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ENTOMOLOGICAL ROOMS OF
THE ACADEMY OF NATURAL SCIENCES,
LOGAN SQUARE.

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INDEX TO VOLUME XXI.

(Notes and articles on geographical distribution are indexed under the names of the States or countries concerned, and *not* under the species listed therein, except in the case of new or redescribed forms. * indicates new generic or specific names.

GENERAL SUBJECTS.

ARACHNIDA

COLEOPTERA

DIPTERA

HEMIPTERA

HYMENOPTERA

LEPIDOPTERA

MALLOPHAGA

NEUROPTERA

(Excl. Mallophaga and Odonata)

ODONATA

ORTHOPTERA

AUTHORS

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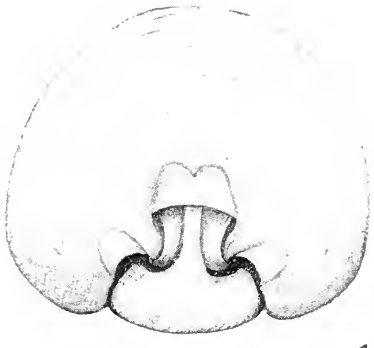

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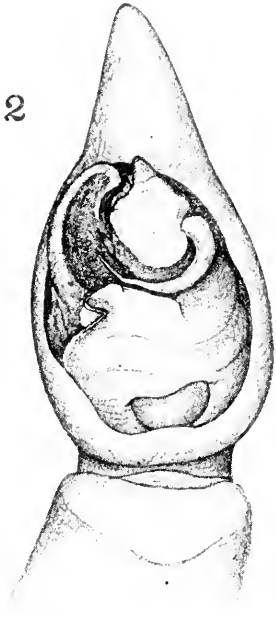

CHAMBERLAIN ON SCHIZOCOSA CELERIOR.

1. OPENINGS OF SPERMATHECA. 2. PALPAL ORGAN.

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CONTENTS:

A New Lycosid from Nevada.

By RALPH V. CHAMBERLIN.

(Plate 1)

Three species belonging to the genus *Schizocosa* have heretofore been known; namely *ocreata* Hentz, *saltatrix* Hentz and *bilineata* Emerton. *Ocreata* and *saltatrix* range from New England south to the Gulf of Mexico and westward into the Mississippi valley; while *bilineata*, having the same range westward, appears not to have been recorded from south of the District of Columbia. The author was much interested at finding a fourth species in the Great Basin region during the past summer (1909). The new species possesses all the characteristic structural features of the genus as drawn from the previously known forms. In general aspect it most suggests *ocreata*, though in coloration it is more like *bilineata*. The structure of the genitalia of male and female is clearly distinctive. The male agrees with these of *ocreata* and *bilineata* in having on the anterior tibiae a dense covering of black

hair which stands out upon the surface like the bristles on a brush, a peculiar feature, the significance of which is at present wholly problematical. *Saltatrix* (the male of which Hentz figures as (*venustula*) is thus alone in the genus in lacking this brush-like structure. In the new species the femur, patella and metatarsi, as well as the tibia, have the tegument black. The following key may facilitate the separation of the four species.

MALES.

1. First tibia clothed densely with black hair standing out in brush-like form . . . . . 2.
   First tibiae not so clothed . . . . . **saltatrix** Hentz.
2. Legs all distinctly annulate; sternum dark . . . . . **ocreata** Hentz.
   Legs not all annulate; sternum yellow . . . . . 3.
3. Tegument of femur, patella and metatarsi as well as tibia, of anterior legs, black; metatarsus of fourth legs distinctly annulate with dark . . . . . **celerior** sp. nov.
   Tegument of femora, patella and metatarsus of first legs not so colored; metatarsus of fourth legs not distinctly annulate with dark . . . . . **bilineata** Emerton.

FEMALES.

1. Sternum yellow, either with or without two rows of dark spots converging caudad . . . . . 2.
   Sternum dark, reddish brown to black . . . . . 3.
2. Cephalothorax more than 4 mm. long; metatarsi of fourth legs distinctly annulate with black . . . . . **celerior** sp. nov.
   Cephalothorax less than 4 mm. long; metatarsi of fourth legs not annulate, all legs without annulations . . . . **bilineata** Emerton.
3. Guide of epigynum much wider immediately in front of transverse arms than between anterior and posterior divisions of these arms; anterior portion of septum not sinuous....**ocreata** Hentz.
   Portion of guide or septum between anterior and posterior divisions of transverse arms much wider than immediately in front of arms; septum sinuous or bent near anterior end.
   saltatrix Hentz.

Schizocosa celerior sp. nov.

Female.—Cephalothorax with a rather narrow blackish brown stripe in the tegument each side and meeting its fellow across the face; eyes surrounded with black; the lateral dark lines leave between them a median longitudinal band of yellow which extends cephalad as a narrow tongue between eyes of second and third rows behind the latter abruptly expanding to the width of the row, indented on each side a

little in front of the dorsal groove and then weakly narrowing to posterior border where it ends truncately and is limited by a black transverse marginal line; below the lateral dark bands the cephalothorax is yellow with, a little above each margin a black line which may not extend cephalad upon the pars cephalica, usually a row of small dark dots below this line and in some a few similar dots above it; clypeus marked below each anterior lateral eye with a trinagular black spot, the two tending to be confluent across the middle; the median and lateral light bands of the cephalothorax densely clothed in life with bright white or grey hair, that of the median band extending over the pars cephalica and down the face to the first eye row. Tegument of the chelicerae reddish brown, a dusky stripe down the interior face of each; clothed with light hair intermixed with darker bristles. Endites and labium yellow. Sternum and coxae of legs clear yellow, clothed in life with white or light grey hair. Legs yellow, without distinct annuli excepting on the metatarsi of the fourth legs, each of which bears a distinct black annulus at its distal end and less strongly marked ones at middle and at proximal end, though in some there are indications on femora of obscure annuli detectable under lens. Tegument of *abdomen* grey; black v-shaped stripe on anterior face, one arm of which passes over each lateral angle upon lateral portion of dorsum, there immediately diffusing into a wider longitudinal band formed of black streaks and dots which form a mesh-work dorsally, but which ventrad become isolated and more and more sparse; these lateral dark bands extending caudad to the spinnerets leave a median dorsal light band in the anterior portion of which is a lanceolate dark outline from back of the middle of each side of which extends a dark line caudolaterad into the dark band, a similar pair of lines from apex forming a chevron mark which is followed caudad by several similar marks; the lines forming the lanceolate and chevron marks are more or less broken, and in the spaces between them are a number of small black dots; venter clear grey, without any markings; epigynum reddish; spinnerets yellowish; abdomen in life clothed chiefly with white or light grey hair.

Chelicerae in length once and a fourth the height of the *face*.

First row of *eyes* much shorter than the second, strongly procurved, the dorsal edge of each lateral eye being ventrad of the centers of the middle ones; anterior median eyes not fully their radius apart, a little closer to the lateral eyes; anterior lateral eyes about three-fourths as large in diameter as the median. Anterior lateral eyes their diameter from anterior margin of clypeus. Eyes of second row some less than their diameter apart. Cephalothorax about 3.25 times as long as the quadrangle of posterior eyes.

Lower margin of furrow chelicerae armed with three teeth, of which

the first is commonly much reduced or sometimes wholly absent; the upper margin with three teeth as usual.

Legs rather long, the distal joints of posterior legs slender. Anterior tibiae armed beneath with the usual three pairs of spines, the relative lengths being much as in typical *Pardosas;* the distal pair short, the median and basal very long, their lengths being double the diameter of the joint and the proximal overlapping the median pair.

Epigynum short. The septum short and wide, showing clearly a division into a narrow median part and broad lateral alae. The posterior division of transverse arms relatively very broad, and the incisions from ends of arms extending acutely mesad between these broad divisions and the alar portion of septum. Openings of the spermatheca plainly showing. See Plate I, Fig. 1.

Length of cephalothorax 4.5 mm.; width, 2.5 mm.

Length of leg I, 12 mm.; tibia plus patella, 4 mm.; metatarsus, 2.5 mm.

Length of leg II, 10 mm.

Length of leg III, 9.7 mm.

Length of leg IV, 15 mm.; tibia plus patella, 4.7 mm.; metatarsus 4.1 mm.

Male.—Coloration nearly as in the female; the sternum more commonly with a row of three black dots near each lateral margin, one dot lying opposite the interval between each two coxae; the ground color of abdomen darker, of a more reddish cast, and the lateral dark bands more nearly solid for entire length.

Anterior legs with the tegument of femora, patellae, tibiae and metatarsi black, the patellae and tibiae and also part of the metatarsi also densely clothed with black hair that stands out in brush-like form.

For structure of palpal organ see Plate I, Fig. 2.

Length of cephalothorax, 3.3 mm.; width, 2.3 mm.

Length of leg I, 10 mm.; tibia plus patella, 3.5 mm.; metatarsus, 2.4 mm.

Length of leg II, 9 mm.

Length of leg III, 8.7 mm.

Length of leg IV, 15 mm.; tibia plus patella 4.1 mm.; metatarsus, 4. mm.

Locality—Southern Nevada (Las Vegas).

Individuals of this species were observed in large numbers running across a footpath along a small stream at Las Vegas. They seemed especilly active after sunset, coming forth at that time from concealment. At the date of observation (early June) both males and females were common. No females with egg-sacs were taken.

New Species of Pogonocherus, with Synoptic Table.

By H. C. Fall.

Four species of this genus—*negundo*, *arizonicus*, *californicus* and *alaskanus*—have been more or less recently described by Mr. Schaeffer. Three more are made known in the present paper—bringing the number of known forms within our faunal limits up to twelve. As only the five of the Henshaw List were known when Leng and Hamilton presented the last synoptic table (Trans. Am. Ent. Soc. 1896, p. 135) a new table is herewith appended.

P. obscurus n. sp.

Moderately stout, black, clothed not very densely with appressed blackish and ashy grey hairs, the latter predominating, especially in a slightly antemedian discal area which extends forward laterally to the humeri; the elytra with four series of small black tufts of short erect hairs, the inner series close to the suture, the three outer ones occupying the positions of the costae, which, however, are feebly or scarcely evident in this species. Entire body above, antennae, legs and sides of abdomen clothed with long flying hairs, which are for the most part blackish on the upper surface and pale beneath. Antennae one-third longer than the body in the male, slightly longer than the body in the female, the longer joints in great part pale, the outer ones black in apical half; scape more than four times as long as wide. Prothorax about as long as wide, lateral tubercles obtuse, discal ones moderate. Legs black, the tibiae variegated with pale hairs. Last ventral segment rounded at apex in the male, truncate with the apex beveled or obliquely ascending in the female. Length 7-9 mm.; width 2.6-3.4 mm.

Described from 2 ♂'s and 1 ♀ kindly given me by Mr. Schwarz, who took them at Bright Angel, Arizona.

This species is rather closely allied to *negundo*, but is readily separated by the tabular characters. It is perhaps even closer to *californicus*, but as this latter is compared by its describer with *oregonus*, I have so associated it in the following table. There is before me a specimen taken by Dr. Fenyes in the San Bernardino Mountains of California, which I refer with some confidence to *californicus*. It is very near *obscurus*, but the long hairs are shorter and less numerous throughout, and all those arising from the antennae are white, while in *obscurus* they are brown and white, the brown predominating.

P. propinquus n. sp.

Piceous, elytra variegated with testaceous, somewhat thinly clothed with brown and grayish white recumbent hairs, the latter, however, condensed in a fascia at the anterior third of the elytra, running obliquely forward exteriorly to a point beneath the humeral umbone, but not reaching the side margin. The fascia is sharply defined posteriorly, but anteriorly merges into an area of pale hairs within the humeri. Behind the fascia the surface is irregularly variegated with pale and dark shades, the paler color predominating toward the apex. Entire upper surface with scattered longer erect blackish hairs, the legs and antennae with hairs of moderate length. Antennae as long as the body (♀), joints pale at base, the scape nearly three times as long as wide. Prothorax slightly transverse, lateral and discal prominences moderately strong, but not acute, median line with a small oval polished tubercle at posterior third. Elytra tricostate, the lateral costae strong, the inner one much less so and bearing a series of four tufts of short erect black hairs, disk sparsely moderately punctured between the costae; elytral apices emarginate, the outer angle more distinct than the inner. Femora black, pale at base; tibiae annulate; basal joint of hind tarsi nearly as long as the next two. Abdomen without erect hairs, last segment (♀) with a transverse apical fovea. Length 9 mm.; width 3 mm.

San Bernardino Mountains, California, 6200 feet. A single female collected by Mr. Joseph Grinnell. This species is rather closely allied to *penicellatus,* but sufficiently distinct by the lateral costa subinterrupted at base, and by the different disposition of the pale markings.

P. pictus n. sp.

Closely related to *mixtus,* and hitherto regarded as a form of that species. It seems to differ constantly from the latter in the denser whiter sub-basal area which broadly reaches the suture but fails to attain the side margin; the dark areas are also blacker and contrast more strongly with the white markings. The elytra are more evidently subcostate than in *mixtus,* the lateral costa being quite well marked though obtuse, and the antennal scape is as a rule shorter and more thickened apically, being but slightly more than twice as long as wide. The size is little greater than in the average *mixtus.* Three specimens are before me bearing labels as follows: "Telluride,

Colorado," 9000 feet; "Colorado," and "Cloudcroft, New Mexico." There is a single example, labeled simply "Col." in the Le Conte collection and placed with *mixtus*.

This is evidently the form referred to by Hamilton ("Trans. xxiii, p. 135) as Le Contes *simplex;* an erroneous determination, however, the true *simplex* being in no appreciable way different from typical *mixtus*. In the original description of *simplex* the apices of the elytra are said to be rounded, but a recent examination of the type by the writer shows them to be truncate and feebly sinuate, the sutural angle slightly prominent.

The following table is offered for the separation of the twelve species now known to us:

SYNOPTIC TABLE.

Elytra each with a strong subbasal discal crest; sides of body and legs with long flying hairs, antennae with moderate hairs; outer apical angle of elytra spiniform. 7–9½ mm. California; Van couver Island . . . . . **crinitis** Lec.

Elytra not or but feebly cristate at base.

Legs and antennae with long flying hairs; apex of elytra rounded.

Lateral tubercle of prothorax acute, spiniform. 5–8 mm. Lower California . . . . . **volitans** Lec.

Lateral tubercle of prothorax obtuse.

Elytral disk with yellowish brown area which extends forward laterally to the humeri, and posteriorly as a gradually narrowing sutural stripe nearly to the apex; last ventral of female foveate at apex. 9.5 mm. Arizona . . . . . **negundo** Schaef.

Elytral disk with a somewhat diffuse grayish area just before the middle, not extending backward along the suture; apex of last ventral of female broadly obliquely ascending or beveled but not foveate. 7–9 mm. Arizona. . . . . **obscurus** n. sp.

Legs and antennae without long flying hairs.

Elytral apices rounded.

Elytra and prothorax clothed uniformly with gray pubescence, with a few small tufts of short black hairs on the elevated intervals. 6¼ mm. Tulare Co., Cal. . . **californicus** Schaef.

Elytra clothed with gray pubescence in about basal half and apical third, the intermediate area forming a broad transverse black fascia. 8–9 mm. Idaho, Oregon, California . . **oregonus** Lec.

Elytral apices emarginate, with more or less distinct limiting angles.

Elytra each tricostate, the lateral costae strong, the inner one feebler and bearing a series of four or five tufts of erect black hairs.

Lateral costa strong throughout, the antemedian pale spot or fascia sharply defined and not extending forward within the humeri . . 4½–6 mm. Maine to Colorado. . **penicellatus** Lec.
6 mm. Alaska . . . . . **alaskanus** Schaef.

Lateral costa feeble or subinterrupted near the humerus; anterior pale area less sharply defined, reaching the base within the humeri. 9 mm. San Bernardino Mts., California.
propinquus n. sp.

Elytra without strongly marked costae.

Fulvous, thorax and elytra at sides with some darker spaces, each elytron with an anterior oblique pale fascia and behind this a row of three tufts of erect black hairs. 13 mm. Arizona.
arizonicus Schaef.

Brownish or piceous elytra without tufts of erect hairs.

Subbasal pale area denser, not reaching side margin, antennal scape stouter, elytra subcostate. 5½–7 mm. Colorado, New Mexico . . . . . **pictus** n. sp.

Subbasal pale area reaching side but usually not the suture; scape less stout, elytra not costate. 4–7 mm. Greater part of United States . . . . . **mixtus** Lec.

According to Schaeffer *alaskanus* differs from *penicellatus* in its "much darker color, the rounded apical angles of the elytra and the shorter first joint of the hind tarsi." The outer apical angle of the elytra is more or less completely rounded in some specimens of *penicellatus* and as no comparative measurements are given of the basal joint of hind tarsi, the characters seem rather too vague to incorporate in the table.

The length given for *arizonicus*—13 mm.— is very great for a species of *Pogonocherus* and is possibly an error.

Penicellatus, alaskanus, propinquus and *arizonicus* agree among themselves and differ from all others in having a small smooth oval tubercle on the median line of the pronotum posteriorly. The first three further agree in having the elytra rather strongly costate and with a single subsutural row of tufts of short erect hairs. *Arizonicus* has a single row of such tufts, but the description does not say whether they are near the suture or not, nor does it mention any elytral costae: and since it is compared by its author with *mixtus*, the presumption is that the elytra are without distinct costa as in that species.

Secondary sexual characters in this genus are chiefly manifest at the abdominal apex. The last ventral of the male is not modified, the apex broadly rounded. In the female of all the species known to me except *crinitus* the last ventral is either foveate or obliquely ascending at apex, the margin more broadly rounded or truncate. In Mr. Schaeffer's description of *negundo* the apex of the last ventral is said to be broadly emarginate in the male and broadly rounded in the female. It is probable that he mistook the sexes and the characters should be reversed. Le Conte says of *mixtus*—"The male has the thorax finely rugose," and of *parvulus* (merely a small *mixtus*) "the thorax of the male is finely rugous, that of the female smooth." Hamilton says that the thorax of the male (*mixtus*) is very closely aciculate, that of the female smooth. These differences are not at all apparent in my own series, and I am forced to consider them imaginary; in fact I find that the two specimens of *parvulus* upon which Le Conte's observations were made are both males. The antennæ are as a rule but little longer in the males than in the females.

The greater number of our species of this genus are known to occur on pines. *Crinitus* is found on live oaks, *negundo* on box elder, and *volitans*—from Lower California—can hardly occur on conifers. These three species, moreover, differ from all following by the more strongly developed and acute lateral tubercles of the prothorax.

Supplementary note on *Pogonocherus*.

Since submitting the above to the NEWS, there has appeared an article by Mr. Schaeffer in the September issue of the Journal of the New York Ent. Soc. containing a table of the species of *Pogonocherus* together with the description of still another new species—*concolor*—with doubtful locality but supposedly from California. I am unable to determine with certainty where *concolor* should go in the above table. Mr. Schaeffer does not say whether the lateral tubercle of the prothorax is acute or obtuse, but assuming that it is obtuse as in the greater number of species, and that the erect hairs of the antennæ and legs are not conspicuously long, it would be associated with *oregonus* and *californicus*, from both of which it is at once distinguishable by its uniform yellowish cinereous coloration and the absence of elytral tufts of setæ.

Two New Cecidomyiidae.

By E. P. Felt, Albany, N. Y.

Lasioptera tripsaci n. sp.

This dark brown, white-banded species was reared at Plano, Texas, August 12, 1909, from larvae occurring between the leaf blades of Gama or Sesame grass, *Tripsacum dactyloides*, and transmitted to this office by Prof. F. M. Webster under the number of 6,011. This species is easily separated from allied forms by the white margined abdominal segments, the unicolorous tarsi, the 18 antennal segments, the fifth with a length three-quarters its diameter and the extended ovipositor, the latter being nearly as long as the abdomen.

Larva.—Length 3 mm., pale yellowish orange. Head small, narrowly rounded anteriorly. Antennae short, apparently uniarticulate. Breastbone bidentate, the teeth widely separated, small, the shaft weakly chitinized. Skin coarsely shagreened. Posterior extremity produced as a conspicuous pair of fleshy, conical pseudopods.

Female. Length 2 mm. Antennae fuscous yellowish, lighter basally; 18 segments, the 5th with a length barely three-quarters its diameter, the terminal segment produced, evidently composed of two closely fused. Palpi; first segment broadly oval, the second a little longer, narrowly oval, the third as long as the second, more slender, the fourth a little longer and more slender than the third. Mesonotum dark yellowish brown. Scutellum fuscous yellowish, postscutellum yellowish. Abdomen dark brown, the segments narrowly margined posteriorly and laterally, venter concolorous; ovipositor yellowish. Wings hyaline, the third vein uniting with costa at the basal half. Halteres yellowish. Coxae fuscous yellowish, femora lighter, tibiae lighter than the coxae, tarsi pale straw, the distal segments fuscous; claws stout, evenly curved, the pulvilli a little shorter than the claws. Ovipositor nearly as long as the abdomen, stout, the terminal lobes with a length three times the diameter, tapering, thickly setose, minor lobes long, slender.

Type Cecid. a2013, N. Y. State Museum.

Cecidomyia opuntiae n. sp.

This species was reared during June, July and August, 1909, from discolored areas accompanied by more or less decay, at the base of spines on *Opuntia* leaves received from

George V. Nash, head gardener of the New York Botanical Gardens at Bronx Park, N. Y. Apparently the eggs are deposited at the base of a spine, possibly near some recent wound and the larvae commence operations upon the tissues, their work being followed by decay and in some instances by the operations of a small *Ptinid* beetle belonging to the genus *Catorama*. In the latter case the dead tissues are traversed by irregular galleries, the *Cecidomyiid* larvae being in the near ing vicinity of living cells. This species occurred in New York in the leaves of *Opuntia banburyana* from Italy and an *Opuntia* from British West Indies. It is probably American and presumable that the infestation originated in this country. The deep red male may be recognized by the short broad, triangularly emarginate ventral plate.

Larva.—Length 3 mm., deep red, rather stout. Head small; antennae long, tapering, biarticulate; breast-bone stout, bidentate, the teeth divergent, broadly rounded, the shaft well chitinized. Skin coarsely shagreened. Posterior extremity broadly rounded with submedian conical processes.

Male.—Length 1 mm. Antennae about as long as the body, thickly haired, dark brown; 14 segments, the fifth binodose, the basal portion of the stem with a length three-quarters its diameter, the distal part with a length one-quarter greater than its diameter, the basal enlargement subglobose, subbasal whorl sparse, the subapical circumfilum stout, the loops moderately long, the distal enlargement subcylindric, tapering basally with a length twice its diameter, the subapical whorl sparse, the subbasal and subapical circumfili moderately stout, the loops moderately short; terminal segment with the basal stem very short, the distal enlargement with a length three and a half times its diameter. Palpi; first segment short, stout, the second with a length three times its diameter, the third one-third longer, more slender, the fourth a little longer and more slender than the third. Mesonotum dark reddish brown, the submedian lines thickly haired. Scutellum yellowish red basally, postscutellum dark brown. Abdomen thickly haired, deep red, dark brown basally, the membrane and pleurae fuscous. Wings hyaline, costa fuscous yellowish. Halteres pale yellowish, reddish tinted basally and apically. Coxae slaty brown, femora and tibiae pale straw, slightly fuscous. Tarsi with the first segment pale straw, the second and third fuscous yellowish, the fourth and fifth dark brown; claws slender, slightly curved, simple, the pulvilli nearly as long as the claws. Genitalia; basal clasp segment stout; terminal clasp

segment moderately stout; dorsal plate short, broad, triangularly emarginate, the lobes broadly rounded, sparsely setose; ventral plate short, broad, triangularly emarginate, the lobes truncate, sparsely setose; style short, stout, tapering.

Female.—Length 2 mm. Antennae nearly as long as the body, rather thickly haired, fuscous yellowish; 14 segments, the fifth with a stem about one-quarter the length of the cylindric basal enlargement, which latter has a length four times its diameter, is rather strongly constricted near the basal third; subbasal whorl sparse, subapical whorl scattering, smooth; circumfili rather strongly arched near the basal third and apically; terminal segment cylindric, with a length three times its diameter and a slender conical apex. Palpi yellowish, the first segment short, stout, the second subquadrate, with a length two and a half times its diameter, the third one-half longer, more slender, the fourth a little longer and more slender than the third. Mesonotum reddish brown, the submedian lines thickly haired. Scutellum orange yellowish, thickly haired, postscutellum dark reddish brown. Abdomen mostly dark brown, the segments rather thickly haired posteriorly, incisures and pleurae deep orange. Ovipositor yellowish, nearly as long as the abdomen when extended, the terminal lobes slender, tapering to a narrowly rounded, coarsely setose apex. Wings hyaline, costa fuscous yellowish, subcosta uniting therewith at the basal half, the third vein just before the apex. Halteres yellowish orange. Legs mostly dark brown, the coxae and femora basally yellowish; claws long, slightly curved, simple, the pulvilli nearly as long as the claws.

Type *Cecid.*, a1,975, N. Y. State Museum.

Three New Trypetidae from the Pacific Islands.

By D. W. Coquillett.

The following new species were received from Mr. Edward K. Carnes the Horticultural Examiner, at Sacramento, California.

Dacus facialis n sp.

Near *oleae* but the face unspotted in the male, while in the female the two antennal furrows are wholly black, in both there is no brown spot at the tip of the third vein, etc. Head opaque yellow, the middle of the front, the third antennal joint and the arista except at the base, brownish; an irregular blackish spot above the center of the occiput. Thorax yellow, the mesonotum except its sides black, gray pruinose except three vittae; a black spot on the pteropleura and one on lower part of the sternopleura; metanotum except its sides black, the middle usually yellowish; scutellum yellow, usually a median brown vitta.

Abdomen yellow, marked with three imperfect black vittae which are sometimes dissolved into spots, ovipositor black. Legs pale yellow, the tarsi except their bases brown. Wings hyaline, the first basal cell above the second, the stigma, the marginal cell and narrow border to the costa to slightly below the tip of the wing, brown; anal cell and a cloud on the apical portion of the sixth vein also brown. Length about 5 mm.

Tonga Island, Polynesia. Two male and four female specimens, bred from guavas. Type No. 12,737, U. S. National Museum.

Dacus virgatus n. sp.

Very near *facialis*, but differing as follows: Thorax black, the humeri, a stripe along the mesopleural suture and one over the hypopleura, bright yellow; mesonotum gray pruinose except two vittae; scutellum yellowish, the sides brown. Black vittae of the abdomen broad and continuous. Hind tibiae brown, the others tinged with brown. Costa of the wings not bordered with brown beyond the stigma. Length 7 mm.

Tonga Island, Polynesia. A female specimen bred from a guava. Type No. 12,738, U. S. National Museum.

Dacus melanotus n. sp.

Head and its members yellow, the middle of the front, third antennal joint, arista except at its base, the proboscis and palpi toward their apices, brownish; upper half of the occiput largely black. Body black, the humeri, a stripe along the mesopleural suture and one over the hypopleura, yellow. Legs brown, the bases of some of the femora and of the hind tarsi sometimes yellowish. Wings as in *facialis*. Length about 7 mm.

Cook Island, Polynesia. Two males and one female bred from oranges. Type No. 12,739, U. S. National Museum.

The American Exposition in Berlin during June, July and August promises great things. J. Pierpont Morgan is the President and His Royal Highness, Prince Henry of Prussia, is Honorary President of the German Reception Committee. The Entomological Congress will have some very distinguished personages as Patrons and Honorary Presidents. The President of the Congress will be Prof. Lameere, President of the Belgian Entomological Society. All American entomologists are invited to attend and become members of the Congress. Those persons desiring further information may obtain the same by applying to ENTOMOLOGICAL NEWS.

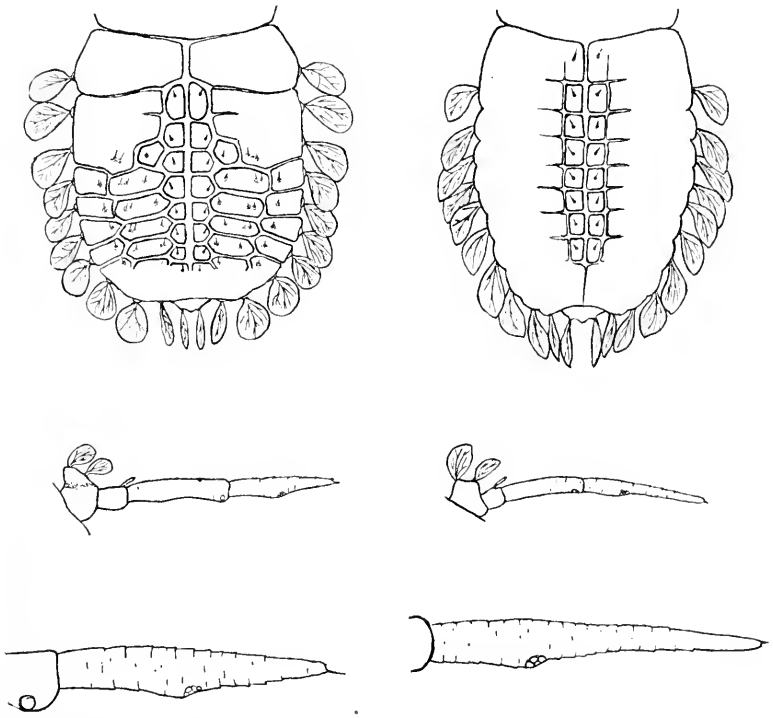
Chaitophorus negundinus Thos. vs. C. aceris Linn.

