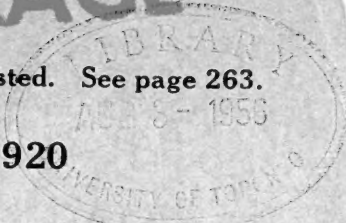


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NOVEMBER, 1920



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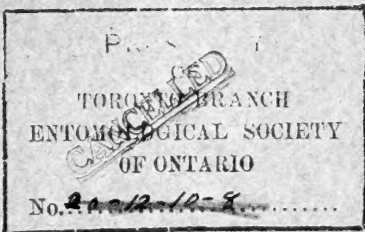
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No. 9

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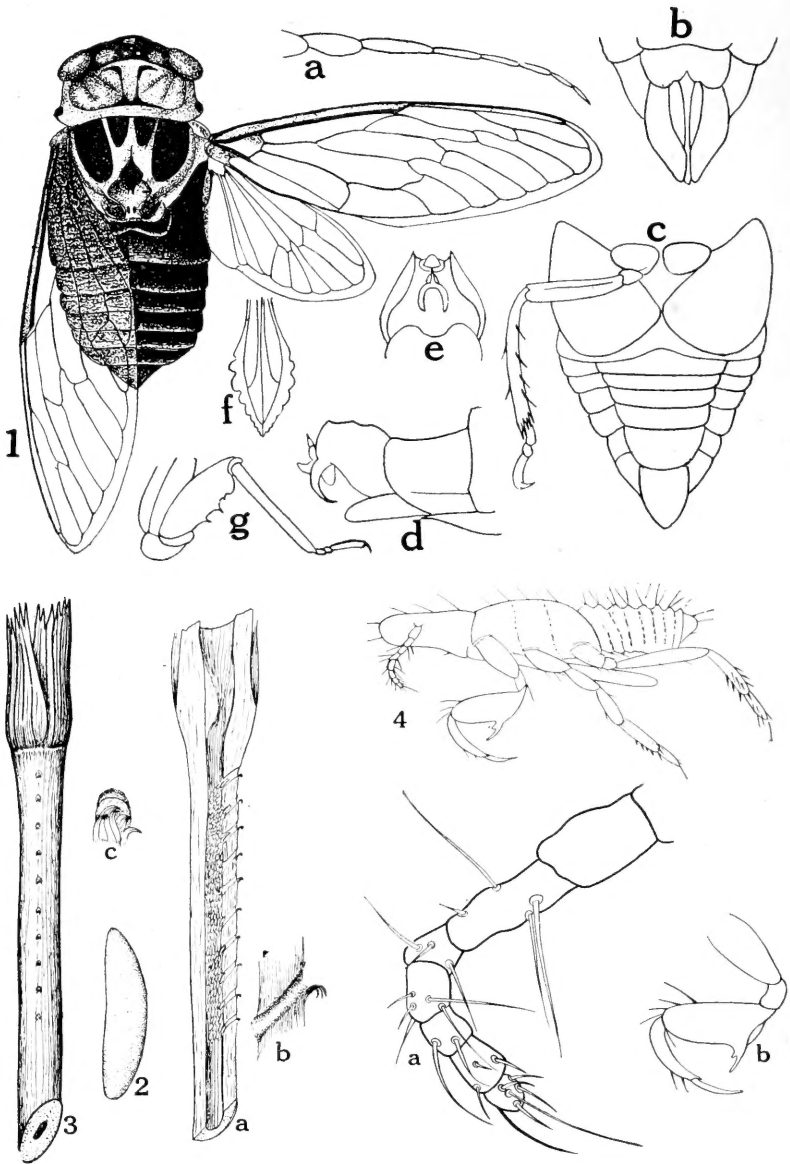
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OSBORN AND METCALF—SALT MARSH CICADA.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXXI.

NOVEMBER, 1920.

No. 9.

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Description of One New Buprestid with Notes on Other Little Known Species (Coleop.).

BY W. J. CHAMBERLIN, Forest Entomologist, Oregon Agricultural College.

Cinyra robusta n. sp.

Form elongate, robust. Entire upper surface, head, thorax and elytra covered with scattered, short, fine, recumbent hairs, arising from the punctures.

Head same color as elytra, not shining, very coarsely punctured, with a faint median line running one-third from the thorax. Front rough with irregular callosities extending across the middle. Clypeus shallow, broadly emarginate. Antennae with the third joint twice as long as the second; from the fourth joint on, all joints are broad and flattened, entire antennae black not testaceous.

Thorax coarsely, moderately densely punctate with irregular smooth callosities, especially along the middle, sides of thorax slightly arcuate, widest just behind the middle and narrowing sharply at the anterior fourth. Scutellum semi-circular, small.

Prosternum dull black not shining, an irregular slight depression extending around the sclerite just inside the border (Fig. 1). From this

depression protrude many lines of long yellowish hairs. Metasternum with large shallow punctures and scattered pubescence.

Length of elytra 10 mm., apex quadri-spinose, finely rather densely punctate, costa apparent on the posterior half; an irregular network of callosities over the whole elytra. Color dull purplish black, the punctures giving a faint bronze reflection in the light. Elytra narrowing rather sharply at the apical fifth.

Abdomen dull black with a faint purplish tinge, sparsely punctate with intermediate, smooth elevations; last ventral truncate.

Length 14.5 mm.

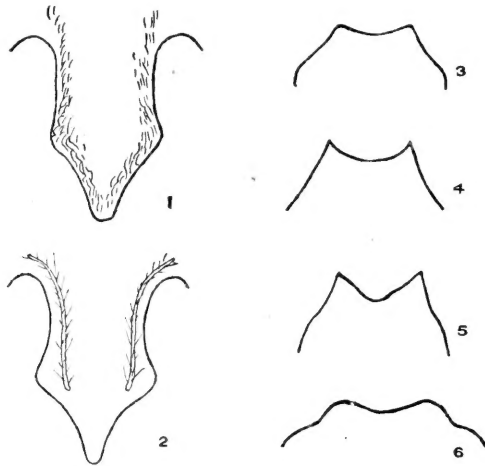


Fig. 1. Prosternum of *Cinyra robusta* n. sp.
 Fig. 2. Prosternum of *Cinyra prosternalis* Schaeffer.
 Fig. 3. Last ventral segment of *Cinyra robusta* n. sp.
 Fig. 4. Last ventral segment of *Cinyra prosternalis* Sch.
 Fig. 5. Last ventral segment of *Cinyra gracilipes* Mels.
 Fig. 6. Last ventral segment of *Cinyra purpurescens* Sch.

One specimen Texas. Exact locality unknown. Type in the author's collection.

Abundantly distinct from its nearest ally, *C. prosternalis* Schaeffer, by its more robust form, darker and less shining color. In the specimen of *C. prosternalis* which I have, the antennae from the fourth joint on have testaceous lobes, (similar to *Chrysobothris dentipes*), a point not mentioned by Mr. Schaeffer. In *C. robusta* the joints are broad, flattened, uniform in texture and color. The border of hairs around

the prosternum as well as the shape of that sclerite (Fig. 1) is different. In *prosternalis* the depression near the border of the prosternum extends only down each side, the hairs are short and scattered, the surface is smooth and shining. In *robusta* the hairs are thick, extend entirely around and the surface lacks any luster.

The last ventral segment of *prosternalis* is stated to be truncate; in my specimen it is slightly sinuate, while in *robusta* it is squarely cut off, almost twice as broad as in *prosternalis* and lacks the definite spines of the latter. Our four* species are, I believe, very readily distinguished as follows:

1. Front coarsely, evenly punctate, metallic coppery color, with no prominent callosities. Clypeus broadly emarginate, rounded at each corner. Length 8 mm. *C. purpurescens* Schaeffer
2. Front with scattered, coarse punctures, dull blackish violet with faint greenish tinge. A depression at the vertex and an irregular callosity extending across the middle. Clypeus broadly, slightly emarginate, corners angulate. Length 14.5 mm. *C. robusta* n. sp.
3. Front coarsely punctate, shining green, with callosities more or less resembling an inverted W. Clypeus more deeply emarginate, angles sharper, edges thickened. Length: 13 mm. *C. prosternalis* Schaeffer
4. Front densely, moderately coarsely, punctate. Coppery bronze, metallic, with a shining green callosity in the shape of an inverted Y. Clypeus triangularly emarginate. Length: 11 mm.

