat. Hist. Survey] 24, article 2: 97–376, ill. (k). **Dupuis, C.**—(See under Anatomy.) **Fiedler, C.**—Südamerikanische Arten der Rüsslergattung Zascelis Lec. (Curc. Cryptorhynch.) [6] 14: 768–807. **Hottes, F. C.**—Descriptions of the sexual forms of some species of Aphiidae. [63] 61: 29–32.—Two new species of Aphiidae. *Ibid.:* 33–40. **Oman, P. W.**—Notes on the beet leafhopper Circulifer tenellus (Baker), and its relatives (Cicad.). [43] 21: 10–14. **Richards, O. W.**—Observations on some British Guiana Rhynchota. [28] 55. **Russell, L. M.**—North American species of White-flies of the genus Trialeurodes. [U.S.D.A. Misc. Pub.] 635: 1–85, ill. (k*). **Smith, C. F.**—A new aphid on sweet potato. [Florida Ent.] 31: 24–26, ill. **Wilson, G. F.**—Two injurious Aphid pests of conifers. [Jour. Royal Hort. Soc.] 73: 73–78, ill. **Wilson, J. W.**—A note on the predaceous habit of the mirid Cyrtopeltis varians. [Florida Ent.] 31: 20. **Wood, S. F.**—The tolerance of rodents to the feeding of Cone-nosed bugs ((Reduviid). [Bull. So. Calif. Acad. Scs.] 46: 144–55.

LEPIDOPTERA—Comstock, J. A.—Notes on the life history of Orthodes accurata. [Bull. So. Calif. Acad. Scs.] 46: 124–26, ill. **Corbet, A. S.**—Papers on Malaysian Rhophalocera. V. The conspecificity of the American P. lavinia (Cramer) with the Oriental P. orithya (L.) [30] 81: 54–56, ill. **Curran, C. H.**—Life story of the tent caterpillar (Lasiocampidae). [56] 57: 168–72, ill. **Gardner, J. C. M.**—Notes on pupae of the Noctuidae. [68] 23: 84–92 (k). **Ghelelovitch, S.**—Coelogregarina ephestiae, Schizogrégarine parasite d'Ephestia kühniella. [Arch. Zool. Exp. et Gén.] 85: 155–68. **Jawlowski, H.**—(See under Anatomy.) **Jones, W. W.**—Paraleucoptera heinrichi n. sp. [Bull. So. Calif. Acad. Scs.] 46: 122–23, ill. (*). **Matthes, E.**—(See under Anatomy.) **Mooser. O.**—Sphinx pitzahuac n. sp. (Sphing.). [8] 18: 547–49 (S), 1947. **Ureta, E.**—Nuevos ropaloceros de Chile. [Boletin del Mus. Nacional de Hist. Nat., Santiago] 23: 47–62, ill., 1947.

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[Coleopterists' Bulletin] 11: 31–32. **Martinez, A.**—Lamellicornia neotropical, I. [Arthropoda] 1: 41–53, ill. (*), 1947.—Addenda y corrigenda al trabajo de Blackwelder "Checklist of the Coleopterous insects of Mexico, C.A., West Indies and So. Amer." (Scarab.). *Ibid.:* 109–14, 1947. —Insectos nuevos o poco conocidos—VI (Col. Scarabaeidae). [Rev. Soc. Ent. Argent.] 14: 3–11. **Monros, F.**—Notas sobre Crioceridae Argentinos (Chrysomelid). [Arthropoda] 1: 78–88, ill. (k*), 1947. **Park, O.**—Observations on Batrisodes (Pselaph.), with particular reference to the Amer. species east of the Rocky Mountains. [Bull. Chicago Acad. Sci.] 8: 45–135.—Checklist of the genus Batrisodes (Pselaph.). *Ibid.:* 137–69, ill. (k*). **Pereira, F. S.**—Descripcion de un nuevo escarabajo Brasileño (Scarab.). [Arthropoda] I: 1–15, ill. (k*), 1947. **Pic, M.** —Sur divers coleopteres phytophages de la Republique Argentine (Atelasis and Megalopus). [Rev. Soc. Ent. Arg.] 14: 51–55 (*). **Robinson, M.**—Studies in the Scarabaeidae, IV. [83] 74: 29–36 (*).—The genus Choeridium inhabiting the United States. *Ibid.:* 37–40 (k*). **Sanderson, M. W.**—Two undescribed species of Phyllophaga from Texas. [57] 504: 1–6, ill. (*). **Saylor, L. W.**—Synoptic revision of the U. S. scarab beetles of the subfamily Dynastinae, No. 5. Key to tribes and genera. [48] 38: 240–43, ill. **Spencer, G. J.**—Notes on some Dermestidae of British Columbia. [Proc. Ent. Soc. Br. Columbia] 44: 6–9. **Wigglesworth, V. B.**—(See under Anatomy.) **Zikan, J. F.** —O gênero Parandra Latr., 1804, com a descrição de 14 espécias novas (Cerambyc.). [Rev. Soc. Ent. Argentina] 14: 22–50, ill. (k).

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Calopteryx versus Agrion; Again ?(Odonata)

By Erich Schmidt, Mozartstr. 22, Bonn, Germany, British Zone

In 1775 Fabricius (Systema Entomologiae . . . , p. 425) created the genus *Agrion* for the two Linnean species *Libellula virgo* and *Libellula puella*. Systematic development afforded further splitting of this genus, so that a new genus name was necessary for one of these species. The next proposal was certainly that of Leach, usually quoted as 1815 (Edinb. Encycl. 9, 1, p. 137), who erected the genus *Calepteryx* for *Agrion virgo*. This new name was corrected by Burmeister 1839 into *Calopteryx* (Handb. Ent. 2, p. 825), which was generally adopted and remained valid over 50 years, until 1890, when Kirby in his well known Catalogue (p. 96) believed a change necessary, as Latreille in 1802 (p. 287) had elected *Libellula virgo* as genotype of *Agrion* Fabr.; he proposed therefore the new name *Coenagrion* for *Agrion puella* as genotype (1890). Since this time a dualism in nomenclature arose not only for these two genera, but also for two principal stems of Odonata, with its unfortunate consequences, especially misunderstanding and changing of opinion (Tillyard, E. M. Walker), and therefore it should be appreciated to remove this unpleasant condition, which was illustrated by Ris (1912, Suppl. Ent. 1, p. 54) and Calvert (1927, Ent. News 38, p. 185f.).

It was a pity that Kirby's Catalogue appeared just at the time, when one of the best experts on literature on Odonata, namely Dr. Hermann August Hagen, became ill and was unable to criticize it.

Selys Longchamps (Ann. Soc. Ent. Belg. 34, CR. (4) 9, p. clix ff., 1890) considered Kirby's views on nomenclature as "ultra-radical" in their excessive application of the laws of priority; he wished more tolerance concerning accomplished facts, which have in their favor a long prescription, often of 100 years, and general use for a great number of years; we should not seek to revive completely forgotten things on the results of curious bibliographic researches into papers often not to be found, and in consequence not to be checked. It is more to the interest of science not to destroy the general works and monographs elaborated with patience and learning by recent specialists. It seemed to him an impossibility to adopt the change of names (*Agrion* for *Calopteryx*) and the new names (*Coenagrion*) which stand in a flagrant contradiction to a nomenclature, the descent of which begins with splitting up the Linnean genus *Libellula* by Fabricius and Latreille and continued by Leach and others, whose papers and nomenclature were generally adopted.

A similar point of view illustrating the "schism" as a result of Kirby's "ultra-radicalism" was published forty years later by Dr. F. Ris. (Mitt. Münchn. Ent. Ges. 20, p. 71f., 1930), of which we give here a somewhat free translation: In the polemics suggested by Kirby's catalogue *Calopteryx* versus *Agrion* the camps are separated—not exactly, but approximately—according to the continents: America is using *Agrion* preponderantly, Europe is still keeping more to *Calopteryx;* Australia (Tillyard) has recently tended from *Calopteryx* to *Agrion;* an unpleasant condition, which probably reflects also the different views concerning history and tradition. Apparently the arguments of neither party are able to convince the other. This is inevitable in many questions of nomenclature, and as it is so, the writer (Ris) takes the following point of view. The first purpose of nomenclature in general is to be understood; questions of priority are secondary. Since it is called *Calopteryx* in classical works as the "Monographie des Calopterygines" by Selys-Hagen, in the "Synopsis" by Selys and the "Revue des Odonates," which the Monographie continued, why should I use

Agrion, when the arguments offered for the change are in no way indisputable? If I continue to use *Calopteryx,* as hitherto in all my published papers, I am sure to be understood correctly at once, and this is the principal matter.

In general it might be said: The naturalists are in error when they try to decide questions of nomenclature among each other, according to their own methods, even in universal congresses. These questions, however, have more relation to quite another sphere of human knowledge and research than to natural history: their near relationship to problems of jurisprudence is unmistakable. And when we consider that the subjects of justice here are not concrete and living persons, but abstract and dead names, we may transfer the whole matter without any reserve to jurisprudence; in other words (as the latter will not concern itself with it in its own interest) we should consult the representatives of this science in a friendly way, that they may help us to disentangle the nomenclatorial chaos with the assistance of their principles elaborated during thousands of years. Without such principles as "prescription," "acquired rights," and similar ideas, this disentanglement is doubtless impossible; but with them it should be possible; the result will certainly be a healthy conservatism, more respect for good custom and not the helpless driving in a casuistry, in which always new entanglements emerge which the law (the international rules of nomenclature with all their annexes) never could foresee or in general solve without ambiguity.

We believe that everyone will acknowledge that such opinions given by two eminent authorities near the ends of their lives of successful work in systematic Odonatology show a reasonable and wise attitude and human superiority; he will also appreciate every attempt to convince those who might be more pretentious in other directions. For such bibliographic grave-diggers the following lines may perhaps be of interest.

Muttkowski (Bull. Wisconsin Nat. Hist. Soc. 8, p. 158f., 1910) stated that "Kirby's change (of name) was based on Latreille (Histoire naturelle générale et particulière des Crustaces et des Insectes, 1805 [1])": "but as Latreille's description

[1] Vol. 3 of the series appeared in 1802.

is somewhat indefinite some doubt may have been had as to the advisability of the decision of the International Commission on Zoological Nomenclature." The result of a correspondence with Dr. Stiles was that *Agrion virgo* was fixed by Latreille in 1810 (Considérations générales . . . p. 434). This statement was repeated by Cowley, 1934 (Entomologist 67, p. 204), apparently without knowledge of Muttkowski's previous statement.

It is noteworthy that another important statement by Hagen, just one hundred years ago (Ent. Ztg. Stettin 10, p. 67 and footnote), concerning the date of publication of Leach's article, taken from Stephens (Brit. Ent. 6, p. 77, 80), where Hagen declared that Stephens had said expressly that the *genera of Odonata formed by Leach were erected in the year 1810,* seems to have been overlooked, as it never was criticized. The date of Brewster's Edinburgh Encyclopaedia, where Leach's paper appeared, is differently quoted in other places. Hagen's Synonymia Libellularum Europaearum 1840, p. 12, has 1810; Agassiz' Nomenclator has 1817 (teste Hagen); in Hagen's Bibliotheca Ent. it is 1815 and a reprint of 1830. Calvert (Trans. Amer. Ent. Soc. 20, p. 227, 1893) mentions an Amer. edition of 1816. We understand that in such a gigantic work as Brewster's Encyclopaedia not all volumes and parts were printed within one year, but appeared in installments, and we are inclined to believe that the part of Leach was ready before 1815, and perhaps even in 1810, as Stephens knew it, and according to his note he was astonished that the "celebrated Latreille did *not* know it!" He says (l. c. p. 77 concerning the species of *Lestes* Leach): "these insects, as well as those of the preceding genus (*Agrion*), were long considered as constituting *one species* only, and are thus considered in the latest works of the celebrated Latreille, although the discrepancies of the two genera were pointed out by Leach in 1810!!" This accentuation, the two marks of exclamation and the further mention of the year 1810 on page 80 exclude any possibility of an error or misprint, and we must suppose, together with Hagen, that "it seems to be more correct that Leach's genera were erected in the year 1810." Under this supposition (which up to date we are unable to verify), the conclusion will be necessary that *the priority of Latreille versus Leach has become at least or even more than doubtful* and that it will be best to reject Kirby's objection definitely.

Another possibility is that Hagen perhaps erroneously carried Stephens' statement over to Leach's article in Brewster's Encyclopedia and Stephens considered another paper of Leach which appeared in 1810. Perhaps this might be that in the "New Cyclopedie von Rees," quoted by Hagen in his Bibl. Ent. 1, p. 457, without sufficient dates and also not accessible to the present writer. In Hagen's quotation the latter precedes that of Brewster.

If we see further the modest contributions only which Latreille gave to the matter after 1802 (the latter was, as was pointed out above, excluded by Muttkowski, Stiles and Cowley), we understand Hagen's opinion (1848, l. c. p. 59), that "Latreille (1804) made only a weak attempt to limit the known species," and this agrees well with Stephens' opinion, mentioned above, and both authors were more or less contemporaries of Latreille. Leach, however, is "the first Englishman, who seems to have subjected the Odonata to a strong scientific criticism. His classification testifies to an exact knowledge of the family and is usually (except for the new exotic genera) up to date" (Hagen 1848, l. c. p. 67).

The writer should be satisfied if this contribution might destroy the dualism in this principal question of nomenclature, and he hopes that no Kirbyus redivivus might ever arise again!

[At Dr. Schmidt's request I add the following: Thanks to the cooperation of librarians of the Academy of Natural Sciences of Philadelphia, the American Philosophical Society, the Library of Congress at Washington, the New York Public Library and the Alderman Library of the University of Virginia at Charlottesville, it appears that no article "Entomology" by William Leach was published in Rees' Cyclopaedia in spite of the references to it in Hagen's Bibliotheca Entomologica, p. 457, No. 1, under Leach, and in Horn & Schenkling's Index Litteraturae Entomologiae, p. 697, No. 12909.—P. P. Calvert.]

Dragonflies Collected from Beaufort County, South Carolina, during the Fall of 1945

By George H. Bick, Zoology Department, Tulane University, New Orleans, La.

During October 1945 three small collections of dragonflies were obtained from Ladies Island, just east of the town of Beaufort in Beaufort County, South Carolina. All collections were by the author and from the immediate vicinity of small fresh water pine land ponds. All specimens have been deposited in the collections of the Zoology Department of Tulane University. Species represented are:

Anax junius. Lot 368. 3 males. October 21.
Epiaeschna heros. Lot 370. 1 nymph. October 21.
Libellula pulchella. Lot 369. 1 male. October 14.
Pachydiplax longipennis. Lot 368. 6 males, 1 female. October 21.
Trapezostigma carolina. Lot 368. 3 males. October 21.

This note supplements the annotated list of Odonata of South Carolina by Prof. B. E. Montgomery (Jour. Elisha Mitchell Sci. Soc., 56–2: 283–301, 1940). Editor.

The Correction of a Genotypic Citation for the Genus Choristoneura Led.

It has been brought to my attention by G. E. Bucher, that in my note on the generic assignment of the spruce budworm *Choristoneura fumiferana* Clem. (Can. Ent. LXXIX: 21, 1947) I cited the genotype as *Tortrix rusticana* Treit. This citation is a *laps. cal.* for *Tortrix diversana* Hbn., the correct genotype as contained in my original manuscript.

T. N. Freeman.

Notes on Some North American Skippers, with the Description of a New Species from Kansas (Lepidoptera: Hesperiidae)

By H. A. Freeman, Southern Methodist University, Dallas, Texas

Urbanus undulatus (Hew.)