By JOHN J. DAVIS,
Office of the State Entomologist, Urbana, Illinois.

In ENTOMOLOGICAL NEWS for March, 1908 (Vol. xix, p. 131-132) Professor O. W. Oestlund gave a synopsis of the known life history of the dimorph of *Chaitophorus aceris* (*testudinatus* of Kessler) as worked out in Europe and suggested the possibility of *Ch. negundinis,* which produces dimorphs similar to those of *aceris,* being a synonym of the European species just mentioned. The dimorph of *Ch. negundinis* had previously been written about by Mr. L. C. Bragg in ENTOMOLOGICAL NEWS (Vol. xviii, Dec. 1907, p. 431-432), and later by the writer in the Annals of the Entomological Society of America (June, 1908, p. 130-32), in both cases the so-called box-elder aphid, *Ch. negundinis,* being considered distinct from the European maple aphids, *Ch. aceris,* et spp. At the same time I wrote to Dr. G. Del Guercio, sending him specimens of *negundinis* and requesting his opinion as to the distinctness of *aceris* (*testudinatus* of Kessler) and *negundinis.* He very kindly made a careful examination and reported the two species as distinct, and also sent me specimens of both the normal and the leafy dimorphic forms of *aceris,* together with sketches showing the variable dark patterns on the dorsum of the "normal" wingless viviparous females.

Dr. Del Guercio writes, "In *aceris,* * * * * one will always find it furnished with thin long hairs. The length of such hairs is about 20 microns and they lay about small tubercles, which are generally brownish, and distinct or indistinct, in a dark mass on the back. * * * *Ch. negundinis,* at least in those sent me, are furnished with rather rigid and short hairs, which measure 6 to 7 microns. This characteristic seems to me very important and less variable than any other in the two species." Following this suggestion I have examined all of the specimens of the winged viviparous females of *Ch. negundinis* in my collection and find the length of the

longest hairs does not exceed .16mm. and seldom are they that long, while the length of the similarly placed hairs on the winged specimens of *acceris* received from Dr. Del Guercio were usually .30 or .31 mm. The difference in lengths of hairs on the wingless forms is also noticeable, but much less



Chait. acceris, Dorsal surface abdomen.
Antenna.
Last antennal segment.

Chait. negundinis, Dorsal surface abdomen.
Antenna
Last antennal segment.

so than in the winged forms. Another characteristic which I find to be quite constant is the sensoria on antennal segment III of the winged viviparous female. In *acceris* there are 25 irregularly placed sensoria on III, while in *negundinis* there are but 7 or 8, which are more or less in a row. The rela-

tive lengths of the base and filament of antennal segment VI in the two species is quite distinct as is shown by the following average measurements:

Species	Form	Antenna				
		III	IV	V	VI base	VI filament
Ch. aceris	Winged viviparous female	.67	.42	.38	.13	.46 mm.
	Wingless " "	.63	.33	.31	.11	.36 "
Ch. negundinis	Winged " "	.41	.28	.22	.10	.24 "
	Wingless " "	.42	.27	.22	.11	.21 "

Further, there are no dark abdominal markings on the dorsum of the wingless females of *negundinis*, these markings being prominent, though variable, characters in *aceris*.

The dimorphic forms, of the two species under discussion, although having a remarkable resemblance, are likewise quite distinct. The dorsal "plates" are very different as is shown in figures 1 and 2. The leaf-like flabellae on *aceris* are usually rounded while those on *negundinis* in most cases at least, are more or less pointed. Another very prominent difference is the relative lengths of the base and filament of the last antennal segment (IV) as is shown in the following table and in figures 3, 4, 5 and 6:

	Antenna			Length of body	Width of body
	III	IV base	IV filament		
Dimorph of *Ch. aceris* Linn.	0.147	0.065	0.070	0.64	0.32 mm.
" *Ch. negundinis* Thos.	0.106	0.058	0.110	0.63	0.31 "

We have in America a *Chaitophorus* on the Norway and hard maples, which is very closely related to the European *aceris*, but which appears to be distinct—probably a variety of *aceris*. The writer wishes, however, to study the species throughout the year in its various forms before making any definite statements.

Concerning Dr. John B. Smith at Dublin, New Hampshire.

By Harrison G. Dyar.

We dislike to take up space in scientific periodicals for purely personal discussions, but as the News is not always strictly scientific and as such matters are generally lively and no doubt interesting to some of our readers we will comment on Dr. Smith's comments.

Dr. Smith is evidently "enjoying" the situation solely because his name was not mentioned in my article. The omission was intentional and made in the interest of accuracy. My examination of the territory and subsequent report were quite unifluenced by any expression of opinion on the part of Dr. Smith. It is easy for Dr. Smith to say, after the fact, that he pointed out the pond in question; but at the time he merely said that it had a favorable appearance. Owing to an unfortunate coincidence, following the regrettable action of Dr. Stowell in desiring an examination by Dr. Smith without my knowledge and before my own examination was completed, I was obliged to enjoy the pleasure of Dr. Smith's company on the tour of inspection of the ponds and marshes conducted by Dr. Stowell. The marsh in which I discovered the breeding-place of *Mansonia perturbans* was the only likely place that we saw on the trip, and if Dr. Smith had not been of the opinion that it looked favorable, he would have exhibited less acumen than I suppose him to possess. It is, however, a gratuitous assumption for him to imagine that my judgment was influenced in the least by his opinion. His company was forced upon me, his advice was not asked, and any acknowledgment of his connection with the matter in my report would have been both superfluous and misleading. My idea of the giving of credit is that it is due in cases where some service has been rendered or some information given whereby the recipient has profited, and in such cases I always gladly give credit. But where expressions of opinion are voluntarily proffered, which coincide with views already held by the recipient, even when such opinion proves

later to have been well founded, it is clear to me that no acknowledgment is due. In the present case I am the more disinclined to make any mention of Dr. Smith in the matter, even to state that he expressed a favorable prognosis, because he was injected into a situation which I considered well in hand, quite without my previous knowledge or desire.

Dr. Smith states that all the information about *Mansonia perturbans* comes from himself or his assistant, Mr. Grossbeck. This is a most disingenuous statement. I happen to know that Mr. Brakeley made all the discoveries in the case and sent his voluminous notes freely to Dr. Smith, and I am astonished that Dr. Smith should attempt to divert credit to himself from a most generous and warm-hearted, if non-publishing, friend. For myself, who am neither generous, nor, I fear, at present particularly friendly toward Dr. Smith, the attempt to annex credit is explicable on the ground that Dr. Smith's point of view is too self-centered to allow him to read the situation in its true aspect.

Note on the Genus Phalaecus Stal.

By Dr. E. Bergroth, Fitchburg, Mass.

In 1773 De Geer described and figured a large and remarkable Pentatomid from Surinam under the name *Cimex pustulatus*. Overlooking De Geer's description Stål described in 1855 a specimen of the same insect from an unknown locality under the name *Macropygium flavopustulatum*. Later, in 1862, he found that the species has only a superficial resemblance to the genus *Macropygium* and founded the new genus *Phalaecus* upon it, identifying it with De Greer's species. In 1872 he published some additional characters of the genus, among others "tarsi biarticulati?" This note of interrogation seems to indicate that his specimen was in poor condition, for the tarsi are really only two-jointed and very distinctly so. Up to the present date no more specimens of this rare insect had turned up, but in 1880 Distant described and figured from Central America what he considered a new species of *Phalac-*

cus, naming it *Ph. decoratus*. Having recently received a specimen of *Ph. pustulatus* De G. from French Guiana and, through the kindness of Mr. Distant, a cotype of his *Ph. decoratus*, I find that there is neither affinity nor resemblance between these two species which belong to widely different genera. Although Distant speaks of "the elevated meso and metasternum," neither of these sterna is elevated in *decoratus*. What Distant has taken for the meso-and metasternum is the basally depressed basal spine of the venter. It will not be out of place to give completer and more accurate data about these two genera.

PHALAECUS Stal.

Body broadly oval. Head small, distinctly narrower than apex of pronotum, sub-rhomboidal, a little exserted and broader than long, eyes not touching pronotum, postocular and anteocular part of equal length, lateral margins before the eyes slightly and broadly sinuate, juga longer than tylus, approaching but not quite meeting in front, blunt at apex, ocelli somewhat more distant from each other than from eyes, bucculæ, nearly reaching base of head, first antennal joint passing apex of head by about two-thirds its length and nearly as long as second joint, third joint longer than second and shorter than fourth, which is as long as fifth, rostrum reaching middle coxæ, first joint reaching base of head, second joint a little shorter than third and fourth combined, fourth shorter than third. Pronotum about three and one-half times broader than head, deeply sinuate at apex with a short transverse impression on either side behind the apical margin, which is not raised, lateral margins narrowly reflexed, very feebly rounded, lateral angles rounded, scarcely prominent. Frena reaching beyond middle of scutellum. Prosternum longitudinally fore coxæ. Metasternum sexangularly elevated in the middle, the elevated part tapering from base to apex and reaching the fore coxæ. Metasternum sexangularly elevated in the middle, the elevated part broadly emarginate behind for the reception of the ventral basal tubercle. Orificial sulcus straight, rather long, its anterior margin thickened. Hemelytra with the cost-

tal margin of corium strongly and acutely reflexed towards the base, apical margin straight, apical angle narrowly rounded, membrane with few veins. Abdomen much broader than hemelytra, almost the whole connexivum not covered by the hemelytra, the apical angles of the segments subrectangularly prominent, second ventral segment with a broad, flattened tubercle filling the posterior sinus of the metasternum, spiracula more distant from the lateral margin of the segments than from the apical margin. Tibiæ sulcated above. Tarsi two-jointed.

Phalaecus pustulatus DeG.

Shining, glabrous, above dark-ferruginous, beneath luteous, base of head and juga (except interior margin) yellow, pronotum with nineteen yellow spots arranged in three transverse rows, first row with 4, second row with 6, and third row with 9 spots, those of the third row more elongate and irregular, scutellum with 5 elongate basal spots, an irregularly v-shaped median marking, a lateral spot at the middle, and the apex yellow, corium with about 6 larger and several smaller yellow spots, conexival segments with a large median quadrate yellow spot, a duplicate spot at the base of the fore and middle acetabula, a single spot at the base of the hind acetabula, and spiracula black, ventral segments with an irregularly and diffusely infuscated sublateral transverse patch inside the spiracula, antennae, rostrum and legs luteous, apex of second antennal joint, less than apical half of third joint, more than apical half of fourth joint, and apical half of fifth joint black. Head impunctate, juga transversely wrinkled, antennae shortly pilose. Pronotum, scuttellum and corium rather sparingly punctured, the yellow spots impunctate. Underside smooth, except prosternum which is finely and sparsely punctured. Legs shortly setose. Length, ♀ 16 mm., width 10 mm.

DISDERIA n. g.

Body oblong-obovate. Head immersed to the eyes, one-third broader than its length, scarcely narrower than apex of pronotum, strongly sinuate before the eyes, rounded at apex, anteocular part twice longer than postocular part, juga longer than tylus and narrowly meeting in front of it, ocelli more than twice wider apart from each other than from eyes, bucculæ almost reaching base of head, rostrum reaching middle coxæ, first joint reaching base of head, second joint as long as third and fourth combined, fourth shorter than third,

base of antennæ visible from above, their first joint reaching a little beyond apex of head, third joint much shorter than second, fourth joint longer than second and shorter than fifth. Pronotum a little more than twice broader than head, moderately sinuate at apex, apical margin scarcely elevated, but with a series of punctures immediately behind it, lateral margins reflexed in the middle only, straight, lateral angles a little prominent. Scutellum with the apical part moderately broad, frena reaching beyond the middle. Prosternum on either side behind the apical margin with a transverse carina, the inner end of which is recurved. Neither mesosternum nor metasternum elevated. Orificial keel long, straight, gradually tapering towards the end. Hemelytra with the costal margin scarcely elevated towards the base, exocorium with a double row of punctures except towards the base where there is but a single row, apical margin slightly rounded, apical angle acute, membrane with numerous veins. Abdomen a little broader than hemelytra, the apical angles of the segments with a short acute spine, second ventral segment with a strong spine reaching the fore coxæ, the basal part of the spine depressed and subexcavated, the apical part laminately compressed, spiracula about equally distant from apical and lateral margin. Tibiae not sulcated above. Tarsi three-jointed.

Type.—*Phalaecus decoratus* Dist.

This genus is not closely allied to any of the other American genera having a basal spine to the venter. The *facies* is that of a *Mormidea*. The genus is named in memory of S. Disderi, whose biological "Observationes entomologicae" (1805-1809) on *Hemiptera* and other insects have fallen into undeserved oblivion.

Disderia decorata Dist.

Head, pronotum, scutellum and breast irregularly rather thinly punctured. Corium more thickly and regularly punctured. Venter smooth, the blackish sublateral band with strong scattered punctures. The first three antennal joints and the femora and tibiae dotted with brown. Connexivum yellow, the basal and apical segmental margins black. Male genital segment short, broad, arcuately sinuate.

A New Species of Aspidiotus.

By Glenn W. Herrick.

(Plates II, III)

Aspidiotus mori n. sp.

Scale of female.—Quite large, 2-2½ mm. in diameter; circular, flat, thin and very inconspicuous with the edges closely applied to the bark. It is reddish-gray in color and very like the bark of the mulberry. The exuviae are bright yellow and central. A thin, white ventral scale is present.

Scale of male.—Like that of the female, except that it is smaller and elongated.

Female.—The body is circular with a long, pointed and very characteristic pygidium (Plate III, Fig. 1), reminding one of the pygidium of *Chrysomphalus perseae.* The pygidium is rather strongly chitinized and has one pair of prominent lobes, the median ones. These are well developed, nearly parallel on their mesal edges and quite close together. The caudal margins are rounded and the lateral margins slope sharply toward the first incision and are conspicuously notched about one-third of the distance from the apex. These lobes, in shape and general appearance, strongly resemble the median lobes of *A. forbesi.* There is a strongly curved, chitinous process at the inner base of each median lobe (Plate III, Fig. 3). The first incision is bounded on each side by a characteristic, club-shaped process, the inner one much the larger and more conspicuous. Two pore openings are present in the incision. The second incision is also bounded by two prominent club-shaped thickenings. There are two long, pectinae (furcated plates) in the first incision and three plates in the second. The spines, on the dorsal surface, are situated at the bases of the lateral margins of the median lobes and the very rudimentary second and third lobes. A fourth spine is situated about one-third of the distance to the penultimate segment and two more a little distance from the base of the pygidium. The ventral spines are a little laterad of these (Plate III, Fig. 3). The anal aperture is small and situated very low down below the apices of the two large club-shaped processes of the first incision.

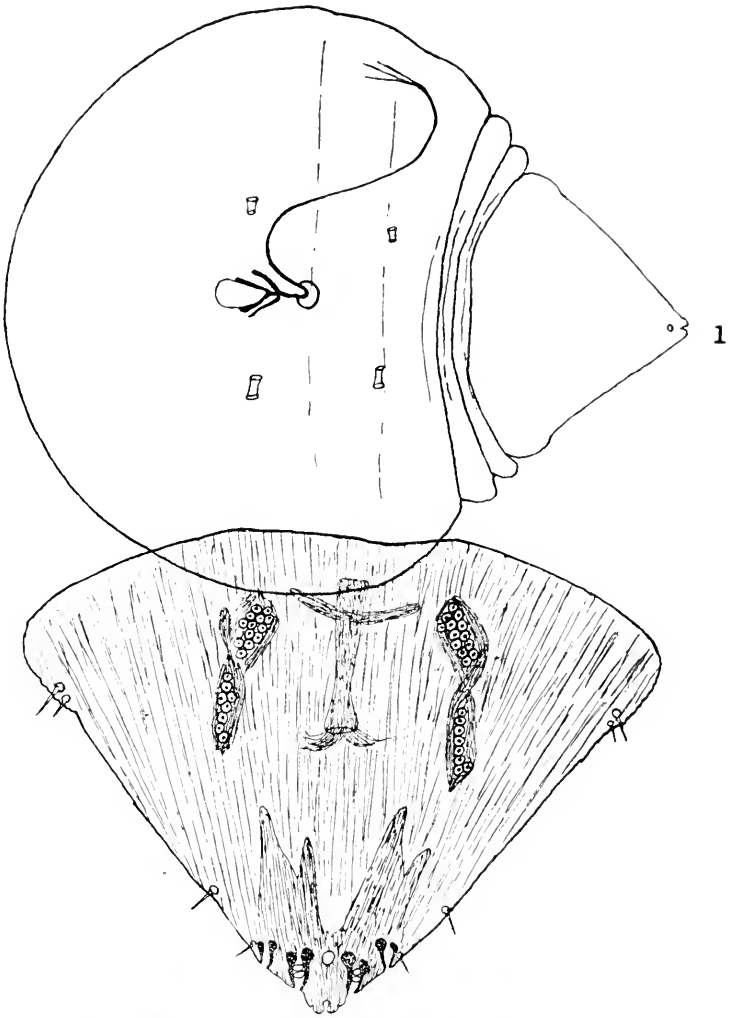
There were four groups of circumgenital pores (Plate III, Fig. 2) in all the specimens examined and they ran as follows in six average individuals:

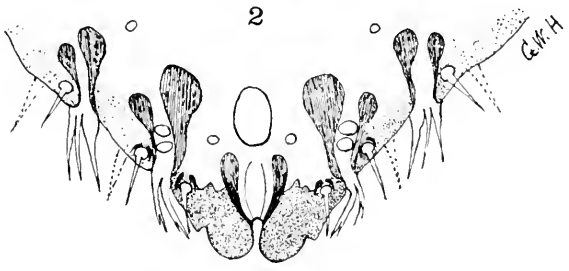
13-14	11-12	15-13	15-11	12-12	11-14
8-7	9-8	9-8	7-8	7-8	10-9

The vaginal opening is conspicuous and is situated between the caudo-lateral groups of circumgenital pores. Described from many individuals.

Host plant.—On the undersides of the branches of native red mulberry trees (*Morus rubra*).

PYGIDIUM OF ASPIDIOTUS MORI HERRICK.





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ASPIDIOTUS MORI N. SP.

1. BODY OF FEMALE. 2. PYGIDIUM.

3. MARGIN OF PYGIDIUM MUCH ENLARGED.

Locality.—Banks of the Brazos River, six miles from the Agricultural and Mechanical College of Texas, College Station, Texas.

Remarks.—The specimens were most abundant on the under sides of the lower branches of the trees which were subject to overflow and a great majority of the insects were dead as a result of the overflow of 1908. Some living females were present however, and one was found that had laid a number of nearly white or colorless eggs (May 4, 1909).

Records of Orthoptera from Western Canada.

By James A. G. Rehn.

The material from which the following records were taken was collected on several different trips; one made in portions of western Ontario, Manitoba, Saskatchewan and Alberta by Dr. Henry Skinner in the summer of 1906 in company with the late Dr. James Fletcher, who published an itinerary of the trip*; the other lot representing material collected incidentally on two botanical trips made in Alberta and British Columbia by Professor Stewardson Brown during the summers of 1906 and 1908.

The localities represented are as follows: Western Ontario, Nepigon; Manitoba, Aweme; Saskatchewan, Radisson, Rudy and Kinistino; Alberta, Banff and the upper Saskatchewan River; British Columbia, Field and Beavermouth.

The material is the property of the Academy of Natural Sciences of Philadelphia. Where no collector is mentioned the specimens were secured by Dr. Skinner.

ACRIDIDAE.

Acrydium brunneri (Bolivar).

Field.—June 26, August 1-2 (Brown). One male, two females. The male has a broad medio-longitudinal bar of ochraceous reaching from the fastigium to the apex of the pro-

* Rep. Ent. and Botanist, Canada Dept. Agric., 1908, pp. 186-188.

notum, the lateral angles also being narrowly outlined with the same color. The females are quite dull in color with a pair of more or less distinct trigonal blackish pronotal maculations.

The species has been recorded from Laggan.

Acrydium granulatum Kirby.

Field.—June 26, August 2 (Brown.) Two females. The June specimen is long-winged with the pronotum elongate, while the August individual has the pronotum and wings much shorter.

Chloealtis abdominalis (Thomas).

Radisson.—July 30. Three immature females. This is the most northern locality from which the species has been recorded.

Chorthippus curtipennis (Harris).

Radisson.—July 30. One immature specimen. Field.—August 1 and 2 (Brown.) Two males.

Gomphocerus clavatus (Thomas).

Radisson.—July 30, August 2. Five males, one female. Rudy.—July 19. Two males, two females. One of the Radisson specimens is in the greenish phase of coloration.

Previous Saskatchewan records of this species are from Moose Jaw (Caudell), Waldeck and Pasqua (Walker).

Mecostethus gracilis (Scudder).

Radisson.—July 30. One male. Dr. Fletcher (Rep. Ent. Soc., Ontario, 1907, p. 130) has recorded this species from the same locality

Arphia frigida Scudder.

Radisson—July 31. Seven males, six females. Rudy.—July 18. Two males, one female. Banff.—June 12, 1906 (Brown), August 2, 1907 (Skinner). Five males, four females.

All of these specimens have red wings, the Banff series having the disk more orange-red than the Saskatchewan in-

dividuals, while the sutural margins of the tegmina are without the pale edging in the Saskatchewan series and with the same in all the British Columbia representatives except one August male. Dr. Fletcher has recorded this species from Aweme, Manitoba, Rudy and Radisson.

Camnula pellucida (Scudder).

Radisson.—July 30. Two females. Beavermouth.—July 15, 1906 (Brown). One male, two females. This species has been recorded from several localities in British Columbia, Manitoba and Alberta, and from Indian Head, Saskatchewan.

Hippiscus tuberculatus (Palisot).

Kinistino.—July 25. One male. Three males and one female taken at Nepigon, Ontario, July 9, 1907, by Dr. Skinner have also been examined. This species has also been recorded from Calgary, Alberta, the Red River of the North, Great Slave Lake and the upper Mackenzie.

Hippiscus zapotecus (Saussure).

Rudy.—July 19. One female. Dr. E. M. Walker has recorded this species from Mill Valley, Manitoba, and Manitoba without further data.

Hippiscus latefasciata Scudder.

Aweme.—July 13. One male, three females. Dr. Fletcher (Rep. Ent. Soc., Ontario, 1905, p. 103) has recorded this species from the same locality The caudal tibiæ vary in these specimens from pale yellowish touched with pinkish internally to carmine with the external faces flesh color.

Hippiscus neglectus (Thomas).

Aweme.—July 13. One male. This specimen lacks the usual sutural stripe and is not quite typical in several other respects, but its separation without the evidence of additional material does not appear to be warranted. The only previous Canadian record for the species was from Fort McLeod, Alberta.

Trimerotropis monticola (Saussure).

Radisson.—July 30. One male, four females. These specimens are distinctly smaller than Nebraska and Colorado individuals, but the material in hand is too limited to make any deductions from it regarding the constancy of the size difference.

Circotettix suffusus Scudder.

Beavermouth.—July 15, 1906 (Brown). Two males, one female. Field.—August 2 (Brown). One male.

Melanoplus kennicottii Scudder.

Rudy.—July 18-19 (Skinner). One male, one female. This species has been recorded from the Souris River, but the present record is the first from the Province with exact data.

Melanoplus alaskanus Scudder.

Banff.—August 2 (Skinner). One male, four females. This is the first record of the species from Alberta.

Melanoplus atlanis (Riley).

Beavermouth.—July 15 1906 (Brown). One male.

Melanoplus extremus (Walker).

Field.—August 2 (Brown). Three males, six females. The series here examined belongs to the form *junius*. No previous records of the species from British Columbia appear to have been published, although it has been recorded from Banff and Beaver Lake, Alberta.

Melanoplus packardii Scudder.

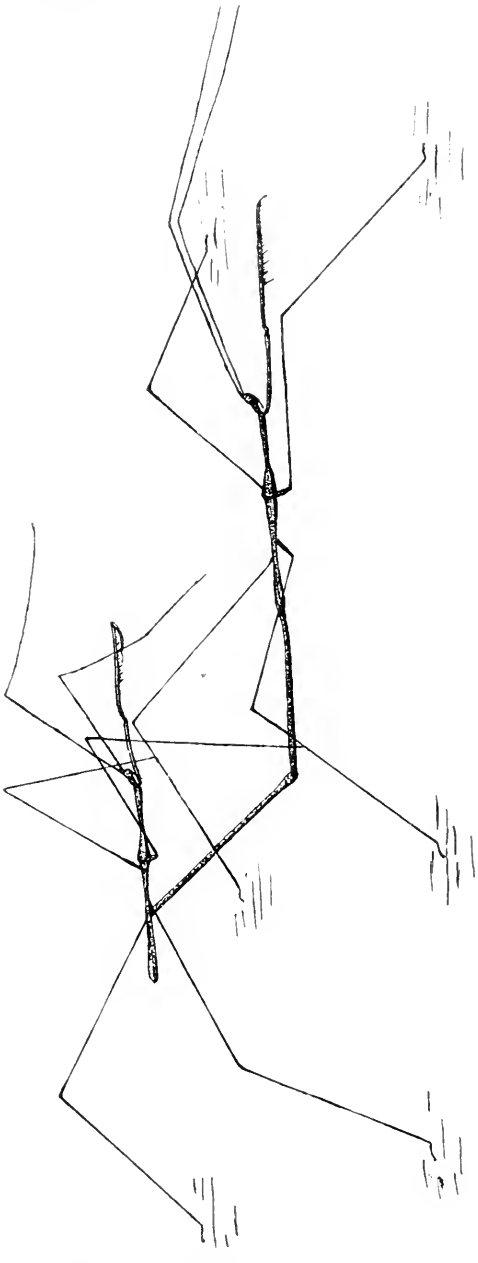
Radisson.—July 30 (Skinner). Four females. This species has previously been recorded from Regina, Saskatchewan.

Melanoplus infantilis Scudder.

Rudy.—July 19 (Skinner). One male, one female. Previous records of this species were from Medicine Hat and Fort McLeod, Alberta, and Regina and Moose Jaw, Saskatchewan.

Melanoplus minor (Scudder).

Rudy.—July 18 (Skinner). One male. This species has previously been recorded from Winnipeg, Manitoba.



EMESA LONGIPES (H. F. WICKHAM)

Melanoplus bivittatus (Say).

Rudy.—July 19 (Skinner). One female. Radisson.—July 30 (Skinner). Two males, two females. This species has been recorded from Medicine Hat, Alberta.

TETTIGONIDAE.

Cyphoderris monstrosa Uhler.

Saskatchewan River, below junction of North Fork, Alberta. —June 18, 1908 (Brown). One male. The only previous Canadian records of this species were from Banff, Alberta, and Ainsworth and Peachland, British Columbia. The present record is the most northern for the genus.

A Note on Emesa longipes.

By H. F. Wickham, Iowa City, Iowa.

(Plate IV)

Last year, I found occasion to make a few notes on the life history of the thread-legged bug,* and since the season just past has offered opportunities for some additional observations, they are brought together in this article as a contribution to the knowledge of the habits of a most unusual insect.

In my back yard was an old shed of considerable size, used long ago to shelter two or three cows. This shed was of rather loose construction, open more or less to the weather, with a dilapidated loft partly filled with lumber of various sorts and thoroughly dusty—rarely disturbed and thickly tenanted by spiders, wasps and such fry. The lower story was used principally to hold pieces of boards, old furniture and the like, while one compartment did duty through the winter as a coal bin. Trees of apple and elm shaded this ancient fabric, whose dusty rafters and web-hung walls afforded to many thread-legged bugs the quiet shelter that they seemed to enjoy.

Anticipating a threatened collapse of the structure I decided to tear it down, and in June began the task of dismantling it

*Ottawa Naturalist, Vol. XXII, March, 1909, p. 255.

piecemeal. This brought to view numbers of partly grown *Emesa,* sometimes resting singly, sometimes in little groups of five or six, while their cast skins could be seen hanging from rough spots on the boards. Early in July I left for the summer, and was unable to resume operations on the shed until the beginning of September, when I started work on a new building in the shade of a big walnut tree, only a few feet distant from the old site. Since the processes of destruction and construction went on more or less intermittently and coincidently I had some chance to note the behavior of the bugs from day to day. The colony was, of course, dispersed by the dismantling of their home, but some clung to the scattered timbers until the frosts came and ended their lives.

Unless disturbed, the bugs were not seen to move much during the middle of the day, but towards the end of the afternoon they would come out and fly slowly and awkwardly through the lane between the trees, their long legs and slender bodies retarding aerial progress despite the swift beat of the little wings. With the sun glinting against the coating of dust particles they made a curious and interesting sight—like nothing else that I have ever seen.

I was very anxious to see something of their feeding habits, since the published statements are somewhat vague or even contradictory. I did at last find one at rest upon a screen door, sucking a gnat about the size of the common mosquito of these parts, and it is probable that in general only small or fragile insects are attacked. Some of the numerous captive *Emesae* were seen to take juices from the bodies of dead flies and spiders with which they had been provided, but they were not seen to catch nor kill any of the living specimens of these insects which were put in with them. Eventually they fed upon their own kind, every morning I would find one or two dead bugs in the cage, one frequently serving as food to a living individual which was extracting the fluids by means of its short, sharp beak. I saw no evidence of attack, it may be that those dying of age or weakness were simply utilized as food by the survivors. Occasionally I saw free specimens of *Emesa*

at rest in spiders' webs, not entangled, but ready to move when disturbed, still I never saw any evidence of the spiders being attacked nor of other insects being taken from the webs. Twice, however, I noticed remains of *Emesa* in webs, one of which belonged to *Agalena*. The bugs had apparently been sucked dry, one of them chewed as well, the fragments being held together with bits of silk. Living specimens were seen out of doors as late as October 5, up to which date we had no heavy frosts.