C. gracilipes Melsheimer

There is, I believe, ample reason for separating the above species into different genera as suggested by Colonel Casey†, but this could only be done by one thoroughly familiar with exotic genera.

Ultimately the species mentioned above will probably fall into three separate genera. *C. gracilipes* Mels. in one, *purpurescens* Sch. in another and *C. prosternalis* Sch. and *robusta* n. sp. in the third.

Agaeocera scintillans Waterhouse.

This beautiful buprestid has not heretofore been reported as occurring in the United States. Dr. Frank Lutz kindly

* I am unable to distinguish Col. Casey's *C. macilenta* from *C. gracilipes* Mels.

† Casey, Proc. Wash. Acad. Sci. XI, p. 176 (1909).

presented me with a specimen of *Agaeocera*, which I took to be *A. gentilis* Horn, but upon comparing it with the type, at Philadelphia, I found it was an entirely different species and have placed it as *A. scintillans* Water., previously recorded from Mexico. The specimen which I have, with another identical specimen in the American Museum, bears the following label: "Sabino Basin, Sta. Catalina Mts., Arizona. July 8-20, '16. 32°22' N. 110°16.5' W. About 3800 ft." Collected by Dr. Lutz.

The species is easily distinguished from *A. gentilis* by its prominent shining costae, narrower thorax, on which is a median sulcus extending two-thirds from the base towards the head and the presence of an elongated fovea on each side of the thorax, which are lacking in *gentilis*.

***Dicerca pectorosa* Lec.**

This rare buprestid has been bred from both peach and prune, where the larvae work low down in the trunk, most commonly in trees attacked by the peach root borer (*Sanninoidea opalescens*). It has been submitted from Roseburg and The Dalles, Oregon, where it is causing considerable damage to orchard trees. Much of the damage in this state attributed to *Chrysobothris femorata* Fab. is in reality due to *C. mali* Horn and *D. pectorosa* Lec. The native host tree of *pecterosa* is not known with certainty, although the author collected one specimen in Grant County, Oregon, on lodgepole pine (*Pinus contorta*), where it was apparently ovipositing.

***Melanophila pini-edulis* Burke.**

This rare species has been recorded from Utah, Colorado, Arizona, New Mexico, and California and Mr. H. E. Burke gives *Pinus edulis* and *Pinus sabiniana* as hosts. A specimen was taken from its cell in Jeffrey pine (*Pinus jeffreyi*) at Waldo, Oregon, in March, 1914, by Mr. J. M. Miller, thus giving a new host plant for the species and extending its range into another state.

Notes on the Genus *Hetaerius* and Descriptions of three New Species (Coleop.)

BY J. O. MARTIN, Berkeley, California

(Continued from page 225.)

Hetaerius nitidus very closely resembles *brunnipennis* Rand; but in that species the lateral thoracic area is crossed at basal third by a distinct sulcus, represented in *nitidus* by a foveate depression. In *brunnipennis* the lateral thoracic area is coarsely punctate, in *nitidus* it is very finely so and the punctures are fewer in number. The interstrial spaces of the elytra in *brunnipennis* have coarse scattered punctures which are lacking in *nitidus*. The pygidium in *brunnipennis* is smooth, in *nitidus* punctate and hairy. They agree in having the margined area of the prosternum closed by the meeting of the marginal striae.

Hetaerius hirsutus sp. nov.

Body oblong, shining, castaneous, upper surface feebly convex.

Head piceous, vertex concave, punctate, portion next to thorax moderately, coarsely punctured, each puncture with a coarse branched hair, cephalic portion more finely punctured without hair; front smooth, shining, impunctate.

Thorax two-fifths wider than long, slightly narrowed in front, divided longitudinally by two suture-like diagonal grooves into a discal and two lateral areas; lateral areas again divided by a deep transverse sulcus at basal third; discal area slightly longer than wide, a little less than one-half as wide in front as at base, bordered laterally by a shallow sulcus which is smooth, shining and impunctate; central portion of discal area smooth, shining, impunctate, between this rounded impunctate portion and the impunctate bordering sulcus is a roughly triangular area with base at upper edge of elytra and extending slightly less than two-thirds the length of disc which is coarsely and thickly punctured, each puncture bearing a long branched hair, depressed and directed caudad, forming a brush-like bunch at its outer basal portion; along the apical border of discal area are ten to twelve punctures, each with a depressed, squamose, fringed hair; lateral area of prothorax widest at its cephalic end, thickly, coarsely punctured, apical punctures bearing depressed, squamose, fringed hairs; in the lateral and basal punctures the hairs are not squamose but are long, pointed and branched, forming at the edge of the transverse sulcus a brush-like tuft which nearly conceals the sulcus; posterior part of lateral area piceous, shining, tuberculate, lateral edge with numerous long,

branched hairs which are combed inward, partly covering the tuberculate portion.

Elytra shining, hairy, slightly wider than adjacent base of thorax, sides sinuate at base, nearly straight at middle, gradually curving inward to the obtusely rounded, outer apical angle, the truncate tips slightly arcuate; first stria from the suture nearly reaching to apical margin, sinuate, outer edge raised and densely covered with inward pointing, squamose, fringed hairs which at basal third become long, branched hairs directed inward and form at base a brush-like tuft which meets a similar thoracic tuft at an acute angle, their tips intermingling; second stria about five-sixths the length of elytra, broad, shallow and rounded at base, smooth and impunctate; third stria not as broad as second, nearly meeting second at tip, subhumeral stria extending two-thirds the length of elytra; the outer edge of all striae being raised; interstitial spaces moderately punctured, punctures bearing depressed, squamose, fringed hairs and among them a few, long, simple hairs.

Prosternum punctate rugose, ventral surface two-thirds its length; area within the margin shining, sparsely punctate with two slightly converging ridges which are widest apart caudally and extend two-thirds the length of the margining striae; marginal striae bent inward at cephalic end but not meeting.

Thoracic and abdominal segments smooth, shining, sparsely microscopically punctured.

Legs smooth, shining, moderately punctured, punctures without hairs.

Pygidium moderately, thickly punctured, punctures with squamose fringed hairs. Pygidium smooth, shining, with a few microscopic punctures.

All hairs of the various parts described are yellow.

Length 2.5 mm. width 1.8 mm.

Described from two examples; one, the *type*, taken by myself at Mill Valley, Marin County, California, is in my own collection, the other, a *paratype*, is from San Francisco and is in the collection of Dr. E. C. Van Dyke.

This species resembles *loripes* Casey, but differs from it in elytral striation and the brush-like tufts of hairs. I have compared it very carefully with *tristriatus* Horn, from which it is distinct in elytral striation, its hairy tufts and the absence of hairs on the sides of the legs which in *tristriatus* are present though very small.

***Hetaerius williamsi* sp. nov.**

Body oblong, one-third longer than wide, shining, castaneous, hairy.

Head shining; vertex concave, shining, evenly, moderately, coarsely punctured, each puncture with a stout fringed hair; front nearly smooth,

clypeus moderately hairy; genae and upper part of mandibles with numerous fringed hairs.

Thorax one-fifth wider than long, divided into a discal and two lateral areas by a suture-like groove which extends nearly to apical border and is paralleled by the shallow sulcus of the discal area, said sulcus being smooth, shining and impunctate; discal area twice as wide at base as at apex, moderately, thickly, coarsely punctured, each puncture with a slightly squamose, fringed hair which becomes longer and more pointed toward the base; lateral area widest in front, the apical angles obtusely rounded, divided at basal third by a deep, transverse sulcus; front portion moderately thickly punctured, punctures with fringed hairs which are longer at sides and edge of sulcus over which they project; basal portion of lateral area piceous, tuberculate with a few punctures on its surface, becoming more numerous on the outer side.

Elytra shining, moderately thickly punctured, hairy, coarsely striate; first stria from elytral suture nearly reaching apical margin, broad and shallow at base, becoming narrow at apex, outer edge raised and thickly covered with squamose fringed hairs; second stria almost as long as first and like it broad and shallow at base; outer edge raised and bordered with squamose fringed hairs which are not as dense as on first stria; third stria slightly shorter than second with raised edges, having fewer and shorter fringed hairs than second stria and likewise broadened at base; subhumeral stria extending two-thirds the length of elytra, also broadened at base; the broad basal part of all striae smooth, shining, impunctate; striae one and two with a few longer, branched hairs at base; interstitial spaces moderately, thickly, coarsely punctured, each puncture with a depressed, squamose, fringed hair and among them a few erect, long, simple hairs.