This species has been recorded from Mexico to southern Brasil and Paraguay, and also from Trinidad. The writer collected a specimen of this species at Tamazunchale, Mexico, during June and another one at Acapulco on the first of July, 1936.

On September 19, 1947, a female specimen of *undulatus* was collected off zinnias in a flower garden in Pharr, Texas. This individual appeared to be fresh, except that both tails were missing. This is the first record for this species in the United States.

Hesperia metea licinus (Edwards)

Pamphilia licinus Edwards, Trans. Amn. Ent. Soc. 3: 275, 1871, near Waco, Texas.
Hesperia horus Edwards, Trans. Amn. Ent. Soc. 3: 277, 1871, near Dallas, Texas.
Hesperia metea belfragei Freeman, Field and Laboratory, Vol. XII, No. 1, p. 20, Jan. 1944, Cedar Hill, Dallas Co., Texas.

For a number of years considerable confusion has existed concerning the status of *Pamphilia licinus* Edwards and *Hesperia horus* Edwards. Recently Dr. A. W. Lindsey [1] placed *Pamphilia licinus* Edwards as a synomym of *Hesperia metea* Scudder and stated "The type of *licinus* is a normal specimen of *metea.* The upper surface, illustrated by Holland, is less distinctive than the lower." With this in mind, the writer described as a new form *Hesperia metea belfragei,* from nine specimens collected at Cedar Hill, Dallas Co., Texas. This form is characterized by being larger, darker and having the maculation greatly re-

[1] Lindsey, A. W., A preliminary revision of Hesperia. Denison Univ. Bull., Jn. Sci. Lab., Vol. XXXVII, April, 1942, p. 16.

duced from typical *metea* Scudder. After corresponding with Dr. A. Avinoff and W. R. Sweader, at that time Assistant Curator, Carnegie Museum, the writer is fully convinced that *licinus* represents the Texas subspecies of *metea*. Dr. Sweadner stated in one of his letters: "I have examined the type of *Hesperia licinus* (Edw.). The ground color on both sides is a dull dark brown similar to the color in the genus *Prenes*. All of the spots are much reduced. The under side of the hind wing lacks the greenish sheen in the anal area that our specimens of *H. metea* have. The white spots around the end of the cell are reduced to minute dots. The band is less than half the width of that of *metea* and appears to be broken on vein 6. There is no whitish scaling on the veins." This description fits perfectly the insect named by the writer *metea belfragei* thus placing *belfragei* as a synomym of *licinus*. The drawing that Dr. Avinoff sent the writer verified Dr. Sweadner's statement.

For several years the writer has thought that *Hesperia horus* Edwards was the female of *Pamphilia licinus* Edwards and after carefully checking the original description and several sketches of the type at Cambridge there appears to be no doubt that this specimen is a female of Edwards' *licinus* and the writer's *belfragei*. Of the five females of this subspecies collected by the writer and his wife, two fit the original description and pictures of *horus* perfectly. In the other three the spots are present in a more or less definite degree. It is very easy to understand why so many lepidopterists have been confused with *horus* as two of my specimens show very little resemblance to the genus *Hesperia* much less to *metea*.

In the past twenty-two years the writer has never seen a typical specimen of *metea* from Texas or from any of the adjoining states. Two females were collected in Arkansas several years ago and one was sent to the late Dr. Eugene Murray-Aaron who in turn stated that it certainly looked like the unique type of *horus* Edwards. These two specimens were not quite as dark and immaculate as Texas examples. There exist in Georgia and the surrounding area specimens of *metea* that appear to be intermediate between typical *metea*, from the northeastern part of the United States, and *licinus* from Texas.

As *licinus* has page priority only over *horus* we will accept that name thus placing in synonymy *horus* Edwards and *belfragei* Freeman.

✓**Atrytone eulogius** Ploetz

This tropical American species has been recorded from Mexico to South America. Hoffmann[2] reports *eulogius* from Vera Cruz to the Yucatan peninsula and around Sinaloa in Mexico. The writer collected two males at Brownsville, Texas; one May 24, 1946, and the other Nov. 28, 1947. This is the first recorded evidence of this species in the United States.

✓**Atrytonopsis turneri** new species

♂. Upper surface, primaries, greyish-brown, with a variable number of white spots, ranging from seven, three subapical, two below these and two near the end of the cell, to immaculate.

Secondaries, greyish-brown, darker near the base, otherwise immaculate.

Under surface, primaries, dark grey with a lighter grey overscaling near the outer margin. The spots reappear and are somewhat better defined on this surface.

Secondaries, grey, with a lighter overscaling over most of the wing. Most specimens immaculate, whereas some may have one or two white spots near the base. A few specimens have a faint submesial row of spots.

Fringes are light, nearly white on both pairs of wings. Palpi sordid white. The body is dark grey above and lighter beneath.

Expanse.—28 mm.–35 mm., average 31 mm.

♀. Similar to the ♂, except that the spots are larger and the fringes somewhat darker.

Expanse.—32 mm.–38 mm., average 34 mm.

Described from 47 specimens, 29 ♂♂, and 18 ♀♀, from Barber Co., and Caldwell, KANSAS; Freedom, OKLAHOMA. Collected by Dr. and Mrs. R. C. Turner, Dr. J. R. Turner, and Mr. and Mrs. Don B. Stallings, during April and May 1945–46.

[2] HOFFMANN, C. C., Catalogo sistematico y zoogeografico de los Lepidopteros Mexicanos. Segunda parte. Hesperioidea. Anal. Inst. de Biol., Mexico, D. F., Tomo XII, No. 1, p. 276, 1941.

This new species is named in honor of Dr. R. C. Turner, who collected a large number of the type series of this undescribed species.

Holotype ♂, Barber Co., Kansas, May 5, 1946, *allotype* ♀, Barber Co., Kansas, April 28, 1946, will be placed in the American Museum of Natural History; 1 pair of *paratypes* will be placed in the following museums: Academy of Natural Sciences Philadelphia and United States National Museum; 2 pairs are in the collection of Mr. Otto Buchholz; 15 ♂♂, and 7 ♀♀ are in the collection of Stallings and Turner and the remaining 9 ♂♂ and 6 ♀♀ are in the collection of the author.

This new species appears to be related to *hianna* Scud. and *deva* (Edw.). The general coloration and maculation are very much like that of *deva,* but it differs from that species in its smaller size. *Turneri* differs from *hianna* in being grey instead of brown and there is more of an even grey coloration on the under surface of the secondaries than is present in *hianna.* The submesial row of spots in *turneri* is greatly reduced from that of *hianna.* The fringes and palpi are also lighter in *turneri* than they are in *hianna.*

✓ **Cobalus percosius** G. & S.

Hoffmann states on page 276 of his Hesperioidea that *percosius* occurs in Mexico in the vicinity of Vera Cruz. On November 28, 1947, the writer caught a ♂ specimen of this species in Brownsville, Texas. While on a collecting trip with Mr. Otto Buchholz between Brownsville and Southmost, Texas, April 4, 1948, we caught 40 specimens of this species, 35 ♂♂, and 5 ♀♀. Three days later (April 7, 1948) Otto Buchholz went back to this spot again and caught 7 ♂♂, and 3 ♀♀, making a total of 50 specimens collected in a three-day period. This species is native to that particular habitat and the specimens were collected off thistles and evening primroses.

This establishes another new skipper record for our North American list, as previously no members of the genus *Cobalus* have been recorded from the United States.

Undescribed Species of Crane-Flies from the Western United States and Canada (Dipt.: Tipulidae) Part X

By Charles P. Alexander, University of Massachusetts, Amherst, Massachusetts

The preceding part under this title was published in Entomological News, 59: 121–128, 1948. At this time I am describing various new species from Arizona, virtually all from the White Mountains in the Apache National Forest. From June 20 to 25, 1947, we were encamped on the South Fork of the Little Colorado River, where we enjoyed and profited greatly by the companionship of John and Grace Sperry. With the Sperrys we visited and collected at various places in the northern part of the White Mountains, particularly at and near Greer, Alpine and Coulter's Ranch, chiefly at altitudes between 8000 and 9000 feet. The types of the novelties are preserved in my collection of these flies.

Limnophila (Phylidorea) semifacta new species

Mesonotum black, sparsely pruinose; mesopleura black, the propleura and metapleura obscure yellow; antennae black throughout; femora black, the bases yellow; wings with a weak brown tinge, the margins a trifle darker than the disk; stigma oval, pale brown; abdomen yellow, the lateral portions darker; segment eight dark brown, forming a narrow ring; male hypopygium with the outer dististyle slender, unequally bidentate at tip; outer gonapophyses appearing as strong blackened blades, narrowed at tip into a strong spine.

♂. Length about 11 mm.; wing 10 mm.

Rostrum and palpi black. Antennae black throughout; basal flagellar segments a trifle produced on lower face, the outer segments more elongate; intermediate segments subequal in length to their verticils. Head uniformly gray.

Pronotum dark gray pruinose. Mesonotum black, sparsely pruinose, the humeral and lateral borders of the praescutum restrictedly obscure brownish yellow; pseudosutural foveae brownish black; scutellum brown, the sides and the parascutella obscure yellow; mediotergite pruinose, pleurotergite brownish yellow. Pleura with the mesopleura brownish black, pruinose, the propleura and metapleura obscure yellow. Halteres with stem pale yellow, knob infuscated. Legs with the coxae and trochanters yellow; femora black, the bases yellow, involving about the proximal fourth; remainder of legs brownish black to black, the tibiae and basitarsi brownish black. Wings with a weak brownish tinge, the costal, apical and posterior regions a very little darker than the disk; stigma oval, pale brown; prearcular field brighter yellow; veins dark brown, yellow in the prearcular area. Venation: Sc_1 ending shortly before the fork of *Rs*, Sc_2 long, ending shortly beyond the fork of *Rs*, R_{2+3+4} a little longer than the basal section of vein R_5; *m–cu* at or just before midlength of cell *1st* M_2.

Abdominal tergites obscure brownish yellow, darker laterally; sternites clearer yellow, similarly patterned; eighth segment darker brown to form a narrow subterminal ring; hypopygium obscure yellow. Male hypopygium with the tergite terminating in two slender lobes, directed caudad, separated by a much broader notch. Basistyle on mesal face produced into a microscopic tubercle. Outer dististyle a slender rod, blackened and unequally bidentate at apex, the smaller subterminal spine being on the outer margin. Inner dististyle with the basal half stout, the outer half abruptly narrowed into a slender lobe. Phallosome with the aedeagus small, slender, the subtending apophyses subequal in length and size. Outer apophyses appearing as strong blackened blades, the tips narrowed into a stout black spine, these spines slightly divergent.

Habitat.—ARIZONA. *Holotype:* ♂, White Mountains, near Greer, 8400 feet, June 21, 1947 (C. P. Alexander).

Limnophila costata Coquillett (Psyche, 9: 149, 1901) was described from a single female specimen, collected by the late Professor T. D. A. Cockerell in the Hudsonian Zone of the range between the Pecos and Sapello Rivers, northwest of Las Vegas, New Mexico, at an altitude of about 11,000 feet, August 1–4, 1900. This is still known only from this unique type which agrees with the present fly in the elongate vein Sc_1 and in other details of venation but differs in the coloration of the body, antennae, legs and wings.

Gonomyia (Idiocera) biacus new species

♂. Length about 5 mm.; wing 5 mm.

Allied to *coloradica* Alexander, differing chiefly in the structure of the male hypopygium. Outer or forked dististyle with the short lateral branch stout, oval in outline. Third dististyle a simple blackened rod, gradually narrowed to the acute gently curved tip. Inner dististyle with the outer spine small and but slightly developed. Aedeagus with the lateral apical spines very long and powerful, approximately four times as long as the central protruding penis-guard, the spines lying generally parallel to one another; setae along face of aedeagus relatively sparse and scattered. Particular attention is called to the differences in the third dististyle and the aedeagus.

Habitat.—Arizona. *Holotype:* ♂, Chiricahua Mts., along small stream below Rustler's Park, 7000 feet, June 5, 1942 (C. P. Alexander).

Gonomyia (Idiocera) sperryana new species

Size large (wing, male, 7 mm. or over); mesonotum gray, the praescutum with two narrow brown lines that diverge behind, extending over the scutal lobes; pleura conspicuously striped longitudinally with gray and yellow; knobs of halteres infuscated; femora yellow, darkened outwardly; wings whitish subhyaline, restrictedly patterned with brown; sternites yellow, with a broad sublateral black stripe, broken at the posterior borders of the segments; male hypopygium with the lobe of the basistyle obtuse at tip; outer dististyle with the branches very unequal, the outer a slender spine, the inner a broad triangular blade; second style a strong black rod, nearly parallel-sided, at tip narrowed into a short point; inner style dilated, the inner margin notched; apex of aedeagus simple, decurved.

♂. Length about 6–7 mm.; wing 7–8.2 mm.

♀. Length about 7.5 mm.; wing 8 mm.

Rostrum and palpi black. Antennae with scape yellow, pedicel and first flagellar segment pale basally, darkened at tips; remainder of flagellum black, the segments oval with short verticils. Head above yellow, the center of vertex darkened; posterior parts of head more brownish gray.

Pronotum gray medially, the sides and the pretergites light yellow. Mesonotum gray, the praescutum with two narrow brown lines that diverge behind, crossing the suture over the scutal lobes; humeral region restrictedly yellow; scutellum with a pair of brown spots; postnotum gray, the dorsal pleurotergite yellow, extended behind onto the sides of the mediotergite. Pleura dark gray, conspicuously striped longitudinally with light yellow, including the dorsopleural region and a more ventral stripe from the fore coxae to the abdomen; sternopleurite darkened. Halteres yellow, knobs infuscated. Legs with the fore and middle coxae light yellow, the posterior pair more obscure yellow; trochanters yellow; femora yellow, darkened at outer end, the extreme tip, in cases, slightly paler; tibiae brown, the tips and the tarsi black. Wings whitish subhyaline, restrictedly patterned with brown, including small spots at Sc_2, origin of *Rs,* cord and outer fork of media; stigma infuscated; a brown wash in outer ends of cells R_3 and R_4; veins dark brown, *Sc* paler. Venation: Apical fusion of veins R_{1+2} and R_3 relatively extensive; *m–cu* more than its own length before the fork of *M*.

Abdominal tergites dark brown, the caudal borders of the segments narrowly yellow, the lateral margins more narrowly so; pleural membrane yellow; sternites yellow, with a broad sublateral black stripe, broken at the posterior borders of the segments; hypopygium chiefly yellow. Male hypopygium with the outer lobe of basistyle relatively small, the apex obtuse, with long setae. Outer or branched dististyle with the arms very unequal, the outer one a slender spine, the inner a broad triangular blade; second style a strong black rod, nearly parallel-sided, at tip narrowed into a short point; third style a very weak pale rod, the shortest of the four styles or branches; inner style narrowed at base, dilated outwardly, the inner margin notched or emarginate, forming a small basal lobe and a large outer blade. Apex of aedeagus simple, decurved.

Habitat.—ARIZONA. *Holotype:* ♂, Alpine, White Mountains, 8400 feet, June 23, 1947 (C. P. Alexander). *Allotopotype:* ♀. *Paratopotypes:* ♂♀ (Alexander and Sperry).

I take unusual pleasure in naming this fine species for the Sperrys, who collected part of the type series. This is by far the largest member of the subgenus in the Nearctic fauna. It is most similar to *Gonomyia* (*Idiocera*) *proserpina* Alexander, differing in the size and in the structure of the male hypopygium.