The copulating habits of these emaciated beasts seem to be undescribed. Just before 8 oclock, on the morning of September 18, I found a pair of them on the kitchen screen. Union had already been effected when I came on the scene and lasted only about five minutes afterwards. In the meantime I had made some notes and a sketch which will give some idea of the curious pose assumed by the male. He stands upon his hind legs, some little distance behind the female, who is in her ordinary resting attitude, his middle legs cling by the tarsal claws to the hind legs of the female, which are grasped a little below the knee. The male abdomen is bent downwards at a sharp angle with the anterior part of the body, the tip overlapping the apex of the female abdomen on the left side. The front legs, in both sexes, are extended forwards, those of the male having the tibia folded back on the femur while in the female it is open. The female started to walk away, but the male was equal to the emergency being able to accompany her and yet to hold his position by tip-toeing on his hind feet and releasing the hind legs of the female alternately or both at once when she moved.

After the pair separated I put them into a large box in order to determine the number of eggs and the length of the period of deposition. The first were found on the morning of the second day after copulation and were either fresh laid or deposited during the preceding night. In all nineteen were produced the time consumed being between three and four days. The male died soon after, without, as far as I know, having resumed relations with his mate who used him as food and

may have been responsible for his death. A few days later she also died, and the eggs have been removed to the new shed in the hope of starting a colony to replace the old one, dispersed by the destruction of their home. It does not seem worth while to describe the eggs here, since they have already been briefly characterized in the article quoted, but it may be said that, as on former occasions, they were not laid in masses nor according to any system, but attached at random to the walls.

The Butterflies of San Francisco, California.

By Francis X. Williams, San Francisco.

San Francisco (in law the city and county of San Francisco) is situated at the north end of a peninsula about 30 miles long. It is roughly quadrate in shape, and occupies an area of about 42 square miles. A spur of the San Bruno Mountains, extending from the south into the city, reaches its highest point in Twin Peaks, over 800 feet above the sea level. The north and northwest shores, on the Straits of the Golden Gate, are quite precipitous and rugged, and still retain much of the native vegetation. Extending southwards from this point, and occupying a great part of the western half of the city, is a rolling country of sand dunes and brush, which, however, is becoming rapidly cleared for human habitation. In the southwestern corner of the county is the Laguna de la Merced, occupying a fertile valley near the ocean. Much of this land has lately been converted into truck gardens. Lobos Creek, skirting the southwestern edge of the Presidio, the military reservation to the north, is still somewhat undisturbed by humanity, but Lone Mountain, an isolated sandy hillock, the classical resort of *Lycaena xerces*, is situated too near the midst of the city to be left unmolested, and is frequently the scene of some autumnal grassfire, not very salubrious to the welfare of its now decimated insect population.

San Francisco in early times was a hilly and barren waste, with no large trees, but much scrubby growth. Dr. Behr says

(Fauna and Flora of California; Proc. Cal. Acad. Sciences, 2nd series, P. 368, 1895): "Up to the year 1856 a considerable part of the neighborhood (now the city) of San Francisco was covered by a Chaparral consisting almost exclusively of *Ceanothus thrysiflorus*. Part of this formerly impenetrable thicket has been removed by human agency, and to a great extent has been replanted by our California *Cupressus macrocarpa, Pinus insignis,* Australian *Acaciae* and *Eucalypti.*" Besides *Ceanothus* were large tracts of scrubby *Quercus agrifolia*, much *lupinus arboreus* and *chamissonis, Rhamnus californica, Baccharis pilularis, Ericameria ericoides*, etc. What remains of this growth is now practically confined to the western half of the city. Very little is left of the former large areas of *Ceanothus,* which at present is only found along the north and northwestern cliffs, and there in small patches. The other shrubs are still plentiful. As a consequence the insects are disappearing along with the destruction of their food, and the hunting grounds of the entomologist, though probably at no time very rich in this vicinity, becoming more and more restricted, and are soon destined to become a thing of the past.

It was with this fact in mind, and at the suggestion of several of my entomological friends, that I have undertaken this little paper. This list could not have been made as extensive as now presented, were it not for the efficient aid rendered me by Mr. James E. Cottle, whose long collecting experience here, and consequently his knowledge of the butterflies of the vicinity, has added much to this paper. Furthermore, his acquaintance with Dr. Behr resulted in his obtaining much valuable information which otherwise would have remained hidden to us.

The author believes that this list of diurnals is quite complete for the locality; a list of the heterocera of the same place, though hoped to be published by the writer, must be deferred for a future date as a work more important and difficult.

The Flora of San Francisco has been thoroughly worked out and listed by Mrs. K. Brandegee (Zoe, vol. 2, No. 4, pp. 334-386, 1892), but the butterflies only incompletely so by Dr. Behr in his "Fauna and Flora of California."

The climate of San Francisco is rather cool, with an abundance of sea fog and strong northwest winds in the summer time; the country immediately south of the city being likewise on the narrow peninsula much resembles it in physical aspect and otherwise; while to the north the higher and warmer elevations of Marin county, separated from San Francisco by the narrow straits, offer a greater variety of vegetation, more salubrious climate and many protected canyons free from fog for the richer insect fauna that inhabits the region.

The list given below contains the names also of those butterflies which once dwelt within the precincts of our city, but that at the present time are thought to be extinct here, or are so in fact.

1. **Danais plexippus** Linn.

Behr says of this butterfly (Fauna and Flora of Cal., Vol. 5, 2nd series, pp. 371-2, 1895): "Rare in the vicinity of San Francisco up to 1856, when suddenly great numbers appeared in the streets of San Franicsco. Since 1880 they have not visited the city." This butterfly is frequently seen in San Francisco, especially in the fall of the year, when it sometimes is, as at this writing (September, 1909), quite plentiful. The larva has been found in the nearby city of Oakland, and though it does not breed regularly in San Francisco, Dr. Behr reports finding a larva of this insect feeding on *Gomphocarpus curassavicus*, an exotic asclepiad which was growing in a garden.

2. **Brenthis epithore** Bdv.

Taken a good many years ago by Messrs. Cottle and Mueller in the commencement of Golden Gate Park, but not met with since.

3. **Melitaea chalcedon** Db. and Hew.

Still an abundant insect in many of those places where its food-plants *Scrophularia californica* and *Castileja latifolia* grow. Feeds also on *Diplacus glutinosus*. I have taken the butterfly as early as March, but here they are most abundant in April and May. One male was observed September 9, 1909. It is not destined to remain many years in San Francisco. Lone Mountain, Lands End, Presidio, Lake Merced, etc.

4. **Melitaea editha** Bdv.

This species has been taken here, but at present is not common.

5. **Melitaea palla** Bdv.

One male taken years ago in a garden by Mr. Cottle. To-day it cannot be said to be a resident of San Francisco, though common in the vicinity.

6. **Phyciodes pratensis** Behr.

An abundant insect.

7. **Phyciodes mylitta** Edw.

Perhaps commoner than the preceding and like it on the wing from early spring till late autumn. I have on several occasions bred these butterflies from larvæ found feeding on the thistle, *Cirsium occidentale*. Lone Mountain, Lake Merced, Presidio, etc.

8. **Grapta satyrus** Edw.

I have several times seen in Golden Gate Park a *Grapta*, probably of this species, and on July 26, 1909, caught a worn female in a garden. It may breed at Lobos Creek and other places here where nettles are abundant.

9. **Vanessa antiopa** Linn.

Not uncommon.

10. **Vanessa californica** Bdv.

This erratic insect has been observed here, and in early times, when *Ceanothus thrysiflorus* grew in profusion, was probably not uncommon. Dr. Behr has taken migrants of this

species in San Francisco. It is usually common in Marin county, flying over the chaparral slopes of Mt. Tamalpais. Edwards has written an interesting article on this insect, describing its life history and remarking on its periodical abundance. (See Proc. Cal. Acad. Sciences, Vol. V, p. 123, 1875.)

11. **Pyrameis atalanta** Linn.

Cannot be said to be a rarity here.

12. **Pyrameis huntera** Fabr.

Strictly resident here and not uncommon. Larva on *Gnaphalium*, which flourishes in sandy localities of sufficient moisture.

13. **Pyrameis cardui** Linn.

This rapid flyer is quite common in certain locations, as Lone Mountain, where the larva feeds principally on *Cirsium occidentale*, but may also be found on *Lupinus arboreus*, *Malvaceae* and *Urticae*. Since its preferred food-plant is commonly found on the outskirts of the city proper, the butterfly is not usually taken in populous districts like the following species.

14. **Pyrameis caryae** Hbn.

The most common of the genus, and before the advent of *Pieris rapae*, perhaps the most characteristic butterfly of San Francisco. It is very commonly seen in gardens and public squares of the city, and is very fond of the blossoms of *Heliotrope*. It can be taken probably throughout the year, but, of course, most abundantly during the summer and fall. The larva, which varies in color, feeds on nettle and various plants of the *Malvaceae*, especially *Malva borealis*, which is of common occurrence in uncultivated districts, and a noxious weed in public squares.

The aberration *muelleri* described by Letcher is a seasonal form of striking aspect. As far as I am aware, this form invariably makes its appearance in late fall, when the cold weather is setting in, and which in a measure is probably responsible for the aberration. It is quite a rarity here, as it is

but seldom met with. I have but two specimens of *muelleri* in my collections; however, in the fall of 1904, Mr. Cottle captured seven fine examples of the aberration in his garden. Perhaps the best method of finding it is to pay regular visits in the fall to those parks where the ordinary *caryae* is abundant, and thus possibly two or three specimens of *muelleri* may be taken in half as many years.

15. **Junonia coenia** Hbn.

One specimen observed in the Lake Merced region September 9, 1909. Occasionally seen in Golden Gate Park, but probably only a visitor here.

16. **Limenitis lorquini** Bdv.

Occurs sparingly in the Lake Merced region.

17. **Heterochroa californica** Butler.

Occasionally seen. It probably breeds in the oak thickets.

18. **Satyrus sthenele** Bdv.

Dr. Behr says of this insect (Proc. Cal. Acad. Sciences; III, p. 163, 1864): "Is rather common near San Francisco, where it is found in June. Only one generation annually." Near San Francisco in 1864 is at present within the city limits. This insect, to the best of my knowledge, has not been taken here within the last 30 years or more. Mr. Cottle says that the locality given him by Dr. Behr as the habitat of *sthenele* is in Golden Gate Park, south of Strawberry Hill. This region, though quite grassy in places, has been much disturbed by man, and is now clothed for the most part with various trees, as *Pinus radiata, Acaciae,* etc. I believe the butterfly extinct here.

19. **Coenonympha california** Db. and Hew.

Have seen this insect quite close to the southern boundary line of the city, and Mr. Cottle says that it occurs south of Golden Gate Park, where there are many apparently suitable localities for it.

20. **Thecla melinus** Bdv.

I took one example of this Hair-streak at Lake Merced. It has several times been observed in the city.

21. **Thecla iroides** Bdv.

Has been observed by Mr. Cottle in a nursery in the northern part of the city. It is very common across the bay in Marin county.

22. **Thecla dumetorum** Bdv.

A common insect occupying a considerable area in the western portion of the city. Its larval food-plant here is *Eriogonum latifolium*, which is very common in sandy places. During June and July of this year I collected a number of larvæ of *dumetorum*.

Mature larva.—Length (at rest) 13 mm., width 4.5 mm. Head small, deeply retracted into seg. 1, pale subhyaline brownish, with the base of the antennae and a strip above labrum whitish. Body quite stout, slug-shaped, well ridged, somewhat concave subdorsal and rather depressed at posterior extremity, segmental incisions deep; ground color quite variable (as is often the case in the *Lycaenidae*), usually rather pale bluish green or dull translucent pale grayish green. Dorsal line inconspicuous, a little paler than ground. From segs. 2-9, inclusive, the ridge on each side of the dorsum is topped with a coral red blotch (sometimes practically obsolete), which is enclosed by the whitish or pale grayish-white, broken ridge stripe, a part of which also runs through this blotch dividing it into the more conspicuous inner and the more obscure outer portion. The blotch is most pronounced at about seg. 4. The ridge stripe is subtriangular on each segment, parallel with the dorsal line on its inner side and sloping obliquly ventrad and caudad exteriorly. An oblique sublateral, dark green dash, plainest on the anterior portion of the segments and sometimes obsolete on their latter half or more. Lateral stripe whitish, distinct, extending from seg. 2 to end of body, in heavily marked specimens this stripe is bordered above and below by purplish. A strong sublateral fold. Cervical shield behind and often partly hidden by a bilobed fold, subquadrate, rose color or whitish, with rather sparse, little ring-like tubercles, some piliferous. Feet pale greenish gray, brown tipped. Body somewhat thickly clothed with rather smooth, stout, short pile of pale brown color with darker tips and arising from small plain tubercles. This pile is not of uniform length.

In another larva the ground color is bright green, the dorsal blotches are rusty red in a broad broken yellowish-white stripe, lateral stripe yellowish-white with coral red borders, cervical shield rose color. Other larvae are pale green and fewer rose color. In one specimen the color is almost wholly coral red and rose and light grayish green ventrad.

Described from living specimens.

Pupa.—Length 10.75 mm., width above the middle of the abdomen 5.85 mm.; quite broad and stout, abdomen wider than high; dull brownish black, making the coloration almost uniform, in some specimens, however, the color is brownish mottled with blackish; stigmata brownish with pale yellowish rim. Body somewhat shining, quite roughened, indistinctly reticulate, well clothed with pale translucent brownish hairs of fair size, mostly pointed, often slightly clavate, and beset with short little spines, giving the hairs a roughened appearance. The hairs arise from small inconspicuous buttons.

Described from living specimens.

The larva of this butterfly, though often of various shades, mimics well the flower heads of the buckwheat; reclining as it does among the pale grayish-green and coral red colors of the flower it is often overlooked, though when once noticed the mimicry does not seem so strong and the larva is conspicuous enough. The larva of *Lycaena behrii, antiacis* and some others girdle themselves quite strongly, differing thereby from *Thecla dumetorum,* which girdles itself imperfectly, if at all, and pupates largely in rubbish, in contradistinction to the more exposed pupation of the former. None of my *dumetorum* pupæ have as yet emerged, and it is probable that it passes the winter in the pupal state.

23. **Chrysophanus helloides** Bdv.

Not uncommon in places where its food-plant grows. Lone Mountain, Presidio, Mountain Lake, Lake Merced, etc.

24. **Lycaena heteronea** Bdv.

Not found here at present. The locality given by Behr is the hilly region in the vicinity of Mountain Lake.

Mature larva.—Length (at rest) 18.25 mm., width above middle 6 mm.; pale translucent ultra ash gray, or with a slight greenish tinge, very nearly the color of the dorsal surface of its food-plant (*Eriogonum* sp.); ordinary onisciform, though slenderer than the larva of *Lycaena antiacis, behrii* or *Thecla dumetorum;* rather rounded and somewhat thickly clothed with rather smooth slender white pile and less numerous little white dots, which under the microscope appear as ovoid tubercles with constricted bases. Under the naked eye the larva presents a rather fuzzy aspect; segmentation not as distinct as in *Thecla dumetorum;* markings quite obscure. A pale ground color line on each side of the median one, then two more or less oblique

ones of the same color. In the spiracular area the ground seems somewhat darker. Stigmata pale yellowish with a narrow, brownish rim. Lateral line (which is the plainest of the markings) whitish. A slight indication of purplish at cephalic end of the largest specimen (described). I could find no indication of caudal cornicles for honey dew. A very sluggish larva.

Described from several living specimens in the final instar, taken in Marin county, May 23, 1909.

Pupa.—Length 12 mm., width at abdomen 5.30 mm.; stout; thorax rather high and humped, rounded; head gently rounded. Markings obscure, coloration pretty uniform, light green, pale greenish gray on wing covers, and most distinctly greenish on abdomen; reticulated with grayish white, this latter color being distributed in about the same proportion as the ground color. Pale green dorsal thoracic line, with blackish where it meets the abdomen line, more obscure on abdomen where it is plainest caudad. Some small, darker greenish subdorsal spots, hardly in a depression. Stigmata obscure, cream color. An ill-defined pale greenish lateral stripe. Wing venation marked by very pale grayish white. An irregular ventral circle of rusty brown crotchets. The raised reticulated surface is quite fine, in contradistinction to that of *Thecla dumetorum.* With the exception of the wing covers the pupa bears numerous little white spots, which, under the microscope are defined as little short-peduncled stellate discs. A smaller pupa is more heavily marked.

Described from living material.

The pupæ were fairly well girdled and produced imagoes in June and July of the same year.

25. **Lycaena pheres** Bdv.

Not uncommon in May and June in the vicinity of *Lupinus chamissonis,* upon which the larva feeds. This butterfly is subject to considerable variation on the underside of the wings. It is sometimes confounded with *L. fulla* of the mountains.

26. **Lycaena xerces** Bdv.

Quite rare, though formerly an abundant insect. Lone Mountain, Lake Merced, etc.

27. **Lycaena antiacis** Bdv.

I have given the life-history of this insect in Entomological News, Vol. XIX pp. 476-482, 1908. This form is more

abundant than the preceding, but is found with it. Like *pheres* it seems doomed to be never understood by many Lepidopterists.

In Great Britain, as I am informed by a correspondent, *Chrysophanus astrarche,* Bgstr, with its variety *artaxerxes,* F. has in the one, eye-spots on the wings, beneath, with heavy black pupils, while in its var. the white spots are without pupils. He further informs me that in Durham, the same batch of eggs will produce both of these forms and also an intermediate. This European insect, therefore, would seem to bear much the same analogy to *L. autiacis, xerces* and the intermediate *mertila,* only in the latter case the test of breeding has not been sufficiently applied.

28. **Lycaena sagittigera** Feld.

Mr. Cottle tells me that he took one specimen of this handsome blue years ago, at Mountain Lake, near the Marine Hospital. None have been taken since.

29 **Lycaena enoptes** Bdv.

Dr. Behr says (Proc. Cal. Acad. Sci., Vol. III, p. 282, 1867) that it is "to be found on the hills near Mission Dolores and in the San Bruno Hills. The species is rather scarce." I have taken one male at Lone Mountain in about 1902. None seen since.

30. **Lycaena acmon** Db. and Hew.

Still quite common and widespread and enjoying a long season. Larva on *Lotus glaber* and *Eriogonum latifolium* and other species. The fall brood of *acmon* is common in September.

31. **Lycaena piasus** Bdv.

Occurs in the Lake Merced region and probably also at Lobos Creek. Wanders occasionally into the city. Very common in the San Francisco Bay region.

32. **Pieris napi** Esper.

The forms *venosa* Scudder and *castoria* Reak. have been observed at Lobos Creek. Uncommon.

33. **Pieris rapae** Linn.

A very common butterfly in and about San Francisco, and quite a garden pest, its larva devouring the leaves of the cultivated *Nasturtium, Mignonette* and a host of others. In the fall of the year pupae are numerous along garden fences, walls, etc. In the southern parts of San Francisco where cabbages are grown extensively, scores of these "Whites" may be seen flying over the fields. Here the insect is probably triple-brooded, and on warm winter days an occasional adult may be seen. I well remember the time when *rapae* was scarce about the streets of the city; at present it is more abundant than *Pyrameis caryae.*

34. **Anthocharis sara** Bdv.

Described from a specimen taken in San Francisco, where it is at present rare or extinct.

35. **Colias eurytheme** Bdv.

This insect, with its several forms is quite abundant in the undisturbed districts. I have reared adults from larvae feeding on *Lotus glaber.*

36. **Meganostoma eurydice** Bdv.

This insect probably never inhabited the city, and I mention it merely because I took a female on the ocean beach west of San Francisco, being evidently blown across the straits from Marin County where it is common enough locally.

37. **Papilio philenor** Linn.

Not uncommon in the Lake Merced region where *Aristochia californica* grows. It is very common in Marin and Sonoma Cos.

38. **Papilio zolicaon** Bdv.

Is a resident of San Francisco where it is scarce however. I have noticed its larva here on one occasion feeding on a large Umbellate.

39. **Papilio rutulus** Bdv.

Observed by Mr. Cottle in the Lake Merced region where it is scarce or extinct at present.

40. **Papilio eurymedon** Bdv

Same distribution as *rutulus* and at present probably extinct here. The climate of San Francisco is probably too cool for these two species, and properly wooded land lacking.

41. **Pamphila juba** Scudd.

Taken by Mr. Cottle in a marshy area at Mountain Lake. May perhaps be still found there.

42. **Pamphila sabuleti** Bdv.

A very common insect and frequently seen in gardens and public squares. The larva, as is well known, feed on grasses, and as lawns are quite plentiful in the midst of the city, this little insect has no difficulty in maintaining a secure existence here. It is quite generally distributed over the western half of the city. The females vary much in intensity of coloration.

43. **Pyrgus tessellata** Scudd.

Quite plentiful. The larva feeds on *Malva sp.* and probably also on *Sidalcea.*

44. **Thanaos propertius** Lint.

Not common at present. Probably breeds in the oak thickets.

RESUMÉ.

Of the 43 species of butterflies given as inhabiting San Francisco at one time, probably not more than 30 could now be taken in the course of several seasons, and a newly arrived lepidopterist might well be surprised on learning that such butterflies as *A. epithore, S. sthenele, L. heteronea* and *sagittigera* formerly dwelt here. Furthermore, it is quite possible that such species as *C. xanthoides, L. amyntula, P. occidentalis, P. nemorum* and others flew in this region.

Before a decade has passed away there will be but little left of the insect fauna of our city, and therefore the importance and necessity of making local insect lists while the fauna is still extant and in an undiluted condition, cannot be too much emphasized.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., JANUARY, 1910.

We said in a previous number that we thought it likely that the review of the literature that we formerly gave would be continued. In this number it has eventuated. The trouble has been to get someone who loved entomology and entomologists enough to do this work. In the first volume of the NEWS, in the first two numbers, these reviews are signed E. M. A. Since that time a number of martyrs to the cause have spent good hours at the work. There is no doubt of the great value of a monthly review of the literature, but how often do those using it think of the person who has compiled it as a labor of love. At the present time we are fortunate in having a case of avatism in our midst. The gentleman who is conducting the Department of Literature at the present time undoubtedly inherited his entomology, as his grandfather was one of the founders of the American Entomological Society and its first meeting was held in his father's home. We are very grateful for the many kind letters received in regard to the increase of price for the present volume and the very great interest shown in the News and its future.

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, excluding Arachida and Myripoda, of the Americas (North and South). Articles irrelevant to American entomology, unless treating of new genera, will not be noted. 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, and are all dated the current year unless otherwise noted.

4. The Canadian Entomologist, London, Ont.—**7.** U. S. Department of Agriculture, Bureau of Entomology Bulletin.—**9.** The Entomologist, London.—**10.** Nature, London.—**13.** Comptes Rendus, Societe de Biologie, Paris.—**15.** Biologia Centrali-Americana, London.—**18.** Ottawa Naturalist.—**37.** Le Naturaliste Canadien, Chicoutimi, Quebec.—**38.** Wiener Entomologische Zeitung, Vienna.—**45.** U. S. Department of Agriculture, Bureau of Entomology Circular.—**50.** Proceedings, U. S. National Museum, Washington.—**58.** Revista Chilena de Historia Natural, Santiago.—**72.** Transactions, Kansas Academy of Science, Topeka.—**81.** Biologisches Centralblatt, Erlangen.—**89.** Zoologische Jahrbucher, Jena.—**92.** Zeitschrift fur wissenschaftlione Insektenbiologie, Berlin.—**101.** Rovartani Lapok, Budapest.—**143.** Ohio Naturalist, Columbus.—**153.** Bulletin, American Museum of Natural History, New York.—**158.** Gardenflora, Berlin.—**159.** Bolletino, Laboratorio di Zoologia Generale e Agraria della R. S. Superiore d'Agricoltura in Portici.—**161.** Proceedings, Biological Society of Washington.—**162.** Papers, American Society of Tropical Medicine.—**163.** American Journal of Science, New Haven, Conn.—**164.** Bulletin, University of Kansas, Lawrence.—**166.** Internationale Entomologische Zeitschrift, Guben.—**167.** O Entomologista Brasileriro, S. Paulo.—**169.** "Redia." R. Stazione di Entomologia Agraria in Firenze.—**170.** Zoological Press Bulletin, Division of Zoology, Pennsylvania Dept. of Agriculture, Harrisburg.—**171.** The Museums Journal, London,—**172.** The American Museums Journal, New York.

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Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

The November number of "The Border," published at Phoenix, zona, contains a very interesting sketch of Dr. R. E. Kunze, the entomologist and botanist. The title of the article is "The Cactus Man."

"My little dog has fleas," the woman cried.
"Do give me something that will cure them, please."
And then the silly drug store clerk replied:
"What seems to be the matter with the fleas?"

The coming summer promises to be a very interesting one in Europe. The First International Entomological Congress will be held in Brussels from the first to the sixth of August. At this time the International Exposition will be held in the same city.

More Unnatural History.—"The sting of some insects will kill a gold fish in almost every instance. 'Snake feeders' and other insects fly close to the water in summer, and, when the tiny fish rise to the surface of the pond, as is their habit, an egg is laid, or a sting inserted, by one of these watchful insects. Either of these inflictions is fatal."—"The Popular Magazine," October, 1909, page 89.

The United States Post Office Department has promulgated a new rule concerning mailing privileges for second class matter. This rule, which is reasonable and proper, provides that all subscriptions not paid for within a reasonable time shall be denied the second class mailing privilege. Kindly assist us in complying with the post office regulations by remitting promptly.

Two Coccidae New to Colorado.—We are indebted to Mr. L. C. Bragg for specimens of two species of Coccidae new to the Colorado list, one a native, the other introduced and only occurring under glass. (1) *Targionia helianthi* (Parrott). On *Artemisia dracunculoides* (a new food-plant). Fort Collins, 1909. (2) *Diaspis zamiae* Morgan. On *Cycas* in greenhouse. Fort Collins, 1909.—T. D. A. Cockerell and L. H. Falk.

The Eighth International Zoological Congress will be held in Graz, Austria, August 15 to 20, and all persons interested in Zoology are invited to become members of the Congress. The meetings will be held in the great Stephaniensaal and there will be interesting excursions to Erzberg and the Leopoldstein See. Trieste and possibly to the Royal Castle of Miramar. Also special excursions to Dalmatia, Bosnia and Herzegovina.

With reference to Mr. Banks' note on the date of Guérin's "Iconographie du Règne Animal," the correct date of the text is 1844. In a letter from Adam White dated London, January 9, 1845, and published in the "Annals and Magazine of Natural History" XV. 119, he writes: "I have seen, for the first time, the text to Guérin's admirable 'Iconographie du Règne Animal' (a work which on the title-page bears the date of 1829-38, although I see on the *wrapper* it was not finished till 1844, through some mistake of the printer [?]." It is therefore evident that the text was actually published in 1844. The plates had been issued some time previously and were cited by the contemporary writers. —G. W. Kirkaldy.

During January and February the address of Mr. John A. Grossbeek will be in care of Dr. William Barnes, Decatur, Illinois. Correspondents please take notice.

A full size specimen of *Thysania zenobia* was taken at Louisiana, Mo., November 10, 1909. It was resting on a board, with its wings flat against the surface, and from the appearance of the hind wings was quite fresh; but, unfortunately, the boy who brought it to me carried it by the tip of one fore wing, and, in its struggles to escape, it had ruined both wings. Isn't it unusual to take this moth so far north?—R. R. Crowley.

Note on Dryophthorus bituberculatus Fab.—As the above species is still retained in Prof. S. Henshaw's list of North American Coleoptera, a note of correction may not be amiss. If I am rightly informed, California has been given as its habitat. However, to the best of my knowledge, it does not exist in any of our collections of North American Coleoptera and is not likely ever to occur within our faunal limits. In a rather large series of Rhynchophora from New Zealand

obtained from Captain Thomas Brown, author of a Manual of New Zealand Coleoptera is a specimen of the species under consideration. It lives according to this author* in the wood of the Kauri *Dammara australis*—and is placed by him among the Cryptorhynchidae and referred to *Mitrastethus* Redt.† It should be eliminated from our list.—W. G. Dietz, M. D.

Doings of Societies.

The fifty-fifth regular meeting of the Hawaiian Entomological Society was held in the library of the Hawaiian Sugar Planters' Experiment Station September 9, 1909.

Mr. Swezey presented a generic synopsis of Hawaiian Microlepidoptera.

Mr. Fullaway exhibited a collection of insects recently collected on Molokai and read notes on same.

Mr. Terry presented notes on *Syritta oceanica* (Dip.).

Mr. Kirkaldy reported the Mantid *Tenodera sinensis* from Kohala, Hawaii.

Mr. Kotinsky exhibited a *Pseudococcus*, possibly new, from Tantalus, Oahu.

Daniel B. Kuhns, *Secretary.*

The fifty-sixth regular meeting of the Hawaiian Entomological Society was held in the library of the Hawaiian Sugar Planters' Experiment Station October 7, 1909.

Mr. Kirkaldy exhibited a series of Scutellerine bugs of several species to show the color variation.

Mr. Swezey exhibited specimens and gave descriptions and notes on life history of some new Hawaiian Lepidoptera.

Daniel B. Kuhns, *Secretary.*

The fifty-seventh regular meeting of the Hawaiian Entomological Society was held in the library of the Hawaiian Sugar Planters' Experiment Station November 4, 1909.

Mr. E. M. Ehrhorn was elected to regular membership and

*—Op. cit. p. 504.