Prosternum opaque, rugose-punctate; margined ventral surface moderately punctate and with fringed hairs, marginal striae extending one-half length of prosternum, very slightly inflexed at cephalic end, not enclosing area.

Thoracic and abdominal segments shining, moderately punctate, punctures with fringed hairs.

Pygidium and propygidium moderately evenly punctured, punctures with fringed hairs.

Legs shining, moderately punctate, punctures with fringed hairs.

Length 3 mm., width 2 mm.

Described from three examples from the collection of Dr. E. C. Van Dyke, taken at Merced Lake, San Francisco, California, in the nests of a grey *Formica* by Mr. F. X. Williams, for whom I have named it. *Type* in the collection of Dr. E. C. Van Dyke, *paratype* in my own collection.

This species has the same form as that figured by Dr. Horn* as *morsus*, Lec. but the elytral striation is quite dif-

* Trans. Am. Ent. Soc. Vol. III (1870), Pl. 1.

ferent and the size much smaller. It resembles *loripes* Casey, but differs from it in having the whole of the discal area of the prothorax, excepting the sulcate lateral border, punctate and hairy. The elytral striae also differ from his description, as does the margined portion of the prosternum and the vestiture of the pygidium. Casey did not describe the vestiture of the leg surface.

Notes on the Life-History of the Salt Marsh Cicada (*Tibicen viridifascia* Walker) (Hemip.)

By H. OSBORN and Z. P. METCALF, North Carolina State College and Experiment Station.

(Plate III)

While collecting at Wrightsville Beach, North Carolina, on July 27, 1919, we had the fortune to collect a goodly number of the adults of the Salt Marsh Cicada (*Tibicen viridifascia* Walk.). We also made some observations on the life-history of this species which seem worth recording.

The adults were common on the beach, frequenting the tall dense grasses that abound everywhere in that region. They were especially common on the so-called Sea Oats (*Uniola paniculata*) which grows luxuriantly on the higher sand dunes on the Wrightsville Banks. The males were busily singing and usually half a dozen or more could be heard at one time. The song is a high pitched zing-g-g-g which is much prolonged. One male observed singing was clinging to a stem of the sea oats about five feet from the ground, head up and abdomen well elevated. Several other males were flushed from a coarse, densely matted, short grass which grows near the edge of the water at low tide. These were not singing and were only flushed when they were in danger of being tramped upon. All the females collected were found in this latter locality but a number of adults were flushed from the sea oats which did not give the peculiar startled zing given by the disturbed males and were apparently females.

A close examination of the stems of the sea oats revealed characteristic cicada egg punctures. These punctures were found principally on the old stems of last year's growth as well as on the growth of the current year. In one case old and new punctures were found in the same stem. These punctures were found at varying distances from the ground, some being about eighteen inches and others about four feet from the ground. The number of punctures found in any one group varied from one to at least ten. Examination showed that the punctures went right through the thick wall of the stem to the pith. The eggs are not placed in pairs as is the case with the periodical cicada, but several are placed in each puncture averaging 6-7 in the cases where the eggs were actually counted. What appeared to be fresh egg punctures were brought back to the laboratory and placed in cages on August 1. Owing to the writer's absence from the laboratory these eggs could not be examined again until September 2, when several larvae were found dead in the bottoms of the cages, so that they had evidently hatched some time previously.

The nymphal cast skins were found in various situations, clinging to the sea oats on the higher sand dunes, clinging to the short grass at water edge during low tide and in the drift cast up by the waves. Some, if not most, of the nymphs must pass their underground life in the between tide zones and be subject periodically to submersion during the incoming tide.

The following technical descriptions are appended.

The egg is pearly white in color and measures from 2.1 mm. to 2.2 mm. in length and .5 mm. in greatest diameter. The egg is slightly curved and tapers to blunt points at either end.

The first stage nymph. The recently hatched nymph is about 1.5 mm. long from tip of head to the end of the abdomen. The abdomen is slender and the head is somewhat flattened. The body is sparsely but rather uniformly clothed with long slender hairs. The hairs on the legs and antennae are somewhat shorter and much stouter. The general body color is chitin yellow with the eye spot dark red. The antennae are rather short, stout and seven-jointed. The first and second joints are subequal in length with the second much more slender. Joints three to six are

subequal in length and diameter. The seventh joint is shorter and subglobular in shape. The arrangement of the spines is shown in figure 4a. The beak is stout and reaches beyond the middle of the abdomen. The fore legs are well developed, with the coxa long; the trochanter about half as long as the coxa; the femur about as long as coxa, broad and heavy with ventral tooth well developed and provided with a prominent lateral tooth; the tibia is slender, about half as long as the femur, and the single tarsal claw is very long, nearly equalling the tibia in length. The middle and hind legs are slender with long coxae and single-jointed tarsi which are without claws at the tip.

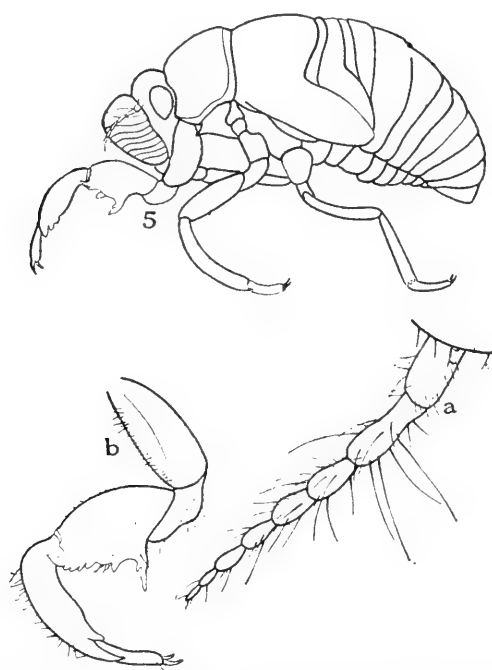


Fig. 5. Mature nymph. $\times 2$. Fig. 5a. Antenna of mature nymph. $\times 15$. Fig. 5b. Fore leg of mature nymph. $\times 4$.

Last nymphal stage. Length of body 18 mm; in general appearance like other cicadas in the last nymphal stage; head large and robust, eyes large; frons well inflated, crossed by eleven rows of long hairs; antennae 3.1 mm long, eight-jointed, the first joint stouter than second about two-thirds as long, joints three to six gradually decreasing in length and diameter, the seventh and eighth abruptly so; beak stout reaching hind

coxae, three-jointed; all the coxae are very much elongate, and the femur of the front legs is thick and heavy with a long ventral tooth provided with an anterior tooth, secondary ventral tooth present; the femoral comb with seven teeth decreasing in size apically; the fore tibia is about as long as the femur, bifid apically; the fore tarsus is long, three-jointed and provided with two sub-equal claws, the median one smaller. The middle and hind legs are nearly equal in size, with the tibia provided with five, stout, black spines at the apex, the tarsi are one-jointed with two very unequal claws at apex, the outer claw about one-half as long as the inner.

The adult is a medium small cicada with a bright green collar, the costal vein brownish and sub-costa and radius bright green to the bend of the wing and the other main veins of the fore wing green to the cross veins, black beyond.

The head is black above, with fuscous spots at the inner angles of the eyes and a greenish stripe from the antennal ledges to the eyes, the frontal arcs are fuscous with the interspaces heavily pruinose; the antennae are eight-jointed with the two basal joints heavy, the others flagellate.

The pronotum is fuscous with narrow anterior border between the eyes and the collar green, two converging black spots continued posteriorly in a broad triangular black spot bordering the collar. The mesonotum is mostly black with fuscous markings. Legs yellowish fuscous with the spines and the tips of the tarsi black.

The abdomen is black above. Beneath, the head, thorax and lateral parts of abdomen are heavily pruinose, the central part of the abdomen lightly so, showing the pale fuscous ground color. The drums are short, broadly, roundly divergent, the uncus is wish-bone shaped with the prongs long, curved and sharp-pointed.