Gonomyia (Gonomyia) filiformis new species

General coloration of mesonotum dark brownish gray; pleurotergite and pleura yellow, the latter restrictedly patterned with light brown; rostrum yellow; antennae black throughout; halteres elongate; wings long and narrow; *Sc* short, Sc_1 ending close to the origin of *Rs;* male hypopygium with the outer dististyle an elongate blackened club that is provided with abundant long black setae; inner dististyle with the usual spine weak and only feebly chitinized; aedeagus long and slender, the tip simple, slightly decurved; apophyses apparently lacking.

♂. Length about 5–5.2 mm.; wing 6.5–7 mm.

Rostrum yellow; palpi black. Antennae black throughout, relatively long; basal flagellar segments long-oval, the outer ones more slender and lengthened, subcylindrical, exceeding the verticils in length. Head above dark gray, yellow beneath.

Pronotum yellow, narrowly infuscated medially; pretergites light yellow. Mesonotal praescutum and scutum dark brownish gray, unpatterned; median region of scutum obscure yellow, the posterior parts of the lobes clearer yellow; scutellum brown, the posterior border broadly obscure yellow; mediotergite dark brown, pruinose, the sides and the pleurotergite yellow. Pleura yellow, restrictedly patterned with reddish brown or light brown on the anepisternum and ventral sternopleurite. Halteres elongate, stem yellow, knob infuscated. Legs with the coxae and trochanters yellow; femora and tibiae brownish yellow, the tips weakly darkened; tarsi passing into brownish black. Wings long and narrow, grayish subhyaline, the prearcular field paler; stigma small, pale brown, scarcely evident; veins brown. Venation: *Sc* short, Sc_1 ending opposite or just beyond the origin of *Rs*, Sc_2 at its extreme tip; *Rs* a trifle longer than R_{2+3+4}; *m–cu* variable in position, from just before the fork of *M* to about opposite one-fifth the length of cell *1st* M_2.

Abdomen slender; tergites brown, the borders of the outer segments narrowly yellow; sternites obscure yellow; hypopygium yellow, the outer ends of the dististyles conspicuously blackened. Male hypopygium with the outer lobe of the basistyle relatively small, long-oval, with a fringe of strong setae on outer end. Outer dististyle an elongate darkened club that is provided with unusually numerous and conspicuous black setae. Inner dististyle erect, the usual spine weak, feebly chitinized and hence little evident, appressed to the main body of style, its tip narrowly obtuse; style terminating in two unequal fasciculate setae, its apex produced into an acute pale point. Aedeagus long and slender, the tip simple, slightly decurved; apophyses lacking or fused with the basal half of the aedeagus.

Habitat.—ARIZONA. *Holotype:* ♂, Greer, White Mountains, 8800 feet, June 22, 1947 (C. P. Alexander). *Paratopotypes:* Several ♂♂, June 21–22, 1947 (Alexander).

The most similar regional species is *Gonomyia* (*Gonomyia*) *filicauda* Alexander, which has the outer dististyle of the male hypopygium somewhat as in the present fly. The actual relationship between the two is probably not close since the structure of the aedeagus is quite distinct in the two flies.

Erioptera (Empeda) perflavens new species

General coloration reddish yellow; head above light gray; halteres and legs yellow; wings uniformly pale yellow, the veins pale; Sc_1 ending about opposite three-fifths the length of *Rs;* male hypopygium with the outer dististyle unequally bifid, the outer arm longest.

♂. Length about 4.6–4.8 mm.; wing 5.4–5.5 mm.

Rostrum yellow; palpi brownish black. Antennae with the scape yellow, pedicel brownish black; basal flagellar segments pale brown, the outer ones somewhat darker. Head with front yellow, the posterior part of head light gray.

General coloration of the entire thorax pale reddish yellow, unpatterned, the sparse vestiture pale. Halteres pale yellow. Legs yellow, the outer tarsal segments brownish black; legs with scattered dark setae and smaller pale linear scale-like setae. Wings uniformly pale yellow, the veins a trifle darker yellow, difficult to see against the ground. Venation: Sc_1 ending about opposite three-fifths the length of *Rs*, Sc_2 close to its tip; R_{2+3+4} about one-half longer than R_2; vein R_3 arcuated at origin, about half as long as R_4; petiole of cell M_3 subequal to the more sinuous *m–cu*, the latter shortly before or close to the fork of *M*.

Abdominal tergites brownish yellow, the sternites and hypopygium clearer yellow. Male hypopygium with the outer dististyle unequally bifid, the outer arm longest, gently curved on the outer third; inner blade shorter, expanded at apex into a triangular head, the inner apical angle somewhat more pointed. Inner dististyle a straight flattened blade, its apex obtusely rounded.

Habitat.—ARIZONA. *Holotype:* ♂, White Mountains, Coulter's Ranch, 9200 feet, June 24, 1948 (C. P. Alexander). *Paratopotypes:* 1 ♂, June 21, 1947 (C. P. Alexander); 2 ♂♂, 9200 feet, June 27, 1947 (John and Grace Sperry).

This species is entirely distinct from the other forms described from the United States. It more resembles certain Mexican species, such as *Erioptera* (*Empeda*) *tridentata* Alexander and *E.* (*E.*) *unidentata* Alexander, which have entirely different hypopygia.

Molophilus (Molophilus) stolidus new species

Belongs to the *plagiatus* group; general coloration black, heavily pruinose to appear gray; antennae short, black throughout; halteres with stem infuscated, knob white; legs with coxae gray, the remainder black; wings with a strong blackish tinge; vein *2nd A* gently sinuous; male hypopygium with the basal dististyle an elongate rod, the tip acute, before apex bearing a smaller acute spine.

♂. Length about 4–4.5 mm.; wing 4.5–5 mm.

♀. Length about 5 mm.; wing 4.5 mm.

Rostrum and palpi black. Antennae short, black throughout; flagellar segments oval, shorter than the verticils. Head black, heavily gray pruinose; anterior vertex broad.

Pronotum black; posterior edge of anterior pretergites restrictedly obscure yellow. Thorax almost uniformly dark gray, being pruinose over a black ground. Halteres with stem infuscated, knob white. Legs with the coxae gray; remainder of legs black. Wings with a strong blackish tinge, the prearcular field and the cells just beyond more whitened; veins darker brown. Venation: R_2 lying just beyond the level of *r–m;* petiole of cell M_3 varying from relatively short, about one-fourth longer than *m–cu,* to approximately twice the length of *m–cu;* vein *2nd A* gently sinuous, ending about opposite the posterior end of *m–cu.*

Abdomen, including genitalia, black. Male hypopygium with the beak of the ventral lobe of the basistyle relatively deep; outer dististyle unequally bilobed. Basal dististyle distinctive, appearing as an elongate rod, the tip acute, before apex with a smaller acute spine; remainder of surface of outer half of style, especially the outer surface, with microscopic roughenings. Aedeagus long and slender.

Habitat.—ARIZONA. *Holotype:* ♂, on slide, White Mountains, Alpine, 8400 feet, June 22, 1947 (C. P. Alexander). *Allotopotype:* ♀, June 23, 1947. *Paratopotypes:* ♂♀, with the allotype (C. P. Alexander).

The most similar regional species is *Molophilus* (*Molophilus*) *arizonicus* Alexander, which differs conspicuously in the coloration of the body and legs and in the structure of the male hypopygium, particularly the basal dististyle.

Personals

Dr. John Adams Comstock, after 20 years service, has retired from active duty as Chief Curator of Natural Science of the Los Angeles County Museum. Dr. Comstock is widely known as the author of the authoritative "Butterflies of California," and of about 100 other technical articles on the taxonomy, ecology and development of Lepidoptera, largely illustrated by his own pen and brush. He has also been associated with the Southern California Academy of Sciences as its secretary, its president and as editor of its publications. A biographical sketch of Dr. Comstock appeared in Los Angeles Co. Museum Quarterly, vol. 7 (2) pp. 11–12.

Dr. Reginald H. Painter has been awarded a University Post-doctoral Fellowship at Ohio State University, Department of Entomology, for the year 1948–49. He has received sabbatical leave from Kansas State College, Manhattan, Kansas, and will spend his leave in Columbus, Ohio, in research and in writing a book on resistance of crop-plants to insect attack. This research was begun in 1926 as a cooperative project with the Department of Agronomy and the Bureau of Entomology and has resulted in the development of insect-resistant varieties of various crop plants. Some of the insects concerned were the Hessian fly, wheat strawworm, corn earworm, grasshopper, southwestern corn borer, chinch bug and the pea aphid.

Catalogue des Lépidoptères

Catalogue des Lépidoptères de France et de Belgique by Leon Lhomme is nearing completion. Twenty-seven years were spent in compiling this work which includes 4500 species, of which 2800 are Microlepidoptera. The volume on Macrolepidoptera costs 500 francs, that on Microlepidoptera 2000. Subscriptions should be sent to M. Leon Lhomme, Le Carriol, par Douelle, Lot, France.

J. L. Williams.

Current Entomological Literature

COMPILED BY RAYMOND Q. BLISS AND R. G. SCHMIEDER.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, pertaining to the Entomology of the Americas (North and South), included 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.

This list gives references of the year 1948 unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

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 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. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

GENERAL—Ander, K.—A few words on entomology at the University of Lund. [Opuscula Ent.] 13: 49–51. **Anon.**—Arturo F. Bayne (obit. with portrait). [Rev. Soc. Ent. Argent.] 14: 124–25. **Chou, Io**—My autobiography. [Insecta Sinensium] 1: 94–95, 1946. **Hemming, F.**—Important advances in Zoological Nomenclature achieved at the Thirteenth International Congress of Zoology. [Coleopt. Bull.] 2: 52–55. **Hennig, W.**—(Larval and adult systematics, see under Diptera.) **Herschberger, R. V.**—Stain combinations in living insects. [58] 48: 160–68. **Krutzsch, P. H.**—Water-like surfaces attract volant desert animals. [26] 29: 391–92. **Lieberman, J.**—(For note on Lawrence Bruner see under Orthoptera.) **MacLeod, J.**—The distribution and dynamics of ked populations, Melophagus ovinus. [61] 39: 61–68. **Meiners, E. P.**—Brief biographies. 14. George Duryea Hulst (1846–1900). 15. George Wheeler (1858–1947). [Lep. News] 2: 66–67.—Phil Rau, 1885–1948. (Obituary.) *Ibid.* p. 62. **Needham, J. G.**—Ecological notes on the insect population of the flower heads of Bidens pilosa. [Ecolog. Monogr.] 18: 431–46. **Orr, J. W.**—Absence of carcinogenic activity of benzene hexachloride (Gammexane). [53] 162: 169. **Preston, F. W.**—The commonness and rarity of species. [26] 29: 254–83. **Tate, P.**—The technique for breeding pure-line cultures of the blowfly Calliphora erythrocephala. [61] 39: 102–04. **Thomas, M.**—Anthropomorphisme et finalisme en psychologie animale. (Premier partie.) ["Scientia," Riv. di Sci., Italy] 42: 145–56.

ANATOMY, PHYSIOLOGY, MEDICAL—Adams, J. P. et J. Lepointe—Recherches sur la morphologie des sternites et des pleurites des Mantes. [Bull. Mus. Nat. d'Hist. Nat., Paris] 2 ser., 22: 169–73, ill. **Amar, R.**—Un organe endocrine chez Idotea (Crustacea). [C. R. Acad. Sci., Paris] 227: 301–03. **Arthur, D. R.**—On the egg of the tick, Ixodes ricinus. [61] 39: 53–60. **Baker, W. L.**—Transmission by leaf hoppers of the virus causing phloem necrosis of American elm. [80] 108: 307–08. **Barlet, J.**—Remarques sur la musculature thorac du Machilides. [Ann. Soc. Sci., Bruxelle] ser. II, T. 60: 1–81, ill., 1946. **Basir, M. A.**—On a Physaloptera larva from an insect: Cameronia biovata g. et sp. nov. (Thelastomatid), a new nematode parasite of the mole cricket, Gryllotalpa africana. [24] 26: 197–200. **Bettini, S. e L. Tentori**—Insetti e vitamine. I. Rivista sintetica. II. Vitamine A et E nell'Anopheles labranchiae var. atroparvus. [Riv. di Parassit.] 8: 129–39, 1947. **Burbanck, Edwards and Burbanck**—Toleration of lowered oxygen tension by cave and stream crayfish. [26] 29: 360–67. **Busvine, J. R.**—The head and body races of Pediculus humanus. [61] 39: 1–16, ill. **Buxton, P. A.**—Experiments with mice and fleas. I. The baby mouse. [61] 39: 119–24. **Camin, J. H.**—Mite transmission of a hemorrhagic septicemia in snakes. [46] 34: 345–54. **Carpenter, F.**—Sur la valeur morphologique des pleurites du thorax des Machilides. Bul. [Ann. Soc. Ent. Belg.] 82: 165–81, ill., 1946.—Quelques remarques concernant la morphologie thorac des Collemboles. *Ibid.* 33: 297–303, 1947. **Demerec, M.**—Induction of mutations in Drosophila by dibenzanthracene. [Genetics] 33: 337–48. **Ford, E. B.**—The genetics of habit in the genus Colias. [30] 81: 209–12. **Grison, P.**—Effet du groupement sur la croissance des chenilles du Bombyx Cul-brun (Euproctis phaeorrhaea) (Liparidae). [C. R. Soc. Biol., Paris] 142: 610–12. **Grison, P. et V. Labeyrie**—Effet de l'humidite sur le tissage des nids chez Bombyx Cul-brun (Euproctis phaeorrhaea). C. R. Soc. Biol., Paris 142: 609–610. **Guareschi, C. e A. Stefanelli**—L'attivita respiratoria della Calliphora erythrocephala durante il ciclo larvale e pupale. [Atti Reale Accad. D'-Italia, Rend. Classe di Sci. Fis. Mat. e Nat.] ser. vii, vol. 3: 464–70, 1942. **Hadorn, E. and G. Bertani**—Induktion männlicher Pigmentierung in somatische Zellen von Drosophila Ovarien. [Rev. Suisse de Zool.] 55: 232–43. **Hamon, J. et M. Ovazza**—Morphologie thoracique des Dermapteres. [Bull. Mus Nat. d'Hist. Nat., Paris] 2 ser., 22: 174–77, ill.

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The Biology of Two Sunflower Gall Makers (Diptera: Cecidomyiidae; Lepidoptera: Lyonetiidae)

By Osmond P. Breland [1] and Lucille Hagan Schmitt,[1]
The University of Texas

The senior author has in two previous papers published the results of studies of certain sunflower insects (Breland, 1938; 1939). The present discussion deals with insects not previously considered. The objectives of this work were to investigate the biology of two species of sunflower gall makers, and to determine the species of parasites with which they are associated. Material has been collected from several localities, but most of the biological work has been done with insects from Austin, Texas, and vicinity. The insects considered here are the tubular bud gall maker, *Trishormomyia helianthi* (Brodie) (Cecidomyiidae), and the lepidopteron that forms a spindle gall on the sunflower stems, *Bucculatrix fusicola* Braun (Lyonetiidae). These studies have extended over several years, but the work was intensified during 1946, 1947 and 1948.