† Voy. Novara.

Dr. R. C. L. Perkins, Dr. David Sharp and the Rev. Thomas Blackburn were elected honorary members.

The Popular Names Committee presented their report on the common names of insects.

Mr. Ehrhorn described and exhibited a new method of mounting Coccidæ, a beautiful bunch of strung "earth pearls," *Margarodes trimeni* Giard (Coccid), also a box containing typical specimens of each family of the beetles of the United States north of Mexico.

Mr. Kotinsky read a very interesting paper on the Sugar-cane Mealy Bug; he also read a note from Brother M. Newell reporting the appearance of the Curculionid *Syagrius fulvitarsus* Pasc. in a fernery in Hilo. The insect has been known in Honolulu for sometime, but this is the first record from Hilo.

Messrs. Fullaway and Kotinsky presented notes and descriptions of *Rhiperziella rhizophilla* n. sp. (Coccid).

Mr. Swezey read a note on *Rhiparobia madeira* (Orth.); and exhibited a collection of insects made on a recent trip in the Waianae Mountains.

DANIEL B. KUHNS, *Secretary*.

At a regular meeting of the Feldman Collecting Social held October 20, 1909, at 1523 South Thirteenth Street, Philadelphia, eleven members were present, Mr. Grossbeck, of New Brunswick, N. J., visitor. President Harbeck in the chair.

Mr. Grossbeck read a paper on *Culex perturbans*, Walk., by Prof. Smith.

Mr. Daecke said since last meeting, when he mentioned having bred *Pyrausta laticlavia* G. and R. from Horsemint, (*Monarda punctata* L), he has bred *P. signitalis* Walk. from same species of plant. Same speaker exhibited *Melanoplus punctulatus* Scud., a rare species of Orthoptera, a ♀ taken while ovipositing in the trunk of a pine tree about four feet above the ground; the abdomen was so far in the wood that the tree touched the base of the hind legs. Said on June 27 while at Englenook he sat down to rest in a place where "skippers"

(*Eudamus tityrus* Fabr.) were common. One flew on his hand where he noticed it was acting in a peculiar manner and upon watching it he found it would touch the tip of its abdomen to his hand where it would deposit a drop of liquid then with its proboscis would suck this up and then repeat the operation. Thought it did this to dissolve the salts on the skin from the perspiration. Tried the same experiment with *Argynnis cybele* Fabr., but failed.

Mr. Wenzel described how he found several species of Coleoptera in New Jersey on *Tephrosia virginia* (Ch.) at different stages of its growth. Also exhibited his collection of *Lycus* containing seven or eight species from the West, each of which is very closely mimicked by a small moth, and a box containing about forty species of Coleoptera, all new and collected on the Kaeber-Wenzel Expedition to the Huachuca Mountains of Arizona. Specially mentioned a new genus and species, *Anoplocephalus cribrifrons,* described by Schaeffer, a new *Euphoria,* two species of *Brachys* and three of *Agrilus.* Said they had found a species of *Coptocycla* common on a certain vine and when Schaeffer had visited this same vine two years before he found another species of *Coptocycla* common, but none of the other.

Mr. Grossbeck mentioned, in connection with what Mr. Wenzel had said about *Coptocycla,* a certain pool in Great Peace Meadows of New Jersey showing how species will disappear and be replaced by others. The first year it was visited it contained thousands of larvæ of *Culex canadensis* Theo., the second year *C. pretans* Grossb. only, the third year *C. abfitchi* Felt only, and the fourth there were some of each.

Mr. Harbeck exhibited a freak Teuthredinid, with four branches to its antennæ; on one side the branches join about half their length and continue as one while the other two branches are perfect for their entire length. The specimen was taken at Trenton, N. J., viii, 23, 1909.

Adjourned to the annex.

GEORGE M. GREENE, *Secretary.*

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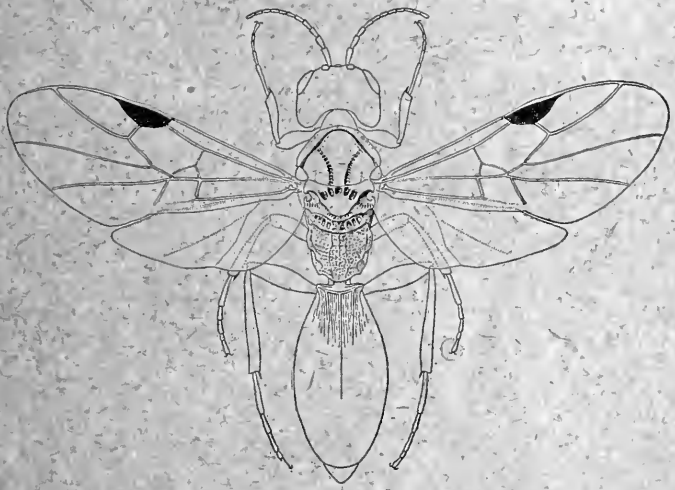

Vanhornia eucnemidarum Crawford.

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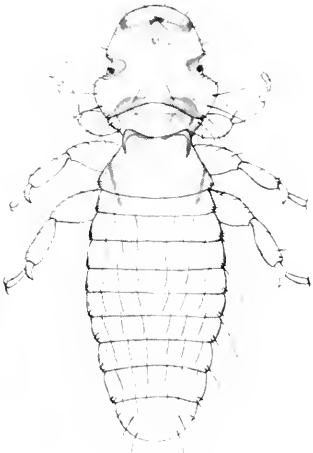
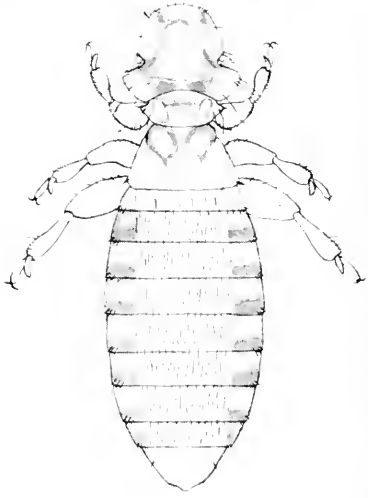
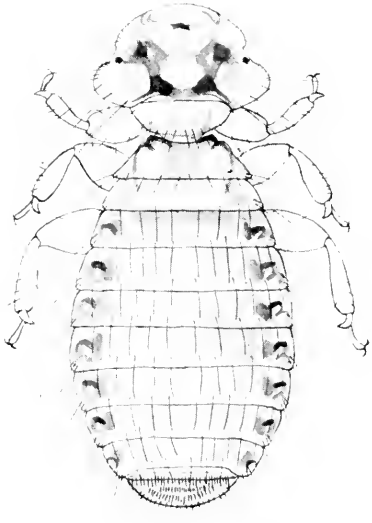
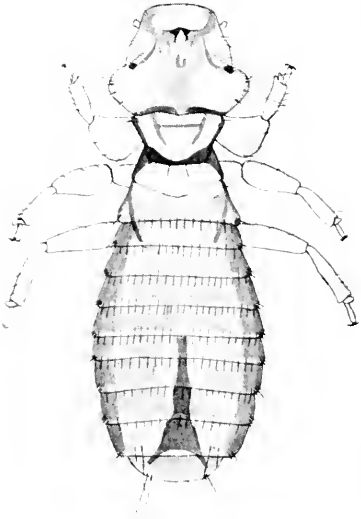








COLPOCEPHALUM OCULARIS.
MENOPON HIRSUTUM.

COLPOCEPHALUM SUBPUSTULATUM.
NITZSCHIA LATIFRONS.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXI. FEBRUARY, 1910. NO. 2.

CONTENTS:

Some new Species of Mallophaga from Michigan.*

BY M. A. CARRIKER, JR., AND CHARLES A. SHULL.

(Plate V.)

The new species of *Mallophaga* described in this paper were captured on birds taken in Huron Co., Mich., during the summer of 1908, by Mr. N. A. Wood, taxidermist to the Museum of the University of Michigan, and ornithologist on the Michigan Biological Survey during that summer.

The specimens of *Mallophaga* taken were examined very carefully by Mr. M. A. Carriker, Jr., who described, named and prepared the illustrations of the new species just before leaving for South America on a long collecting trip. The descriptions as here given are taken verbatim from his manuscript notes.

Of the five new forms found, two species and one subspecies belong to the genus *Colpocephalum,* one to the genus *Menopon,* and one to that small and interesting genus *Nitzschia.*

*Published by permission of Dr. A. G. Ruthven, Chief Field Naturalist of the Michigan Biological Survey.

Suborder **AMBLYCERA** Kell.

Family LIOTHEIDAE Nitzsch.

Genus **COLPOCEPHALUM** Nitzsch.

Colpocephalum spinulosum obscurum subsp. nov.

Of the same size as *Colpocephalum spinulosum minor* Kell., from which it differs in the proportions of the head, the clear temples and legs; the pitchy markings on legs; the absence of clear pustules along the posterior margin of the abdominal segments; and in the darker lateral abdominal bands, which are abruptly darker than the transverse bands.

Piaget's description of *C. spinulosum* (Les Pediculines, p. 563, pl. XLVII, 3) is very clear and the plate excellent, and both he and Mr. Kellogg agree on the statement that the male of both *C. spinulosum* and *C. spinulosum minor* Kell. has a single transverse row of large pustulated hairs on each abdominal segment, while in the female there are two such rows. The present form has (in both male and female) a row of fine hairs along the posterior border of the metathorax and each abdominal segment (except the ninth), but set closely together and in very small pustules of exactly the same size as the numerous small ones scattered over the whole segment. In the present form the median transverse and longitudinal clear bands are wanting, while the coxal bands are entire, very conspicuous and pitchy brown, also the sternal markings of both prothorax and metathorax. The temples, sides of front part of head and the front of the clypeus are perfectly clear, while the median portion of the head is clear brown, with the pitchy ocular, frontal, and occipital markings of true *spinulosum*. With these exceptions the new form agrees better with Piaget's description and plate than with Mr. Kellogg's plate of *C. s. minor* (New Mall. III, 112, pl. VII, Fig. 9).

One male and a female from the Turnstone (*Arenaria interpres*), *C. spinulosum minor* Kell., was taken from the Sanderling (*Calidris arenaria*), while true *C. spinulosum* Piaget was described from *Limosa melanura*.

Colpocephalum ocularis sp. nov. (Fig. 1)

Female.—Body, length 1.12 mm., width .38 mm.; clear, light brown throughout; paler on posterior portion of abdominal segments, on

legs and on a line from inner corner of ocular band to occiput. Head, length .25 mm., width .38 mm.; somewhat flatly parabolic in front, with six short hairs on clypeal margin and with four short and one long hair between palpi and (including) anterior angle of the ocular emargination; ocular emargination rather deep; eye large, bipartite, with a median black fleck, temples expanded, rounded, with two long and three shorter hairs; temporal angles slightly rounded; occipital margin regularly concave, with two submarginal hairs; tips of mandibles dark brown; pitchy brown bands curve forward from the base of the mandibles to the frontal margin; narrow, pitchy brown ocular bands extend inward from either angle of the ocular emargination and meeting internally, inclose a V-shaped area, which is darker brown than the remainder of the head; a darker submarginal band along the occiput, broken medially (probably showing through from thorax), clear lines extend inward and backward from the point of the V-shaped ocular bands to a median point where they join, thence extend backward to occipital margin.

Prothorax as wide as head at temporal angles (.25 mm.); lateral angles produced, bluntly rounded, and with one hair just posterior to the angle; coxal bands of darker brown, entire, and very plain from above.

Metathorax quadrangular, sides broadly diverging; mesothoracic suture prominent on margin; anterior angles acutely rounded, naked, with narrow dark brown marginal and submarginal bands which unite on median anterior margin of segment and at their posterior ends; a narrow brown band runs backward and inward from the lateral margin across the postero-lateral angles and into the first abdominal segment; posterior angles acutely rounded, with two spines and one hair; posterior margin of segment convex, without hairs (?).

Abdomen rather spindle-shaped, slightly constricted at the sixth and seventh segments; lateral angles not prominent, rounded, with one small spine and one longish hair; posterior margins of segments transverse (except seventh and eighth, slightly concaved), with about six longish hairs; faint, incomplete transverse bands of clear brown; lateral bands of darker brown, darker near lateral margins of segments, and scarcely separated at the sutures; the ninth segment the longest, rounded posteriorly, with some short hairs, two long marginal and two long submarginal hairs. Legs long and strong, with especially large tibiae and tarsi; femora and tibiae with some short hairs.

Taken on *Arenaria interpres*. This is apparently not very closely related to any form which I have seen described or figured, the V-shaped ocular bands and spindle-shaped, constricted abdomen distinguishing it at once.

Colpocephalum subpustulatum sp. nov. (Fig. 2).

Female.—Body, length 2.05 mm., width .64 mm.; uniform clear brown throughout, with no large clear areas and few markings much darker than the general color of the body.

Head, length .20 mm., width .48 mm.; front flatly rounded, with seven stout hairs between the tips of the projecting palpi; a slight angulation just in front of palpi, between the front and sides of the fore part of the head; four short hairs between this angulation and the anterior angle of the ocular emargination; ocular emargination deep, with a fringe of stout hairs along the posterior margin; temples expanded, with rounded angles in front and rear, between which are four hairs, only one of which is rather long; occipital margin deeply and evenly concave, without hairs; mandibles small, dark chestnut; short curving bands of same color from base of mandible to near frontal angulation; eye prominent, with a large black fleck; a blotch of dark chestnut brown at inner margin of ocular emargination; a darker band along occiput, narrower in center.

Prothorax, .35 mm. in width, hexagonal, with prominent rounded lateral angles, furnished with a spine and one short hair; narrow, complete coxal bands of darker brown showing plainly from under surface. Mesothoracic suture visible on the lateral margins only; metathorax, length .30 mm., width .48 mm.; quadrilateral, with broadly diverging sides, rather acute, slightly rounded, anterior angles and more broadly rounded posterior angles, with two small spines, posterior margin (?) transverse; narrow band of dark brown around frontal margin of mesothorax, curving inward and backward at the lateral suture (coxal bands).

Abdomen elongate oval, lateral angles scarcely projecting and with but one or two very short, fine hairs; slightly darker brown lateral bands, inside of which is a narrow, longitudinal clear streak, running the whole length of the abdomen; transverse bands solid, with scarcely any lighter area at the sutures, each segment with two or three irregular rows of fine short hairs, the median row of which are set in very small clear pustules (not shown in drawing); ninth segment largest, slightly clear in anterior portion, with faint, parallel, longitudinal striations along sides; one short hair on lateral margin. Legs robust, concolorous with body, femora considerably swollen and all segments (especially tarsi) with short stiff hairs along posterior and anterior margins.

Taken on *Ceryle alcyon,* the first record for a species of this genus on any member of the family. Osborn has recorded *Colpocephalum pustulosum* from the kingfisher, but it was

probably a specimen of the present form, as the two have a superficial resemblance.

This form most nearly resembles *C. pustulosum* Piag., described from the European Ruff (*Machetes pugnax*), but from which it is at once recognized by the absence of the conspicuous double row of clear pustules on the abdomen and on the posterior margin of the head, by the absence of very long hairs on any portion of the body (except one on temples), and by the absence of the fringe of fine hairs on the posterior extremity of the abdomen.

Genus **MENOPON** Nitzsch.

Menopon hirsutum sp. nov. (Fig. 3).

Female.—Body, length 2.64 mm., width .83 mm.; clear, tawny brown throughout, with darker brown and chestnut bands on head and body.

Head, length .37 mm., width .65 mm.; front broad and flatly rounded, with numerous short hairs; ocular emargination almost entirely filled by swelling; ocular fringe present but very sparse and short; eye small, almost wholly concealed by a black fleck; temples greatly expanded, regularly rounded, with four long stiff hairs, three of which arise from clear pustules; occipital margin re-entering, occiput transverse, with pitchy brown submarginal bands from which extend broad chestnut bands forward to base of mandibles, with prolongations extending outward toward eyes and a paler internal connecting band even with the eyes, and enclosing a small triangular clear spot on each side; mandibles slender, pointed, tips pitchy brown; short curved marginal bands just in front of palpi, connected by a paler band with the ocular bands.

Prothorax transverse (.41 mm. broad); lateral angles produced, rounded, and with one long hair; posterior angles scarcely evident, very obtuse and with one long hair; posterior margin slightly convex, with six stout hairs.

Metathorax broad and short (.16 mm. x .52 mm.); mesothoracic suture very conspicuous on the lateral margins, sides straight, diverging, posterior angles acute, with two stout hairs, posterior margin transverse, with about eight hairs; pitchy marginal bands around anterior angles; region of posterior angles darker, with a dark band extending backward and inward from mesothoracic suture to posterior margin of the first abdominal segment.

Abdomen broadly oval, with prominent transverse bands on each segment, and clear sutures, lateral bands present, scarcely darker than transverse bands, but in the lateral portion of each segment, except

the ninth, there is a curiously shaped, doubly curving darker band, ending internally in a dark blotch, ninth segment uniform clear tawny brown, with a row of short hairs along the posterior margin, and a submarginal double frings of very fine short hairs on the dorsal surface, posterior angles of abdomen rather prominent, colorless, and with about three stout hairs; about twelve stout hairs along posterior margin of each abdominal segment. Legs rather stout, concolorous with body, and with a few short hairs.

From *Dryobates pubescens*. This form is very different from any species of *Menopon* heretofore described from any of the woodpeckers and seems to have no near relative.

Genus **NITZSCHIA** Denny.

Nitzschia latifrons sp. nov. (Fig. 4).

Male.—Body, length, 1.45 mm.; width, .53 mm.; clear fulvous brown, darker on the abdomen, and with a few narrow dark brown bands on the head, thorax and broad lateral bands on the abdomen.

Head, length, .32 mm.; width, .43 mm.; front broad, very flatly rounded, and with the lateral angles very pronounced, sides slightly diverging, sinuate, with the palpi projecting for nearly entire apical segment; front with two short hairs, lateral angles with two, and two on each side, ocular fringe long and strong, eye concealed by a black fleck, temples expanded, rounded, with two long and two shorter hairs; occipital margin concave, occiput convex, without hairs, mandibles small, pointed, pitchy at tips; short curving bands from base of mandibles to lateral frontal angles; ocular bands narrow, curving, and extending from eye to root of mandible.

Thorax longer than head (.48 mm.), broadest at posterior angles of metathorax; lateral angles of prothorax prominent, rounded, with one heavy spine, narrow lateral marginal bands, posterior margin extending over mesothorax, flatly convex and with four short hairs. Mesothorax with the anterior angles and margin heavily colored, the sides diverging and posterior margin angulated in the median portion. Metathorax scarcely longer than mesothorax, sides diverging, lateral angles broadly rounded, with one spine, and the posterior margin transverse, and furnished with a row of short, slender hairs; posterior portion of segment more heavily colored than the anterior portion and mesothorax; lateral margins with narrow darker bands and with bands curving inward and backward from the lateral margins, and extending nearly across the first abdominal segment.

Abdomen slightly oval, rather small, with heavy, almost continuous transverse bands and heavier lateral bands; region of sutures clearer; lateral angles rounded, not prominent and furnished with three short

hair-like bristles; ninth segment evenly rounded, uniformly colored throughout, same as remainder of segments, except a clear portion on each side of posterior margin, from which arise two long hairs, all the segments from first to seventh furnished with a row of fine hairs along the posterior border, about twenty in number; eighth segment with but two on each side of middle.

Legs rather long and strong, front femora much swollen, hind femora slender, all legs having a few short stiff hairs on the femora and tibiae.

Taken on *Riparia riparia*. This form is nearest *N. pulicaris* Nit. and *N. bruneri* Carriker, resembling most in coloration the latter form, but from which it may be distinguished at a glance by the broad, very flatly rounded forehead. The female is larger, especially the abdomen, measuring about 1.60 mm., with an abdominal width of .62 mm.

Description of a new Species of Coriscium. [Lepidoptera, Tineidae.]

By Charles R. Ely.

Coriscium serotinella n. sp.

Labial palpi straw-colored, sprinkled with black anteriorly on second joint; much more profusely shaded with black exteriorly, especialy at the tip of each joint; the second joint ending in a brush; the third joint somewhat enlarged toward tip. Maxillary palpi straw colored with black at the tip of each joint. Antennae black with white annulations; basal joint straw color tipped with black and first two or three segments at base whitish, contrasting with remaining segments. Face, head and thorax purple gray more or less mixed with yellowish; a straw-colored whorl of scales on top of head at the base of each antenna. Abdomen uniform gray above, lighter than thorax, but more or less mixed with yellowish on under side; extreme tip of abdomen covering genitalia straw color. Legs near body colored like thorax, outer segments yellowish with annulate dark shading; tibiae smooth. Fore wings very dark purple with yellowish white markings; a white streak from costal edge near base slanting outwardly to dorsal edge; a V-shaped mark of mixed white and yellow scales on costa near middle of wing, with vertex directed toward dorsum and extending about three-fourths of the distance across the wing, from this point a straight whitish line extends perpendicularly to the dorsal edge; two white patches on costa between V mark and vertex, nearly equally spaced; two white patches near dorsal edge at

points about ½ and ¾ of wing from base; cilia smoky, interspersed with black near vertex; three yellowish streaks cut through cilia from points just above, just below and at vertex. Hind wings somewhat lighter gray than cilia, which are yellow gray. Alar expanse 13—14 mm.

Habitat.—East River, Conn.; Dublin, N. H.

Food plant.—Prunus serotina.

Type.—U. S. Nat. Mus., No. 12,854.

Described from one male and one female bred by the writer on *Prunus serotina* during August, 1909, at East River, Conn.,

Co-types.—One male, Dublin, N. H.; collector, A. Busck; four specimens, East River, Conn.; collector, Chas. R. Ely, July 11 to August 12, 1909.

The larvae from which the two bred specimens were obtained were taken from the tips of the leaves of *Prunus serotina,* which had been folded over in the form of a hollow tetrahedron. The cocoons were made in a slightly folded leaf and were yellowish in color, boat-shaped below and flat on top. At emergence the pupal casing was left protruding from one end of the cocoon.

The captured specimens, which do not have the maculations as sharply defined as do the bred specimens, also vary somewhat in shading.

The writer is under obligation to Mr. August Busck for the privilege of describing and naming this species.

A new Xiphidion from Northern Georgia.

By A. N. Caudell, U. S. Nat. Museum.

Xiphidion allardi n. sp.

Brachypterous, the elytra failing to cover the abdomen in either sex. Head with face uniformly green; eyes black and prominent; vertex narrow, about one-fourth as wide as the distance between the eyes, slightly ascending and somewhat constricted before the apex. A uniform dark stripe extends along the top of the head to the apex of the vertex, posteriorly continued across the entire length of the pronotum, growing somewhat less distinct posteriorly. Thorax and abdomen green, the latter, together with the genital organs, mottled above with fuscous. Elytra apically broadly rounded, the sides about parallel, in

the male covering three-fourths of the abdomen and light brownish green, the tympanal plates darker; in the female the elytra cover about one-half the abdomen and are unicolorous. Wings falling a little short of the tips of the elytra. Legs green, the geniculations of the posterior pair fuscous, the hind femora spotted with reddish brown, and unarmed beneath. Cerci of the male with the tooth situated about the middle, triangular and forming an angle with the apical portion of the cercus, which is about twice as long as the basal width and apically depressed. Ovipositor brown, straight, longer than the posterior femora and apically tapered somewhat abruptly, the lower margin tapered slightly more than the upper. Length, elytra, ♂, 6.5 m.m., ♀, 5 m.m.; posterior femora, ♂, 11.5 to 12.5 m.m., ♀, 13 m.m.; Ovipositor, 15 to 16 mm.

Type.—No. 12,747, U. S. Nat. Mus.

Two males, two females, Tray Mountain, Towns Co., N. Georgia (alt. 4,389 ft.) H. A. Allard, collector.

This green little grasshopper superficially resembles *Xiphidion brevipenne* and *X. ensifer,* but is amply distinct from both these species. The collector, in whose honor the species is named, contributes the following notes relative to the occurrence and song of the insect:

"I first heard and captured specimens of this *Xiphidion* late in September, in a sunny, grassy spot in the woods at Indian Grave Gap, Towns County, North Georgia. A few days later I found it in similar sunny, open situations on Tray and Blue Mountains, in the immediate neighborhood of Indian Grave Gap.

"It prefers the low weeds and short grass, and was very musical during the sunny hours of the day. Its song is strikingly unlike the notes of *Xiphidion fasciatum* or *Xiphidion memorale,* as no staccato notes whatever precede the more or less prolonged lisping phrases. These phrases are soft, faint and often greatly prolonged. In sound-quality, they recall to mind the notes of *Orchelimum minor.* I did not find this *Xiphidion* particularly common."

Eight illustrated lectures on The Development and Significance of Animal Societies were given by William M. Wheeler, Ph.D., Professor of Economic Entomology, Harvard University, at the University of Pennsylvania, last month.

Studies in the Tenebrionid Tribe Eleodiini—Order Coleoptera.

By F. E. Blaisdell, Sr.

It was originally intended to include in the writer's recent monograph of the Eleodiini a list of the genera, subgenera, species, varieties and forms in the order that they should be placed in a cabinet arrangement; also, a philosophical discussion of the taxonomic grades and autogenesis, but it was found advisable to reduce the size of the manuscript as it exceeded a desirable magnitude.

The cabinet arrangement is now presented to aid Coleopterists when going over their material. The *formae* are not to be given in a check list arrangement.

More recent studies by the author in the East and at home have determined several changes in certain of the grades, in order to present a more satisfactory status of relationships.

Through the courtesy of Col. Thos. L. Casey the writer had an opportunity to examine his types, such as were not at hand while the monograph was in preparation.

The following is the list with such changes as are deemed absolutely necessary for a presentation of more recent notions regarding relationships. Formae or incipient races are given in italics; true synonyms are in italics and parentheses.

ELEODES Esch.
(Melaneleodes Blais.)

1. debilis Lec.
2. carbonaria Say. (*immunis* Lec.)
   - *forma glabra.*
   - *forma typica.*
   - *forma interstitialis.*
   - var. soror Lec.
3. ampla Blais.
   - var. nitida Casey (*dolosa* Blais.)
4. Obsoleta Say.
   - *forma glabra.*
   - *forma typica.*
   - *forma punctata.*
   - *forma annectans.*
   - var. porcata Casey.
5. knausii Blais.
6. omissa Lec. *interrupta* Blais.)
   - *forma typica.*
   - *forma catalinae.*
   - *forma communis.*
   - *forma emarginata.*
   - var. pygmæa Blais.
     - *forma typica.*
     - *forma borealis.*
   - var. peninsularis Blais.

7. quadricollis Esch.
   forma typica.
   forma tarsalis. (*tarsalis* Casey.)
   var. anthracina Blais.
   var. lustrans Blais.
8. cuneaticollis Casey.
9. humeralis Lec.
   forma typica.
   forma granulato-muricata.
   forma tuberculo-muricata.
10. rileyi Casey.
11. tricostata Say. (planata Sol; alternata Kirby.)
   forma typica.
   forma ovalis.
   forma costata.
   forma robusta. (*robusta* Lec.)
12. pedinoides Lec.
   forma typica.
   forma asperata. (*asperata* Lec.)
   var. neomexicana Blais.

(LITHELEODES Blais.)

13. arcuata Casey.
14. extricata Say.
   forma typica.
   forma convexicollis.
   forma cognata typica. (*cognata* Hald.)
   forma cognata punctata.
   forma elongata.
   var. arizonensis Blais.
15. granulata Lec.
   forma typica.
   forma obtusa. (*obtusa* Lec.)
   forma aspera. (*aspera* Lec.)
   forma tuberculata.
16. letcheri Blais.
   var. vandykei Blais.
   forma typica.
   forma parvula.

(TRICHELEODES Blais.)

17. hirsuta Lec.
18. pilosa Horn.
   forma typica.
   forma ordinata.

(PSEUDELEODES Blais.)

19. granosa Lec.
   forma typica.
   forma fortis.

(PROMUS *Lec.*)

20. insularis Linell II. (*forma typica.*)
   var. terricola n. var. (*forma peninsularis.*)
21. subnitens Lec.
   forma typica.
   forma sinuata.
22. goryi Sol.
23. striolata Lec.
24. fusiformis Lec.
25. opaca Say.

(HETEROPROMUS Blais.)

26. veterator Horn.

(ELEODES Esch.)

27. obscura Say.
   var. dispersa Lec.
   forma deleta. (*deleta* Lec.)
   var. *typica.*
   var. sulcipennis Mann.
   forma arata. (*arata* Lec.)
28. acuta Say.
29. suturalis Say.
   var. texana Lec.
30. grandicollis Mann. (*elongata* Grinnell.)
   forma typica.
   forma valida. (*valida* Boheman.)

31. sponsa Lec.
forma typica.
forma convexa.
32. hispilabris Say. (*sulcato* Lec; *lecontei* Gemm.)
forma typica.
forma nupta. (*nupta* Lec.)
var. *sculptilis* n. var. (*forma sculptilis.*)
forma elongata.
forma convexa. (*convexa* Lec.)
forma laevis.
var. composita Casey.
33. caudifera Lec.
forma glabra.
forma sublaevis.
forma typica.
forma scabra.
34. longipilosa Horn.
35. gracilis Lec.
var. distans Blais.
36. subpinguis Blais.
37. dentipes Esch.
var. pertenuis n. var (*forma pertenuis.*)
var. elongata n. var. (*forma elongata.*)
forma laevis.
forma punctata.
var. prominens Casey.
var. confinis Blais.
forma robusta.
var. elegans Casey.
38. armata Lec.
forma typica.
forma sinuata.
var. impotens Blais.
var. subcylindrica Casey.
forma typica.
forma subedentata.
39. militaris Horn.
forma typica.
forma subedentata.
var. femorata Lec.
40. acuticauda Lec.
forma typica.
forma punctata.
var. laticollis Lec.
forma typica. (*f. muricata major.*)
forma minor. (*f. muricata minor.*)
forma insularis.
41. eschscholtzii Sol.
var lucæ Lec.
forma typica.
forma ecaudata.
forma inflata.
forma grandis.
42. tenuipes Casey.
43. wickhami Horn.
44. ventricosa Lec.
var. falli Blais.