Length to end of abdomen, male 23 mm; female 24 mm; to tip of wings, male 38 mm; female 41 mm; width of collar 10 mm.

Previous records indicate a distribution restricted to the Atlantic and Gulf Coasts from North Carolina to Louisiana, but no suggestion of the adaptation to aquatic conditions appears in any record that has come to our notice.

EXPLANATION OF PLATE III.

Tibicen viridifascia Walk.

- Fig. 1. Dorsal view adult male. $\times 1\frac{1}{2}$, showing characteristic color pattern and venation of fore and hind wing.
Fig. 1a. Adult antenna. $\times 15$.
Fig. 1b. Female genitalia ventral view. $\times 2$.
Fig. 1c. Ventral view of male abdomen, showing hind leg, opercula and male genitalia.

- Fig. 1d. Male genitalia extended lateral view.
Fig. 1e. Male genitalia extended posterior view.
Fig. 1f. Tip of ovipositor. $\times 8$.
Fig. 1g. Anterior leg. $\times 2$.
Fig. 2. Egg. $\times 15$.
Fig. 3. Stalk of sea oats showing characteristic egg punctures. $\times \frac{1}{2}$.
Fig. 3a. Stalk of sea oats cut longitudinally to show arrangement of egg punctures. $\times 1\frac{1}{2}$.
Fig. 3b. Single egg puncture. $\times 15$.
Fig. 3c. Single egg puncture. $\times 15$.
Fig. 4. Recently hatched nymph. $\times 20$.
Fig. 4a. Antenna of recently hatched nymph. $\times 120$.
Fig. 4b. Anterior leg of recently hatched nymph. $\times 35$.
-

The Occurrence of Mallophaga on a Dragonfly (Odon.).

Mr. E. B. Williamson has recently sent me specimens of *Mallophaga*, several of a small species of *Gyropus*, and one *Trichodectes*, which he found at Quebrada La Camelia, Colombia (Feb. 18, 1917) attached to a dragonfly (*Ischnogomphus jessei* Williamson). The only recorded case of a Mallophagous insect found on another insect is that noted by Sharp (Proc. Zool. Soc. Lond. 1980, p. xxx) who found several attached, apparently by the mandibles, to a Hippoboscid fly, *Ornithomyia avicularia*. As this is also a bird parasite it is not surprising that the smaller Mallophaga should at times crawl upon it, but the occurrence of the Colombian specimens on the dragonfly seemed at first inexplicable, especially as the genus *Gyropus* lives exclusively on small terrestrial rodents. However Williamson, in his description of the dragonfly (Occ. Papers, Mus. Zool. Univ. Mich. No. 52, 1918, p. 44) shows that it is in the habit of alighting on the ground or on leaves near the ground, and one may reasonably suppose that the dragonfly had recently perched upon some dead agouti or similiar rodent and that the insects had then attached themselves to it. So while this case is very interesting, it is not an example of phoresy, but more properly belongs with other cases of insects being found in unusual situations, best explained by our genial E. A. Schwarz in words which formulate a simple yet indubitable biological law: "They must sit somewhere."

WM. M. MANN, U. S. Bureau of Entomology, Washington, D. C.

Studies on Costa Rican Odonata.

IX. *Sympetrum*, with Description of a New Species.

By PHILIP P. CALVERT, University of Pennsylvania, Philadelphia, Pa.

The only *Sympetrum* recorded from Costa Rica in the *Biologia Centrali-Americana* is *S. illotum virgula*, specimens of which were examined from San José, San Francisco and from an altitude of 6000–7000 feet on Irazú. Dr. Ris, in the *Catalogue, Collections Zoologiques* . . . *Selys** and in his *Libellen (Odonata) aus der Region der amerikanischen Kordilleren von Costarica bis Catamarca*,† has neither added any Costa Rican data for this form nor increased the number of species of *Sympetrum* from that country.

In the course of the year May 1, 1909,–May 10, 1910, we observed *Sympetrum illotum* in Costa Rica at Cachí, Paraiso, Cartago and vicinity, Laguna Ochomogo, on the mountain Carpintera, near Tres Rios and at Alajuela. These seven localities represent a range in altitude from 985 to 1600 meters (3230–5250 feet).‡ For the vicinity of Cartago, including San Isidro del Tejar, our notebooks record its appearance in every month except December and January (during the latter of which we were absent except for short visits by one of us), transformation to the imago on September 20, October 30, 31, November 12, 21, 29, and oviposition

*Fasc. XIII. Libellulinen, p. 677, Bruxelles, 1911.

†Archiv f. Naturges. 82 Jahrg., Abt. A, 9 Heft., p. 180. Berlin, 1918.

‡Details as to altitudes, localities, etc will be found in "A Year of Costa Rican Natural History" by A. S. and P. P. Calvert, New York, Macmillan, 1917.

I have also one male, intermediate between *i. illotum* and *i. virgula*, sent by Mr. C. H. Lankester with specimens taken near the Rio Jesus Maria, on the Pacific slope, April 2–4, 1918. The altitude of this locality, less than 100 meters, is much below that in which this species has been observed elsewhere in Central America or Mexico. The specimen has been submitted to Mr. Lankester, who writes that it "conveys no memory of capture." The envelope in which it was originally sent to me is part of a printed page, another piece of which contained an *Erythrodiplax connota* whose occurrence at Rio Jesus Maria there is no reason to doubt.

on May 10, June 20, August 28, September 26, October 7, 11, 31, November 12, 21, April 5, 20. Specimens are not at hand for all the dates on which the species was noted, so that it is impossible to specify which subspecies was the form seen at each observation. Those which are accessible, irrespective of locality, are chiefly of the subspecies *illotum virgula*, or intermediates between *i. virgula* and *i. gilvum*, as these are defined in the *Biologia*, volume *Neuroptera*. There are before the writer 1 ♂ *i. virgula* and 2 ♀ intermediate between *i. virgula* and *i. gilvum*, all three taken at Cartago, May 10, 1909, over the same swampy place. Two males taken just above Cartago, May 24, 1909, are respectively intermediate between *i. illotum* and *i. virgula* and between *i. virgula* and *i. gilvum*. It seems unlikely, therefore, that the exact form of the species has any strict correlation with the habitat.

In Costa Rica we found this species in open swamps and open fields, at small pools (as in lanes at Cartago), on the banks of the Rio Reventazon (at Cachí), at a tank in a coffee plantation (Cachí). As in other species of this genus, the male and female fly around together while the latter is ovipositing, the male holding the female's head with his abdominal appendages.*

The occurrence of this species at a given station is erratic. Thus on the southern edge of the town of Cartago:

"The day was May 10, 1909. The rains of the two preceding days had changed the dusty roads to damp and produced little swampy spots in the pastures. Over one of these swamps a species of dragonfly (*Sympetrum illotum virgulum*) was swarming There was an exceedingly handsome frog here (*Agalychnis helena*) . . . The morning of May 11 was not so bright as that of the preceding day,

*Dr. C. H. Kennedy states that in California "Usually the female of this species oviposits unaccompanied by the male but here [Auburn in Placer County] I observed a pair working together." Proc. U. S. Nat. Mus. vol. 52, p. 609, 1917.

On all of the eleven dates mentioned above for oviposition in the vicinity of Cartago and also at Laguna Ochomogo on Sept. 25, our field note books expressly record that male and female were flying together, the male holding the female. We have no record of oviposition in any other way.

although the sun was shining. We revisited these same swampy spots but not a single individual of the bright red species of dragonfly nor one of the peculiar frogs was to be seen there . . . "†

On March 4, 1910, this species was at a tank in a coffee plantation at Cachí and on March 5, by stagnant pools near the bank of the Rio Reventazon near Cachí; on March 9 and 10 it was not found at these two places respectively although the days were sunny.

The dates at which this species was observed at localities other than the vicinity of Cartago and Cachí were: September 25, Laguna Ochomogo; December 4, La Carpintera; December 9, Alajuela and vicinity; March 17, east of Tres Rios.