Several hundred galls of each type were collected and dissected during the period. Each gall was opened on one side only, and its contents examined before removal. If the insect within, whether parasite or gall maker, was a mature larva or a pupa, it was removed and placed in a covered staining dish to complete its life cycle. When the insect inside the gall was in an early larval stage, it was transferred into an artificial gall made by rolling a piece of lens paper into a cylinder and twisting the ends. These lens paper galls were then placed in a

[1] The writers greatly appreciate the assistance of Messers A. B. Gahan, C. F. W. Muesebeck, Carl Heinrich and the late E. P. Felt who determined some of the insects discussed in this paper.

covered staining dish. Moisture was maintained by adding an occasional drop of water to a piece of toweling paper inside the dish. Immature gall makers were seldom reared by this method, presumably because they were removed from their food supply, but considerable success was attained with the parasites. The immature parasite and its host were placed in a cylinder, and allowed to remain here until the parasite had become a mature larva or had pupated. The contents of the artificial gall were easily examined from time to time. This method of rearing proved superior to that of wrapping a partially opened gall in a piece of lens paper, since the gall either shriveled or developed mold causing the death of the occupants.

Each gall maker will be discussed separately, followed by notes on the parasites associated with each species.

Trishormomyia helianthi (Brodie)

The tubular bud gall and the insect producing it were originally described by Brodie (1894) as occurring on the sunflowers *Helianthus decapetalus* and *H. divaricatus* in Canada. Brodie gave the gall maker the name of *Diplosis helianthi.* Felt (1913) placed the insect in the genus *Hormomyia,* and later (1920) transferred it to *Trishormomyia* where it remains at this writing.

The tubular gall is more common in this area than is the gall of *Bucculatrix fusicola.* It occurs on *Helianthus annuus,* and as yet has not been found on other composites in the vicinity. In this area there is considerable variation in the size, structure and the position of the galls on the plants. Size is presumably somewhat dependent upon rainfall. During dry summers the galls have a tendency to average smaller than when more rain occurs. They have been found to range from ten to fifty millimeters in length. In many cases the galls occur as polythalamous structures of ten to twenty-five divisions. Ten to fifteen of these large galls may be found on a single plant. Single galls are sometimes collected, but these are most often near the polythalamous galls on the main axis of the plant. Both types of galls are also found at the bases of and on the lateral branches of the sunflowers. Occasionally single galls are formed in the leaf axil or on the petiole, or even on the involucre of the flowers. Double or triple galls sometimes develop in these latter locations, but they rarely have more divisions than this.

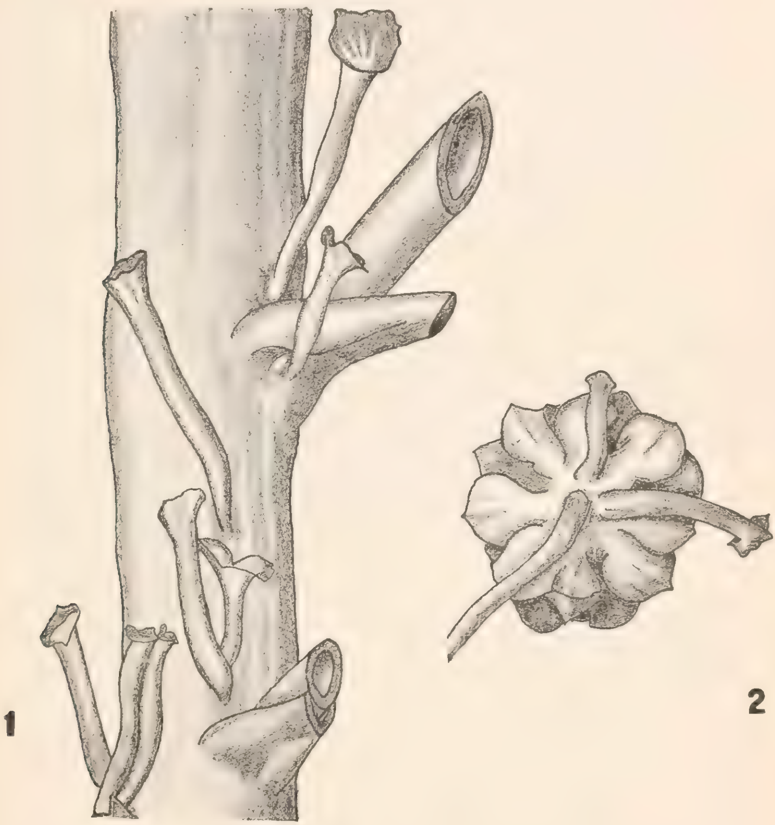

PLATE *I*

Galls of *Trishormomyia helianthi* (Brodie). Fig. 1. Single and double galls on main axis of sunflower. Fig. 2. Two single galls on involucre of flower. Approximately natural size.

Variations of the galls in size, shape and position on the host plant are indicated in plates I and II.

In all winter collections the gall makers have been mature larvae, indicating that the insect passes the winter in this stage. The first appearance of mature galls in the spring varies somewhat, and is probably partially dependent upon climatic conditions. In the spring of 1947, mature galls were first found in the field near the end of May, and some adults emerged from galls that were collected at that time. In the spring of 1948, however, rainfall was slight, and mature galls were not recovered from the field until the last of June. Mature galls have been collected in the fall and winter, and kept outside in breeding bags until spring. Gall makers were first noted to emerge near the middle of April.

It is thought probable that two generations of *T. helianthi* occur per year in this area, although emergence of the spring generation is spread over several months. Large numbers of pupae and adults have been obtained in June and July, and mature larvae removed from galls pupated within a short time in the laboratory. After this time, however, most of the gall makers were in the larval stage, and mature larvae seldom pupated although they remained alive in the laboratory for several months.

The normal mature larva of *T. helianthi* is from three to four millimeters in length. It is quite inactive, opaque, salmon-colored and exhibits definite segmentation. The gradual transformation of the larva into a pupa requires four to five days, during which time the general shape changes from an oval to a longer spindle-shape. The head and thorax assume a deep orange waxy appearance during this period. The pupal period averaged 9 days for a few individuals.

The adult insect emerges from the gall through the natural opening at the flanged tip. All observations indicate that before the adult insect emerges, the pupa, by writhing movements, propels its body up the hollow tube of the gall and partially

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PLATE *II*

Galls of *Trishormomyia helianthi* (Brodie). Fig. 3. A cluster of polythalamous and single galls. Fig. 4. Galls on leaf, petiole and in axil. Approximately natural size.

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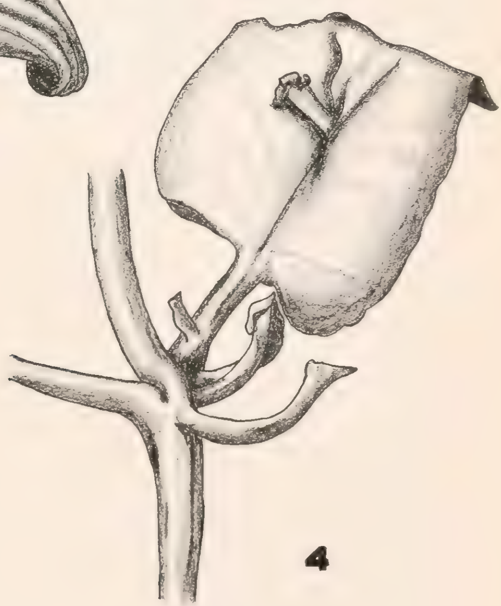

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protrudes through the opening at the end; then the adult insect breaks through the pupal skin and emerges. Free pupae in staining dishes exhibited a writhing movement for several hours, or for even a day before the adults emerged. In two cases, during dissection, pupae were seen at the tips of galls, and in several instances when adults emerged from the galls in the laboratory, pupal skins were found at the gall openings.

Parasites: More than 2,500 galls have been dissected during the studies of the gall makers and their parasites. Collections have been made during practically all months of the year, although in winter the host plants were dead and the galls were difficult to find in numbers. A total of 593 galls were found to be unoccupied, probably because the gall makers or their parasites had emerged or had died and disintegrated before the galls were examined. On the basis of occupied galls only, the cecidomyiid exhibited an overall parasitism of 60.4 per cent. Many of the unparasitized larvae were immature when collected so that it is possible that the percentage of parasitism would have been greater if these immature insects had been allowed to become mature.

Parasites reared included *Torymus brevis* Breland (1948), (Torymidae), and undescribed species of *Leptacis* and *Platygaster,* family Scelionidae. *Torymus brevis* was invariably found to be an external parasite of the larvae of the gall maker, while both *Leptacis* sp. and *Platygaster* sp. are internal parasites. The next to last larval stage of *Leptacis* sp. is a cyclopoid larva, similar to those that have been reported for other species within the family. Although cytological studies were not made, evidence indicates the *Platygaster* is a polyembryonic species. Many individuals that emerge simultaneously develop within a single host larva. Most of the broods observed consisted of a majority of one sex, while all members of an occasional brood were of the same sex. In addition, the bodies of the host larvae containing the parasites are always very similar to the host bodies of species that have been established as being polyembryonic.

Bucculatrix fusicola Braun

This insect produces the so-called spindle gall on the stems of sunflowers. It was originally described by Braun (1920) from Cincinnati, Ohio, as producing galls on the sunflower, *Helianthus tracheliifolius.*

In the region of Austin, Texas, the gall has been collected only on the sunflower, *H. annuus.* Most frequently the galls produced by this lepidopteron are found on the main axis of the plant, but they also occur on the secondary branches. The shape of the gall is apparently greatly dependent upon the size of the stem upon which it is formed. On small stems, galls are usually spindle-shaped and symmetrical, and resemble the original description as given by Braun. However, if the gall develops on a stem more than a centimeter in diameter, it generally appears as a small bump or swelling on only one side of the stem. Galls in this area are from one to two centimeters in length with an average of about one and a half centimeters. They average somewhat shorter than those originally described by Braun which averaged approximately two centimeters in length, and many have a greater diameter. Braun's galls had a maximum width of one-half a centimeter, but in this region, some are as much as one centimeter in diameter. Variations in the size and shape of the galls are indicated in plate III. Galls were first obtained in the field in late July, but they occur only in small numbers until somewhat later than this.

The normal larva of the gall maker is quite active. It displays a characteristic habit of twirling rapidly when the gall is opened and the insect is disturbed. This reaction was observed in all of the larval instars that were examined. The average mature larva is a light cream color and from seven to nine millimeters in length. Parasitized larvae are completely inactive.

Most larvae of the gall maker do not become mature until fall, and they pass the winter in the larval stage as they have been reported to do in Ohio (Braun, 1920). Larvae obtained in September were approximately one-half the size of those collected in October. No pupae have been found until spring, but mature larvae collected in winter and kept in the warm laboratory temperature exhibited a decided tendency to pupate. There is apparently only a single generation per year.

Just prior to pupation the larva changes in color from a cream to a greenish gray color, and the skin becomes loose and wrinkled. After eating a small hole in the side of the gall, the larva emerges and spins its cocoon on the stem of the plant near the gall. Larvae kept in the laboratory in artificial galls of lens paper emerged from these galls and spun cocoons on pieces of toweling paper on the floor of the cage in which the insects were kept. Several cocoons have been found in the field on stems of plants near the galls (plate III, fig. 8). The cocoons averaged one centimeter in length, and in most instances they are formed above the gall with the head of the larva or pupa directed away from the gall. An occasional cocoon has been found below the gall. The pupal period in the laboratory ranged from ten to fourteen days.

Cocoons that have been observed differ considerably from those described by Braun (1920), who found that the cocoons were dark brown fuscous, and that the outer surface was smooth. Those examined by the writers have been white to a light gray color, while the outer surface had a series of longitudinal ridges (plate III, fig. 8). These variations may of course be variations of the type that occur frequently in different parts of the ranges of many species. However, in view of the differences in the cocoons, and those in the size and shape of the galls previously noted, it would not be at all surprising if some future worker with good series were to find that the lepidopteron in this region is closely related to, but different from, the species described by Braun.

Parasites: During the course of these studies, more than 1,000 galls of the lepidopteron were collected throughout the year, dissected and examined. Of this number, 152 were empty, indicating that the gall maker or its parasites had emerged or died before the galls were collected. The overall percentage of parasitism, calculated on the basis of occupied galls, was 42 per cent.

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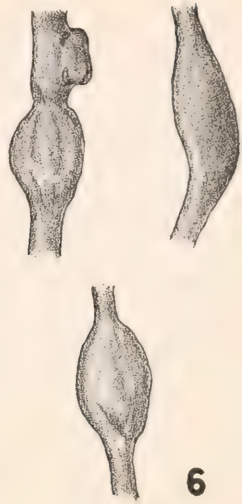

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PLATE *III*

Galls of *Bucculatrix fusicola* Braun. Figs. 5 to 7. Variation in size and shape of the galls. Fig. 8. Galls and cocoons of *B. fusicola*. Approximately natural size.

Parasites reared from *B. fusicola* included *Eupelmus cyaniceps* Ashmead (1886) (Eupelmidae), *Eurytoma* sp., tentatively determined as *Eurytoma tylodermata* Ashmead (1896) (Eurytomidae), and a new species of *Microbracon,* family Braconidae. The braconid is an external parasite of the lepidopteron larva, and when the parasitic larva becomes mature, it spins a cocoon inside the gall and remains here until it emerges an adult. *Eupelmus cyaniceps* is most often an external parasite of the gall maker, but it sometimes occurs within the cocoon of the braconid mentioned above, in which case it is an external larval parasite of this insect. The eurytomid has always been found as an external parasite of the larval gall maker.

Literature Cited

Ashmead, W. H. 1886. Studies on the North American Chalcididae with descriptions of new species from Florida. Trans. Am. Ent. Soc. 13: 125–135.

——. 1896. Descriptions of new parasitic Hymenoptera. Trans. Am. Ent. Soc. 23: 179–234.

Braun, A. F. 1920. New species of Lyonetiidae (Microlepidoptera). Ent. News 31: 76–80.

Breland, O. P. 1938. Notes on sunflower Callimomidae with description of a new *Zaglyptonotus*. Ann. Ent. Soc. Am. 31: 202–206.

——. 1939. Additional notes on sunflower insects. Ann. Ent. Soc. Am. 32: 719–726.

——. 1948. A new species of *Torymus,* parasite of a sunflower gall maker. Proc. Ent. Soc. Wash. 50: 57–58.

Brodie, W. 1894. Canadian galls and their occupants. Biol. Rev. Ontario, N. S. 1: 417–419.

Felt, E. P. 1913. Two new Canadian gall midges. Can. Ent. 45: 417–419.

——. 1920. Thirty-fourth report of the State Entomologist. N. Y. State Mus. Bulls. 231 and 232.

Observations on the Incidence of Ticks on Kenya Mammals

By Neal A. Weber, Swarthmore College, Swarthmore, Pennsylvania

In January-February 1948 the Central African Expedition of the American Museum of Natural History, led by Dr. James L. Clark, was on safari for several weeks in Kenya 0–30 miles from the Tanganyika frontier and less than 100 miles from Lake Victoria.[1] As biologist to the expedition I had an opportunity to examine briefly a series of freshly killed mammals with respect particularly to their ectoparasites. Although time was limited because of other activities it was possible to make some observations on the incidence of these on the mammals as well as to make representative collections.

Through Willis J. Gertsch the ticks have been identified by Glen M. Kohls of the United States Public Health Service and I am also indebted to H. E. Anthony and T. Donald Carter for identification of the mammals. I am obliged to Brayton Wilbur for the opportunity to examine the mammals.

Most of the parasites are deposited in the collections of the American Museum of Natural History except for representatives retained by the United States Public Health Service for further study or for its own collections.

While the immediate environment of these ticks was of course the skin of the mammals, the ecology of the region played an important part in determining the incidence of infestation.