(Blapylis Horn.)

45. tibialis Blais.
forma typica.
forma oblonga.
46. snowii Blais.
forma typica.
forma sinuata.
forma robusta.
47. lecontei Horn. (*subaspera* Lec.)
48. tenebrosa Horn.
var. nana Blais.
49. inculta Lec.
50. consobrina Lec. (*veseyi* Lec.)
51. scabripennis Lec.
52. blanchardii Blais..
53. fuchsii Blais.
54. neotomæ Blais.
55. hornii Blais.

56. parvicollis Esch.
    forma typica.
    forma farallonica.
    var. behrii Grinnell. (*intermedia* Grinnell.)
    var. planata Esch.
    var. producta Mann.
    var. constricta Lec.
57. hoppingii Blais.
58. clavicornis Esch. (*impressicollis* Bohemann.)
59. scabrosa Esch.
60. cordata Esch. (*tuberculata* Esch; *intricata* Mann; *stricta* Lec.)
    forma sublaevis.
    forma typica.
    forma intermedia.
    forma elongata.
    forma oblonga.
    var. rotundipennis Lec.
61. pimelioides Mann. (*viator* Lec.; *subligata* Lec.)
    var. brunnipes Casey.
62. caseyi Blais.

(METABLAPYLIS Blais.)

63. nigrina Lec.
    var. perlonga Blais.
64. dissimilis Blais.
    var. nevadensis Blais.
65. schwarzii Blais.

(STENELEODES Blais.)

66. gigantea Mann.
    var. gentilis Lec.
    var. estriata Casey.
67. longicollis Lec. (*haydenii* Lec.)
68. innocens Lec.

(DISCOGENIA Lec.)

69. marginata Esch. (*fischeri* Mann.)
70. scabricula Lec.
    forma typica.
    forma deplanata.
71. planipennis Lec.

EMBAPHION Say.

1. depressum Lec.
2. elongatum Horn.
3. glabrum Blais.
4. contractum Blais.
5. planum Horn.
6. contusum Lec.
    forma typica.
    forma grandis.
    var. Laminatum Casey.
7. muricatum Say. (*concavum* Lec.)

The *formae* enumerated under each specific heading constitute the specific aggregate. The individuals making up the aggregate exhibit variation, such variation necessitates the recognition of minor grades or incipient races.

The particular form of variation which happened to serve as the type of the species, characterizes the *forma typica;* the latter may be mesotypical or heterotypical of the aggregate,—it all depends whether it takes its place as an intermediate or an extreme in the specific series.

For example, the species *carbonaria* as a specific aggregate includes individuals which are comparatively smooth, others

which are strongly and more or less roughly sculptured, these two extremes being connected by an unbroken series of intermediates in degree of sculpturing.

It happens that the type specimen which served for Say's description, takes its place in the middle of the series and it is therefore mesotypical of the specific aggregate; the extremes being respectively the *forma glabra* and *forma interstitialis* of the present list.

The individuals making up the specific aggregate do not necessarily breed true to any intraspecific degree of sculpturing, as this is wonderfully influenced by environment and food supply. It has been observed that those individuals that develop in an exposed, open or dry region, where the body fluids are reduced to a minimum by evaporation during the closing chapters in the ontogenesis, especially after casting of the pupal skin, will develop a feeble or a comparatively smooth form of sculpturing; on the other hand, those individuals developing in a moist, shaded or protected region or area, where the body fluids are conserved and abundant, evaporation being reduced to a minimum, will have the integuments and elytral apodemes after the casting of the pupal skin, well distended by the body fluids and the punctures and striæ relatively deepened and more or less fixed in that condition during the hardening of the exoskeleton. In this way a more strongly punctured or strongly striate form is produced; rapid evaporation of the body fluids at this time tends to produce a wrinkling of the elytral wall.

It is to be borne in mind that any given geographical area, small or large, will have relatively dry and warm, moist and cold conditions co-existing in different sections of that area.

These data have been noted by my colleague, Dr. E. C. Van Dyke, as well as by myself in the field and laboratory.

The individuals that constitute the specific aggregate, therefore, are only those which really belong to a single species and will breed true *within the limits of normal specific variation.* The development of smooth and rough forms depending more upon meteorological conditions than anything else, nanoid

forms from lack of food, and other unfavorable conditions, large forms from abundant food supply and favorable conditions. True specific characters are inherent, but modified by the conditions mentioned above.

Seasonal conditions determine the character of the dominant form of sculpturing. Some seasons developing a large per cent. of the smooth form, or a cold, damp season the more strongly punctured and striate forms. Rapid evaporation of the body fluids the rugulose forms. In each instance a varying per cent. of the intermediate forms.

The progeny of any pair of individuals of either form will reproduce a certain per cent. of all the forms; *all these from eggs deposited by a single female.*

The per cent. of each form produced depending upon the peculiar environmental conditions prevailing during ontogenesis.

The recognition of the above facts will be a check to the describing of slightly differentiated forms as distinct species, when they are not, and cannot be, unless the specimen should represent a new and heretofore unknown specific aggregate.

If I were to mention an example of a distinct species of *Eleodes,* I would name *E. veterator.* A collector comparing the specimens constituting his catch of this species would note that the series is distinctly homomorphic. A similar catch of *Eleodes carbonaria* would present a decidedly heteromorphic series.

Eleodes nitida Casey is *dolosa* Blais. Casey's type is a male, and it agrees quite perfectly with my male type of *dolosa* and my name must be suppressed. *Nitida* bears the same relation to the *carbonaria* section that *lustrans* bears to the *quadricollis* section. The female of *nitida* has the anterior spurs of the anterior tibiae small, while the female of *lustrans* has large anterior spurs.

Composita Casey looks like a *porcata* in the character of its sculpturing. The thorax is more transversely convex, the sides especially, so that the pronotum looks narrow. The armed an-

terior femora and sulcate elytra, place it as a race of *hispilabris,* most closely related to the var. *sculptilis.*

Prominens Casey is a race of *dentipes.* It is peculiar on account of the prominent basal angles of the pronotum. In a series the angles pass into the normal form.

Elegans Casey is a small, short and particularly symmetrical unique, somewhat resembling some individuals of *parvicollis.* In facies it is related to *dentipes,* and is analogous to certain nanoid individuals of *acuticauda.*

Subcylindrica Casey.—The peculiar coloration of the types is due to immaturity. The two types are perfectly similar, the form of the pronotum is that of *armata,* the surface luster is dull and alutaceous. Specimens of *armata* collected by Prof. Wickham at Amedee, Lassen Co., Cal., and others collected in Nevada, southward to Arizona, have this same surface luster. The most striking character is the absence of teeth on the middle and posterior femora. Otherwise I cannot see that they differ from numerous specimens of fully armed *armata.* I consider these specimens as subedentate *armata.* Remarks upon this variation will be found in my recent monograph. Before seeing the types I had no idea of their true relationship.

Lecontei Horn.—While in the East I had an opportunity of examining specimens of this species in the collection of Mr. H. W. Wenzel. They were identical with the specimen received from Mr Frederick Blanchard; a specimen in the Horn collection was homomorphic.

Mr. Chas. Drury informs me that he took this species at Trinidad, Colorado, to Santa Fé, New Mexico. and that he distributed it in the East. He also remarks that hardly any two of them were exactly alike. Some were flat, and others up to the convex form, and that all had the same style of sculpture. I desire a large series of this species and also of *snowii* for a more critical study.

I have included *E. behrii* Grinnell in the present list as I believe it to be extant, and that careful collecting at Rosemary, Los Angeles Co., will bring specimens to hand. For the privilege of studying the Grinnell types, in the collection of In-

vertebrate Palaeontology of the University of California, I am indebted to the courtesy of Prof. J. C. Merriam.

At this time I take the opportunity to correct the following Errata observed in the Monograph of the Eleodiini, namely:

On page 18 the 12th line from the top should continue to *read* as follows: "At this point the pleural region is differentiated, less so in the fifth and not at all in the other segments."

Omit line 13 from the top, same page.

On page 19, in line 18 from the bottom, "inferior" *should read* "ventral," and "postero-inferior" *likewise* "postero-ventral."

On page 86, in line 19 from the bottom *insert* before "abdomen," "first segment of—."

On page 186, in line 9 from the bottom, *read* "tarsal grooves" *instead* of "tibial grooves."

New Bees of the Genus Prosopis.

By Myron H. Swenk and T. D. A. Cockerell.

Prosopis grossicornis n sp.

♂. Length 4.5 mm. Supraclypeal mark very large, its breadth at base greater than that of lateral face marks at same level, continuing but slightly narrowed upward for a distance equal to its breadth when its margins abruptly and rapidly converge and terminate in a narrowly truncate apex. Lateral face marks filling the space between the clypeus and subquadrate portion of supraclypeal mark and the orbits, the upward extension very short, less than width of the lateral marks and barely attaining level of antennal socket, narrowly linear, curved, acuminate at tip and divergent from the orbit. Both of these areas, together with whole of clypeus, pale yellow, the labrum, mandibles, and tubercles black. Antennae very long, distinctly surpassing the tegulae, flagellum pale ferruginous beneath, dusky above, front of scape with a yellow line. Head round, opaque, finely roughened, face but little converging below. Legs black with the tibiae and tarsi yellow except for a dark spot on posterior face of anterior tibiae and dark rings around middle of intermediate and posterior tibiae. Thorax and abdomen wholly black, the former dull and rather coarsely shallowly punctured, the latter shining, its basal segment impunctate and following ones but feebly punctured, segments 4-7 with short sparse white hair. Wings somewhat darkened, nervures and stigma very dark brown. Tegulae black. Enclosure of metathorax rugose on basal middle, elsewhere smooth and opaque.

Type.—Lincoln, Nebraska, May 14, 1901, on *Tamarix gallica* (L. Bruner). Collection University of Nebraska.

This species differs from *P. cressoni* Ckll. [= *pygmaea* Cress.], specimens of which were taken at the same time as the unique type, principally in its much longer antennae, black tubercles and entirely different face marks. It is very similar to *P. digitata fedorica* Ckll., 1909, but differs in the larger upward process of the lateral face marks, with no basal angles at junction, with lateral marks, longer supraclypeal mark and larger, much paler antennae.

Prosopis magniclavis n. sp.

♂.—Length, 4.5 mm. Very closely related to *P. cressoni* Ckll. but differing as follows: Upward extension of lateral face marks clavate, terminating in a large knob which curves around antennae; whole of front of scape yellow, or nearly so; face distinctly longer and narrower and more converging below; supraclypeal mark longer, twice as long as wide, the subquadrate portion distinctly longer than basal width; hind tibiae with only a broad dark ring on apical half.

♀. Length 5 mm. Differs from ♀ of *cressoni* as follows: Collar always with yellow marks; face rather longer and narrower, clypeus more produced; hind metatarsus more or less yellow basally, not all dark; abdominal segments 3-6 more hairy, usually bearing abundant short pale pile; enclosure less rugose.

Types.—Bad Lands, Sioux County, Nebraska, August 10, 1908, on *Solidago* (R. W. Dawson). Collection University of Nebraska.

Paratypes.—Type lot, 1 male and 6 females; Glen, Sioux County, Nebraska, August 13, 1906, on *Cleome serrulata* (M. H. Swenk), 1 male and 1 female; Crawford, Sioux County, Nebraska, July 28, 1901, on *Mentzelia nuda* (M. Cary), 1 male and 1 female.

The male of this species resembles *P. bakeri* Ckll. in the heavily clavate face mark extensions and yellow scape in front, but that species has the upward extensions much constricted at their junction with the face marks, meeting them at a conspicuous angle and away from the orbit. The female is exceedingly like the same sex of *P. mesillae* Ckll., indeed practically indistinguishable from it, but the male is distinct from the male of *P. mesillae*. In *P. mesillae* the upward extension of the lateral marks resembles the end of a finger, and is not clavate.

Prosopis megalotis n. sp.

♂. Length 4.5-5 mm. Supraclypeal mark long, its upper edge abruptly converging and its apex narrowly truncate. Lateral face marks deeply notched about bases of antennae, the notch beginning at the point of convergence of the sides of the supraclypeal mark, and extending inward for one-half the width of the mark, then curving slowly outward and upward nearly to vertex, forming extremely large ear-like upward extensions with the upper end broadly truncate. All of clypeus, supraclypeal mark, lateral face marks, labrum and mandibles except extreme base, pale yellow. Antennae short, scarcely attaining tegulae, scape and pedicel wholly deep black, flagellum bright ferruginous. Tubercles, except for a central black dot, an uninterrupted line on collar, most of tegulae and a broad stripe on wing base, yellow. Head rather coarsely punctured, thorax with close punctures. Tarsi,, except the terminal joints and claw, anterior tibiae, except for a large spot behind, middle and posterior tibiae, except for broad, dark subapical rings, yellow, rest of legs black. Wings perfectly clear, nervures and stigma fuscous. Abdomen shining black, with the apices of the segments broadly testaceous, first two segments distinctly punctured, third and following segments with very inconspicuous, short, sparse, pale hair.

♀. Length 5 mm. Agreeing in general with the ♂, but clypeus, supraclypeal area, labrum and mandibles wholly black; the lateral face marks are long and narrow, extending from base of mandibles well beyond antennal bases and nearly to vertex, the upper end broadly rounded or subtruncate, the lower end acuminate, widest at middle near upper edge of clypeus where there is a slight tooth, pale yellow in color. Tubercles yellow, usually undotted. Tarsi more blackish, only the basal joint ever extensively yellow, the black rings on middle and posterior tibiae involving all but the upper ends of those joints. Apical margins of abdominal segments more conspicuously and extensively testaceous or rufotestaceous.

Types.—Glen, Sioux Co., Nebraska, August 17, 1906, on *Cleome serrulata* (M. H. Swenk). Collection University of Nebraska.

Paratypes.—Type lot, 1 male; type locality, August 14, 1906, on *Solidago* (P. R. Jones), 1 male, do., August 15, 4 males and 2 females; do., August 17, 1 male and 6 females; do. (H. S. Smith), 3 males and 6 females; do., August 19 (P. R. Jones), 3 males and 4 females; do., August 20 (L. Bruner), 1 male and 3 females; do. (H. S. Smith), 9 males and 11 fe-

males; Fort Garland, Colorado, August 14, 1907 (L. Bruner), 1 female.

This species is very distinct. The male face marks resemble in a general way those of *P. episcopalis* Ckll., but the two are quite distinct. The female resembles the same sex of *P. asinina* Ckll. most, but the characteristic broadly rufotestaceous apices of the abdominal segments easily separate it from that species. From *P. maguiclavis,* just described, the female may be separated by the uninterrupted yellow stripe on the collar, and from the females of *ziziae, dunningi, sayi, illinoiensis, polifolii, coloradensis,* etc., by the partly yellow hind basitarsus.

Prosopis subtristis n. sp.

♀. Length 7-7.5 mm. Lateral face marks short, extending from base of mandible to level of insertion of antennae, shaped like those of ♀ *cressoni,* yellow. Remainder of head black. Collar wholly black. Tubercles yellow with a black spot. Tegulae with a yellow spot, wing bases wholly black. Legs black, the middle and posterior knees, especially the latter, more or less yellow. Head and thorax coarsely, closely punctured. Abdomen black, two basal segments distinctly punctured and moderately shiny. Wings smoky, nervures and stigma black. Antennae short, not reaching tegulae, wholly black.

Type.—Warbonnet Canyon, Sioux County, Nebraska, July 13, 1901, on *Pentstemon glaber* (M. Cary). Collection University of Nebraska.

Paratypes.—Type locality, July 1, 1901, on *Symphoricarpos* (M. A. Carriker), 1 female; Jim Creek, Sioux County, Nebr., June 22, 1901, on *Malvastrum* (M. Cary), 1 female; Sioux County, 6 females.

This species is very closely allied to *P. varifrons* Cresson, but differs in its darker, more reddish wings. Possibly it is only a variety of that species, which can best be determined after the discovery of the male. From *cressoni* and *pasadenae* it may be distinguished by its much larger size, from *elliptica* by its wholly dark clypeus and broader face marks, from *mesillae, ziziae, dunningi, sayi, illinoiensis,* etc., by the wholly black collar.

Prosopis excavata n. sp.

♀. Length 4 mm. Face marks yellow, rather long and narrow, extending from base of mandible well beyond level of insertion of anten-

nae and almost to vertex, broadest at middle and filling space between clypeus and orbit, excavated for antennal sockets at upper edge of clypeus and thence continued upward as a linear mark. Antennae short, not attaining tegulae. Head black, coarsely punctured. Thorax with a scarcely interrupted yellow line on collar, yellow tubercles and spot on tegulae. Legs black with all the knees partly yellow. Abdomen very shining, first segment distinctly punctured, apices of the segments narrowly testaceous. Wings perfectly clear, nervures and stigma fuscous.

Type.—Monroe Canyon, Sioux County, Nebraska, August 23, 1908, on *Solidago* (R. W. Dawson). Collection University of Nebraska.

Distinguished by its small size, partly yellow collar, dark hind basitarsus, narrow face marks, clear wings and by the conspicuous excavations of the face marks about the antennal sockets. Most closely related to *P. coloradensis* Ckll. [= *tucrtonis* Ckll.] and *P. polifolii* Ckll., but differing from these species in the excavated face marks.

Prosopis supracurta n. sp.

♂. Length 5 mm. Very similar to the same sex of *P. sayi* Rob., but basal abdominal segment more strongly punctured, the apical tarsal joints strongly suffused with dusky, the nervures and stigma darker, blackish rather than brownish.

Type.—Ute Creek, Colorado, July 17, 1907 (R. W. Dawson). Collection University of Nebraska.

This is the western or mountain representative of *P. sayi* Rob. and may prove to be only a subspecies of that form. It is also related to *P. episcopalis* Ckll. and *P. universitatis* Ckll., but the lateral face marks of these species are distinctly different.

We offer our heartiest congratulations to Dr. C. J. S. Bethune, editor emeritus of The Canadian Entomologist and wish to express our deep appreciation of the work he has done for that journal and for entomology in America. It is not often that such men are found, and when they are we should pay tribute to their unselfish love and devoted labor. Dr. Bethune put forth the first member of the Canadian Entomologist in 1868, and brought to completion the 41st volume. Twenty-eight volumes were edited by Dr. Bethune and thirteen by Dr. Saunders.

On the Habits of Beetles of the genus Nemognatha.

By S. Graenicher, Public Museum, Milwaukee.

These Meloid beetles are of unusual interest in more than one respect. The larvae of the Meloidae, as also of the Rhipiphoridae and Stylopidae are parasitic in their habits, and pass through a series of transformations known as hypermetamorphosis. This subject has been thoroughly dealt with in a paper on "Some Hypermetamorphic Beetles and Their Hymenopterous Hosts," University Studies (Nebraska), Vol. 4, No. 2; April, 1904. Comparatively little is known of the life history of those Meloid beetles that pass their larval stage in the nests of bees or wasps, as for example species of *Meloe, Cantharis, Sitaris* and *Zonitis*. In its first stage (instar) such a larva has the terminal joints of its feet fitted with claws whereby it is enabled to cling to some insect with which it may come in contact. In this form it is called a triunguline, and is found on flowers, awaiting its chance to attach itself to a flower visiting insect, thereby to be transported to the nest of its host.

To my knowledge nothing has been reported so far concerning the larval life of the beetles belonging to the genus *Nemognatha*. In the adult stage these insects show in structure and habits a remarkable degree of adaptation to flowers. Attention was called to this fact about 30 years ago by Hermann Mueller, the well-known naturalist, to whom we owe such a wealth of information concerning the mutual relations between insects and flowers. After considering the structural peculiarities of the flower visiting beetles of Europe, Mueller states that some tropical and sub-tropical beetles present much more thorough adaptation to flower-food. Thus in a species of *Nemognatha* which my brother Fritz Mueller observed sucking flowers of *Convolvulus* at Itajahy (in South Brazil), the outer maxillary lobes (galeae) are modified into sharp grooved bristles (12 mm. long), which when apposed form a suctorial tube like the proboscis of a butterfly, but of course incapable of being rolled up" (Fertilisation, etc., p. 33, note).

In the southeastern part of Wisconsin *Nemognatha* seems to be represented by one species only, *N. vittigera* Lec., and

this is apparently of rare occurrence. Two years ago I came across this beetle for the first and only time in this part of the State. It was visiting the flowers of *Rudbeckia hirta* L. (black-eyed Susan) on a prairie in Racine Co., about 20 miles south of Milwaukee (visit recorded in "Wisconsin Flowers and Their Pollination. Compositae." By S. Graenicher. Bull. Wis. Nat. Hist. Soc., April, 1909, pp. 27 and 64). In the beetle collection at the Public Museum of Milwaukee 14 species of *Nemognatha* from different parts of the United States are represented, among them *N. vittigera* with 5 specimens, 4 of which are from Missouri and 1 from Wisconsin. This is the only representative of the genus that has heretofore figured in this collection.

As a member of the Milwaukee Public Museum collecting expedition along the St. Croix River in the northwestern part of Wisconsin (6 weeks in July and August of the present year) I was agreeably surprised to find this beetle of rather common occurrence near the mouth of the Yellow River in Burnett Co., Wis. I came across 4 specimens of another species, *N. nemorensis* Hentz, at the same locality where 5 days were spent, from July 29 to August 3. *N. vittigera* was also met with farther south in the pine barrens at Randall, Burnett Co. Altogether 22 specimens of this species were secured, and these show a great diversity in length, ranging from 7 to 11 mm. As to the length of the tongue (suctorial tube) an average of 4 mm. was found. In one specimen the tongue was a trifle shorter, and in six a trifle longer, but of main importance is the fact that increase or decrease in tongue length does not run along with an increase or decrease in body length. The length of the tongue seems to be a rather constant factor within the species and to develop independently of the body as a whole.

These beetles were observed as regular visitors at the flowers of *Rudbeckia hirta,* the tubal florets of which have a length of about 3.5 mm. As stated above, the tongue of the insect is about 4 mm. long, and therefore perfectly able to reach the nectar at the bottom of the florets. Some of the beetles were seen on the flowers of two other species of Compositae, of the

sunflower *Helianthus occidentalis* and the goldenrod *Solidago graminifolia,* but the great majority were paying their attentions to the flowers of *Rudbeckia* which were present in large numbers in that particular locality.

The four specimens of *Nemognatha memorensis* referred to above do not differ at all in size, they have a body length of 8 mm. and a tongue length of 3.5 mm., and they too were visiting the flowers of *Rudbeckia hirta.*

Both of these species of *Nemognatha* are, so far as the length of their mouthparts is concerned, very nicely adapted to the tubal florets of *Rudbeckia,* as also of some other composite flowers of similar structure and dimensions.

Of the 14 species represented in the collection of the Public Museum of Milwaukee, two have been dealt with already, and I herewith present the figures for the tongue length of the remaining twelve species:

N. cribricollis Lec.	1.5 mm.
N. sparsa Lec.	2.5 mm.
N. immaculata Say	2.5 mm.
N. scutellaris Lec.	3.0 mm.
N. nigripennis Lec.	4.0 mm.
N. apicalis Lec.	4.0 mm.
N. piezata Fab.	6.0 mm.
N. cribraria Lec.	7.0 mm.
N. dichroa Lec.	8.0 mm.
N. lutea Lec.	8.0 mm.
N. lurida Lec.	8.0 mm.
N. bicolor Lec.	10.0 mm.

These figures show a gradual increase from the short-tongued *cribricollis* to the long-tongued *bicolor,* and the tongue length in the latter falls only 2 mm. short of that of the Brazilian species, which, according to Hermann Mueller, was obtaining nectar from the flowers of a morning-glory. Among other beetles observed by W. D. Pierce (*loc. cit.,* p. 24) on the flowers of a goldenrod, *Solidago rigida,* at Lincoln and West Point, Nebraska, are *Nemognatha immaculata* and *N. sparsa.*

Prof. T. D. A. Cockerell (Flower and Insect Records from New Mexico, Ent. News, Feb., 1901, p. 40) has seen *Nemognatha bicolor,* a long-tongued species, at the flowers of *Cleome serrulata* Pursh. at Las Vegas, New Mexico.

These are the only records of the visits of North American beetles of this genus that I have been able to come across in

the literature. The species with the longest tongues (8 and 10 mm.) might be expected to visit flowers with tubes of a corresponding length, such as are adapted to long-tongued bees or butterflies.

The behavior of these beetles when at work on the flowers presents additional evidence of the high degree of adaptation. Immediately after alighting on a flower, on the head of a *Rudbeckia* for example, the insect proceeds to insert its tongue into a tubal floret for the purpose of sucking. After a short while the head is lifted upward, the tongue withdrawn, and with a downward movement thrust into a neighboring floret. These upward and downward movements are carried out with much precision, with little or no loss of time, and much in the same manner as the corresponding movements of the highly specialized flower-flies of the genera *Systoechus, Sparnopolius, Anthrax, Exoprosopa,* etc., belonging to the Bombyliidae. These beetles surpass in this respect any of the flower visiting beetles of our region, except possibly their nearest relatives, those belonging to the Meloid genus *Gnathium,* which are also equipped with long tongues, of the habits of which, however, we have no information.

Observations on Cicindelidae in Northern Cape May County, N. J., during the Summers of 1908-09.

Henry Fox, Ph. D., Ursinus College, Collegeville, Pa.

During the past two summers I made a series of observations on the occurrence, abundance and distribution of *Cicindelidae* with reference to the physical features of northern Cape May County. These observations were made almost continuously from early in July to September 9th in 1908, while in 1909 they were extended at intervals until October 3.

The physical features of the region may be broadly grouped as follows:

I—The Barrier Beaches.
II—The Maritime Marshes.
III—The Interior Uplands.
IV—The Cedar and Sphagnum Bogs.

I—The Barrier Beaches—I use this term to designate the long sandy islands immediately facing the ocean. The par-

ticular beaches on which my observations were made were Ludlams and Seven-mile Beaches. Both consist of a fine, white quartz sand, overlying a floor of dark, maritime marsh mud, patches of which may often be seen exposed on the seaward side at low tide.

From the standpoint of Cicindelid distribution the beaches show three well-defined zones, which I have designated as (a) the lower strand, (b) the upper strand, and (c) the dune area.

The lower strand includes all that part between mean high and low tides. It consists of a firm, compact sand with a relatively smooth surface and is, of course, destitute of all vegetation. Of Cincindelas the characteristic species of this zone is *C. dorsalis,* which during the proper season occurs there in swarms. Much less frequent in *C. hirticollis,* while on rare occasions I have observed *C. marginata.*

The upper strand includes that portion between mean high tide and the outer limit of the grass-covered dunes. It is composed chiefly of loose white sand, which is piled up here and there in small hillocks about the clumps of various halophytic plants, the most abundant of which is the sea rocket, *Cakile edentula.* In this area there are numerous tidal depressions and in these the sand is more compact and of a darker hue. In these depressions we have the favorite haunts of *C. hirticollis.* Individuals of both *C. dorsalis* and *C. repanda* may also occur in this zone, but they are not so abundant as *C. hirticollis.*

The upper strand with *Cakile edentula* as the characteristic plant is not equally developed at all points. It is most clearly marked where the beaches as a whole are low, while in places where the dunes are high and approach close to the water's edge the zone is narrow or absent.

The Dune Area occupies the greater part of the barrier beach, extending landwards to the border of the maritime marsh. It is typically covered with the dune grass, *Ammophila arenaria.* Within the dune area are numerous more or less extensive depressions which harbor a vegetation resembling that of the marshy tracts bordering the maritime marshes.

Cicindelas are apparently rather scarce in the dune area and are almost entirely limited to the higher, dry portions, where the grass is not particularly thick. The most abund-

ant species here was *C. repanda, but C. punctulata* also occurred, especially where artificial alterations had introduced special conditions. On the seaward sand ridges *C. hirticollis* also occurred, but not so regularly as on the upper strand. Locally, as at Peermont, where the dunes are very high and dry, *C. lepida* may occur in considerable numbers.

II—The Maritime Marshes in northern Cape May form a zone about three miles in width. The greater part of the marshes is covered with the characteristic salt-marsh grass, *Spartina,* but here and there, especially near the seaward edge are numerous, more or less extensive patches of bare sandy flats on which a thin crust of dried and decayed vegetation is often present. On these flats *C. marginata* is typically found. Less abundant and usually limited to the banks of the various creeks and thoroughfares are *C. repanda* and *C. punctulata.*

III—The Interior Uplands include the higher dry land between the landward edge of the maritime marsh and the shores of Delaware Bay. The region as a whole is sandy and, except in the more cultivated districts, is covered with scrubby woodlands, composed largely of second-growth oaks and pines with a sprinkling of hickories and sassafras. There is usually a dense undergrowth formed partly of saplings of the above trees and of various shrubs, such as huckleberries, blueberries, azaleas and sweet fern. These woodlands are traversed by numerous sandy roads or paths and along these, at the proper time, such Cicindelas as *C. punctulata, C. vulgaris, C. purpurea* and *C. modesta* are common. On the more open paths, especially in the vicinity of swamps or stream. *C. repanda* also occurs.