On April 21, 1916, Professor Anastasio Alfaro, Director of the Museo Nacional de Costa at San José, who has done so much to advance scientific knowledge of that country, collected some *Sympetra* on the Volcano Poas. These at first sight appeared to be intermediate between *S. illotum virgula* and *S. illotum gilvum*, but a detailed study apparently justifies their recognition as a distinct species for which I propose the name

***Sympetrum nigrocreatum* n. sp.**

Similar to *S. illotum virgula* Selys but differing as follows: Size larger. Range of length of abdomen ♂, 26-28 mm. (22-25*), ♀, 26-28 (21-23); average ♂ 27.045 (23.33), ♀ 27.14 (22.6) mm. Range of length of hind wing ♂ 30-33 (26-29), ♀ 31-34 (27-30); average ♂ 31.72 (27.41), ♀ 32.35 (28) mm.

No additional transverse carina on abdominal segment 4 in ♂, except in one ♂ in which it is low but distinct (present, distinct), but present in the ♀ (present, distinct).

†A Year of Costa Rican Nat. Hist., pp. 73,74.

*The figures and other statements enclosed in parentheses in this description are those obtained from 12 ♂, 5 ♀ of *S. illotum virgula* and intermediates between it and *S. illotum illotum* on one hand and *S. illotum gibrum* on the other, from the seven Costa Rican localities mentioned on page 249. They are given immediately after the corresponding figures for *S. nigrocreatum* which latter are based on 11 ♂, 7 ♀. Where percentages of variation are given, as for venational characters, each wing, fore or hind, = 2.777 % for *nigrocreatum* and 2.941 % for *S. illotum virgula* and intermediates.

Apices of the femora and all of the tibiae and of the tarsi blackish brown (femora and tibiae luteous or reddish); some tendency toward paling of the legs is shown by one male which has all the tibiae with a superior luteous stripe, two males which have the third tibiae somewhat reddish superiorly and one female which has all the tibiae reddish.

Venation, especially near the front margin of both front and hind wings blackish brown (luteous or reddish except in three ♀).

Yellow coloring at the base of the wings reaching on the front pair to the first antenodal, less frequently to the arculus (most frequently to the level of the triangle), on the hind pair to the second, rarely the third, antenodal (to the nodus, less frequently to the second antenodal or triangle and then a nodal yellow spot is present); no yellowish spot at nodus of front wings (present). Dark brown streak at base of wing in subcostal and partly in costal area reaching distad on the front wings to one-third or one-half way to the first antenodal (one-fourth way or less to the first antenodal), on the hind wings to the arculus or, less frequently stopping at a point half-way from first antenodal to arculus (first antenodal, less often to arculus). Dark brown basal streak in cubital area of hind wings varying from a mere trace to reaching almost to the cubito-anal cross-vein or anal crossing.

Pterostigma uniformly luteous or even golden yellow, not paler at its distal end (luteous or ochre brown, paler at the distal end, but golden yellow in 1 ♂, 1 ♀, and not paler at distal end in 3 ♂, 3 ♀), longer, 2.66-3.26 ♂ (2.33-2.74), average 2.92 (2.51), 2.81-3.18 ♀ (2.52-2.81), average 2.97 (2.63) mm.*

Antenodals, front wing, 8½ 2.77%, 9½ 36.1%, 10 2.77%, 10½ 44.43%, 11½ 5.55%, the remaining 8.32% somewhat irregular (7½ 8.82%, 8½ 79.38%, 9½ 5.88%, 8¾ 5.88%); hind wing 6 22.17%, 7 72.2%, 8 5.55% (5 + ½ 5.88%, 6 91.14%, 6½ 2.94%). Two rows of cells between *M*₂ and *R*_s on the front wings begin at the following distances from the margin and extend thence distad: 2 cells 2.77%, 3 cells 8.33%, 4 cells 33.33%, 5 cells 33.33%, 6 cells 16.67%, 7 and 9 cells each 2.77%† (2 cells 41.16%, 3 cells 23.52%, 4 cells 5.88%, while 29.4% have but one row of cells here); marginal cells here 2 25%, 3 61.1%, 4 13.88% (1 5.88%, 2 82.4%, 3 11.76%). Two rows of cells between *M*₂ and *R*_s on the hind wings begin at following distances from the margin and extend thence distad: 3 cells 22.21%, 4 cells 41.66%, 5 cells 27.77%, 6 cells 2.77% (2 cells 58.8%, 3 cells 8.82%, while 29.4% have but one row of cells here); marginal cells here 2 11.10%, 3 69.43%, 4 11.1%, 5 2.77% (2 88.2%, 3 11.76%).

*The measurements for the length of the pterostigma and for the superior and inferior appendages of the ♂ were made with an eye-piece micrometer in a Zeiss binocular microscope fitted with eyepieces 4, paired objectives F 55.

†Portions of the hind margin of two wings have been injured, = 5.55%.

Double cells between *Rs* and *Rspl*, front wings, 0 11.11%, 1 11.11%, 2 22.22%, 3 22.22%, 4 30.54%, 5 2.77% (0 97.03%, 1 2.94%); hind wings 0 36.11%, 1 19.44%, 2 16.66%, 3 13.88%, 4 13.88% (0 100%). Marginal cells between *Rs* and *M*₃, front wings, 17 13.88%, 18 22.21%, 19 30.54%, 20 16.66%, 21 2.77%, 22 8.33% (13 5.88%, 14 14.7%, 15 5.88%, 16 47.05%, 17 20.58%, 18 5.88%). Marginal cells between *M*₄ and *Cu*₁, front wings, 4 36.1%, 5 36.1%, 6 13.88%, 7 8.33%, (2 5.88%, 3 52.94%, 4 38.23%, 5 2.94%).

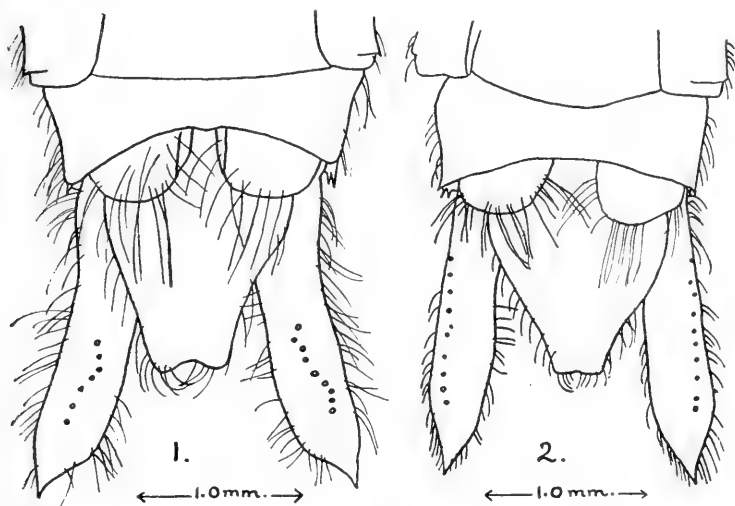


Fig. 1. Ventral view, apex of abdomen *S. nigrocreatum*, ♂, no. 5, Volcan Poas, alt. 2500 m., April 21, 1916, A. Alfaro. Camera lucida, card at stage level, Zeiss stand, comp. micros. oc. 2, obj. A, lower lens off.

Fig. 2. Ventral view, apex of abdomen *S. illotum* intermediate between subsp. *virgula* and *gilvum*, ♂, no. 53, Cartago, February 19, 1910, Calvert. Same lens and camera lucida outfit.

♂. Inferior denticles of the superior appendages, viewed from below, tending to form a reversed curve as shown in text figure 1 (line of denticles almost straight, see fig. 2) and occupying .28-.416, average .353 (.409-.532, average .461) of the total length of the appendage as measured in profile.

Inferior appendage .89-1.11 mm. (.89-1.04) wide at base, average 1 mm. (.96), .30-.44 mm. (.22-.30) wide at apex, average .37 (.28) mm. Ratio of apex width to base width .333-.435 (.229-.337), average .368 (.295).

Locality. Poas Volcano, Costa Rica, 2600 metres [8530 feet], April 21, 1916, by Professor A. Alfaro. 12 ♂, 8 ♀

sent for examination, 1 ♂, 1 ♀ returned to him. *Type* ♂ in the writer's collection at the Academy of Natural Sciences of Philadelphia. As to the type locality Professor Alfaro wrote, July 22, 1916:

"Durante la semana santa estuve en el Volcan de Poas y colectado muchas libéllulas en el Potrero del Alto, cerca del crater; alli hay un Hotel y junto a los desagües de la casa me pareció distinguir tres especies, lo mismo que en la zanja del Potrero; la especie de mayor tamaño no dejaba arrimarse y de la tercera solamente un ejemplar vi; creo pues que mis ejemplares colectados en numero de 40 son ♂ y ♀ de una sola especie . . . las libéllulas del Volcan de Poas, por ser esa la mayor altura en que he colectado Odonatos: 2600 metros."