The region is one of high plains, a savannah of short grass with scattered clumps of trees and bushes as well as thin forest bordering the intermittent streams. The general elevation is about 5,500 feet above sea level and numerous volcanic hills and ridges rise a few hundred feet higher. January and February are usually considered to be dry months with rains breaking the long dry season in March. The region is uninhabited by hu-

[1] Within a radius of 20 miles of Latitude 1°38′ South and Longitude 35°17′ East.

mans because the infected tsetse flies (Glossina) prevent the Masai people of the area from keeping their indispensable cattle.

Though without permanent habitations here the Masai set grass fires during the dry seasons that burn through this region and help to prevent a thick, lush growth which would afford good cover for the ticks. The fires must burn tremendous numbers and the short grass makes it harder for ticks hanging to it to transfer to the flanks of the larger mammals. This periodic burning is of course an ancient practice and to be thought of as part of the normal primitive environment. Such factors probably contributed to some Thomson's gazelles, for example, being apparently free of any ticks. Indeed, a record given below is of a tick found crawling rapidly over the blistering, hard soil with scanty short grass and showing this as a means of dispersal. By way of comparison, in the longer grass of the southern Sudan, ticks were taken hanging on the stems a foot or more above ground in readiness to transfer to mammals.

The plains supported large numbers of a great variety of the larger mammals and there appeared to be a nice balance between predators and their prey. Lion and leopard probably made nightly kills in the vicinity of the camp. Jackals and hyenas were numerous and apparently well fed. The generally abundant grass seemingly supported more ruminants or a greater weight of ruminants than a good cattle ranch of Western United States of America.

There was also a balance between the mammals and their ectoparasites. No sickly mammal was seen and none was heavily infested. Any sickly or crippled animal of course would not have survived long. No domestic horses were more sleek or in better condition than the abundant herds of zebras which, like the similarly abundant herds of antelope, were commonly seen at close range.

There was, in short, as "natural" conditions as could be expected in an Africa inevitably changing with civilization, and the records here given, though unavoidably less quantitative than qualitative, are of interest in this connection.

Collections were made from the following mammals:

Warthog. *Phacochoerus aethiopicus aeliani* (Cretzschmar)

A large male carried both ticks and fleas. *Hyalomma savignyi* (Gerv.) and *Rhipicephalus simus* Koch [2] adults of both sexes were found.

Hartebeest. *Alcelaphus buselaphus cokii* (Günther)

Rhipicephalus evertsi Neum.[3] and *Haemaphysalis leachii* Aud.[4] adults of both sexes were taken about the anus of a male host and were few in number. A single adult female *Boöphilus* species (probably *decoloratus* Koch) [5] was also taken.

Another male host apparently carried no adult ticks but a single small nymphal *Rhipicephalus* species was found deep in one ear.

Topi. *Damaliscus korrigum jimela* (Matschie)

No ectoparasites aside from two nymphal *Rhipicephalus* species could be found on a male host. The nymphs were in an ear.

Another male host similarly appeared to carry no adults but again contained two nymphal *Rhipicephalus* species in one ear.

Waterbuck. *Kobus defassa* Rüppell

A male which I shot in the Anglo-Egyptian Sudan (Muragatika, Prov. Equatoria, August 8, 1939) had several female *Haemaphysalis aciculifer* Warb. (det. Dr. Bequaert) on the inguinal region.

Reedbuck. *Redunca redunca wardi* (Thomas)

A single male adult *Amblyomma variegatum* (Fabr.) [6] at one eyelid was all to be seen on a male host.

[2] *Rhipicephalus simus* Koch, believed to be a vector of the protozoon disease anaplasmosis, caused by *Anaplasma* species. A three-host species.

[3] *Rhipicephalus evertsi* Neumann, the red tick, vector of East Coast fever and of equine piroplasmosis caused by the protozoon, *Nuttallia equii* (Laveran). A two-host species.

[4] *Haemaphysalis leachii* (Audouin), the common dog tick of Africa and vector of malignant jaundice in dogs caused by the protozoon, *Babesia canis* (Piana and Galli-Valeris).

[5] *Boöphilus decoloratus* (Koch), vector of two protozoon diseases of cattle caused by *Babesia bigemina* (Theobald Smith) and *Anaplasma marginale* Theiler.

[6] *Amblyomma variegatum* (Fabricius), vector of the disease known as heartwater caused by *Rickettsia ruminatium* (Cowdry).

Dik-dik. *Rhychotragus kirkii cavendishi* (Thomas)

A female host had a few adult *Ixodes pilosus* Koch of both sexes about the eyes.

Impalla. *Aepyceros melampus rendilis* Lonnberg

Adult *Boöphilus decoloratus* of both sexes and nymphal *Amblyomma* species were taken on a young male host.

A few adult *Rhipicephalus evertsi* of both sexes were taken at the base of the scrotum of a second male host. No others were seen. A third male host carried nymphs and males of this species in an ear and a female at the anus. Another female was taken on grass in the gorge of the Siabe River, Kenya, at an altitude of 5,850 feet.

Grant's gazelle. *Gazella granti granti* Brooke

Adult *Rhipicephalus evertsi* and *Boöphilus decoloratus* of both sexes were taken on the flanks and about the anus of a male host.

Thomson's gazelle. *Gazella thomsonii thomsonii* Günther

These attractive and numerous little gazelles were remarkably free from adult ticks and on several none could be found. One male had *Rhipicephalus evertsi* adult males at the anus only, another had a single adult female of *Rhipicephalus neavei* at the margin of the sub-orbital gland.

Eland. *Taurotragus oryx pattersonianus* Lydekker

A male eland about six years of age in excellent condition had numerous adult ticks of five species chiefly on the perineal region. *Rhipicephalus evertsi* and *Amblyomma variegatum* appeared to be the most numerous and were in close clusters on the skin. *Hyalomma savignyi* and *Rhipicephalus capensis* Koch [7] males and *Amblyomma cohaerens* Dönitz of both sexes were taken in smaller numbers.

[7] *Rhipicephalus capensis* Koch, the Cape brown tick and vector of the highly fatal East Coast fever of cattle caused by the protozoon, *Theileria parva* (Theiler). A three-host species.

Zebra. *Equus burchellii böhmi* Matschie

The sleek coats of the abundant zebras appeared to be completely free of ticks. Adults would have been prominent in the short, appressed fur. They were found only on the inguinal and perineal regions and, rarely, in the ears. Scarring of the flanks and at the border of the inguinal regions may have indicated that the zebras picked off ticks at these places with their teeth, or it may have come through fighting.

On one male zebra *Rhipicephalus evertsi* adults, chiefly male, occurred at the perineum and mostly on the scrotum posteriorly. On another male the same tick species and a single male adult *Amblyomma variegatum* were taken on the inguinal and perineal regions, including the base of the penis. The *Rhipicephalus* were numerous and in the proportion of about two males to one female.

A male and a female zebra each had *Rhipicephalus evertsi* adults in the inguinal and perineal regions with engorged nymphs of probably the same species in the ears.

Rhinoceros. *Diceros bicornis bicornis* (Linnaeus)

Dr. Thomas of Nairobi kindly gave me adult ticks of both sexes of *Amblyomma petersi* Karsch which he had taken from a male rhinoceros on his safari near ours.

Elephant. *Loxodonta africana* (Linnaeus)

No opportunity to collect ticks from elephants presented itself in Kenya. At the Elephant Training School in Northeastern Belgian Congo which Colonel Offerman has long conducted he obligingly had about forty elephants examined for me. Each elephant has the same native mahout assigned to it consistently and this man takes excellent care of his charge. These men report ticks scarce on elephants. One elephant was known to have had a single tick attached to it in the morning but this was absent later in the day during the examination. Ticks could not be seen on the other elephants.

Hare. *Lepus capensis crawshayi* De Winton

Numerous adults of *Rhipicephalus oculatus* Neum. and an adult female *Haemaphysalis leachii* were taken mostly on the neck and ears of a hare found in grass-woodland with grass of a length longer than that of the open plains. Close by on the same morning hartebeest, impalla and a small mongoose were shot, the hartebeest and impalla each having *R. evertsi* instead of *R. oculatus* while both the hartebeest and the mongoose carried *H. leachii.*

Lion. *Felis leo massaica* Neumann

Ticks on a large male lion weighing 400–500 pounds had caused a severe lesion at the posterior margin of the mane and this was the only place badly infested. Three species of adults of ticks were present, *Haemaphysalis leachii, Rhipicephalus capensis* and *R. simus,* the latter being the most numerous and *capensis* being the least numerous.

Mongoose, large, gray. *Mungos mungo colonus* (Heller)

Two mongoose out of a pack of seven running over the open plain about 5:30 P.M. were shot and examined. Each contained a few male *Haemaphsalis leachii* in the ears. At another time a young male mongoose was found to have a single nymphal *Haemaphysalis* species.

Mongoose, short-tailed, brownish yellow. Unidentified

This much smaller and brownish yellow instead of grayish mongoose also carried adult *Haemaphysalis leachii* but sparingly.

Hyena. *Crocuta crocuta fisi* Heller

A large male hyena had a few adult *Rhipicephalus simus* of both sexes on the ears. Another specimen examined some hours after death appeared to be free of ticks although in life it may have carried them.

Bat-eared fox. *Octocyon megalotis virgatus* Miller

An adult female appeared to carry few ectoparasites although these included three species of adult ticks, *Haemaphysalis leachii* male and female, *Haemaphysalis* species males and *Rhipicephalus simus* male and female. One small tick, doubtless a male, was taken in one ear, another of the same sex at an eyelid.

Silver-backed jackal. *Thos mesomelas mcmillani* Heller

An adult female carried a few adult *Haemaphysalis leachii* of both sexes and a male *Rhipicephalus simus* generally distributed on the skin.

Other Records

A large unengorged female *Amblyomma petersi* was taken January 23 in short grass at the edge of thin forest. The next day in a similar place single ticks, *Rhipicephalus simus*, of both sexes were taken on me. Also on me February 5 while walking in grass of moderate length above a rocky stream bed a female of the same species was taken. A European took from his leg at 6 A.M. February 3 a nymphal *Amblyomma* species. An unidentified large flat tick, probably an unengorged female, was taken in the middle of a sunny day as it crawled rapidly over hot dry soil with scanty grass near my tent.

Three additional records are from the Belgian Congo. North of Beni 20 miles in the Ituri high rain forest a female *Rhipicephalus dux* Dönitz was taken on my trouser leg February 25, a dry season time. East of Stanleyville 10 miles, also in high rain forest, a male *Haemaphysalis leachii* came down to the ground sheet from the dense vegetation above while an aerosol bomb was being used to collect insects March 17. While talking with a European gentleman seated next to me in a plane flying from Stanleyville, Congo, to Europe I noticed a small tick (*Rhipicephalus sanguineus* Latreille) [8] on his neck. It had probably been acquired in or near Stanleyville from human habitations and was sluggish in the cool of the cabin at 8,500 feet altitude.

[8] *Rhipicephalus sanguineus* (Latreille), the common brown dog tick widely distributed in the tropics and subtropics. A vector of malignant jaundice in dogs caused by the protozoon, *Babesia canis* (Piana and Galli-Valerio).

Conclusions

In as "natural" an area of Africa as may readily be found at the present time observations were made under severe time limitations of the ectoparasites, especially ticks, of a representative series of African mammals. The region was a high plains of short grass with scattered woodland and free from human habitations because of the tsetse fly (*Glossina*) infected with African sleeping sickness or nagana. Periodic burning of the grass undoubtedly destroyed vast numbers of ticks and must have been a factor in keeping the numbers down although there were available as food great numbers of mammalian hosts of many species and sizes. Only one mammal, a lion, bore a marked lesion from tick bites. No sickly mammal was seen. Predators and scavengers would quickly dispose of any appearing. One large mammal, an eland, carried five species and some small to medium sized mammals such as Thomson's gazelle appeared to be free of ticks.

That ticks may rapidly be transferred from one area to another is shown by a record of one on a man's neck in a plane flying from Stanleyville, Belgian Congo to Europe.

Permanent Mounts of Dissections to be Kept with Pinned Specimens

By John W. H. Rehn [1]

In the course of various studies on the Orthoptera it has been found necessary to make numerous dissections. Microscopic slides are not usually used for the preservation of material of this group and but little material is kept in fluid preservatives. Moreover, as a result of the desire to keep all portions of the specimens dissected in one place several methods are in use.

The extending of the genitalia of the Acridoidea, while still leaving them attached, is thoroughly suitable for these and cer-

[1] Research Associate, Columbia University; Research Associate, School of Tropical Medicine, San Juan; Research Associate, Academy of Natural Sciences of Philadelphia.

tain other structures. When mouthparts and other relatively small portions are removed they can usually be stored in glycerine in 5 by 10 mm. shell vials that are placed on the pin under the specimen.

However, when wings, and certain other structures, are removed this latter method is not convenient, as the organ or part must be removed and arranged for examination. The older method of mounting such portions of a specimen on cards, that can be pinned under the specimen, has been found unsatisfactory as they cannot be examined by transmitted light. As a result of examining numerous Blattaria wings the following method which allows for immediate examination has been evolved. This has been found satisfactory for all small and many moderate sized dissections. The structure is mounted between two glass cover slips separated by 2 ply bristol board. The size of the cover slips depends on the size of the object to be mounted. Square or rectangular slips are much more convenient than round ones. A piece of bristol board is cut in a U-shape so that the arms may extend along the opposite sides of the cover slip. At the base it is left protruding so that it may be placed upon the insect pin. A cover slip is fastened [2] to the outer surface of this piece of bristol board. After this has hardened, the dissection, after routine handling, is mounted on this base the same as on any slide. The cavity is filled with mounting media and the preparation is closed on the top by another cover slip of the same size. The open end of the U allows for contraction during drying, and for the addition of media if it is found necessary.

A dry mount may be made by essentially the same method. The dissection is placed on the first cover slip and covered with a second one. In this method they are placed one on top of the other, instead of being separated by the thickness of the bristol board. The second cover slip can be held in place by a gummed label.

Mounts made ten years ago by this method are at present in excellent condition, and I believe will last as long as any of the usual forms of slides.

[2] I have used only Canada balsam for mounting purposes but believe that most other standard media would serve as well.

Additional Records of Bat Parasites of the Family Nycteribiidae

By R. B. Eads and G. C. Menzies, Bureau of Laboratories, Texas State Department of Health

Several specimens of the family Nycteribiidae were among the ectoparasites taken by Dr. Frank W. Blair, University of Texas mammalogist, and a group of his students on a field trip to the Big Bend National Park of Texas in June of 1948. These curious, wingless flies were tentatively identified as *Basilia antrozoi* (Townsend). Dr. J. C. Bequaert kindly checked them and stated that both *Basilia antrozoi* and *B. corynorhini* Ferris were represented. The lot included four female *B. corynorhini* and five *B. antrozoi* (3 males and 2 females) taken from *Antrozous pallidus* (Le Conte) by J. L. Reagan in Presidio County, Texas.

Basilia corynorhini was described by Ferris in 1916 from a single female taken from *Corynorhinus macrotis* in Tulare County, California. Dr. Bequaert says that the Texas specimens "agree well with the original account, except that the finger-shaped extensions of the second tergite are more elongate." As far as can be ascertained this is the first collection record other than that from which the original description was made.