South of the Great Cedar Swamp and especially along the coastal and bay strips much of the interior is under cultivation. Here the artificial conditions are very favorable to two species, *C. punctulata* and *C. repanda.* The former is very abundant everywhere on the roads and in the fields, while *C. repanda* is mostly confined to the vicinity of streams, lakes or swamps.

IV.—The Cedar and Sphagnum Bogs are lowlands of the interior, originally occupied mostly by the white cedar, but since the almost complete extermination of the latter overgrown by a thick jungle of low trees and shrubs. No Cicindelas have been observed by me in these bogs.

I have collected the following species of Cicindelas in the region under consideration:

C. dorsalis
C. lepida
C. hirticollis
C. punctulata
C. marginata
C. repanda
C. vulgaris
C. purpurea
C. scutellaris modesta
C. formosa generosa
C. patruela

C. dorsalis.

This is the dominant insect of the lower strand, where at times it occurs in immense numbers, the various individuals darting rapidly about over the wet sand just above the reach of the surf. In 1908 it was abundant from early July until the middle of August when it became less numerous and in early September had apparently become scarce. Thus on September 8 during a trip between Sea Isle and Townsend's Inlet I counted only twenty-five individuals, all but one being observed at the Inlet, which had always proven a favorite spot for them. In 1909 they were not common on July 3, but by the end of that month and in August they were very abundant and were not uncommon as late as September 7. I also saw a few individuals as late as September 25. The 1909 brood was therefore, apparently about two weeks later than the 1908 brood both in its appearance and disappearance—a difference which I think may be attributed to the more retarded spring and early summer of 1909.

Although characteristic of the lower strand this species is not infrequently found on the dry upper strand associated with the there more common *C. hirticollis*. In such a location I caught a larva, which I think belongs to this species.

No individuals were seen inland, though Smith states they are local there on pure white sand.

All of my specimens are apparently normal with normal markings. No clearly immaculate individuals were observed, nor did I observe any clear difference in the intensity of the markings between individuals collected in early summer and those collected in September. Davis (Ent. News, xiv, p. 273) suggests that as the season advances the elytral markings dis-

appear by the wearing action of the sand, and he adds that late in the season he got heavily immaculate specimens. It would be interesting to learn how far this explanation accords with the experience of collectors. On both Ludlam and Seven-mile Beaches the sand is blown about almost constantly, but individuals taken in late September do not show any perceptible difference in the intensity of the color from those taken in mid-summer.

The light coloration of *C. dorsalis* has been cited as an example of protective coloration, in adaptation to the white sand of the beach. This would be satisfactory if the animals were frequenters of the dry sand of the upper strand, but, although they are found there, they are much more abundant on the lower wet strand, where the sand is a deep gray. Here, although their colors partly blend with that of the sand, they do so much less perfectly than those of either *C. hirticollis* or *C. marginata*, both of which are exceedingly difficult to detect when they alight. *C. dorsalis*, on the other hand, can be readily seen. It might be suggested that it is of more value to *C. dorsalis* to be better protected on the upper strand where it probably deposits its eggs than on the lower strand. In the latter place its enemies seem to be few, while on the upper beach they are perhaps more numerous. This is especially true of the large robber-flies which frequently kill the Cicindelas.

C. lepida.

In 1908 I found only two individuals of this species, both taken on the outer sand dune at Sea Isle on July 6. On July 3, 1909, I found the species fairly common on the high sand dunes at Peermont. A few were seen near the same place on August 26, of which two were taken. One was seen at Avalon as late as September 9, but was not captured.

This species is never very abundant and, so far as my observations go, is confined to the more seaward dunes, especially those which are relatively bare. It is most common in early summer, but soon becomes scarce so that in August and September it is rarely encountered.

C. hirticollis.

This is the characteristic species of the upper strand, where it especially frequents the tidal depression facing the outer line of the dunes. Here the sand is rather damp and of a grayish hue, with which the colors of the beetle blend perfectly.

Although common in its favorite haunts during the entire summer and early fall *C. hirticollis* never seems to occur in such swarms as *C. dorsalis*. It is also more locally distributed, in some places it will be abundant, while in others, apparently equally favorable, it will be rare or absent.

This species is also found in smaller numbers on both the lower beach and the more exposed dunes. At the inlets it is found on the sandy shores of the thoroughfares. It also occurs on the shores of Delaware Bay, where I have taken it near Green Creek.

According to Davis (Ent. News, xiv, '03, p. 272-273) those individuals of *C. hirticollis* "which live on white sand are marked with wide white bands, while those which live on mud-deltas are heavily black for purposes of protection." My own specimens were all collected from the situations mentioned before and, while some show clear white markings, others have the markings brownish, in some cases so dark as to be seen only by careful examination. So far I have never seen any correlation between the intensity of the color markings and the colors of the surroundings, the differently tinted individuals being found indiscriminately and in about equal numbers in the same places. For example, of eight specimens taken on August 26, 1909, on the clear white dunes at Peermont not one showed the clear white bands and in three of them the bands were moderately dark. No specimens were taken inland.

C. marginata.

This form is characteristic of the bare sandy or mud flats on the seaward borders of the maritime marshes. Its color is in close harmony with the dark gray tints of such places. Of all the species I have met it is the most difficult to detect. It is

very wary and when closely pursued, will often escape capture by hiding in the thick grass (*Spartina*) surrounding its habitat.

This species also occurs in fair numbers on the roads crossing the marshes and on neighboring sand banks. On rare occasions I have also caught it on the ocean front in association with *C. dorsalis*.

C. marginata appeared to persist in about equal numbers through the entire summer though it was at no time very abundant. It also appeared to be more or less locally distributed. Thus it was fairly common on the numerous mud flats close to the old biological laboratory at Sea Isle and on some newly-made sand banks at Peermont, while at Townsend's Inlet in situations apparently similar it was seen only once or twice.

C. punctulata.

This is the common summer resident of the interior, where it was exceedingly abundant in such locations as fields, gardens, lawns, roadsides, sandy paths and woodland clearings. None was found in the bogs or on the paths leading through them. On the beaches it was moderately abundant where it usually occurred on the less frequented streets and sidewalks. Some were taken on the railroad embankments and sand banks facing the salt marshes.

This species I have found as late as early October but it is much less common in the early fall than in mid-summer.

In the 1899 edition of the insects of New Jersey Smith states that this species is "common almost everywhere, but seems locally absent in the southern counties." My experience in Cape May County is rather at variance with the latter part of this statement, as I found *C. punctulata* abundant at such localities as Ocean View, Sea Isle Junction, Dennisville, Cedar Grove, Cape May Court House, Dias Creek, Green Creek and Rio Grande, also in the dry districts north of the Great Cedar Swamp.

C. repanda.

This species, although not rare is rather local, being most frequently encountered in the vicinity of water. In Cape May

County I have not yet seen it in July, but it was common in August and September. It occurs in the interior uplands, usually in the vicinity of lakes, streams or bogs, and on the barrier beaches, where it is most common in the dune areas, especially along paths. Occasionally individuals were taken on the upper strand in company with *C. hirticollis*.

C. vulgaris.

This is one of the early fall species, no individuals having been observed in the summer months. In September it was found in large numbers on dry sandy paths through the wooded portions of the interior uplands. I have never seen this species on the beaches or in the more cultivated districts.

C. purpurea.

This species appears to me to be the most abundant of the early autumn forms, though *C. vulgaris* is a close second. It is found in the same localities and at the same time as the latter species.

Smith reports this species as "reported from all points between April and July and again in September, though hardly abundant anywhere." So far as my experience goes the last part of this statement does not apply to northern Cape May County.

C. scutellaris modesta.

This is another early autumn species the first individuals having been observed in late August. In September it was common in the same situations as *C. purpurea* and *C. vulgaris*, but less abundant than these two forms.

C. formosa generosa.

In this form we have another autumn species. So far I have found *generosa* in only moderate numbers in northern Cape May, where I have seen it only in September. It appeared to occur most regularly in the more open places in the oak-pine districts of the interior.

C. patruela consentanea.

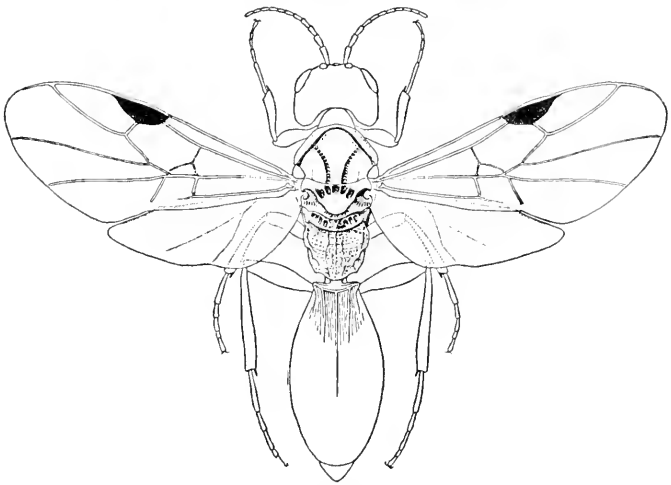
Only two individuals of this species were taken September 7, 1909, on a sandy road in the oak-pine district between Mt. Pleasant and Formosa Bogs.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., FEBRUARY, 1910.



Vanhornia eucnemidarum Crawford.

In accordance with our custom we have selected this species as being the most remarkable submitted to us. It was described and figured in the Proc. Ent. Soc. Wash. XI. 63, 1909. The figure of the species will appear on the cover of the NEWS during the present year. It represents a new genus as well as a new species. The specimens were found in Maryland and Virginia. We are disappointed that more entomologists do not send in their species for representation on the cover. When they do apply it is generally too late to have the figure on the cover of the January number.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

ONCE MORE CULEX PERTURBANS.—Concerning the suggestion made by Dr. Dyar in the January number of the NEWS, that I had failed to credit Mr. J. Turner Brakeley with observations made on this insect, let me refer to my report to the New Jersey Experiment Station for 1907, pp. 546-553, and for 1908, pp. 410-415, where full abstracts of Mr. Brakeley's notes are given. It is no habit of mine to steal the work of others.

A quotation or two from a letter received from Dr. Stowell, under date of October 19th, may be informing: "When the Laboratory report is finally published you will see that in my mind and also the opinions of my Laboratory Committee, the help we got in the discovery of the breeding place of *perturbans* came from Dr. John B. Smith, when his trained eye selected the most typical pond in Dublin, in which to seek for *perturbans* eggs.".*****

"As to the article; Dr. Dyar sent me the printer's proof all marked as if it had been already set in type. I wrote him objecting to the omission of mention of the part that you and Mr. Grossbeck had taken in the discovery of the *perturbans* here. If there is a footnote to the article I do not know of it and I did not authorize it, whatever it states."

"I begged you to come to help us because I felt that our problem was so complicated that only the eye of special experience would be able to solve it."

And the fact remains that after two seasons of work Dr. Dyar "discovered" a breeding place of *perturbans* the day after I had pointed it out and told how to look for the insects.

January 10, 1910. JOHN B. SMITH.

I BEG to advise that, after January 31, 1910, my address will be College Station, Texas, U. S. A., instead of Baton Rouge, Louisiana.—WILMON NEWELL.

RARE BUTTERFLIES IN MAINE.—If Mr. George R. Minot, who contributed some notes on the above subject to the December NEWS will refer to Dr. C. H. Fernald's "Butterflies of Maine," published in 1884, he will see that *Junonia coenia* and *Euptoieta claudia* are both included in it, the latter on my authority, I having taken it near Portland in that State in August, 1882. I also took a specimen of the former in the same place in August, 1876, it being included under the name *lavinia*, as used by Harris, in my "List of Diurnal Lepidoptera taken in the vicinity of Portland, Maine," in Can. Ent. XII, 7.

August is rather late to look for *Limenitis arthemis*, it should be sought for early in July.—HENRY H. LYMAN, Montreal.

At a meeting of the Ottawa Field-Naturalists' Club, held December 9, 1909, it was decided to erect a drinking fountain consisting of a granite shaft with bronze medallion inscription, etc., at the Central Experimental form, as a memorial to the late Dr. James Fletcher.

ON AN EPISODE.

THE CHARGE.

Said Doctor Smith to Doctor Dyar: I'm amused and yet I'm sad;
I found the pond where wiggletails disport themselves, and had
Assigned myself the arduous task of telling to all men,
How such things court, and what they eat, and how they feed, and when.
Then you appeared upon the scene ('Twas strange to find you there!)
I welcomed you and smiled on you and showed you where they were;
Yet when I looked your paper through, my Coddington in hand,
I failed to find that you had this sufficiently explained.
Your presence there was passing strange, but this was stranger still;
I've wondered ever since if you intend to treat me ill.

THE RETURN.

Said Doctor Dyar to Doctor Smith: You surely must be leery;
Your conduct quite reminds me of our townsmen, Cook and Peary;
Your name's not in my paper and the search you may forego;
I left it out on purpose and am free to tell you so.
If I had been a blind man and deaf and dumb beside,
A roaming round the country with no kind friend to guide,
And you had chanced upon me and grasped me by the hand,
And led me round the boggy ground right to the small pond's side,
Your name had been emblazoned in my paper without doubt,
In letters large and very black, a 'steenth inch tall—about;
But since I see like anything, indeed I saw through you,
My perspicacity alone had brought the pond to view;
Besides, I'll have to tell you, and with purpose most pacific,
(Though this journal more's the pity's not so very scientific),
Neither your name nor my own name should by good right be there,
Since another found the wigglers and showed us both their lair.

AU REVOIR.

Said Doctor Smith to Doctor Dyar: I'm grieved, but yet I'm cheery.
Said Doctor Dyar to Doctor Smith: You're Cook and I am Peary.

My steed is a little lame and needs currying. In truth for fifteen odd years she has been tied in her stall and has had only dry feed.

Please make some allowance for this.—THE AUTHOR.

Mr. Alfred F. Satterthwait, of Middletown, Pa., has withdrawn from the position of Assistant Economic Zoologist of Pennsylvania. He will continue to do entomological work and is open for an engagement in that line.

Work of the Leaf-cutter Bees in Idaho.—(Megachile Species.)—The settler in the reclaimed sagebrush lands of the West and Southwest, usually turns his first efforts to raising windbreaks and planting trees, if he has any idea of a permanent home, where once was naught but the sage brush, the coyote and the sage hen, "that couldn't get away."

Among the first trees set out about our house were two ash trees. As soon as foliage began to appear these trees were attacked by Leaf-cutter bees which completely defoliated one and nearly the other.

First, we noticed circular holes in many of the leaves, but it was not long until, on going near the trees, one noticed the noise made by the bees at work, almost like a swarm of bees intent on gathering honey. Sometimes we would see a bee with a section of leaf so large it could hardly fly, but working diligently, carrying its burden to a sandy spot just outside the yard, where the bees had their tunnels. During the heat of the day they were so numerous, near their tunnels, that one passer-by was alarmed and inquired what so many bees were doing there.

The bees continued their work all the first summer when we had no water for irrigation, but confined their cuttings almost or entirely to the two ash trees. The following season, however, I found them working on cherry, apple and poplar trees in same way, but either not so energetically, or their efforts were distributed among more trees, for, on no other trees near us was their work sufficient to defoliate them.

We made some effort to protect the trees by covering with netting but fear the ashes have been killed by the persistent work of the Leaf-cutters.

The past summer I stopped to talk with a friend some fifteen miles from here, who complained that the grasshoppers were taking the leaves from his maple trees. On examination, I found that here, again, the bees were the mischief-makers.

We are wondering whether the bees will increase in numbers sufficiently to do serious injury, but hope that as irrigation progresses, and more trees are planted, their work will be so distributed that the injury will not be worthy of notice.

So far as observed, but one species of Magachile has appeared.

These reclaimed tracts of land offer an excellent opportunity for the student of insects to observe how the species natural to a locality

change. The real estate agent talks about new land, "where no old bugs have reared their little buglets," but the settler must class his statement with the other fiction propagated by the promoter. Even the one-time desert, has its insect life, and weeds spring up to replace the sage, even if the settler is careful not to introduce the worst varieties. The persistent Russian thistle rolls for miles across the plains and distributes its seed, and, use all the care you may, the insect pests soon follow the production of crops and planting of trees.

I have wondered what desert plants the Leaf-cutter bees used to line their tunnels before the coming of the settler with trees, but have not been able to find their former upholstering materials.—ARTHUR J. SNYDER, Springfield, Idaho.

ERRATA.

In Dr. Bergroth's article in the January, 1910, ENT. NEWS, seventh line from bottom of page where description begins "Prosternum longitudinally for coxæ" *read* Prosternum longitudinally raised in the middle. Mesosternum elevated in the middle, the elevated part tapering from base to apex and reaching the fore coxæ. Metasternum sexangularly elevated in the middle, the elevated part broadly emarginate behind for the reception of the ventral basal tubercule.

Entomological Literature.

COMPLIED 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, excluding Arachida and Myripoda, of the Americas (North and South). Articles irrelevant to American entomology, unless treating of new genera, will not be noted. Contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in heavyfaced type refer to the journals, as numbered in the following list, in which the papers are published, and are all dated 1909, unless otherwise noted.

For complete record of Economic Literature, see the experiment Station Record, Office of Experiment Stations, Washington.

2—Transactions, American Entomological Society. **5**—Psyche. **6**—Journal, New York Entomological Society. **8.**—Entomologist's Entomological Magazine. **9**—The Entomologist. **10**—Nature, London. **11**—Annals and Magazine of Natural History. **42**—Journal, Linnean Society, Zoology. **45**—Deutsche Entomologische Zeitschrift. **46**—Tijdschrift voor Entomologie. **47**—The Zoologist. **50**—Proceedings, U. S. National Museum. **78**—Gardeners' Chronicle. **92**—Zeitschrift fur wissenschaftliche Insektenbiologie. **143**—Ohio Naturalist. **157**—Meddelanden, Societas pro Fauna et Flora Fennica. **174**—Bulletin, U. S. National Museum. **175**—Aus

der Natur, Berlin. **176**—Archiv fur Entwicklungsmechanik der Organismen, Leipzig. **177**—Quarterly Journal of Microscopical Science, London. **179**—Journal, Economic Entomology. **180**—Annals, Entomological Society of America. **181**—Guide to Nature, Sound Beach, Conn. **182**—Revue Russe d'Entomologie. **183**—Glasgow Naturalist. **184**—Journal of Experimental Zoology, Philadelphia. **185**—Journal, Quekett Microscopical Club, London. **186**—Journal of Economic Biology, London. **187**—Jahrbucher des Nassauischen Vereins fur Naturkunde, Wiesbaden. **188**—Bulletin International, Academie des Sciences de l'Empereur Francois Joseph I, Prague. **189**—Pomona Journal of Entomology, Claremont, Cal. **190**—Deutsche Entomologische Zeitschrift "Iris." **191**—Natur, Munchen. **192**—The Cairo Scientific Journal, Alexandria. **193**—Entomologische Blatter. **194**—Genera Insectorum.

GENERAL SUBJECT. Baldwin, D. A.—Observations on grasshoppers and ants, **118**, ii, 306. **Bartels, C. O.**—Auf frisher tat beobachtungen aus der niederen tierwelt in bilderserin nach naturaufnahmen. **Cockerell, T. D. A.**—New fossil insects from Florissant, Colo., **180**, ii, 251. **Kempers, K. J. W.**—Nog iets over het adersysteem der kevervleugels, **46**, lii, 272. **Howard, L. O.**—Notes on a flying trip to Russia, **202**, xl, 192. **Schneider, K. C.**—Vorlesungen ueber Tierpsychologie, Insekten, Leipzig, 106-160, 1909. **Zhuravsky, A. V.**—Essai d'une critique des principes de la geographie biologique comparee (Russian), **182**, ix, 35.

NEUROPTERA. Bagnall, R. S.—On two new genera of Thysanoptera from Venezuela, **42**, xxx, 329. **Crawford, D. L.**—Some new Thysanoptera from South California, **189**, i, 100; Some Thysanoptera of Mexico and the South, **189**, i, 109; Notes on California Thysanoptera, **189**, i, 120. **Forster, F.**—Beitrage zurden gattungen und arten der Libellen, **187**, lxii, 211. **Handlirsch, A.**—Zur kenntnis fruhjurassischer Copeognathen und Coniopterygiden und ueber das schiksal der Archipsylliden, **22**, xxxv, 233. **Klapalek, F.**—Beitrag zur kenntnis der gattung Pteronarcys, **188**, xii, 150. **Kolbe, H.**—Ueber unberveglich gehause von Trichopterenlarven, **175**, v. 550. **Patch, E. M.**—Chermes of Maine spruces, **5**, xvi, 136. **Pierce, W. D.**—A monographic revision of the twisted-winged insects comprising the Order Strepsiptera, Kirby, **174**, No. 66. **Valikangas, Y. I.**—Muistiinpanoja tvarmininen Odonati-elaimistosta, **157**, xxxv, 74. **Williamson, E. B.**—The No. American dragonflies (Odonata) of the genus Macronia, **50**, xxxvii, 365.

ORTHOPTERA. Davis, W. T.—A cricket new to New Jersey, **6**, xvii, 187. **Przibram, H.**—Aufzuch farbwechsel und regeneration der gottesanbeterinnen (Mantidae, iii), **176**, xxviii, 561.

HEMIPTERA. Distant, W. L.—Descriptions of Oriental Cap-

sidae, **11,** iv, 89. **Essig, E. O.**—Combating the citrus mealy-bug, **189,** i, 89; Aphididae of So. California III, **189,** i, 98. **Gadd, G.**—Contributions a l'anatomie comparee des Cigales I. Appareil salivaire (Russian), **182,** ix, 138. **Gillette, C. P.**—Plant louse notes, family Aphididae, **179,** ii, 385. **Hambleton, J. C.**—Life history of Corizus lateralis, **180,** ii, 272. **Heidemann, O.**—Two new species of No. American Aradidae, **202,** xi, 189. **Matausch, I.**—Gynandromorphic Membracidae, **6,** xvii, 165. **Sanders, J. G.**—The identity and synonymy of some of our soft scale insects, **179,** ii, 428. **Schumacher, F.**—Beitrage zur Kenntnis der vervreitung und biologie der einheimischen Poeciloscytus-arten, **92,** xiv, 380.

LEPIDOPTERA. Anon.—Lord Walsingham's collection of Micro-Lepidoptera, **10,** lxxxii, 194. **Busck, A.**—New Micro-Lepidoptera from New Mexico and California and a synoptic table of the No. American species of Heliodines, **202,** xi, 175; Two new species of Mexican Tienids, **202,** xi, 212. **Britton, W. E.**—The cocoons on the sassafras tree, **181,** ii, 304. **Dyar, H. G.**—The life-history of an Oriental species of Cochlidiidae introduced into Mass. (Cnidocampa flavescens), **202,** xi, 162; Description of another unidentified Notodotian larva, **202,** xi, 171; Description of the lavra of Eustrotia caduca, **202,** xi, 200; A new species of Acrobasis, **202,** xi, 214. **Fiske & Thompson**—Notes on the parasites of the Saturniidae, **179,** ii, 450. **Forbes, W. T. M.**—Notes on a few of the rarer New England Lepidoptera, **5,** xvi, 134. **Hampson, G. F.**—Catalogue of the Lepidoptera Phalaenae in the British Museum; Catalogue of the Noctuidae in the collection of the Br. Museum; Vol. viii. **Jacobson, E.**—Beobachtungen ueber den polymorphismus von Papilio memnon, **46,** lii, 125. **John, O.**—A generic subdivision of the genus Palpangula Stgr, **182,** ix, 115. **Pagenstecher, A.**—Ueber die verbreitungsbezirke und die lokalformen von Parnassius apollo, **187,** lxii, 116. **Pfurtscheller, Dr.**—Die verwandlung des koplweisslings, **175,** v, 515. **Poulton, E. B.**—Mimicry in the butterflies of No. America, **180,** ii, 203. **Reiff, W.**—The relation of sex to heliotropism in the brown-tail moth, **5,** xvi, 115. **Reval, W. P.**—Ein beitrag zur kenntnis der gattung Eupithecia; Vergleichende untersuchung der generationsorgane, **190,** xxii, 203. **Sanderson & Jackson**—The oblique-banded leafhopper (Archips rosaceana), **179,** ii, 391. **Sleight, C. E.**—Catocalla herodias at Lakehurst, N. J., **6,** xvii, 166.

DIPTERA. Austen, E. E.—Illustrations of African blood-sucking flies, other than mosquitoes and testse-flies (British Museum Publication). **Back, E. A.**—The robber-flies of America north of Mexico belonging to the subfamlies Leptogastrinae and Dasypogoninae, **2,** xxxv, 137. **Balfour, A.**—Mosquitoes: with reference to

imigration and horse sickness, and notes on the destruction of their larvae by fish in the Sudan, **192,** iii, 242. **De Mejere, J. C. H.**—Drei myrmecophile Dipteren aus Java, **46,** lii, 165. **Dyar & Knab.**—Descriptions of three new American mosquitoes, **202,** xi, 173. **Hendel, F.**—Ueber eine neue palearktische Cordylurinen gattung, **45,** 1909, 777. **Hewitt, C. G.**—The structure, development, and bionomics of the house-fly (Musca domestica), pt. III, **177,** liv, 347. **Johnson, C. W.**—The rediscovery of Glutops singularis, **5,** xvi, 132. **Lundstrom, C.**—Beitrage zur kenntniss der Dipteren Finlands, IV, Suppl. Mycetophilidae, **178,** xxxii, No. 2. **Malloch, J. R.**—A division of the Dipterous genus Phora into subgenera, **183,** i, 24. **Townsend, C. H. T.**—Description of some new Tachinidae, **180,** ii, 243. **Wesche, W.**—Notes on the life-history of the tachinid fly Phorocera serriventris, and on the viviparous habits of other Diptera, **185,** x, 451.

COLEOPTERA. Aaron, S. F.—The under-bark grub (Dendroides canadensis), **181,** ix, 302. **Bickhardt, H.**—Beitrage zur kenntnis der Histeraden III, **193,** v, 220, 240. **Bruch, C.**—Neue Buprestiden aus Argentinen nebst synonymischen berichtigungen, **45,** 1909, 746. **Borchmann, Dr.**—Systematische und synonymische notizen uber Lariiden und Alleculiden, **45,** 1909, 712. **Bouwman, B. E.**—Ueber die lebenweise von Methoca ichneumonides, **46,** lii, 284. **Bovie, A.**—Family Curculionidae, subfam. Brachycerinae, **194,** fasc., 99; Curculionidae, subfam. Nanophyinae, **194,** fasc. 98. **De Groot, G. J.**—Das nervensystem der Cicindelalarven, **46,** lii, 294. **Fall, H. C.**—A new Platycholeus, **5,** xvi, 133. **Felsche, C.**—Neue und alte coprophabe Scarabaeiden, **45,** 1909, 751. **Fenyes, A.**—Two new species of Aleocharinae from California, **202,** xi, 197. **Gates, B. N.**—The rose cuculis (Rhynchites bicolor) in Mass., **179,** ii, 465. **Hagedon, M.**—Diagnosen bisher unbeschrieben berkenkafer, **45,** 1909, 733. **Kerremans, Ch.**—Monographie des Buprestides, IV, No. 3-4. **Schaeffer, C.**—Three Cuban Coleoptera new to the fauna of the U. S., **6,** xvii, 148. **Schenkling, S.**—Coleopterorum catalogus, Pars. 4. Ipidae. **Semenov-Tian-Shansky, A.**—Coleoptera nova faunae Luranicae, **182,** viii, 295. **Shoebotham, J. W.**—The life-history of Callidium violaceum, **186,** iv, 144. **Smirnov, D. A.**—La vie et les metamorphoses de quelques especes du genre Rhinoncus, **182,** ix, 100. **Spath, F.**—Kritische studien uber Chelymorpha, und die verwandten gattungen, **45,** 1909, 715. **Strohmeyer, O.**—Beschreibung zweier neuer Phlocoberus-arten und erganzung der diagnosen eindger bekannten . . . der secundaren geschlechtscharaktere, **193,** v, 248. **Tucker, E. S.**—Additional notes upon the breeding of the coffee-bean weevil, **179,** ii, 373. **Wagner, H.**—Zur synonymie der gattung Apion, **45,** 1909, 766. **Weber, L.**—Ueber

den leuchtkafer Phosphaenus hemipterus speziell dessen mannlichen geschlechtsapparatus, **45,** 1909, 784. **Zaitzev, P.**—Analytische uebersicht der mirbekannten arten der gattung Sternolophus nebst bemerkungen uber die anderen arten diesergattung, **182,** viii, 228.

HYMENOPTERA. Cameron, P.—Some Odyneminae of the Southwest U. S., **189,** i, 122. **Crawford, J. C.**—New parasitic Hymenoptera, **202,** xi, 203. **Donisthorpe, H. St. J. K.**—Formica sanguinea, at Bewdley, with an account of a slave riad and description of two gynandromorphs, **47,** xiii, 463. **Gales, B. N.**—Notes on honey bees gathering honey-dew from a scale insect (Physokermes piceae, **179,** ii, 466. **Girault, A. A.**—A new Chalcidoid genus and species of the family Mymaridae from Illinois, parasitic on the eggs of the weevil Tyloderma foveolatum, **6,** xvii, 167. **Girault & Sanders**—The Chalcidoid parasites of the common house or typhoid-fly (Musca domestica) and its allies, **5,** xvi, 119. **Kieffer, J. J.**—Family Ceraphronidae, **194,** fasc. 94; Family Serphidae, **194,** fasc. 95. **McGillivary, A. D.**—A synopsis of the American species of Scolioneurinae, **180,** ii, 259. **Ross, H.**—Pflanzen und Ameisen un tropischen Mexiko, **74,** xxiv, 822. **Schmiedeknecht, O.**—Family Chalcididae, **194,** fasc. 97. **Schrottky, C.**—On the beegenus Centris, **202,** xi, 160. **Viereck, H. L.**—Hymenoptera for the N. J. List of insects, and other Hymenoptera, **202,** xi, 208.