Mr. E. B. Williamson, at my request, has examined a pair of these specimens collected by Prof. Alfaro and independent of any suggestion from me has also reached the conclusion that they represent a new species allied to *Sympetrum virgula*.

Several features of *S. nigrocreatum* described above are of special interest. According to Dr. Ris,* but three species of *Sympetrum* possess an additional, or supplementary, transverse carina on abdominal segment 4: *dilatatum* Calvert of St. Helena, *illotum* Hagen and *corruptum* Hagen of (chiefly North) America. *S. nigrocreatum* is clearly closely related to *illotum*, yet the male, in the majority of specimens examined, lacks this carina, although the female possesses it distinctly developed. In the male, the appearance is as if the carina had been smoothed out, its site being indicated by a slight difference in the surface of the segment. Whether the presence or absence of such transverse carinae has any correlation with the internal anatomy has not been determined, apparently.

Assuming that *S. illotum* is the nearest ally of *S. nigrocreatum*, the latter is larger and has a greater number of cross-veins (e. g. antenodals) and of cells on its wings. As *nigrocreatum* inhabits a higher, and presumably cooler, station than does the Costa Rican *illotum*, a causal relation is

*Libellulinen Monographisch bearbeitet. Cat. Coll. Zool. Selys, fasc. XIII, pp. 617-624, 1911.

suggested when similar conditions existing in highland and lower land individuals of *Ischnura ramburi* and *I. denticollis** are recalled. Similarly individuals of *Erythrodiplax berenice* from the northern Atlantic coast of the United States are larger and more densely veined than those of the coasts of Florida, the West Indies and Central America.† The question needs much further investigation to determine whether a presumably lower temperature is a cause of larger size and denser venation. If this be so, one would expect individuals of *S. illotum* from British Columbia and the northwestern United States to exceed those of corresponding or lower altitudes in Mexico for example. It is to be hoped that some one with sufficient material will study it from this point of view. A number of the venational features of *nigrocreatum* given above are not in themselves sufficiently diagnostic to distinguish this form from *illotum* and its subspecies. They do, however, show the tendency to vary away from the conditions to be found in *illotum*.

A New *Kricogonia* from Cuba (Lep., Rhop.)

By CHAS. T. RAMSDEN, Guantanamo, Cuba.

While on a recent visit to the Academy of Natural Sciences of Philadelphia, Dr. Henry Skinner generously called my attention to specimens of *Kricogonia* from Guantanamo, Cuba, I had sent him some years before. These differ so much from individuals of other localities that they seem to belong to a new form and may be known as:

Kricogonia cabrerai n. sp.

♂ *Upperside*. Primaries: Yellowish white; costa from insertion of wing to one-quarter of its length is lemon yellow, the remainder slightly tinged with yellowish.

Secondaries: Same colour as primaries except for a black band 8 mm. long and 3 mm. wide which begins at the costa running toward end of

*Biol. Centr.-Amer., Neur., pp. 387-389, 1907.

†Ibid., p. 268.

discal cell. This band is unbroken by the nervures while in *terissa* it is broken.

Underside. Primaries: Pearly white, base of wing lemon yellow, apices straw color and marbled.

Secondaries: Straw colour having a marbled appearance produced by short brown lines except where the black band shows through.

♀ *Upperside.* Primaries: Same as male, the lemon yellow parts being more intense.

Secondaries: Also as in male but with the outer margins and base suffused with yellow. Black band lacking.

Underside. Primaries: As in male, lemon yellow base more intense.

Secondaries: Straw colour entirely marbled with short brown lines.

Expanse one wing, ♂ 27 mm., ♀ 26.5 mm.

Male and female, Guantanamo, Cuba, May 27th, 1914. Collected by the author.

Type and *allotype* in the collection of The Academy of Natural Sciences of Philadelphia. Paratypes in collection of the same Academy and also in that of the author.

This form is larger than any I have seen from any other locality.

It differs from *terissa*, on the upperside, in having the black band longer and wider, extending in this form to nearly the middle of the wing, while in *terissa* it hardly extends to more than one quarter. The base of the primaries is not orange as in *terissa* and differs on the underside, by the marbled appearance of the secondaries.

I take pleasure in naming it after don José Cabrera of El Cotorro, Cuba, a tireless and unassuming student of Cuban Entomology.

Indiana Insects

It is the plan of the department of Entomology of Purdue University and the Agricultural Experiment Station to build up a collection of insects which will satisfactorily represent the insect fauna of the Central West, east of the Mississippi, and particularly that of Indiana. Records, publications dealing with Indiana insects, and specimens themselves are solicited.

Careful records of occurrence and economic importance will be kept with a view to publishing the "Insects of Indiana" at a future date. Records should, therefore, include name, authority for determination, exact locality, date of capture, stage, host if known, collector and other pertinent data.

Your coöperation is earnestly solicited.—JOHN J. DAVIS, Agricultural Experiment Station, Lafayette, Indiana.

On *Scolia bicincta* Fab. and *Scolia undata* Klug (Hymenoptera, Scoliidae).

BY C. S. BRIMLEY, Division of Entomology, North Carolina
Department of Agriculture, Raleigh, N. C.

On looking over our specimens of *S. bicincta* and *S. undata* I find that they grade into one another and that no definite line of demarcation can be drawn between them.

In addition to the usual white cross bands on the second and third abdominal segments above, which may be without any interruption whatever, even in otherwise typical *undata*, there are present in two-thirds of the males examined and in one-third of the females, white markings of some sort on either the pronotum, post-scutellum, first abdominal segment above or second abdominal segment below, or on all of these or in any combination.

The spots on the pronotum are usually a small round spot on each side in front; one specimen, however, has a spot on only one side and another has an enlarged transverse wedge-shaped spot on each side. Present in five males.

The marking on the postscutellum is usually a small roundish dot, elongate in one specimen. Present in nine males and three females.

The marking on the first abdominal segment is either a roundish dot or a transverse stripe; in the latter case it may be either short and narrow, extending on about the middle fourth of the segment, or it may be broader and extend right across the segment. In two cases there is a roundish dot on one side of the middle, instead of in the middle. Present in some form in twenty-seven males, and three females.

On the underside of the second abdominal segment there is, in seventeen males, a roundish or oval spot not far from the lateral margin of the segment. These spots vary a good deal in size and but little in shape.

The following table shows the number of specimens showing the various combinations of the above markings:

With usual white stripes on segments 2 and 3 only, males 16, females 11.

With additional markings as below: males females

1 A spot or stripe on seg. 1 above only.....	9	2
2 A pair of white spots on seg. 2, below only.....	1	0
3 A white dot on postscutellum only.....	2	2
4 On seg. 1 above, and seg. 2 below only.....	10	0
5 On seg. 1 above, seg. 2 below and postscutellum only.	1	0
6 On seg. 1 above, seg. 2 below, postscutellum and pro- notum.....	3	0

7 On seg. 1 above, seg. 2 below and pronotum only....	1	0
8 On seg. 2 below and postscutellum only.....	1	0
9 On seg. 1 above and postscutellum only.....	1	1
10 On seg. 1 above, and pronotum only.....	1	0
11 On seg. 1 above, pronotum and postscutellum only..	1	0
	—	—
Total.....	47	16
With white crossbands only on segs. 2 and 3 above..	16	11
With additional white markings.....	31	5

Specimens examined, Raleigh: 33 males, 9 females; Elizabeth City: 6 males, 1 female; Andrews: 4 males, 1 female; Jefferson: 1 male; Blowing Rock: 1 male; Bushnell: 1 male; Statesville: 1 male; Greensboro: 2 females; Durham, Blantyre and Whittier: 1 female each. All localities in North Carolina and all specimens taken between mid-July and mid-September.

House Flies in Court.