Host and locality records for *Basilia antrozoi* are more numerous. Dr. G. H. Ferris, 1916 (Ent. News, 27), lists the following: original description from a single female off an *Antrozous pallidus* taken in New Mexico; five specimens off *Antrozous pallidus* from Ventura and Merced Counties, California; and in 1924 (Ent. News, 35) from *Antrozous pallidus* and *Myotis californicus*, Santa Anita, Lower California, Mexico; from *Corynorhinus macrotus*, East Painted Cave, Texas; from *Nyctinomus cynocephalus*, New Orleans, Louisiana; and from Dulzura and Stanford University, California, off *Antrozous pallidus*. H. M. Smith, 1934 (Jour. Kansas Ent. Soc., 7, 62–64), lists this species off *Antrozous* sp. taken in Barber County, Kansas.

Current Entomological Literature

COMPILED BY RAYMOND Q. BLISS AND R. G. SCHMIEDER.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, 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

This list gives references of the year 1948 unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

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 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. The number of the volume, and in some cases, the part, heft, &c is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

GENERAL—Anon.—Obituary: George Shirley Brooks. [23] 79: 170, 1947. **Bailey, S. F.**—An annotated list of N. Amer. Thysanopterists. Pt. I. [Florida Ent.] 31: 35–49. **Batte, E. G.**—A technique for mounting ectoparasites. [37] 41: 523–24. **Bromley, S. W.**—Honey-bee predators. [45] 56: 195–99. **Bushnell, O. A.**—A list of scientific institutions in the Pacific area. [Pacific Sci., Honolulu.] 11: 243–61. **Callan, E. McC.**—Effect of defoliation on reproduction of Cordia macrostachya. [19] 39: 213–15. **Deputy, O. D.**—Editorial: Are foreign plant quarentines worth while? [37] 41: 528–31. **O. E. Essig**—Theodore Dru Alison Cockerell. (Obit. with portrait by T. Dix, and list of biographies.) [60] 24: 117–31. **Ferris, G. F.**—The principles of comparative morphology. [50] 13: 50–56. **Frank, Hutchinson, Livingston, McCulloch, and Wiener**—Teleological mechanisms. [Ann. N. Y. Acad. Sci.] 50 (4): 187–278. **Grant, C.**—Selection between armed and unarmed arthropods as food by various animals. [39] 40: 66. **Gulick, A.**—The evolution of terrestrial life as seen by a biochemist. [81] 67: 267–72. **Hatch, M. H.**—The "complete" taxonomist. [Coleopt. Bull.] 2: 71–72.—Why locality labels? *Ibid.:* 76. Hayward, C. L.—Biotic communities of the Wasatch chaparral, Utah. [25] 18: 473–506. **Hoffmann and Merkel**—Fluctuations in insect populations associated with aerial applications of DDT to forests. [37] 41: 464–73. **Holmes, S. J.**—What is natural selection? [81] 67: 324–30. **Howard, N. F.**—Obituary: Loyd W. Brannon. [37] 41: 527. **Kempson, Thomas and**

Baker—A simple method for phase-contrast microscopy. [74] 89: 351–58. **Lees, A. D.**—The historical aspect of insect distribution. (A review of papers by B. P. Beirne, R. Jeannel, F. E. Zeuner.) [Science Progress] 36 (144): 695–98. **Lindsey, A. W.**—The fallacy of Communism. [58] 48: 169–75. **Lord, F. A.**—Australian moth is World's largest. [39] 40: 46–46. **Michener, C. D.**—Obituary, T. D. A. Cockerell. [45] 56: 171–74. **Milum, V. G.**—Some factors affecting the color of honey. [37] 41: 495–505. **Miner, F. O.**—A carbon tetrachloride killing bottle. [37] 41: 506–07. **Muller, H. J.**—Letter of resignation of Professor Muller from Academy of Science of U.S.S.R. [80] 108: 436. **Noble and Gammon**—Obituary: Cecil Cline Wilson. [37] 41: 525–26. **Oettlé, A. G.**—A rapid catoptric technique for recognizing axial illumination of the substage condenser. [Jour. Royal Micro. Soc.] 67: 9–13, 1947, Pub. Sept. 1948. **Orton, C. R.**—The problem of quarantining of plant viruses. [37] 41: 477–86. **Pearse, A. S.**—Zoological names, a list of phyla, classes and orders. Prepared for Section F, A.A.A.S. 3rd ed., Durham, North Carolina. **Potter, C.**—Some biological problems in the study of insecticides. [The Advancement of Sci.] 5: 94. **Schilder, F. A.**—Probleme und Methoden der Biostatistik III. Die Ausgleichskurve (der trend). [Biol. Zentralbl.] 66: 401–16, 1947. **Teale, E. W.**—The strength of the frail. [Nature Mag., Washington, D. C.] 41: 401–04 (popular). **H. B. W.**—"Useless and ill-advised." [45] 56: 154.—Insects and slang. *Ibid.*: 170. **Watts, R. H.**—A mass-production method for paraffin and frozen sections. [Jour. Royal Micro. Soc.] 67: 19–20, 1947, Pub. Sept. 1948. **Wigglesworth, V. B.**—The contribution of insect physiology to the study of insecticides. [The Advancement of Sci.] 5: 94–95.—Chemical stimuli and insect behavior. (A review of Dethier's book.) [53] 162: 150

ANATOMY, PHYSIOLOGY, MEDICAL—Abdel-Malek and Goulding—A study of the rate of growth of two sclerotized regions within larvae of four species of mosquitoes. [58] 48: 119–28. **Auclair, J. L., and C. A. Jamieson**—A qualitative analysis of amino acids in pollen collected by bees. [80] 108: 357–58. **Barron and Tahmisian**—The metabolism of cockroach muscle (Periplanete americana). [105] 32: 57–76. **Bettini e Barachini**—Primi risultati della lotta con l'Octa-Klor ed il gammaesano contar le mosche domestiche resistenti al DDT. [Riv. Parassit.] 9: 85–91. **Brunson and Allen**—Oriental fruit moth parasites.

[37] 41: 446–50. **Cleveland, L. R.**—An ideal partnership (Blatt.). [81] 67: 173–77. **Cooper, K. W.**—The evidence for long range specific attractive forces during the somatic pairing of dipteran chromosomes. [41] 108: 327–35. **Dade, H. A.**—The laboratory diagnosis of honey-bee diseases. [Jour. Quekett Micros. Club] ser. 4, vol. 2: 272–85, ill. **Doutt, R. L.**—The suitability of insect-conditioned plant tissues as habitats for successive insect species. [60] 24: 121–22.—Arrenoclavus, a new genus of polyembryonic Encyrtidae. *Ibid.*: 145–48, ill. **Dowden, Buchanan and Carolin**—Natural-control factors affecting the spruce budworm. [37] 41: 457–64. **Eckert, J. E.**—Toxicity of some of the newer chemicals to the honeybee. [37] 41: 487–91. **Filho, J. O.**—Sôbre a genitália das fêmeas de Hepialidae. [Summa Brasil. Biolo.] 1 (16): 384–425, 1947, Publ. May 1948. **Glasgow and Collins**—Ecological, economic and mechanical considerations relating to the control of ticks and Rocky Mountain spotted fever on Long Island. [37] 41: 427–31. **Hagmann, L. E.**—Overwintering habits of Phaenicia sericata. [37] 41: 510. **Hanke, R.**—The nervous system and the segmentation of the head in the Hirudinea (Annelida). [50] 13: 57–64. **Haseman, L.**—An authentic case of ox warble in man. [37] 41: 515. **Henry, L. M.**—The nervous system and the segmentation of the head in the Annulata (continued). Section V. Onychophora, Section VI. Chilopoda, Section VII. Insecta. [50] 13: 27–48. **Jahn and Koel**—The effect of temperature on the frequency of beat of the grasshopper heart. [5] 41: 258–66. **Lees, A. D.**—The function of the corpora allata of insects. (Review of articles by Wigglesworth and others.) [Science Progress] 36: 698–70. **Lee, H. T.**—A comparative morphological study of the prothoracic glandular bands of some lepidopterous larvae with special reference to their innervation. [5] 41: 200–05. **Lees and Beament**—An egg-waxing organ in ticks. [74] 89: 291–332 & Pl. I. **Lejeune and Filuk**—The effect of water levels on larch sawfly populations. [23] 79: 155–60, 1947. **Lord, K. A.**—The sorption of DDT and its analogues by chitin. [Biochem. Jour.] 43: 72–78. **Mendes, L. O. T.**—Sôbre a meiose de Dysdercus mendesi (Pyrrhocor.). [Bragantia, Brasil] 7: 243–56, 1947. **McGregor, E. A.**—A newly detected structure in certain tetranychid mites. [65] 50: 173–75. **Munger, F.**—Body-temperature measurements of the California red scale. [37] 41: 422–23. **Munger and Cressman**—Effect of constant and fluctuating temperatures on the rate of develop-

ment of California red scale. [37] 41: 424–27. **Neri, I.**—Osservazioni morfologiche sul pretarso delle culicine. [Riv. Parassit.] 9: 93–96. **Neiswander, R. B.**—Plum curculio on peaches and plums in Ohio. [37] 41: 450–53. **Nielsen, A.**—Postembryonic development and biology of Hydroptilidae. A contribution to the phylogeny of the caddiceflies and to the question of the origin of the case-building instinct. [Det Kong. Danske Videnskabernes Selskab, Biol. Skrifter] 5 (1): 1–200. **Pflugfelder, O.**—Die Entwicklung embryonaler Teile von Carausius (Dixippus) morosus in der Kopfkapsel von Larven und Imagines. [Biol. Zentralbl.] 66: 372–87, 1947.—Volumetrische Untersuchungen an der Corpora allata der Honigbiene, Apis mellifica. *Ibid.*: 67: 223–41. **Piza, S. de T., Jor.**—Comportamento dos cromosômios sexuais do Dysdercus mendesi na segunda divisão dos espermatócitos (Pyrrhocor.). [Bragantia, Brasil] 7: 269–71, 1947. **Rensch, B.**—Histological changes correlated with evolutionary changes of body size. [100] 2: 218–30. **Roth and Lindquist**—Ecological notes on the deer fly at Summer Lake, Oregon. [37] 41: 473–76. **Salles, H.**—Sôbre a genitália dos drosofilídios: (I. Drosophila melanogaster e D. simulans). [Summa Brasiliensis Biol.] 1 (15): 311–83, 1947, Publ. Mar. 1948. **Shaw, F. R.**—A contribution to the phylogeny of the Mycetophilidae. [5] 41: 189–99. **Simmonds, F. J.**—The effective control by parasites of Schematiza cordiae, Barber, in Trinidad. [19] 39: 217–20. **Uvarov, B. P.**—Anti-Locust Bulletin. 1. Recent advances in acridology. Anatomy and physiology of Acrididae. [88] 99 (1): 1–75. Reprinted by the Anti-Locust Research Center, Brit. Mus., London. **Wallace, B.**—Studies on 'Sex-Ratio' in Drosophila pseudoobscura. I. Selection and 'Sex-Ratio.' [100] 2: 189–217. **Wellington and Henson**—Notes on the effects of physical factors on the spruce budworm, Choristoneura fumiferana (Tortric.). [23] 79: 168–70, 1947. **Wiersma, C. A. G., and Zawadzki, B.**—On the relation between different ions and peripheral inhibition in crustacean muscle. [105] 32: 100–03.

ARACHNIDA AND MYRIOPODA—Glasgow and Collins—(See under Anatomy.) **Goodnight, C. J., and M. L.**—A new member of the genus Caddo (Phalangid). [45] 56: 201–03. **Lees and Beament**—(See under Anatomy.) **McGregor, E. A.**—(See under Anatomy.) **Rousselot, R.**—Hyalomma brumpti. Description de la larve et de la nymphe. Biologie. [Ann. Parasit. Hum. et Comp.] 23:

31–34. **Strandtmann, R. W.**—Atricholaelaps traubi and A. chinchillulae, from callosciurius and the chinchilla respectively (Acarina). [65] 50: 187–92 (*). **Travassos Santos Dias, J. A.**—Quelques cas curieux d'anomalies observés chez Ixodidés des generes Rhipicephalus et Aponomma. [Annales de Parasit.] 23: 27–30.

SMALLER ORDERS—Bailey, S. F.—Thysanoptera. (See under General.) **Edmunds, G. F., Jr.**—A new genus of mayflies from western North America (Leptophlebiinae). [63] 61: 141–48. **Emerson, K. C.**—A new Mallophaga from a ruffed grouse. [43] 21: 92–95, ill. (k to Goniodes). **Gurney, A. B.**—Notes on nearctic Hemerobiidae with descriptions of two new species (Neuroptera). [5] 41: 213–22 (k). **Kimmins, D. E.**—A new species of Acroneuria (Plecoptera) from Trinidad. [68] 17: 105–06, ill. **Mosely, M. E.**—The venation in the genus Hydroptyla (Trichoptera). [68] 17: 107–08. **Nielsen, A.**—Trichoptera. (See under Anatomy.) **Sommerman, K. M.**—Two new nearctic psocids of the genus Trichadenotecnum with a nomenclatorial note on a third species (Corrodentia). [65] 50: 165–73. **Wygodzinsky, P.**—Redescription of Nesomachilis maoricus Tillyard 1924, with notes on the family Machilidae (Thysanura). [Dom. Mus. Rec. in Ent., Wellington, N. Zealand] 1 (6): 69–78, ill.

ORTHOPTERA—Barron and Tahmisian—(See under Anatomy.) **Cleveland, L. R.**—(See under Anatomy.) **Jahn and Koel**—(See under Anatomy.) **Pflugfelder, O.**—(See under Anatomy.) **Uvarov, B. P.**—(See under Anatomy.)

HEMIPTERA—Barber, H. G.—Records of the species of Nysius occurring in the Dominion of Canada (Lygae.). [23] 79: 194, 1947. **Beamer, R. H.**—Some new species of Delphacodes (Fulgorid). [43] 21: 96–110, ill. **Caldwell and DeLong**—A new species of Issidae from California. [58] 48: 176–77. **De Carlo, J. A.**—Los Ranatridae de Sud America. [An. Mus. Argent. Cien. Nat. "B. Riv."] 42: 1–38, 7 pls., 1946–47. **DeLong, D. M.**—A proposed new genus name Marganana and the allotype description of Prairiana hirsuta DeL.—Gypeninae (Cicadell.). [58] 48: 101.—Two new species of Neokolla closely related to Gothica (Cicadell.). [60] 24: 141–44, ill. **DeLong and Hershberger**—A synopsis of the genus Iowanus in N. Amer., including Mexico. [58] 48: 107–15 (k*). **Drake, C. J.**—New genera and species of Tingidae. [63] 61: 149–56. **Mendes, L. O. T.**—(See under Anatomy.) **Munger, F.**—(See under Anatomy.) **Munger and Cressman**—(See under Anatomy.) **Piza, S. de T., Jor.**—(See under Anatomy.)

LEPIDOPTERA—Brunson and Allen—(See under Anatomy.) **Clark, A. H.**—A new subspecies of Glaucopsyche lygdamus (Lycaen.). [65] 50: 176–78. **Dowden, Buchanan and Carolin**—(See under Anatomy.) **Filho, J. O.**—(See under Anatomy.) **Gardener, J. C. M.**—On larvae of the Noctuidae. [88] 99 (8): 291–318, ill. **Lee, H. T.**—(See under Anatomy.) **Lord, F. A.**—(See under General.) **Wellington and Henson**—(See under Anatomy.)