Indian Insect Life. A manual of the insects of the plains, Tropical India. By H. Maxwell-Lefroy, M. A., F. E. S., F. Z. S., Entomologist, Imperial Department of Agriculture of India. Author of Indian insect pests, etc. Assisted by F. M. Howlett, B. A., F. E. S., Second Entomologist, Imperial Department of Agriculture for India. Published under the authority of the Government of India. Agricultural Research Institute, Pusa. W. Thacker & Co., 2 Creed Lane, London.

This great work of 786 pages, 84 plates and 536 text cuts, make a fine addition to the literature of Entomology and a valuable addition to the papers on Economic Entomology in India. It will have a stimulating effect not only on the study of species in that country, but in other tropical lands. The plates and figures appear to be excellent and accurate and the subject matter well written. The author says, "I shall be glad if those who see omissions or errors will point them out, as it may be that a better volume will be built up on this basis, when the study of Indian Entomology is further advanced. I may also emphasize the fact that where little is said little is known and the blanks in the books are designedly prominent to emphasize the enormous scope there is for work. I also trust that the volume may be a real stepping

stone to better things and may help those who are advancing our knowledge of insect life in India." A wonderful foundation has been laid and this foundation will undoubtedly be a great stimulus to bringing about the future work. Entomology is advancing rapidly and is breaking down politico-geographical lines and we are glad to see the increasing number of entomologists who are interested in Entomology in its broad sense. The authors are to be commended and congratulated on the production of this valuable and epoch making volume. Now that Economic Entomology is being taken up the world over we hope to see similar works from some of the other tropical countries that have official entomologists.—H. S.

Doings of Societies.

A meeting of the Rhode Island Entomological Society was held in the offices of the Providence Forestry Co. on Monday, November 22d, at 8 P. M., eight members being present.

After the minutes had been read and approved, Mr. Billson read a most interesting paper on "The Destructive Habits of the larva of *Pieris rapae*," which pointed out the tremendous amount of damage done annually by this insect and also showed the rapid rate at which it has covered the continent.

Mr. Place then exhibited some Lepidoptera, which was viewed with interest.

The new cabinet which is to contain the society's collection of Lepidoptera and Coleoptera and which had just been delivered was carefully inspected by all the members present who pronounced themselves well satisfied. After a brief social talk the meeting adjourned.

WILLIAM PLACE, JR., *Secretary.*

The fifth meeting of the Entomological Society of America was held at the Harvard Medical School, Boston, December 30th and 31st, 1909. The President, Dr. Henry Skinner, presided throughout the sessions. The President announced the deaths of Wm. H. Edwards, an Honorary Fellow; Prof. Mark Vernon Slingerland, a Fellow; B. H. Guilbeau, W. Brodie and H. M. S. Seib, members. Suitable resolutions on the deaths of Mr. Edwards and Prof. Slingerland were adopted.

The report of the Executive Committee showed among other things that sixteen new members had been received during the year and twenty-two memberships had terminated, not including those who had died. Also that a memorial drawn up by Mr. W. C. Wood regarding the tariff on insects and signed by the President and Secretary had been productive of no action by Congress.

The question of appointing delegates to the approaching International Congress of Entomology was referred to the Executive Committee.

The following officers were elected: *President,* Dr. John B. Smith; *First Vice-President,* Dr. S. A. Forbes; *Second Vice-President,* Prof. V. L. Kellogg; *Secretary-Treasurer,* Mr. C. R. Crosby.

ADDITIONAL MEMBERS OF THE EXECUTIVE COMMITTEE.

Prof. J. H. Comstock,	Prof. J. M. Aldrich,
Dr. W. M. Wheeler,	Rev. Prof. C. J. S. Bethune,
Mr. E. A. Schwarz,	Prof. Lawrence Bruner.

MEMBER OF THE COMMITTEE ON NOMENCLATURE.

Prof. T. D. A. Cockerell (to succeed himself.)

The report of the Committee on Nomenclature concerning the nomenclature of gall insects read at the Baltimore meeting, and printed in the *Annals* for 1909, was adopted as printed, with the provision that the Society express itself as standing with the majority of the Committee in Section V.

Mr. Brues suggested that Prof. Felt submit a list of names of gall insects that he thought could be accepted as standard.

Moved and carried that the request of Dr. Stile's, published in *Science,* for the preparation of a list of one hundred important names to be adopted by the Congress of Zoology as standard be referred to the Executive Committee.

The following amendment to the Constitution was adopted:

Article V, Sec. 3. Election of Officers. All officers shall be elected by ballot at the annual meeting for the term of one year and shall be eligible for re-election. Their term of office shall commence with the first of June following their election.

The Secretary was instructed to take a mail vote of all members and Fellows of the Society as to whether the present arrangement of paying separate dues and subscriptions to the *Annals* should be continued, or a single membership fee of two dollars be charged, and members receive without further expense the publications of the Society.

Prof. Sanderson suggested the adoption of a uniform style of button for both the entomological societies meeting in affiliation with the American Association for the Advancement of Science. Referred to the officers.

The following papers were read during the sessions:

R. MATHESON.—"Remarks on the External Anatomy of the Haliplidae."

W. M. WHEELER.—"On the Effects of Parasitic and Other Kinds of Castration in Insects."

A. H. MORGAN.—"Some Correlations of May-fly Structure and Habit."

C. R. CROSBY.—"Some Observations by the Late Prof. Slingerland and the Speaker on the Life-History of "*Heterocordylus malinus*" (Read by title).

C. J. TRIGGERSON.—"The Life-cycle of the Oak Hedge-hog Gall-fly (*Acraspis crinacea*)."

F. L. WASHBURN.—"A Jumping Seed-gall on the Burr Oak."

A. D. MACGILLIVRAY.—"The Female Reproductive Organs of *Corydalis cornuta*."

W. L. W. FIELD.—"The Offspring of a Captured Female of *Basilarchia proserpina*."

H. H. LYMAN.—"An Improved Drawer for Insect Cabinets and a New Substance for Lining Them."

C. T. BRUES.—"Some Notes on the Geological History of the Parasitic Hymenoptera."

J. C. BRADLEY.—"The Plaiting of the Wings of Hymenoptera."

T. J. HEADLEE.—"An Apparatus for the Determination of Optimums of Temperature and Moisture for Insects."

A. D. MACGILLIVRAY.—"The Radical Sector in *Phlebatrophia mathesoni*."

W. T. M. Forbes.—"A Structural Study of Some Caterpillars."

M. J. Elrod.—"The Blackfoot Glacier as an Entomological Burying Place" (Read by title only).

J. J. Davis.—"*Chaitophorus populifoliae*, Fitch versus *Chaitophorus populifoliae* Oestland" (Read by title only).

L. Haseman.—"The Life-History of a Species of Psychodidae" (Read by title only).

A. G. Hammar.—"Notes on the Life-History of *Fidiobia flavipes* Ashmead, an Egg Parasite of the Grape Root Worm (*Fidia viticida* Walsh).

A very interesting and extensive exhibition was held in conjunction with and under the auspices of the Cambridge Entomological Club in rooms adjoining the meeting hall.

The Annual Public Address was given by Dr. John B. Smith on the evening of December 30 in the hall of the Boston Society of Natural History, title "Insects and Entomologists: Their Relations to the Community at Large."

On Tuesday evening the visiting entomologists were the guests of the Cambridge Entomological Club at a most enjoyable smoker held in Copley Hall.

J. Chester Bradley, *Secretary-Treasurer.*

A meeting of the Newark Entomological Society was held September 12, 1909, in Turn Hall, Newark, N. J., the president in the chair and fifteen members present.

Mr. W. D. Kearfott presented the Society with a bound set of his papers on micro-lepidoptera.

Mr. Buchholz reported the capture of the following species of Lepidoptera in New Jersey: Lakehurst, *Pamphila attalus* Edw., *Lapara coniferarum* S. & A., *Eucalyptera bipuncta* Morr., *Monoleuca semifascia* Walk.—all July 17. Elizabeth, *Mamestra rosea* Harv., June 10, *M. lorea* Gn., June 21, *Bellura gortynoides* Walk., Aug. 9, *Papaipema rutila*, Gn. Sept. Plainfield, *Platythyris oculatana* Clem., *Acronycta increta* Morr., both on July 5. Newark, *Paectes oculatrix* Gn., July 1. He also showed specimens of *Schinia brevis* in their natural atti-

tude on the blossoms of the New England aster. The color and ornamentation of the moths harmonizes with that of the flowers, and it is only with difficulty that they can be detected.

Mr. Brehme exhibited types of his new *Anisota* which he is calling *neomexicana*.

Mr. Grossbeck showed some Lepidoptera taken during the summer. Among them were *Polychrisia formosa* Grt., Lake Hopatcong, July 4, *Cirrhophanus triangulifera* Grt., New Brunswick, Aug. 2, *Acronycta hastulifera* Sm. & Abb., Paterson, July 21, *Orcta irrorata* Pack., New Brunswick, June 4, *Raeselia minuscula* Zell., Plainfield, June 29, *Memythrus asilipennis* Bois., Maurer, May 16 and *Thecla polios* C. & W., Milltown, April 8.

JOHN A. GROSSBECK, *Secretary*.

The October meeting of the Newark Entomological Society was held in Turn Hall, Newark, N. J., on the 10th of the month with twenty-five members and the following visitors present: Dr. Henry Skinner, Frank Haimbach and Henry and Harry Wenzel, of Philadelphia; Chas. J. Martin and Chas. E. Olsen, of New York; F. Wintersteiner, of Brooklyn; Wm. T. Davis, of Staten Island; Geo. Domidion, of Jersey City, and Ignaz Matausch, of Newark, N. J.

Mr. Bischoff gave an extended talk on collecting Coleoptera locally and dwelt upon the importance of ascertaining the life-histories of the various species. No species is really rare when these are known, Mr. Bischoff asserts, and he cited a number of instances where innumerable examples of species ordinarily regarded as rare were secured after the breeding habits had been discovered. *Leptotrachelus dorsalis*, for example, he found literally by the hundred between the sheaths of cattail on which plant the species breeds. *Mordella octopunctata*, also, while not especially rare, is never taken in any numbers; yet he found the larvae and pupae in great abundance in an old, fallen tree at Maurer, N. J.

Mr. Bischoff further recorded the capture of *Staphylinus violaceus* at Rahway, April 25 and at Maurer, April 16.

Mr. Buchholz read a paper on Collecting in Arizona. He drew a strong contrast between collecting in that region and in New Jersey. Sugaring, which usually brings such excellent results here in the East, was an absolute failure in the West, and collecting on tree trunks was also as good as useless there. Lights proved to be a prolific collecting ground.

Mr. Kearfott remarked that the secret of collecting at lights was to secure a locality where lights were recently installed.

In contrast to Mr. Buchholz's collecting in the West Mr. Doll spoke of his experiences in Arizona many years ago. At that time it was utterly impossible to attract insects of any kind to light, while on sugar they abounded.

Mr. Harry Wenzel outlined his trip with Mr. Koeber to Arizona for Coleoptera. On their arrival everything was barren and insects scarce, but with the advent of rain vegetation sprang up everywhere and with it came the insects. Numbers of beetles were found under logs and cactus leaves. *Cicindela obsoleta* var. *santaclarae* was found after five weeks' search on the plains among the high grass. They fly with the locusts which were also present among the grass and were distinguished therefrom by the former's higher and more prolonged flight. Many water beetles were concentrated in puddles on the verge of drying up. *Plusiotus gloriosa* was taken in some numbers and in one instance twenty-seven were clustered on a beheaded cedar tree.

After the meeting the members and visitors adjourned to the dining hall where dinner was served in honor of the Twenty-fifth Anniversary of the Society. Music was furnished by Professor Wormsbacher and his pupils. Speeches were made by many of the members and most of the visitors.

JOHN A. GROSSBECK, *Secretary.*

The November meeting of the Newark Entomological Society was held on the 14th of the month with seventeen members present.

Mr. Bischoff remarked on a dipterous insect which he ob-

served ovipositing on fungus. Later he examined the fungus to obtain the larvae, but they had already left. In examining some decomposed material in the hollow of the tree directly under the fungus he found, not the pupae of a dipteron, but those of a beetle, *Megalodacne fasciata*, as was proved when the adults emerged. This beetle becomes mature late in fall and soon after issuance seeks winter quarters.

JOHN A. GROSSBECK, *Secretary*.

The December meeting of the Newark Entomological Society was held in Turn Hall, Newark, N. J., on the 12th of the month. Nineteen members were present.

The officers elected for the ensuing year were as follows: For President, Otto Buchholz; vice-president, Edwin Bischoff; secretary, John A. Grossbeck; financial secretary, T. D. Mayfield; treasurer, Geo. J. Keller; librarian, Wm. H. Broadwell.

Mr. Buchholz exhibited a series of *Eudule mendica* and *meridiana*, showing that in markings the two species almost run together. He said that he has been taking the latter species at Elizabeth, N. J., for the past three years and that it is triple brooded, appearing in May, in July and again in September. He further recorded the capture of *Epiglaea decliva* at Elizabeth on November 13 and a specimen of *Leucania extincta* at the same place.

Mr. Ignaz Matausch showed a considerable number of superb water color enlargements of Membracids and their nymphs. He spoke at length on the time of their occurrence, their abundance, rarity and distribution, and of the specific characteristics and habits of each. In his belief there are three species of *Smilia* in this country instead of only two, one of the supposed variations being in reality a distinct species. One drawing illustrated a hermaphrodite of *Telemona ampelopsidcs*.

Mr. Bischoff remarked that the membracid, *Thelia bimaculata*, mimics the thorns of the locust tree, and until this fact is discovered it is not readily seen.

JOHN A. GROSSBECK, *Secretary*.

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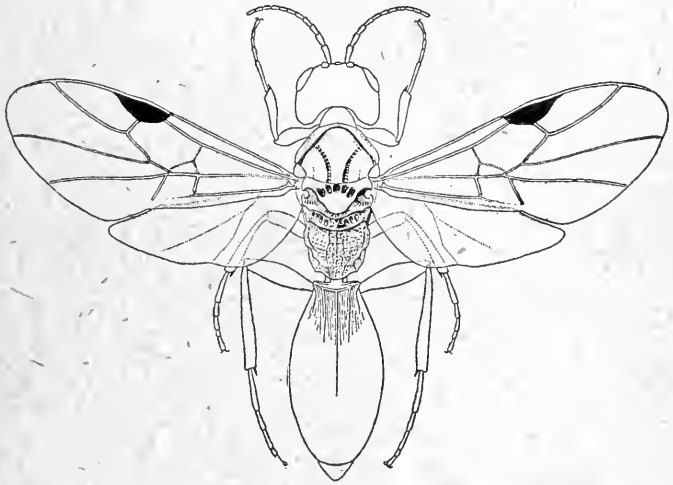

Vanhornia eucnemidarum Crawford.

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HENRY ULKE.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXI. MARCH, 1910. No. 3.

CONTENTS:

HENRY ULKE.

(Plate VI)

Henry Ulke died at 8 o'clock, February 18th, in Emergency Hospital, at Washington, D. C., of concussion of the brain, due to a fall at his home, 411 Fifteenth street northwest, last Saturday.

Mr. Ulke was born in Frankelstein, Germany, 89 years ago. His father was a prominent naturalist.

In 1849, with his father, he came to this country. The father soon returned to Germany, and young Ulke came to Washington, where his talent as an artist soon gained recognition.

At the time of the accident that caused his death Mr. Ulke was, considering his advanced age, in excellent health. Saturday he fell and struck the side of his head against a door. He was found by his son in an unconscious condition, and was taken to the hospital, where he died without regaining consciousness.

Mr. Ulke belonged to the first generation of American Coleopterists, having been a charter member of the Entomological Society of Philadelphia and was intimate with the men

of that day, such as Leconte, Horn, Ridings, Bland, Cresson, Wenzel, Wilt and Feldman. He was a noted collector, particularly of the smaller Coleoptera, such as the Pselaphidae, Scydmaenidae and Silphidae, and also a master in technic. His collection and material were frequently used by the systematists of the time. Many references to it will be found in the writings of Cresson, Leconte and Horn, as well as in those of Dietz and others. Many rare and interesting specimens were presented by him to the collection of the American Entomological Society, the first lot being donated in 1861. He was the owner of a famous collection of Coleoptera, the work of a lifetime. It is now in the Carnegie Museum in Pittsburgh, Pa. He had a large circle of scientific friends and was admired and respected by all.

Perhaps no portrait painter in this country was better known in the last generation that Henry Ulke. He was a personal friend of Abraham Lincoln, portraits of many of whose cabinet members he painted.

One of Mr. Ulke's most famous portraits that of President Grant, until the building of the new executive offices last summer, hung in the private office of the President. It now hangs with the White House collection, in the long gallery.

Mr. Ulke painted more than 100 portraits, notable among them being those of Secretaries Sumner, Chase and Stanton, of Lincoln's cabinet; James G. Blaine, John G. Carlisle, Carl Schurz, John Sherman, Chief Justice Taney, of the Supreme Court; Robert Ingersoll, and W. W. Corcoran, founder of the art gallery that bears his name.

He is survived by three sons.

THE First International Entomological Congress to be held in Brussels from the 1st to the 6th of August is sure to be a success. Delegates from Canada and the United States have signified their intention to be present. Seven subscriptions have been received from Africa and seven more are expected. India, Japan and the British West Indies will be represented. The Entomological Society of America will appoint delegates, and it is hoped that other American Entomological Societies will do the same.

The Life History of Cricula trifenestra.

By James H. Stebbins, Jr., Ph.D.

Through the courtesy of Dr. G. Lagai of The Kny-Scheerer Co. I came into possession, on April 10, 1909, of a dozen live cocoons of *Cricula trifenestra* which he had shortly before received from India.

The cocoons were firmly spun of silk, and were of a bright yellow color. In size they were 35-40 mm. long by 14-16 mm. wide.

The first moth to emerge from its cocoon was a male, and it made its appearance on the night of June 6, 1909, and the remaining moths emerged thereafter on the following nights: June 7, a male and a female; June 8, a female; June 9, two females; June 11, a female; June 25, a male; June 27, a female; June 28, a male. Two cocoons did not develop at all, and among those which did develop four were males and six females.

On June 23d a male and female were found in copulation, and on June 25th the female began ovipositing. The ova were small, white and spherical. There were only 40-50 of them, and they were deposited in small scattering clusters.

July 8, 1909. The ova laid on the 25th inst. began to hatch out, thus making the egg period 14 days.

The larvae obtained were about ¼ inch long. The head was large and black, with a slender body gradually tapering towards the anus. The color of the body was brownish-yellow, with a blackish collar on the thoracic segment. There were four tubercles on each segment, surmounted by dark colored setae, and a dark spot on the eleventh segment and anal shield. The legs were black, and the props greenish-yellow, while the anal shield is dark colored.

Not knowing the food plant of this larva, several were tried, among which I would mention lilac, lettuce, wild cherry, hickory, maple and oak leaves, but they refused everything excepting the oak leaves, which they devoured with great relish. They all feed in a row, quite close together, forming quite a sociable

family and starting at the outer edge of the leaves they gradually eat inward toward the midrib.

July 16, 1909. Eight days after hatching the larvae have moulted for the first time. They are now about half an inch long and quite slender, and of a dark velvety-brown color, with four tubercles surmounted with whitish hairs on each segment. The props are of the same color as the back. The legs are whitish, and the anal shield dark brown. They devoured all their skins excepting the heads.

At this stage of the larva's development it was discovered that if the larva's setae accidentally come in contact with the tender portion of the skin, that a pronounced stinging sensation is felt, followed by a slight reddening of the same.

July 24, 1909. On the sixteenth day the larvae have moulted for the second time. They now appear about the same as before, but are considerably longer. Their heads are now brownish-red instead of black, and each segment has become covered with minute yellow dots. They again ate most of their skins.

July 31, 1909. On the 23d day the larvae have moulted for the third time. They are now over an inch long, but still quite slender. Their heads are now red, their bodies black, with numerous bright yellow spots, and there are now 6 tubercles on each segment surmounted with white setae, thus giving them a red and black banded appearance. The props, legs, abdomen and anal shield are brownish-red.

August 7, 1909. On the thirtieth day the larvae have stopped eating, and have begun moulting for the fourth time. They are now about 2 inches long and quite slender, but show no other marked change.

August 14, 1909. Thirty-seven days after hatching the larvae are now moulting for the fifth time. They are now about 3 inches long and much thicker, but otherwise their appearance has changed very little.

August 20, 1909. After a couple days' abstinence from food the larvae have begun spinning their cocoons. These are smaller than the original ones, and not nearly as heavily or compactly built.

September 12, 1909. Two male moths emerged from their cocoons. They are much smaller, and of a somewhat different color than the originals. The male with wings extended, measures 50-52 mm. from apex to apex of the primaries, and the length of body is 17-20 mm.

The line markings are less pronounced, but the translucent spots are well defined, but smaller than in the originals.

The larvae are quite hardy, and though our summer at Clayton, N. Y., was a cold one, and the variations in temperature at times considerable, but very few were lost.

September 12-14, 1909. A number of males and females emerged from their cocoons, and on the 14th a male and female were found in copulation.

September 15, 1909. The female fertilized on the 14th inst. deposited sixty eggs, and on September 30, 1909, fifteen days later these eggs hatched out.

The young larvae were very small, but had the same general characteristics as the previous brood. It will thus be seen that *Cricula trifenestra* is double-brooded in these latitudes.

Owing to my return to New York just at this time, I was unable to follow up the development of the second brood of larvae for lack of the necessary food-plant, but hope to renew my investigations upon this subject during the summer of 1910.*

THREE NEW RECORDS OF BLATTIDAE (ORTHOPTERA) FOR THE UNITED STATES, by James A. G. Rehn and Morgan Hebard.—*Ceratinoptera diaphana* (Fabricius). An adult female of this species, in the Hebard Collection, was taken from under a coquina boulder in heavy scrub in Key West, Florida, January 20, 1904, by the junior author. The species has been recorded from Cuba and a number of the other Greater and Lesser Antilles south as far as Barbados. *Phoetalia laevigata* (Palisot). A female of this West Indian species from Key Largo, Florida, taken March, 1898 by C. L. Pollard, is in the collection of the United States National Museum. *Blaberus cubensis* Saussure. A male of this species taken at Key West, Florida is in the collection of the Academy of Natural Sciences.

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*Just after concluding this article, my attention was called to another one relating to this subject, entitled "The Breeding of the *Cricula* Larvae," by J. English, Entomologische Zeitschrift, Sept. 25, 1909, p. 120, but as the results obtained by me differ somewhat from those obtained by English, I feel justified in giving my observations publicity.

Further Study of the Catocalae.

By R. R. Rowley and L. Berry.

In the late summer and fall of 1908, the senior author received from various European sources, eggs of *Catocala sponsa, dilecta, fulminea, fraxini, electa, pacta, puerpera,* and *clocata,* and remembering the experiences of the previous spring, kept the eggs on a cold cement floor till the foliage of the food plants had burst the bud coverings and was ready to supply larvae with abundant food.

The first egg to hatch was of *pacta,* April 27th. *Sponsa* was next on May 2d, then *fulminea* on May 5th, *fraxini* on the 6th, *nupta* on the 8th, *electa* on the 13th, on the same day *dilecta,* and lastly *puerpera* and *clocata* on the 23d.

The growth of these larvae was very satisfactory except in the last two, the author scoring a signal failure on these as far as securing chrysalids was concerned, still there was some satisfaction in the fact that the larvae lived almost to maturity.

There was a worse disappointment in the *dilecta* which readily matured and pupated and then perished without giving a single imago.

Especially gratifying were the beautiful series of *sponsa, fulminea, fraxini, electa* and *pacta* moths. *Pacta, fulminea,* and *fraxini* seemed to be unusually hardy as caterpillars and were a source of much interest to the author.

The imago of *pacta* is a beautiful little creature with pink hind wings and pink abdomen, while the larva of *fulminea* is a strange departure from the typical "Cato-worm", in the possession of long dorsal tubercles.

The caterpillar of *puerpera* is almost white and it was not a matter of much surprise to learn that the front wings of the moth are very light. The first imagoes of *fulminea* were on June 21st and the first *pacta* on the 22d. The first *sponsa* on the 24th.

However, it is the intention of the authors, in this article, to record their observations on such American species of Catocala as they were fortunate enough to have the opportunity to study during the spring and summer of 1909.

The eggs of *cerogama, relicta, palaeogama, ilia,* and *cara* were obtained by the junior author from moths captured the summer before, in the neighborhood of Vinton, Iowa, while double lots of eggs of *amatrix* and *concumbens* were furnished by both the junior author and Mr. C. Leonhard, Kearny, N. J.

The first eggs to hatch were those of *ilia* on May 2d, and, despite the fact, the senior author kept the jars well filled with fresh young leaves of both bur oak and chestnut oak, few of the larvae reached the first moult. To all appearances they traveled themselves to death and, with the exception of the caterpillars of *relicta,* were the most active *Catocala* larvae the author ever handled. The larvae of most Catocalae are very active just after hatching, but those of *relicta* lose none of their activity till well grown.

The junior author had better success with *ilia* and secured several chrysalids from larvae fed on bur oak and, on June 4th, she found well grown larvae of this species lying in the grooves of the trunks of bur oak trees, partly concealed by the shaggy outer bark. Without concealment, these caterpillars would probably be conspicuous in their light color, at maturity. Larva rests with head upward.

It seems that the oak-feeding larvae, as a rule, are much more difficult to rear than larvae feeding on other plants, unless it be the walnut caterpillars. Of course, *Catocala* larvae only are meant. About half of the willow and poplar feeders are easy to bring to maturity, all of the locust and most of the hickory "worms." At least, this is the experience of the senior author.

On the 4th of May the first *cerogama* egg hatched and the little caterpillar was light smoky yellow with a black head. Later, but before moulting, the body of the larva became quite dark brown with black pro- and true legs.

After first moult, but near the second, the caterpillar is light brown, striped longitudinally with white. The head, gray with black dots and marks while on the top of the last two abdominal segments are distinct black points or granules. True legs dark, tipped with black. Pro-legs, flesh color. Between moults in this larva the time is from four to five days.

After the second moult the larva is short, thick, and much

unlike a *Catocala* "worm", yellow, striped with longitudinal lines of a dark brown color. Head brown with lighter streaks. The dorsal portion of the first thoracic segments bright yellow and without the stripes. The tubercles on the top of the first thoracic segment and the last two abdominal segments, black, True legs black, pro-legs, yellow with black tubercles. A strange looking *Catocala* larva.

The young *cerogama* larvae have the habit of hiding in the leaf buds and the older ones down in the foliage.

After the third moult the larva is yellowish with longitudinal black parallel lines. The top of the first thoracic segment has a yellow collar-like surface with black dots or points. The pro-legs, color of the body. True legs with black tips and dark outside. The pair of tubercles over the eighth abdominal segment, short, black horns. The top of the caudal shield yellow with back dots as with the first thoracic segment but not so distinct. A very sluggish larva.

After the fourth moult the color is unchanged. Head, mottled yellow, brown and white and much larger than just before the moult, without any black dashes. True legs, shiny black. The two dorsal tubercles over the eighth abdominal segment, black pointed, prominent, horn-like. The larva still has the bright yellow collar with black dots over the first thoracic segment. The ventral surface is a light green with small, not very dark, mid-ventral spots.

The grown larva of *cerogama* is fully two inches long, thick, dark purplish brown with interrupted longitudinal lines of black, very fine. A pair of short tubercular dark brown spines on the top of the last spiracular segment (8th abdominal). The yellow collar and yellow caudal shield, with black dots or low tubercles. Head mottled, white, yellow and black (black streaks). True legs black on the outside. Pro-legs, body color. Ventral surface, yellow-green (light) with an almost entire absence of the mid-ventral spots. The caterpillar is very tame and lazy. The spiracles of the grown larva of *cerogama* are very noticeable, being rather large, black and surrounded by a yellow ring. (The mid-ventral spots, when present are light brown).

After spinning and before pupation the larvae are quite green along the side and greenish all over.

The caterpillars began spinning on May 31st and the last one was not ready till June 6th. The chrysalis of *cerogama* is from one to one and one-fourth inches long, brown. Light reddish-brown over the abdomen.

Pupa covered by a slight prunescence. The larvae spun both in paper in the bottom of the jar and in the folds of leaves. When first freed of the larval skin the chrysalis is a beautiful light green.

But few of the larvae died, two of the pupae, however, failed to give imagoes. The food plant is linden or basswood. The first imago appeared on the 6th of June, having spent a month in the chrysalis state. The last pupa gave an imago on the 13th.

The first *innubens* egg hatched on May 7th and the larva passed its moults on the 12th, 17th, 22d, and 27th, and began spinning on June 1st.