One of the noblest decisions on record, so far as bald-headed men are concerned, has been handed down by the Supreme Court of Maine. It is notorious that a bald head has a peculiar attraction for the common house fly. He prefers to roost there or promenade there to any other place in the neighborhood. Now the high court has declared the bald-headed persons are entitled to protection. In the case of Williams vs. Sweet, a hotelkeeper sued because the defendant, who had contracted for accommodations for a certain period, left the hotel before the time had elapsed. The defendant said he was pestered by flies, which were particularly numerous in the dining room.

The august court held that the fly is a nuisance and its disease-carrying characteristics are well known. A patron of a hotel was warranted in leaving the establishment, regardless of a contract for a longer stay, if the dining room was infested with the pests. An innkeeper, it declared, agreed by implication to furnish accommodations compatible with the prices paid, the standing of the hostelry and the class of persons invited to become patrons. "Accommodations," the judges asserted, included apartments, dining service and sanitary conditions, and if the hotelkeeper failed to maintain these in inviting and wholesome manner the patron was warranted in seeking quarters elsewhere, regardless of an engagement to remain for any specified time.

Hotel men had better get busy with their fly swatters. Restaurant people also.—RICHARD SPILLANE in the *Public Ledger*, Philadelphia, Aug. 4, 1920.

ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., NOVEMBER, 1920.

Mental Attitudes toward Insects.

Among other occupations, the editor of the NEWS gives a course of lectures and readings to university students on the history of entomology. The other day they were reading Otto Keller's *Die Antike Tierwelt*, which called his attention again to the long period in the history of civilized peoples in which progress in zoology, and hence in entomology, was very slow. It may seem difficult for a zoologist to realize what must have been the mental attitude of many a cultured Egyptian, Greek or Roman toward insects. But while the editor was in this frame of mind (he is one unit of the fifty millions who make up the rural population of these United States), the butcher came. His business transacted, the butcher observed that the coming winter was likely to be cold only in its latter part—because he had been feeling the caterpillars along the road and they were hard to the touch *only at their hind ends!*

Anent an Increased Subscription Price.

In the October NEWS (page 226) we asked all our readers to fill in and mail to us a card, from a page near the back cover, stating their willingness or unwillingness to subscribe for the NEWS for 1921 at \$2.50. About eighty replies have been received, but we urge all others to whom the October number has gone to send us their message on this question at once, as we must hear from all our subscribers in order to make our plans for 1921.

Two Syntomidae New to Mississippi (Lep.).

Mr. W. C. Dukes, of Mobile, Alabama, has recently sent me two species of Syntomidae (Lep.) from a new locality. They were taken on Cat Island, Mississippi, in the Gulf of Mexico. The species are *Cosmosoma auge* Linn. and *Didasys belae* Grote. The former is found in Florida, West Indies, Central America and South America, and the latter, so far as I am aware, has not been recorded outside of the State of Florida.—HENRY SKINNER.

Entomological Literature.

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

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

The numbers in HEAVY-FACED TYPE refer to the journals, as numbered in the following list, in which the papers are published.

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

The records of papers containing new genera or species occurring north of Mexico are all grouped at the end of each Order of which they treat.

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.

2—Transactions of The American Entomological Society, Philadelphia. 4—Canadian Entomologist, London, Canada. 5—Psyche, Cambridge, Mass. 7—Annals of The Entomological Society of America, Columbus, Ohio. 9—The Entomologist, London. 11—Annals and Magazine of Natural History, London. 12—Journal of Economic Entomology, Concord, N. H. 17—Lepidoptera, Boston, Mass. 20—Bulletin de la Societe Entomologique de France, Paris. 31—Proceedings of the Entomological Society of Nova Scotia, Truro. 33—Annales de la Societe Entomologique de Belgique, Brussels. 39—The Florida Buggist, Gainesville. 45—Zeitschrift fur wissenschaftliche Insektenbiologie, Berlin. 49—Entomologische Mitteilungen Berlin-Dahlem. 50—Proceedings of the United States National Museum, Washington. 53—Nature Study Review, Ithaca, N. Y. 62—Bulletin of the American Museum of Natural History, New York. 68—Science, Lancaster, Pa. 76—Nature, London. 81—The Journal of Parasitology, Urbana, Illinois. 82—The Ohio Journal of Science, Columbus. 90—The American Naturalist, Lancaster, Pa. 103—Biologisches Centralblatt, Leipzig. 110—Naturwissenschaftliche Wochenschrift, Jena. 111—Archiv fur Naturgeschichte, Berlin. 112—Entomologische Berichten, The Hague, Holland.

GENERAL. **Blackmore, E. H.**—Rare and uncommon insects taken in Br. Columbia during 1919. (Rept. Prov. Mus. Nat. Hist. Br. Columbia, 1919, 17-23.) **Bouvier, E. L.**—Revue d'entomologie pour les Annees 1910-1914. Part 1, Biologie; Part 2, Structure et physiologie, developpement et adaptation. (Rev. Gen. d. Sci. Pures et Appl., xxxi, 410-18; 155-62.) **Bouvier, E. L.**—The psychic life of insects. (An. Rept., Smiths. Inst., 1918, 451-9.) **Chetverikov, S. S.**—The fundamental factor of insect evolution. (An. Rept., Smiths. Inst., 1918, 441-9.) **Crampton, G. C.**—Remarks on the basic plan of the terminal abdominal structures of the males of winged insects. 4, lii, 178-83. **Dixey, F. A.**—The geographical factor in mimicry. (Rept. Br. Assoc. Adv. Sci., Bournemouth, 1919, 201-7.) **van Eecke, R.**—Varia entomologica. 112, v, 153-5. **Folsom, J. W. et al.**—Symposium on "The life cycle in insects." 7, xiii, 133-201. **Gibson, E. H.**—Professional entomology: the call and the answer. 12, xiii, 355-7. **Lyon, M. W.**—Family and

subfamily names in zoology. 68, lii, 291-2. **McConnell, W. R.**—Obituary. 12, xiii, 371-3. **Onslow, H.**—The iridescent colours of insects. 76, cvi, 149-52 (Cont.). **Parman, D. C.**—Observations on the effects of storm phenomena on insect activity. 12, xiii, 339-43. **Raymond, P. E.**—Phylogeny of the Arthropoda with especial reference to the Trilobites. 90, liv, 398-413. **Sahlberg, J. R.**—Obituary notice. 68, lii, 216-17. **Smulyan, M. T.**—An insect and lack of entomological knowledge an immediate cause of the world war. 5, xxvii, 85-6. **Tothill, J. D.**—The chloral hydrate method of preserving insects for dissection. 31, 1919, 8-10. **Weiss, H. B.**—The contents of our entomological journals during 1919. 4, lii, 169-73. The insect enemies of polyporoid fungi. 90, liv, 443-7.

ARACHNIDA, ETC. **Bilsing, S. W.**—Quantitative studies in the food of spiders. 82, xx, 215-60. **Chamberlin, R. V.**—On chilopods of the family Mecistocephalidae. 4, lii, 184-9. Corrections to Mr. Gunthrop's summary of Wood's Myriopoda papers. 4, lii, 202-3.

Chamberlin, R. V.—New spiders from Utah. 4, lii, 193-201.

NEUROPTERA. **Lacroix, J. L.**—Deux Odonates nouvelles. 20, 1920, 175-9. **Watson, J. R.**—An apparently new Haplorthrips from Cuba. 39, iv, 7, 12.

Macnamara, C.—A new sp. of Pseudachorutes (Collembola). 4, lii, 173-6. **Watson, J. R.**—New Thysanoptera from Florida. 39, iv, 13.

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MANUAL OF THE ORTHOPTERA OF NEW ENGLAND, INCLUDING THE LOCUSTS, GRASSHOPPERS, CRICKETS AND THEIR ALLIES. By ALBERT P. MORSE. Proceedings of the Boston Society of Natural History, vol. 35, no. 6, pp. 197-556, pls. 10-29, 99 text figs. April, 1920.—It is a rare occasion in the experience of any student of a special field in zoology or botany when he is able to pick up a new comprehensive work, purporting to be both technical and popular, written by a brother specialist, with almost all of whose conclusions and methods the reader finds himself quite in accord. Usually there will be found a number of rocks upon which the conformity of opinion is shattered, some radical innovation which is untried and frequently unwarranted. Morse's "Manual" is clearly one of these rare studies, a painstakingly accurate and thorough piece of work, a model of its kind and fully in keeping with the high plane achieved by that author in his previous memoirs.