DIPTERA—Alexander, C. P.—Records and descriptions of neotropical crane-flies (Tipul.), XXIII. [45] 56: 137–48 (*). **Arnett, R. H., Jr.**—Notes on the distribution, habitat and habits of some Panama culicines. Part II. [45] 56: 175–93. **Bettini e Barachini**—(See under Anatomy.) **Carpenter, J. J.**—Gyandromorphism in Aëdes canadensis. [37] 41: 522–23. **Dowden, Buchanan and Carolin**—(See under Anatomy.) **Faurchild and Hertig**—Notes on the Phlebotomus of Panama (Psychod.). III. P. cruciatus, trinidadensis and gomezi. [5] 41: 247–57. **Hagmann, L. E.**—(See under Anatomy.) **Haseman, L.**—(See under Anatomy.) **Neri, I.**—(See under Anatomy.) **Palmer, E. L.**—Fly time. [Nature Mag., Washington, D. C.] 41: 417–24 (popular, educational). **Parsons, C. T.**—A classification of N. Amer. Conopidae. [5] 41: 223–46. **Roth and Lindquist**—(See under Anatomy.) **Salles, H.**—(See under Anatomy.) **Shaw, F. R.**—(See under Anatomy.) **Wallace, B.**—(See under Anatomy.)

COLEOPTERA—Callan, E. McC.—(See under General.) **Cartwright, O. L.**—The American species of Pleurophorus (Scarab.). [83] 74: 131–45 (k*).—Ataenius strigatus (Say) and allied species in the U. S. (Scarab.). *Ibid.:* 147–53. **Dibb, J. R.**—The eco-taxonomic approach to the study of beetles. [Coleopt. Bull.] 2: 61–65.—Beetle ecology (1). *Ibid.:* 73–74. **Fender, K.**—The Cavicollis-Corneus group of Podabrus (Cantharid.). [60] 24: 131–40 (k*). **Guppy, R.**—Corrections and additions to "Some records of Carabidae collected on Vancouver Island." [Coleopt. Bull.] 2: 75–76. **Hicks, S. D.**—Brachyrhinus raucus a European weevil new to N. Amer. [23] 79: 171, 1947. **Klapperich, H.**—Notes about German and Austrian coleopterists and collections. [Coleopt. Bull.] 2: 67. **Kono, H.**—A new species of Curculionidae, Phyllobius intrusus, injurious in the state of Rhode Island. [63] 61: 169–70. **Lane, M. C.**—Some generic corrections in the Elateridae.

I. [65] 50: 179–82. **Leech, H. B.**—Collecting larvae of two species of Ditylus (Oedemer.). [Coleopt. Bull.] 2: 66–67.—Host records for Calopus angustus (Oedemer.). *Ibid.:* 75. **Martinez, A.**—Addenda y corrigenda al trabajo de Blackwelder "Checklist of the Coleopterous insects of Mexico, C. A., West Indies and So. Amer." (Scarab.). [Arthropoda] 1: 109–14, 1947. **Monrós, F., y J. M. Viana**—Revisión sistemática de los Hispidae argentinos. [An. Mus. Argent. Cien. Nat. "B. Riv."] 42: 125–324, 27 pls., 1946–47. **Neiswander, R. B.**—(See under Anatomy.) **Ritcher, P. O.**—Descriptions of the larvae of some ruteline beetles with keys to tribes and species. [5] 41: 206–12. **Robinson, M.**—A new species of Canthon with a key to the Humectus group (Scarab.). [83] 74: 155–58. **Simmonds, F. J.**—(See under Anatomy.)

HYMENOPTERA—Auclair and Jamieson—(See under Anatomy.) **Bohart, R. M.**—The genus Euparagia in North America (Vespidae). [60] 24: 149–54 (k*). **Bromley, S. W.**—(See under General.) **Brown, W. L.**—A preliminary generic revision of the higher Dacetini (Formicid.). [83] 74: 101–29, ill. (k*). **Brunson and Allen**—(See under Anatomy.) **Dade, H. A.**—(See under Anatomy.) **Doutt, R. L.**—(See under Anatomy.) **Dowden, Buchanan and Carolin**—(See under Anatomy.) **Eckert, J. E.**—(See under Anatomy.) **Evans, H. E.**—Two new southwestern spider wasps (Pompilidae). [60] 24: 123–30. **Gregg, R. E.**—An unusual nest of the prairie mound-building ant. [65] 50: 183–86. **Hicks, S. D.**—An unusual nesting site for the ant Lasius flavus nearcticus. [23] 79: 170–71, 1947. **Lejeune and Filuk**—(See under Anatomy.) **Milum, V. G.**—(See under General.) **Pflugfelder, O.**—(See under Anatomy.) **de Santis, L.**—Adiciones a la fauna Argentina de afelínidos (Chalcidoidea). [Notas del Moseo de la Plata] 13 (Zool. 101): 43–48. **de Santos, L.**—Estudio monográphico de los a felínidos de la República Argentina (Chalcidoidea). [Rev. Museo de la Plata, n.s., sec. Zool.] 5: 23–280 (k*). **Scullen, H. A.**—New species in the genus Eucerceris with notes on recorded species and a revised key to the genus. [60] 24: 155–64. **Spieth, H. T.**—Notes on a colony of Polistes fuscatus hunteri. [45] 56: 155–69. **Timberlake, P. H.**—Additions and corrections to the list of Nearctic species of Dianthidium (Apoidea). [45] 56: 149–53 (k*). **Weber, N. A.**—A revision of the N. Amer. ants of the genus Myrmica Lat. with a synopsis of the Palearctic species. II. [5] 41: 267–308.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

Diptera—Tachinidae-Dexiidae wanted, No. Amer. and exotic. Will collect most orders in exchange or will purchase. P. H. Arnaud, 60 Woodrow St., Redwood City, Calif.

Will collect—Zoological and entomological specimens in tropical and subtropical parts of Peru. Jose M. Schunke, Pucallpa, Peru.

Wanted—Diplotaxis; will buy or exchange. E. W. Mange, 307 W. Walnut St., Hanover, Pa.

Hymenoptera-Aculeata (except ants and bees) for exchange. Will collect other orders in exchange. N. F. de Andrade, Casal Novo, S. João do Estoril, Portugal.

Meliponidae—Wanted, information on the bionomics, culture, and economic importance of the stingless bees, particularly of the Old World. P. Nogueira Neto, Av Cicade Jardim 170, S. Paulo, Brasil.

Wasps (Vespoidea, Sphecoidea, Chrysidoidea) of the world by exchange or purchase. Will collect other orders in exchange. D. G. Shappirio, 4811 17th St., N.W., Washington 11, D. C.

Lepidoptera—Large quantities of Plexippus, Colias, Cardui, Vanillae wanted for cash or exchange for tropical butterflies. G. MacBean, 710 Miller Rd., Sea Island, Vancouver, B. C.

Ants of the tribe Dacetini (*Strumigenys, Rhopalothrix* and related genera) wanted for world revision. W. L. Brown, Jr., Harvard University Biological Laboratories, Cambridge 38, Mass.

Mallophaga (on which immediate determination is not necessary) wanted for study and determination. R. L. Edwards, Dept. Biology, Harvard University, Cambridge 38, Mass.

Tingidae (Heteroptera) of the world wanted, in alcohol, with host and other ecological data. Will collect other orders in exchange. N. S. Bailey, 16 Neponset Ave., Hyde Park 36, Mass.

Bombidae, nearctic and neotropical, wanted for exchange, identification, or purchase. Will exchange in other groups for bumblebees. Barth Maina, Dept. Zool., Univ. of Chicago, Chicago 37, Ill.

Saturnidae of the world. Will purchase individual specimens or cocoons. F. E. Rutkowski, St. Bede College, Peru, Illinois, U. S. A.

Butterflies of New England, principally from New Haven, Conn., for exchange. Louis Clarke, 28 W. Elm St., New Haven 15, Conn.

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ENTOMOLOGICAL NEWS

DECEMBER 1948

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ENTOMOLOGICAL NEWS

Vol. LIX DECEMBER, 1948 No. 10

Opportunities for Entomological Research in the Arctic

By Neal A. Weber, Swarthmore College, Swarthmore, Pa.

Cartographers and others refer to that part of the earth lying north of the Arctic Circle as the Arctic. The term, however, is a cartographic rather than a biological term since the boundary of the most frigid section of Alaska, for example, does not coincide with the Circle. The lowest temperatures in Alaska have been recorded in the interior south of the Circle. The northward limit of trees forms a line running irregularly for the most part north of the Circle and it is that treeless area in Alaska extending back from the coast of the Arctic Sea into the Brooks Range to which the present note refers.

On a brief visit to the Alaskan Arctic, for which I thank the Office of Naval Research, the Arctic Research Laboratory, and Doctors Laurence Irving and M. C. Shelesnyak, it was possible to make some general observations which contrasted vividly with a longer tour a few months earlier in Equatorial Africa. While the differences are great, the opportunities are similar. Comparatively little research of an entomological type has been done in either, and surveying the fauna of each has yet to be accomplished.

The Alaskan Arctic was visited at the close of its summer and by this time many of the most conspicuous insects, such as mosquitoes, had largely disappeared. The time was propitious, however, for collecting those stages of insects which remain active up to the onset of snow and cold weather. Warm weather, which might have induced some insects to come out, was at no time experienced and the temperature remained in the 30°'s and low 40°'s (Fahrenheit).

The period was thus particularly appropriate for determining those insects adapted to activity in weather comparatively cold for poikilothermic, or cold-blooded animals. Others which take advantage of brief spells of warm weather to telescope their activity into a few short days or weeks were unavoidably missed as adults. The general nature of the Alaskan Arctic insect fauna, however, could readily be estimated.

The great majority of the visible insects not only at this time but at all seasons undoubtedly belong to the Order Diptera, or flies, which are readily distinguished from other insects by possessing two wings instead of the customary four. Not only are they conspicuous but their rôle is of primary importance. The nuisance value of the mosquitoes, of which a few males still remained, is universally appreciated and the harassment of the mammals by them is more than a nuisance. Flesh flies or blowflies feed on carrion which decomposes slowly in this cold climate. The botfly (*Oedemagena tarandi* L.) which develops in caribou and during other times of the year may render the skins of little value to the Eskimos was not present on its host at this late date, nor was the larval botfly (*Cephenomyia*) which lives in the caribou nasal passage earlier in the year. Other Diptera constituted the majority of the readily visible adult insects and, as immature stages, were the commonest insects in fresh water. Larval Diptera (Calliphoridae) were present in animal carcasses lying on the exposed tundra though their development must have been slow because of the low temperatures. In some instances they were feeding amid frost crystals. It is probable that an hour or more of calm, sunny weather would warm these carcasses sufficiently to accelerate development even to the adult stage this late in the season. In the Point Barrow construction camp small flies (*Leptocera fontinalis* Fall. and *Copromyza* sp.) lived in the mess hall and were the only "domestic" insects established in this area. The common house flies were not present though permanently heated buildings may sooner or later permit them to become established unless insecticides are regularly used.

At the other end of the insect scale, the primitive Collembola ranked with the Diptera in abundance in the tundra. Their rôle is of considerable importance, though difficult to evaluate readily.

These tiny, wingless insects, which are commonly called "springtails" from their habit of leaping like fleas by means of an abdominal appendage on the under side of the body, are present in vast numbers on and in the tundra. They feed upon dead or decaying organic matter as well as on living algae and fungi and appear to be at the bottom of the animal series of a food chain. Since they are fed upon by larger animals which in turn form the food of still larger animals, they are an important link in transforming the tundra into food for higher forms of life. It is these Collembola and Corrodentia, or bark lice, which are probably responsible for the stories of "snow-fleas" in Greenland and other Arctic areas where they are found actively walking, leaping and burrowing on or in snow. In addition, small species of Diptera and larger Plecoptera, or stoneflies, walk about on the snow.

Next to Diptera and Collembola related arthropods, the Arachnida, or spiders and their allies, appear to be of importance. Though not insects they are commonly considered with them. Spiders are abundant on the tundra where they prey on insects or other small animals. Mites occur with Collembola in great numbers in the tundra and perhaps play a somewhat similar rôle as scavengers. Centipedes (of the related Chilopoda) found at Anaktuvuk Pass in the Brooks Range may be near the northern limit of this class of arthropods.

As pollinators of the numerous flowering plants of the tundra, along with flies, the bumblebees (Hymenoptera), including *Bombus moderatus* Cr., have a certain importance. Other Hymenoptera include a few parasitic forms and a social wasp (*Vespula norvegica albida* Sladen). The northernmost record of ants in the New World is of *Leptothorax acervorum canadensis* Prov. taken by Dr. P. F. Scholander in Latitude 69° 22′ North at Umiat within the Alaskan Arctic region.

As food for fresh-water fishes, second to larvae of Diptera, the larvae of the neuropteroids, Perlidae (Plecoptera) and Trichoptera or Caddis flies, including *Grensia praeterita* (Walker), are important. They were active in streams at a near freezing temperature up to the time of my departure in late August at

Anaktuvuk Pass. Dr. Irving took imagoes of the *Grensia* active on the ice over a month later in Latitude 70° 54′ North. These and dipterous larvae probably remain active as long as there is water and, as the water freezes downward, hibernate in the bottom mud in an immature state.

Coleoptera or beetles are not uncommon and appear to be mostly of the carabid type. A single weevil was seen at the end of summer. Also at this late date the parasitic Siphonaptera or fleas were not abundant on the ground squirrels (*Citellus parryii barrowensis* Merriam), foxes and other mammals though reported by the Eskimos to be more numerous in the Spring as are the parasitic Diptera. Significantly, the Eskimo dogs appear to be free of ticks and fleas. The custom of tethering them separately and the cold climate are not conducive to infestation. Lice (Anoplura—*Antarctophthirus trichechi* Boheman) were taken on the walrus and reported from seals. The Mallophaga, parasites mostly on birds, also appear to be scarce on their hosts at this late time of year. An unusual species (*Trichodectes mephitidis* Osborn) was taken on the Arctic weasel (*Mustela arctica arctica* Merriam). Lepidoptera (butterflies and moths) had nearly all disappeared except for a few densely hairy caterpillars crawling sluggishly on the snowy tundra. Aphids (Homoptera) and true bugs (Hemiptera) were scarce. Other orders of insects occur but had mostly disappeared by late summer in the areas visited.

In summary, those insects of primary importance from the standpoint of numbers and biological rôle appear to be the numerous species of Diptera, conspicuous to everyone, and the lowly Collembola which are seldom seen unless appearing as "snow-fleas" on the snow. Hymenoptera and Lepidoptera have specialized rôles as do insects of a few other orders. Social insects, the most numerous terrestrial animals in the tropics, are almost absent, though a study of the farthest north stragglers might prove of special interest.

In conclusion it may be stated fairly that the opportunities are great for the study of insects in the Alaskan Arctic. The adaptation of insects to the climate and the telescoping of the activity of most forms into a brief period in the summer combined with a long period of hibernation present many unsolved problems. Since the insect fauna is practically unknown, intensive and extensive collecting will add materially to present knowledge on the distribution of many species. The Arctic Research Laboratory now established at Point Barrow on the coast of the Arctic Sea offers for the first time facilities for investigations on these and other problems.

Evening Flight Habits of a Male Tabanid [1]

By Lyle E. Hagmann, George W. Barber,[2] Eleanor B. Starnes and Ordway Starnes, Department of Entomology, Rutgers University, New Brunswick, N. J.

During the first week of August, 1948, one of the authors observed dead males of *Tabanus giganteus* DeGeer (determined by L. L. Pechuman) along the edge of a country road in Middlebush, New Jersey, in numbers sufficient to indicate that certain of their flights took place above the road in such a way that they were struck and killed by automobiles. Sufficient preliminary observation was made to show that these flights probably occurred in the evening. Therefore, observations were made on about ¼ mile of a gravel road from August 10 to 12. This road was bordered on each side by dense woods, many of the largest trees being from 50 to 60 feet high.