The style is attractive, literary and where needed is scientifically concise, the illustrations are generally well selected and carefully executed.

The first paragraph of the Introduction (p. 207) fully deserves quotation, as it epitomizes the order better than we have seen done by any previous author:

"The Orthoptera form a group of insects whose members touch upon man's interests in a variety of ways. Some are among the scourges of the earth, devastating wide areas, reducing the inhabitants to penury and starvation and leaving in their wake misery and pestilence. Others of obnoxious character enter dwellings in search of food and shelter, and though acting in part as scavengers destroy large quantities of food-stuffs and defile the premises. Wherever he wanders, whether on some nameless peak of the farthest ranges or in the less inviting vacant lot next door, by seabeach, grainfield, alkali desert, or mangrove swamp, on city pavements or yielding footpath to the spring, these little creatures are his companions; whether he sleep in hut or palace or beneath the stars their voices soothe his rest."

The "Manual" is made up of five major divisions: Introduction, The Orthoptera of New England (treated in systematic fashion), Accented List of Scientific Names, Glossary and Index. The introductory division

is made up of eighteen major sections, all of interest, very well presented and taken as a whole the best presentation of the subjects there treated we have ever seen in a work of this character. We feel called upon to comment upon certain of these sections, largely to direct the inquiring student to their contents. The "History of New England Orthoptero-logy" is well and concisely presented, the author, however being too modest to give his own most valuable published work its proper emphasis. Under "Classification" there is reviewed that published by Brues and Melander, and a modified form of the classic arrangement of the order, as influenced by the work of Brues and Melander, is followed in the Manual. Under "Anatomy," the external structure is clearly discussed and explained, with the aid of numerous figures, and the basic internal structure is briefly summarized. Under "Habits" we find egg-laying, situations for egg placing, hatching, moults, maturity, food and migration discussed; while under "Songs" we find a careful exposition of the three methods of sound production in the Orthoptera. Under the third method it might have been well to have considered the possibility of the thickened radiate veins of the wings of certain Oedipodinae producing sound in display flight or direct flight by rubbing one over the other, as their surfaces possess accessory modifications in certain species.

"Coloration of Orthoptera" is treated in a very careful summary, in which there are discussed the types of colors in insects, relative predominance of "sympathetic and protective" coloration in the Orthoptera, the principles of "counter-shading," display coloration, "contrast-mimicry" or "signal coloration" as it has been variously called, the seasonal deepening of color in certain locusts, the rare albinistic and melanistic conditions, pink katydids, dichromatism, and the uncertainty and unreliability of color shade and markings in general as diagnostic features in New England Orthoptera. The author's suggestion as to the signal value of the conspicuous wing colors in the Oedipodinae is clearly logical and fits in with our own field experience. Dr. Phineas Whiting has contributed a section giving a summary of his experimental work on color determination in the green-striped locust (*Chortophaga viridifasciata*), from which it appears that temperature rather than light or humidity is the important factor in color determination in that species, and that certain "so-called color varieties . . . are but color phases dependent to a large extent at least upon environmental conditions." This is an interesting piece of evidence, making less secure the position of those workers who would name all such probably purely physiological forms.

Under "Geographical Distribution of New England Orthoptera" we find a discussion of the New England life zones, analyses of the more typical species of the three zones, *i. e.* Boreal, Transition and [Upper] Austral, with a classification of the remainder of the Orthopterous fauna into such categories as "Domiciliary—all introduced" and "Adventive or introduced." The Orthopterous "Colonization of New England" and

"Dispersal Routes" are very well presented and the effect of the disappearance of the one-time extensive coastal sandy plain on the range of certain Orthoptera, which now have discontinuous or localized distributions, is considered. The importance of the influx of campestrian sand-loving species from the southwest is emphasized, and a comprehensive summary of locust habitats or societies is given, the groups being those already used by the author. Morse's attitude toward certain of the present day ecological work is a just one and his footnote on page 260 is well worth reading by those interested.

In the section on "Wingless and Vestigial-winged Orthoptera" the author reaffirms his previously expressed hypothesis on the correlation of long and short-winged locusts in general with definite types of habitat.

In his table of the species recorded from New England the author gives 132 species as recorded from New England, 104 of these native and 28 introduced purposely or accidentally.

In the discussions of locust injuries and other matter of economic importance the fact is emphasized that in New England severe outbreaks usually have been local in area and of comparatively limited extent, although, as the context shows, occasionally of great severity. Methods of control and natural enemies are discussed and it is shown that such enemies are numerous and varied, ranging from fungus to the lowly farm-yard cat. There is a most useful section on "Methods of Collecting and Preservation," which gives a summary of the procedure followed by the author, and also draws upon the experience and practice of other workers.

The division of the work treating systematically of the New England Orthoptera follows in general the following method: discussion of each family, general character, summary of development, food, general distribution, key to species; under species, leading references, brief description, measurements, habits and life period, distributional notes and records in New England, and generally one or more figures. Under families such as the Blattidae and Gryllidae established exotic species and adventive species are each properly treated separately from native forms. English names are given in all cases for species, the majority newly coined; the results are not always happy, as for example the "Broad-shouldered Angulate Pygmy Locust," although as a whole the names have been more carefully selected than is usually the case. The author avoids initiating nomenclatorial novelties, which is greatly to be commended, as a work intended as a manual for the student is no place for the airing of innovations or controversial matter, but should, instead, be founded on previously published conclusions.

We find the earwig *Euborellia annulipes* reported as introduced in New England for the first time. Brief analyses of the variant color patterns of the species of *Orphulella* and of *Chorthippus curtipennis* are given, and these are particularly timely and useful. The word pictures of habits and actions of *Arphia xanthoptera*, *Psinidia fenestralis*, *Trimerotropis*

maritima, *Circotettix verruculatus* and *Melanoplus punctulatus* are particularly fine, although all of such verbal sketches are good. The data presented (pp. 481 to 482) on the probable stridulation of species of spine-breasted locusts (Locustinae) is interesting and should stimulate further observation along these lines.

The author's picture (p. 495) of the repopulation of glaciated land, in treating of *Podisma variegata*, well deserves quotation. "Not by extended flights of many miles at a time was the land in the wake of the retreating ice-sheet re-peopled by this species, but by hopping, hopping, hopping, a foot or a yard at a time, pressing northward as the vegetation and circumstances permitted, clambering up the mountains as fast as the forest line advanced, dying out in the southern areas and on dry slopes as 'the fatal sea of warmth filled the valleys below' and swept onward far to the north, until now such colonies as that on the summit of Ascutney Mt. are forever cut off from their kind."

Another species definitely and correctly recorded from New England for the first time is *Melanoplus dawsoni*, while some additional light is given upon the surprising occurrence of the western *Phoetaliotes nebrascensis* in New England.

The Glossary is most useful and quite extensive, the "Accented List of Scientific Names" is welcome and the "Index" quite full.

Of the twenty plates, three are originals in color, eight are black and white plates of details, in large part original, one plate of crickets is taken from a paper by E. M. Walker, three plates in colors of tree crickets are from Fulton's study, a set most desirable to have republished in a work of this character, and five plates are of habitat photographs.

The author has labored for years in his all-too-few spare hours on this splendid paper and his fellow students have eagerly awaited its appearance. We need say in summarizing only this—it has met every expectation in scholarly, dignified fashion, it is more than a "Manual," it is instead a monograph. It will soon be one of the much thumbed works of constant reference in the library of the student of the order.

J. A. G. R.

Correction

On page 235 of the October, 1920, NEWS, in the review of Blatchley's "Orthoptera of Northeastern America," the words "original constancy" are used in the fifteenth line. The words intended were "regional constancy," and the line as printed might convey a meaning quite the reverse of that intended by the reviewer.

EXCHANGES.

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

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

Wanted—For cash, or exchange, papers on insect biology, ecology or behavior (especially aculeate Hymenoptera). P. Rau, 2819 S. Kings highway, St. Louis, Mo.

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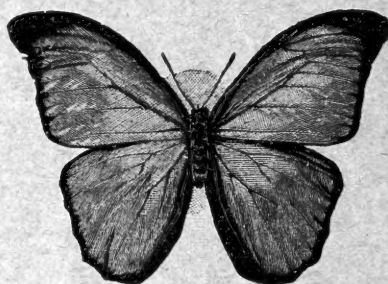
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