On August 10 the males were seen to hover over the road between 7:20 and 8:10 P.M. (E.D.S. time). Each remained in one position for several minutes but darted off swiftly if disturbed. That the flies were active well into twilight was shown in that very soon after they disappeared on this date bats were observed above the road. On August 11 they were observed hovering between 7:20 and 7:40 P.M. At the latter hour rain began to fall and seemingly prevented their further flight. On

[1] Journal Series Paper of the New Jersey Agricultural Experiment Station, Rutgers University, Department of Entomology.

[2] We regret to report that Dr. Barber died on December 6, following a heart attack. This article was submitted by him to Entomological News on October 11, 1948.

August 12 they were seen to hover from 7:40 to 8:00 P.M. Although they were usually hovering from 2 to 5 feet above the road, some were observed up to 20 feet. Careful watch before and after the stated hours showed that no flies were hovering then.

When hovering they were captured rather easily and on the dates mentioned 34, 24, and 20 respectively were taken and many others were seen.

On the first mentioned date one pair was observed to mate. The male struck the female and connection was made in flight, after which the pair attached to a leaf, one holding firm thereto while the other hung motionless below.

Females of this species were observed feeding on cattle in a pasture several miles distant but no males were seen in the vicinity. The road where males were observed was located between a possible breeding area and a herd of cows. It seemed probable that the males lay in wait for the females which were returning, after a blood meal, to the breeding ground.

The hovering habit appeared to be restricted to the period just before darkness when the temperature was falling, and its purpose may have been to maintain the body temperature of the males sufficiently to enable them to make the rapid flights necessary to overtake the females at this time.

A Third Species in the Chelodesmid Genus Semionellus (Diplopoda)

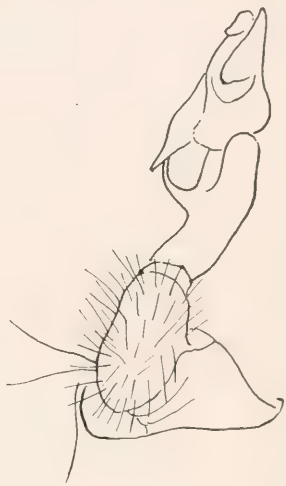
By Ralph V. Chamberlin, University of Utah

The type of a new species of Semionellus, established by the author for *Leptodesmus placidus* Wood, was noted in the routine examination of a collection of millipeds and chilopods made by Stanley and Dorothea Mulaik near Kerrville, Texas, in 1939 and now in the author's collection at the University of Utah. *Semionellus michiganus* (Chamberlin), described originally under Chonaphe, was previously (1946) found.

Semionellus tertius new species

Chestnut brown above, with the thickened borders of the keels yellow. Legs brownish yellow. Antennae and cauda chestnut brown.

1



2

Semionellus tertius n. sp.

FIG. 1. Left gonopod of male, ventral view.
FIG. 2. The same, ectal view.

In the gonopods of the male the characteristic subflagelliform spine of the telepodite is much shorter than in either of the previously known species; also the terminal lobes are obviously different as shown in the accompanying figures.

Width, 4.2 mm.

Locality: TEXAS, near Kerrville (?).

One male taken by S. and D. Mulaik, 1939. A somewhat smaller form than the two species previously known and than the species of Chonaphe, a closely related genus of the Pacific Coast region.

Current Entomological Literature

COMPILED BY RAYMOND Q. BLISS AND R. G. SCHMIEDER.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, 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.

This list gives references of the year 1948 unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

For other records of general literature and for economic literature, see the Bibliography of Agriculture, 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 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. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

GENERAL—Breland, O. P.—Why not check the literature more carefully? [18] 43: 132–34. **Carpenter, F. M.**—The supposed nymphs of the Palaeodictyoptera. [73] 55: 41–50, ill. A Permian insect from Texas. *Ibid.:* 101–03 (*). **Collin, J. E.**—On the interpretation of Article 31 of the International Rules of Nomenclature. [28] 84: 235–36. **Filho e Pereira**—Comportamento da humidade em recipientes de barro porosa para a criação de arthrópodos. [Papéis Avulsos, Dept. Zool., São Paulo] 8: 123–26, ill. **Grant, C.**—Transmetamorphic memory vs. instinct. [39] 38: 46–47. Spirit. *Ibid.:* 48, 1946. **Ghigi, A.**—La specie. [Scientia] 42: 175–81. **Hovanitz, W.**—Ecological segregation of inter-fertile species of Colias. [26] 29: 461–69. **Johnson, F. H.**—Bioluminescence: a reaction rate tool. [81] 67: 225–35. **Kretzschmar, G. P.**—Soybean insects in Minnesota with special reference to sampling techniques. [37] 41: 586–91. **Linsley, E. G.**—Obituary, Theodore D. A. Cockerell. [18] 43: 116–18. **Meiners, E. P.**—Mary Esther Murtfeldt (1839–1913) (Biogr. with portrait). [Lep. News] 2: 83. **Olsen, C. E.**—Memories of early visits to J. R. de la Torre-Bueno and his bug sanctuary. [18] 43: 135–37. **Paulian, R.**—Notion, limites et importance des niches écologìques. [Rev. Fran, D'Ent.] 15: 161–65. **Remington, J. E.**—Alfred Jefferis Turner (1861–1947) (Obit. with portrait). [Lep. News] 2: 82. **Sherman, J. D., Jr.**—Books, pamphlets and serials about insects and spiders. Catalogue No. 62, Nov. 1948. **Sweadner, W. R.**—Important collections. 1. Carnegie

Museum. [Lep. News] 2: 80. **Swinton, W. E.**—Notes for students. III. Type specimens. [Museums Jour., London] 48: 72–73. **Williams, C. B.**—The Rothamstead light-trap. [68] 23: 80–85, ill. **Zikán, J. F. and W. Zikán**—A inseto fauna do Itatiaia e da Mantiqueira. [Minist. da Agric. serv. Florestal] 1946: 1–50. **Zikán, W. and P. W. Wygodzinsky**—Catáogo dos tipos de insetos da Instituto de Ecologia e Experimentação Agricolas. [Bol. Serv. Nac. Pesq. Agron., Rio de Janeiro] No. 4: 1–93.

ANATOMY, PHYSIOLOGY, MEDICAL—Abeloos, M.—Étude comparative de la croissance deux espècies de Timarche (Chrysomel.). [Trav. Sta. Zool. Wimereux] 13: 1–16, 1938. **Anderson, E. J.**—Hive humidity and its effect upon wintering bees. [37] 41: 608–16. **Anderson, R. F.**—Host selection by the pine engraver (Ipid.). [37] 41: 596–602. **Beier, M.**—Zur Kenntnis von Körperbau und Lebensweise der Helminen (Dryop.). [112] 24: 123–211. **Berrie and Sansome**—Wild population studies; Drosophila funebris near Manchester. [Jour. Genetics] 49: 151–52, ill. **Bettini, S.**—Contributo allo studio della resistenza all'azione del DDT nelle mosche domestiche. [Riv. de Parasit.] 9: 137–42. **Bird, M. J.**—Genetics and cytology of Drosophila subobscura. V. The genital abnormalities associated with the sex-linked recessive crossveinless. [Jour. Genetics] 49: 141–50. **Burnside and Revell**—Observations on nosema disease of honey bees. [37] 41: 603–07. **Burr, M.**—Are ants attracted to bright colors? [29] 60: 95. **Buyckx, E. J. E.**—Recherches sur un dryinide, Aphelopus indivisus, parasite de cicadines. [La Cellule] 52 (1): 61–155 & 11 Pl. **Carayon, J.**—Les organes parastigmatiques des Hémiptères (Nabidae). [C. R. Acad. Sci. Paris] 227: 864–66. **Carrera e Filho**—Dados morfológicos e bionômicos sôbre Hylemyia poeciloptera minadora das folhas de beterraba (Beta vulgaris). [Papéis Avulsos, Dept. Zool., São Paulo 8: 49–62. **Chen, S–Y.**—Action de la température sur trois mutants a panachure de Drosophila melanogaster w^{258-18}, w^{m5} et z. [Bull. Biol. Fr. et Belg.] 82: 114–29. **Cheo, C. C.**—Notes on fungus-growing termites in Yunnan, China. [Lloydia] 11: 139–47. **Clark and Grosch**—Fat cell size in the mutant small-wings of Habrobracon. [12] 95: 264. **Corradetti, A.**—Osservazioni sulle preferenze alimentori dell'Anopheles pseudopunctipennis e dell'A. punctimacula nel Perù. [Riv. di Parasit.] 9: 129–35. **Deleurance, E.–P.**—Le comportement reproducteur est indépendent de la présence des ovaires chez Polistes (Vespid.). [C. R. Acad. Sci. Paris] 227: 866–67. **Dupuis, C.**—Remarques sur le mode de specífité parasitaire des Phasiinae (Larvaevorid). [Bull. Biol. Fr. et Belg.] 82: 130–40. **Gary and Nelson**—Serological evidence of resistance of larvae and workers (Apis) to Bacillus larvae. [37] 41: 661–63. **Goetsch, W.**—Forschungsreisen in Südamerika zum Studium der Insekten-Staaten. [Jenaische Zeitsch. Med. Naturwiss.] 1942: 128–54. **Goustard, M.**—Inhibition de la photonegativite par le gressage chez Blatella. [C. R. Acad. Sci., Paris] 227: 785–86. **Grassé, P.-P. et C. Noirot**—La "climatization" de la Termitiere par ses habitants et le transport de l'eau. [C. R. Acad. Sci., Paris] 227: 869–71. **Grosch, D. S.**—Growth in Habrobracon. [Growth] 12: 243–54. **Guareschi, C.**—Richerche sperimenali sulla Epilachna chrysolmelina. [Pontifica Acad. Sci., Comm.] XI (5): 157–204, ill., 1947. **Haydak, M. H.**—Notes on biology of cyclopic bees. [37] 41: 663–64. **Heal and Menusan**—A technique for the blood stream injection of insects and it application in tests of certain insecticides. [37] 41: 535–45. **Heinze, K.**—Das pflanzliche Virus im Übertäger. [Natur u. Volk, Ber. Senck. Naturf. Gesell.] 78: 65–74. **Kalmus and Smith**—Production of pure lines in bees. [Jour. Genetics] 49: 153–58. **Keister, M. L.**—The morphogenesis of the tracheal system of Sciara. [44] 83: 373–424, ill. **Lamy, R.**—The genetic basis of sterility in some Drosophila hybrids. [Jour. Genetics] 49: 120–25. **Lawrence, R. F.**—Studies on some parasitic mites from Canada and South Africa. [46] 34: 364–79 (k*). **Le Calvez, J.**—In (3R)SS^{Ar}: mutation "aristopedia" hétérozygote dominant, homozygote léthal chez Drosophila melanogaster. [Bull. Biol. Fr. et Belg.] 82: 97–113. **McClung, C. E.**—The apical cell of the insect testis—a possible function. [Trav. Sta. Zool. Wimereux] 13: 437–43, ill., 1938. **Nichols, W. C. G. and J.**—A study of the blood of some crustacea. [44] 83: 425–43. **Pryor, M. G. M.**—Mouth parts and feeding habits of Blepharoceridae (Dipt.). [68] 23: 67–70, ill. **Querner, H.**—Untersuchungen über die Flügelform der Mehlmotte Ephestia kühniella, insbesondere den Faktor kfl (kurzflügelig). [Biol. Zentral.] 67: 293–319. **Ray, D. T.**—Dominant lethals induced by x-rays in sperm of the chalcidoid wasp Nasonia brevicornis. [12] 95: 257–58. **Ricci, M.**—Sull'-azione del DDT su Blatta orientalis. [Riv. di Parasit.] 9: 143–67. **Richards, O. W.**—The interaction of environmental and genetic factors in determining the weight of grain weevils, Calandra granaria (Curclionid). [72] 118: 49–81. **Rings and Weaver**—Effects of benezene hexachloride and DDT upon parasitization of the oriental fruit moth. [37] 41: 566–69. **Scudamore, H. H.**—Factors influencing moulting and the sexual cycles in the crayfish. 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[Trav. Sta. Zool. Wimereux] 13: 691–98, 1938. **Viette, P.**—Morphologie des genitalia males des Lepidopteres. [Rev. Franc. D'Ent.] 15: 141–61. **Whiting, A. R.**—Method of origin of androgenetic males in Habrobracon. [12] 95: 259. **Whiting and Blauch**—The genetic block to free oviposition in the chalcidoid wasp Melittobia sp. [12] 95: 243–44. **Williams and Sanborn**—The cytochrome system in relation to diapause and development in the Cecropia silkworm. [12] 95: 282–83. **Wright, M.**—Notes on swarming of certain species of insects (Ephem., Neuropt., Dipt.) [47] 23: 255–58.

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EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

Will collect—Zoological and entomological specimens in tropical and subtropical parts of Peru. Jose M. Schunke, Pucallpa, Peru.

Wanted—Diplotaxis; will buy or exchange. E. W. Mange, 307 W. Walnut St., Hanover, Pa.

Hymenoptera-Aculeata (except ants and bees) for exchange. Will collect other orders in exchange. N. F. de Andrade, Casal Novo, S. João do Estoril, Portugal.

Meliponidae—Wanted, information on the bionomics, culture, and economic importance of the stingless bees, particularly of the Old World. P. Nogueira Neto, Av Cicade Jardim 170, S. Paulo, Brasil.

Wasps (Vespoidea, Sphecoidea, Chrysidoidea) of the world by exchange or purchase. Will collect other orders in exchange. D. G. Shappirio, 4811 17th St., N.W., Washington 11, D. C.

Lepidoptera—Large quantities of Plexippus, Colias, Cardui, Vanillae wanted for cash or exchange for tropical butterflies. G. MacBean, 710 Miller Rd., Sea Island, Vancouver, B. C.

Ants of the tribe Dacetini (*Strumigenys, Rhopalothrix* and related genera) wanted for world revision. W. L. Brown, Jr., Harvard University Biological Laboratories, Cambridge 38, Mass.

Mallophaga (on which immediate determination is not necessary) wanted for study and determination. R. L. Edwards, Dept. Biology, Harvard University, Cambridge 38, Mass.

Tingidae (Heteroptera) of the world wanted, in alcohol, with host and other ecological data. Will collect other orders in exchange. N. S. Bailey, 16 Neponset Ave., Hyde Park 36, Mass.

Bombidae, nearctic and neotropical, wanted for exchange, identification, or purchase. Will exchange in other groups for bumblebees. Barth Maina, Dept. Zool., Univ. of Chicago, Chicago 37, Ill.

Saturnidae of the world. Will purchase individual specimens or cocoons. F. E. Rutkowski, St. Bede College, Peru, Illinois, U. S. A.

Butterflies of New England, principally from New Haven, Conn., for exchange. Louis Clarke, 28 W. Elm St., New Haven 15, Conn.

Wanted—Proc. Ent. Soc. Phila., vols. 1–6; Proc. Cal. Acad. (Nat.) Sci., 1–7; Proc. Acad. Nat. Sci. Phila., 1–20; Trans. Amer. Ent. Soc., 1–10; Bull. Buff. Soc. Nat. Sci., 1–5; Psyche, 11, 13, 15; Ent. Amer. n.s., 7–26. C. F. dos Passos, Mendham, N. J.

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