Before the first moult, the larva is light gray, streaked longitudinally with a darker color. Head, light. True and pro-legs gray. No hump, larva very small. After second moult, the caterpillar is very light gray, almost white. Head, legs and pro-legs, white or gray. The tubercles show up as dark points. After the third moult the larva differs little from the full grown larva, is light gray or almost white with a slight hump over the fifth abdominal segment. The lateral body stripe darker than the dorsum. Black dots or small tubercles show distinctly over the dorsal white. Head, gray, streaked with delicate black lines. After the fourth moult the dorsal gray has an under shading of light brown while the lateral stripe is a beautiful red-brown. The hump over the 5th abdominal segment is rather strong. Tubercles small, black. Head, light reddish-brown. True legs light brown. Pro-legs gray with reddish-brown dots. When well grown the larva is almost white, dorsally, with a lateral yellowish or orange stripe. Black dots and interrupted lines are in the dorsal stripe. Over the 5th abdominal segment is a slight hump with dark patches about it. The top of the first thoracic segment is orange. True legs, orange. Pro-legs, yel-

low. The ventral surface is cream-yellow with large black spots. Head, light yellow with fine longitudial lines, gray or black. The larvae of *innubens* are the hardiest of the hardy, and while there were no deaths in the brood, there wasn't a *scintillans* among the imagoes. The chrysalids gave moths from June 27th to July 1st.

Individuals of this species are the most abundant *Catocala* moths in the forests of Pike County, Missouri. The food plant of the larva is honey locust.

The larvae of *palaeogama* began hatching on the 15th of May and were dark blue or dove color with white legs, white pro-legs and white ventral surface. The head not quite as dark as the body color. Longitudinal lines hardly discernible. After the first moult these larvae are black with indistinct longitudinal lighter lines. Head black. Both true and pro-legs light, almost white. Little or no change in these larvae after the first and second moults save an increase in size and a little lightening of the ground color. After the third moult, general color bluish-gray with black head, lined with fine white marks, dark thoracic segments, dark dorsal patch on both 5th and 6th abdominal segments and dark sides to the 8th and 9th segments and dark 10th segment. The 3d and 4th pro-legs black, the 1st and 2d, gray. True legs dark brown. Tubercles black. A slight hump over the 5th abdominal segment. After the fourth moult, the larva entirely loses its bluish color and becomes dark gray with the three thoracic segments, a cross band between the 5th and 6th abdominal segments and the 8th, 9th, and 10th abdominal segments black. Head gray, streaked with dark brown. True legs, dirty yellow. Pro-legs, of the general body color. A slight cross ridge over the 5th abdominal segment and prominent black tubercles over the 8th abdominal segment. Tubercles black. In a few hours after the moult they resume their bluish-white color. After the fifth (?) moult, the *palaeogama* larva is light red-brown over the abdominal region to the 5th segment, where a cross black band covers half of the 5th and half of the 6th segments. The thoracic segments, as well as the 8th, 9th, and 10th abdominal segments, are dark brown,

quite black. The head, true and pro-legs are flesh color. Head large and round and without a lateral black dash. No hump. The tubercles are whitish and yellowish and very prominent, the dorsal pair over the 8th abdominal segment being the strongest and somewhat brown in color. Stiff bristles but no lateral row of setae. The eggs from which the above larvae were obtained were found by the junior author in a crowded cluster under the loose outer bark of shag bark hickory, but the larvae were fed to pupation on pecan and were quite free from disease. The caterpillars began spinning on June 15th to 24th.

The chyrsalis is one and a fourth inches long, light brown. wing cases lighter than the rest of the body. The whole pupa covered by a slight prunescence. The larvae spun either at the bottom of the jar between folds of paper or above, between leaves. The chyrsalids began to give imagoes on July 10th and continued to the 14th. Among the imagoes were two *phalanga* and one or two very dark forms, on the hind wings of which the yellow cross band was almost eliminated. The junior author fed a brood through on walnut and pignut hickory.

The first larva of *Catocala relicta* hatched on the 13th of May and was green with a light chestnut head. True and pro-legs light. Caterpillar very small and exceedingly active. The hatching from this first batch of eggs continued for a number of days. The mother of the brood was a light moth. The first egg from a dark female hatched on the 19th of May and others hatched, one or two a day, for some time. After the first moult, the larva was pale yellow or chestnut with a head a little deeper in color. The legs colored as the body. After second moult, the caterpillar is gray, longitudinally streaked and with very light chestnut colored head. True and pro-legs slightly browner than the body color. No hump.

After third moult, the larva is an inch long, grayish brown with a small flat head like that of the *Cara* larva, lobed above and yellowish at the lobes. Behind the yellow tips or lobes, the head is black. There is a small cross hump over the 5th abdominal segment, quite black, and set in a large, dark, dorsal spot. The true and pro-legs, body color. Over the 8th ab-

dominal segment is a slight ridge like elevation with a black line behind it. The top of the 1st thoracic segment is dark. A row of stout setae are along each side. Body dots minute, dark.

After fourth moult, the larva is yellowish gray with black or dark brown head, less flattened than at third moult, with bright yellow lunules at the upper lobes. The top of the 1st thoracic and 2d abdominal segments darker than the body color. A cross band of dark brown, almost black, envelops the hump over the 5th abdominal segment and a cross streak of black behind the double dorsal tubercle over the 8th abdominal segment. True legs, reddish gray. Pro-legs, body color. Tubercles not noticeable. At this stage the larva is much like that of *Catocala fraxini*. There is a lateral fringe or row of short setae. Later, probably after the fifth moult, or rather, at the fifth moult, is one and a half inches long, whitish yellow. Head black, large and much as in *C. fraxini* with yellow-white lunules at the lobes above. True and pro-legs, body color. A slight hump over the 5th segment, with a small yellow-brown spot on top, enveloped in a cross band of dark, a black line crossing the 8th abdominal segment as a shade line behind the two dorsal tubercles which are not strong.

The rest of the body tubercles cream color and inconspicuous. A dark shade line crosses the front of the 2d abdominal segments, a dimmer one at the front of the 3d abdominal segment. Two small dark spots are on the top of the 7th abdominal segment. The front of the head, that is about the mouth, is grayer than above. Tubercles darker than the body color. Row of short lateral setae. Full grown larvae two and one-fourth inches long and the first began to spin on the 22d of June.

The full grown larva is greenish gray with an indistinct double V of dark dots on the tops of the 1st and 2d abdominal segments and a slight dark patch of dots on the side of the 1st thoracic segment. A cross band of black, invaded by the body color, mid-dorsal and laterally, crosses the back of the 5th and front of the 6th abdominal segments, extending onto the third pro-leg. A slight mid-dorsal cross black line on the 7th ab-

dominal segment and a stronger one on the 8th, forming a blunt V. Black lines bound the anal pro-legs. The true legs are flesh color with green at the joints. Pro-legs, body color. Head, black above, except at the lobes, where a dirty reddish yellow lunule is conspicuous. About the mouth, the color is lighter, flesh color and appears in dots and streaks. The ventral surface is pale green with black spots.

This larva from the time of hatching to the time of spinning is the most active I have ever had anything to do with, but is apparently without fear, as it seems to prefer to crawl on one's fingers. You can't leave one for a minute and expect to find it again. It is strongly like the larva of *C. fraxini*, differing only in minor details. In spinning, it seems to prefer the top or middle of the jar and the willow leaves, to paper. It seems to be hardy on black willow, except that it does not reach the size of the aspen feeder.

On the 25th of June ants destroyed seven grown larvae of this species, all the "worms" in one jar. The pupa of *C. relicta* is rather long and slender, dark, reddish brown with whitish prunescence. Wing cases not darker than the body. The chrysalis when disturbed is quite a wriggler, like the larva. The first imago was a white one and on July 20th and the last one was a dark one and on August 5th. The imagoes straggled like the larvae. From the eggs of the white female all the moths, save one, were white, and from the eggs of the dark female most of the moths were dark. There was no difference in the size or color of the larvae of the two varieties.

The junior author had larvae quite three inches long, fed on aspen, but no luck in securing imagoes as her larvae died when full grown. She finds the imagoes in the woods among the largest of *Catocala*, but bred on black willow by the senior author, they were no larger than *concumbens*. By striking a smart blow on the tree just over a resting *relicta* moth the junior author was surprised, on several occasions, to see the moth drop to the ground and remain motionless, even allowing itself to be picked up.

On the 24th of May the first larvae of *concumbens* hatched.

They were at first greenish, getting darker, with a light chestnut head, as in young *C. relicta* larvae. True and pro-legs concolorous with the body. After the first moult, the larva is almost black with fine longitudinal whitish lines, the dorsum being a little lighter than the sides. Head dark brown. True legs brown. Pro-legs black. A white dorsal streak just back of the head and another one on the top of the last three or four body segments. After the second moult the caterpillar has a yellowish brown dorsum and a dark lateral stripe. Body marked longitudinally. Head dark, flattened as in *cara,* lobed above and streaked. Yellowish lunules at the lobes with dark dot in the crescent. Body and head streaked longitudinally but indistinctly. True legs lighter than the lateral stripe. Pro-legs dark with dark yellow. A cross black ridge over the 5th abdominal segment. The ridge over the 8th abdominal segment not distinct. Ventral side cream color with intensely black spots.

After the third moult, the larva is one and one-half inches long, light yellowish brown with a reddish yellow cross band, inclosing the orange hump over the 5th abdominal segment. Hump with a dark line encircling the base. Black dashes at the pair of dorsal tubercles over the 8th abdominal segment. Pro-legs body color with yellow central surface. True legs, red-brown. Head, gray with brownish lateral dash and reddish-yellow spots at the lobes above, and flattened as in *cara.* Tubercles reddish. Larva very much like that of *cara.* Whitish beneath and with black round spots. Short lateral fringe. At this stage of its life, the larva of *concumbens* is hardly distinguishable from that of *amatrix* at the same stage.

After the fourth moult, the larva is less than two inches long, dark yellowish-brown about the middle and dark brown about the anterior and posterior ends. The tubercles are deep red-brown with yellowish tops. Head flat as in *cara,* colored like the body, with red lunules at the lobes above and shaded on the outside by black dashes that extend from the mouth entirely around above. True legs, flesh red. Pro-legs, body color with indistinct light spot outside. Over the 5th abdominal segment is a cross elliptical raised yellow place or hump surround-

ed by or flanked behind by, rather, a cross band of deep yellow. Ventral side reddish with the central black spots (almost pinkish below). The tubercles over the 8th abdominal segment rather strong, flanked behind by a strong cross line of black. The lateral setae very short, almost absent. After the fifth (?) moult, the larva of *concumbens* has the same colors and marks as after the fourth moult, except that the body color is a shade lighter. Length from two to two and a fourth inches.

On the 23d of June, ants killed the last jar of *concumbens* larvae. Grown larvae of *concumbens* received from the junior author were from two and a half to three inches long, brown with faint reddish tinge. Tubercles deep red-brown. A cross band of light red-brown over the back half of the 5th abdominal segment. The cross elliptical hump over the 5th abdominal segment is hardly noticeable, reddish yellow with a darker basal girdle. The two dorsal tubercles on the 8th abdominal segment scarcely stronger than the rest but with a cross line of black for a back boundary. True legs reddish yellow. Pro-legs, body color. Head, body color, flattened as in *cara* with a lateral boundary line of black from the mouth around to the mouth, not broken above. The horn-like lobes of the head above orange yellow. Ventral side of the body, beautiful pink with black central spots. Bristles not long. Lateral fringe of short setae. The junior author had better luck with her larvae of *concumbens,* securing pupae and imagoes, feeding her larvae on broad leaf willow while the senior author fed his brood on black willow. Four chrysalids of *concumbens* sent by mail from Vinton, Iowa, to Louisiana, Mo., produced as many beautiful imagoes while chrysalids of *amatrix, relicta,* and *piatrix* either perished on the road or died later, but the weather was intensely warm when these pupae started through the mails. Among a number of pupae of *neogama,* sent under similar circumstances, three produced moths.

On the 25th day of May the eggs of *amatrix* began to hatch. The young larva is light brown with lighter longitudinal streaks. Head, chestnut or light brown. True and pro-legs, colored as the body. Much darker than most other willow feeders at this stage, that is, before first moult.

The *amatrix* eggs from a *urus* female began hatching on the 1st of June. After first moult, the larva changes from a light chestnut color to almost black with a mid-dorsal cream colored stripe from the head half the length of the body. Head, dark brown. True legs, dark brown. Pro-legs, black. After second moult, the caterpillar is reddish brown with a somewhat lighter mid-dorsal line from the head to the middle of the body length. There is a very black lateral longitudinal band. Head darker brown than the body. The lateral black band crosses over the body at the 5th abdominal segment in a slight hump. The pro-legs, black. The true legs dark brown. At this stage of its growth it is a very pretty larva.

The larva of *urus* is light yellowish brown before first moult. After first moult, it is almost black with head a little lighter. Pro-legs, black. True legs, dark, almost black. Longitudinal streaks absent or indistinct.

After third moult, the larva of *amatrix* is nearly two inches long, yellow brown, with a yellow elliptical cross ridge or hump over the 5th abdominal segment and a cross brownish band inclosing the hump. Tubercles reddish yellow. A dark shade line behind the tubercles on the 8th abdominal segment. Head, brownish gray and flat as in *cara,* with red-brown lobes above. True legs, red brown. Pro-legs, body color. Larva very much like that of *cara.*

After the fourth moult, the larva is over two inches long, dark brown with a faint reddish tint and with reddish tubercles. Flesh colored legs and with pro-legs of body color.

The cross elliptical hump over the 5th abdominal segment is about half as large as that in *concumbens* of the same length, yellow in a dark red-brown cross band, rather, the cross band is behind the hump. The dorsal tubercles over the 8th abdominal segment rather strong red and with a black cross shade line behind. Lateral fringe short. Head flat with reddish border, bounded behind by a black line or dash that goes all the way around from one side of the mouth to the other. Ventral side of the body deep red with the black spots. The description at this stage is much like that of *concumbens* at the same stage.

By June 21st the *amatrix* and *concumbens* larvae were dying fast and not a single one of the larvae of either, handled by the senior author ever pupated. The eggs of *relicta, amatrix,* and *concumbens* hatched slowly, a few a day for weeks, it seemed, and the larvae were just as slow to develop. All three of these were fed on black willow.

Another larva of *amatrix* after fourth moult, was gray with a faint reddish tint. Tubercles, red. True legs, flesh color, also pro-legs. Head flat as in *cara* and with strong black dashes from mouth to lobe above but not across the top. Head, gray in front with pale reddish lobes above. A brownish band crosses the 5th abdominal segment. The hump is small and pinkish but not including the lateral tubercles, in fact, the hump is scarcely larger than a tubercle. Short lateral fringe. Ventral surface paler at front than above and with strong black spots in brownish yellow. A handsome larva.

A peculiarly banded larva of *amatrix* found by the junior author on the 16th of July on blue willow was two and a half inches long, very light gray with four lateral, rather narrow longitudinal dark, almost black bands, two to the side, the light gray appearing as broader bands. Head concolorous with the body and with a strong lateral black dash. Head, as in *cara,* but with small gray spots or low tubercles at the upper lobes. Body dots dark. Tubercles, white. The hump over the 5th abdominal segment not otherwise than the body color. The strong tubercles over the 8th abdominal segment, dark gray. True legs and pro-legs, light gray as body. On the back half of each body segment, the dark bands become black. Ventral side of the body pinkish with black central spots. By comparing this description with the one of the grown larva of *Amatrix* in our last year's article, a great difference in color will be found. Two of these striped larvae were found by the junior author, but the one sent to the senior author had succumbed to six fat, parasitic dipterous larvae, larger than the full grown maggots of the common house fly. The other larva gave the junior author a chrysalis and an *amatrix* moth in due time. We had hoped it might be something else. After all, there is much variation in the larva of this species. It is somewhat

strange that the larvae of *amatrix, cara, parta, concumbens, piatrix,* and *ncogama* are so peculiarly subject to a deadly dysentery, so much so that in ordinary years it is almost impossible to secure imagoes from larvae fed in breeding jars, and it is almost certain that the larvae in nature fare little better, at least here in Missouri, considering the scarcity of the imagoes and knowing that each female lays from 500 to 900 eggs.

The junior author had better success with her larvae of *concumbens, amatrix* and *parta,* securing imagoes from all three.

On the 3d of September, the senior author saw in the woods a magnificent specimen of *nurus* fully four inches expanse and the following day captured a battered specimen, the first he ever took on the wing.

On the 9th of May, the senior author collected from honey locust sprouts, twenty-five larvae of *Catocala illecta,* eight of them being past fourth moult. At the same time, a single larva of *C. innubus,* past second moult, was found. The first of these *illecta* pupated on the 21st and 23d of May and gave the first imago on the 9th of June. The first warm days of April hatch the *illecta* eggs and the little caterpillars struggle through biting frosts and even severe freezes but they escape many of the parasitic foes and diseases that come with warm weather.

Catocala minuta. Larvae of this little moth were found on honey locust by the junior author. When fully grown, the caterpillar is one and a fourth inches long, very dark, especially about the head and from the 5th abdominal segment back. Head almost black. The dorsal portion of the body lighter than the side. Longitudinal bands of lighter and darker brown. Pro-legs, body color. True legs, red-brown. A hump over the 5th abdominal segment. Dorsal tubercles almost white. The pair over the 8th abdominal segment the strongest and of a red color. Under side with the black spots. The larva reared by the senior author spun between leaves and the pupa was brown with the usual prunescence. The larva pupated on the 13th of June and the chrysalis gave an imago on the 26th. The junior author secured three imagoes from bred pupae. Since 1901 this *Catocala* has been scarce about Louisiana.

Two new Fulgorids (Hemiptera-Homoptera).

By Abram Herbert Manee.

Amyele vernalis n. sp.

Length from tip of head to end of body 14 mm.; head 5 mm., expanse 27 mm.; head brown, prolonged to nearly twice its width at base and tapering from base to outer third where from a slight broadening it tapers to rounded point; upper side of head with carinal edges and two carinae which approach from front run parallel to first third, then separate to outward curve as if to enclose the strong carina of prothorax; under side of head with carinal edges and strong central carina; eyes large, longer than wide; legs brown, hollowed on inside, hind tibiae with five spines; abdomen above black centered broadly with orange tipped with brown, under side brown sprinkled lighter; fore wings brown, veins prominent; hind wings clear, broadly based with pink and tipped with fuscous.

Southern Pines, N. C. Early April. Five specimens, one at National Museum sent by author, one in possession of Dr. E. B. Wilson of Columbia University, one collected by R. S. Woglum and two in possession of author.

Helicoptera pinorum n. sp.

Length 9 mm., expanse 20 mm.; eye round, in diameter ¾ mm., ¾ mm., round-pointed, carinal-edged, a central canal formed by 2 parallel carinae; prothorox with three carinae forming similar aspect to upper and under sides of head; under side of head piceous with broad ivory-white band which includes the *extruded* antennae and suffuses bases of legs; legs brown, hind tibiae with a median spine; body b- upper part light; fore wings brown, sprinkled lighter, and light spot at apical third of edge, veins prominent; under wings clear with tips smoky.

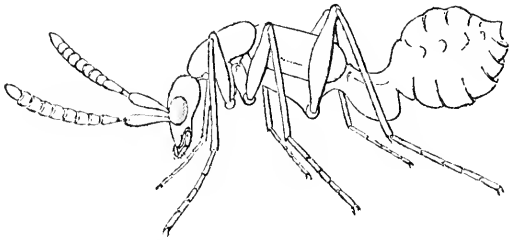
Southern Pines, N. C. September. Four or five specimens taken by author.

A New Staphylinid (Col.) Genus from Arizona.

By A. Fenyes, Pasadena, Cal.

Mr. G. Beyer of New York has sent me lately two specimens (one in fragments) of a very odd-looking beetle, which evidently belongs to a new genus of the subfamily *Aleocharinae* (*Staphylinidae*). Mr. Beyer writes me that he took four specimens in the Rincon Mountains in Arizona (5,000 feet above sea level) in August, 1907; the beetles came to the camp-light with a number of wasps of the same size and color, the two insects being scarcely distinguishable when on wing.

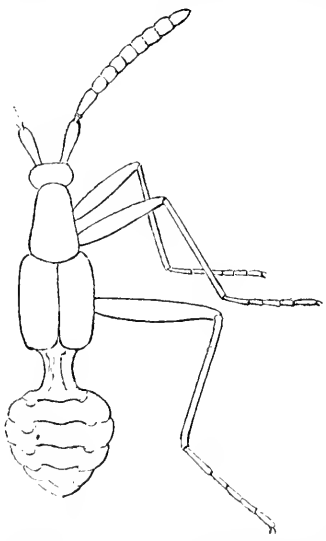
The above two specimens were accompanied by two drawings (made by Mr. I. Mattausch of New York), which will give a good conception of the general outline of this peculiar, almost surely inquilinous beetle.



Following is the description of the new genus, based on the two above specimens.

BEYERIA gen. nov.

Labrum transverse, moderately sinuate at tip. Mandibles apparently simple. Inner lobe of the maxillae on the inner side with comb-like teeth; outer lobe on the inner side and tip with fine and long spine-like hairs. Maxillary palpi 4-jointed; joint 2 short, thick, cup shaped; 3 very long, three times longer than 2, almost cylindrical; 4 subulate, more than half as long as 3. Mentum transverse. Ligula not clearly visible in my specimen, apparently absent. Labial palpi moderate, 3-jointed; joint 1 the thickest, about as long as 3; 2 a little shorter than 1 or 3. Head with the eyes wider than the prothorax, very elongate, much longer than wide, behind the eyes gradually narrowed; above deeply and almost entirely, longitudinally, widely excavated; eyes moderately small, coarsely facetted; tempora much longer than the eyes; genae not at all margined. Prothorax about as long as the head, sides almost parallel, be-



hind a little wider; base and hind angles rounded; sides near the epipleurae longitudinally, deeply impressed, the impression reaching neither apex nor base. Elytra about as long as, and together considerably wider than, the prothorax, together longer than wide; shoulders and outer hind angles rounded. Abdomen strongly pedunculate, the peduncle apparently consisting of the third segment; segments 4-8 forming a short oval, above flattened, below convex mass. Legs and all their parts very long; all the tarsi five jointed. Mesosternal process moderately projecting between the middle coxae, at tip slightly rounded. Metasternal process moderately produced, at tip broadly rounded.

I cannot assign to this genus the proper systematic position in the tribe *Alcocharini; Gastrorhopalus* Sol. and *Ecitophya* Wasm. are, to my knowledge, the only other genera of the tribe having a similar abdomen.

The type species of the genus is—

Beyeria vespa sp. nov.

Slender, elongate, winged; entirely yellowish brown; shining. Antennae elongate, longer than head and prothorax together; scarcely incrassate distally; joint 1 long, thick; 2 short, conical, about one-half as long as 3; 3 elongate; about as long as 1; 4-10 approximate to each other, gradually slightly shorter, from a little longer than wide to a little wider than long; 11 as long as 9 and 10 together, acuminate, with moderate pubescence. Head, smooth, sparsely pubescent. Prothorax, with uneven, shallow and indistinct punctures, sparsely pubescent. Elytra, with sparse, coarse and shallow punctures. Abdomen smooth. Legs, with long and delicate hairs. Length, 3.5 mm.

Rincon Mts. in Arizona.

Type in my collection.

LIBELLULA.

'Round and 'round in a figure-of-eight,
Over the hemlock pool;
Gauzy wings in the sunshine gleam
Where, here and there, a fitful beam
Pierces the shadows cool.

'Round and 'round in a figure-of-eight,
Playfellows blue and green,
Evenly matched in a tireless jig,
A perfect mechanical whirligig,
The liveliest ever seen.

New Bees of the Genus Osmia from California.

By T. D. A. Cockerell.

Osmia gabrielis sp. nov.

♀. Length about 13½ mm., width of the rather long and *nearly parallel-sided abdomen* about 4 mm.; color a fine dark indigo blue, brilliant on the abdomen, suffused with purplish on the face, and with greenish on the anterior part of the mesothorax; *pubescence all black*, except on inner side of anterior tarsi, where it has a coppery tint; in some lights there is an appearance of pale hair here and there, owing to reflection from the surface of the coarse black bristles; head and thorax very densely punctured, the punctures on the mesothorax conspicuously finer than those on the vertex; head rather large, the cheeks broad; mandibles with the two apical teeth well developed, but the others nearly obsolete; clypeus simple, its lower margin black; antennæ black; tegulæ black; wings fuliginous, broadly more or less hyaline along the veins, especially the outer ones; first r. n. entering, second s. m. nearly twice as far from base as second from apex; legs black, the femora strongly tinged with blue; second abdominal segment purplish basally.

A very distinct and beautiful species, having the general form and appearance of *O. armaticeps* Cresson, but without the cephalic peculiarities of that insect.

Hab.—San Gabriel Mountains, California, alt. 3000 ft., June 16, 1909 (*F. Grinnell, Jr.*). At the same time and place, Mr. Grinnell took *O. quadriceps* Cresson.

Osmia grinnelli sp. nov.

♀. Length about 10 mm., rather robust, with a short abdomen; head and thorax black, with feeble metallic tints, strongest at sides of face, where the greenish contrasts with the black of the clypeus; abdomen dark bluish, the first two segments partly brassy; hair of head and thorax inconspicuous, black mixed with shining white; a tuft of white hair behind the wings, but that on sides of metathorax and on pleura black; hair of abdomen black, even on first segment, but some white hairs forming a little tuft at sides of first segment near hind margin; legs black, with black hair, that on inner side of anterior tarsi copper-red; tegulæ dark; wings hyaline, more or less stained along the nervures, b. n. exactly meeting t. m.; second s. m. low, receiving first r. n. only a little more remote from base than second from apex; antennæ black; mandibles with only the two apical teeth well developed, these far apart; clypeus with very large punctures, smaller and extremely dense toward lower margin, next to which is a median broad shining pit or depression.

A very ordinary looking species, easily known from *O. nigrifrons, wilmattae, pikei,* etc., by the disc of the mesothorax, which has large well separated punctures, with extremely small punctures between them. It is related to *O. leonis* Ckll., but that is larger and has the clypeus much more densely punctured.

Hab.—Strawberry Valley, San Jacinto Mts., California, 6000 feet, July 16 (*F. Grinnell, Jr.*).

Osmia sanctæ-rosæ sp. nov.

♀. Length about 8½ mm., moderately robust, *fine deep indigo blue,* the abdomen brilliant and shining, though not equal to that of *O. cobaltina;* pubescence black, including inner side of front tarsi and tuft behind wings, but a little short glittering white hair on hinder part of disc of thorax, and a quite conspicuous little pale patch on each side of first abdominal segment, along the hind margin; *mandibles evenly tridentate,* the teeth all strong; clypeus normal, two little tufts of orange hair beneath lower edge; punctures of head and thorax small and very dense; antennæ black; *tegulæ shining blue;* wings dilute fuscous, paler along the veins; second s. m. receiving first r. n. at least twice as far from base as second from apex; legs black, femora blue behind; beneath the femora have large concave smooth and shining areas for the reception of the tibiæ; scopa black.

Related to *O. tristella* Ckll., but with no white tuft behind the wings, legs partly metallic, and venation different. The less brilliant colors separated from *O. cobaltina* Cresson.

Hab.—Santa Rosa Mountains, California, 7500 ft., June 26 (*F. Grinnell, Jr.*) *O. cobaltina* was taken by Mr. Grinnell on Mt. Wilson, California, June 5, 1909. The male has the same parallel-sided form as the female.

Osmia pogonigera sp nov.

♀. Superficially like O. *wilmattae,* with which I at first confused it, but readily separable as follows: abdomen narrower and bluer, less closely punctured; wings redder; hair of under side of prothorax white; face with much glistening white hair, though coarse black hairs are intermixed; pleura denuded in type, but with some short white hairs, especially behind; cheeks beneath with some white hair, but also with *long curled black bristles, forming a conspicuous beard.* The last character is absolutely distinctive. Length about 10 mm.; legs black; sides of metathorax with white hair; ventral scopa black; tegulæ partly blue.

Hab.—Strawberry Valley, San Jacinto Mountains, California, 6000 ft., July 17 (*F. Grinnell, Jr.*). *O. wilmattae* Ckll. (A variety with hair on inner side of hind tarsi; dark) was taken by Mr. Grinnell in the San Gabriel Mountains, California, at 3000 ft., June 16, 1909.

Osmia pasadenæ sp. nov.

♂. Length a little over 8 mm., *olive-green,* the mesothorax more bluish-green; head and thorax with abundant long pale hair, which is dorsally pale ochreous, lighter laterally, and white ventrally; no dark hairs on head or thorax; hair of abdomen and legs also all pale, without any black, forming distinct through thin bands on segments 3 to 5; hair on inner side of hind basitarsus pale orange; antennæ black, the *flagellum slender, not at all moniliform;* head and thorax very densely punctured; tegulæ shining black; wings dilute fuscous; second s. m. long and low, receiving first r. n. not twice as far from base as second from apex; legs (except hind coxæ) not metallic; tarsi ordinary, except that *hind basitarsus has a small tooth* as in the subgenus *Ceratosmia* (to which the insect is not otherwise closely allied); abdomen rather narrow; sixth segment somewhat reflexed, and feebly emarginate; seventh bidentate, the teeth rather short and far apart; first ventral segment obtusely triangularly produced at apex; margin of third ventral undulate.

In general appearance similar to *O. inurbana* Cresson, but smaller, with a narrower abdomen, and readily distinguishable by several structural characters above described.

Hab.—Pasadena, California, April 2, 1909 (*F. Grinnell, Jr.*). *O. olivacea* Ckll. also has the tooth on the hind basitarsus, and must be closely allied, but it is easily separated by the black hair on the abdomen, etc.

Also at Pasadena, April 8, 1909, Mr. Grinnell took *O. bennettae* Ckll., new to California.

Description of a New Deltoid Moth.

By John B. Smith, Sc.D.

Renia atrimacula n. sp.

Dull reddish gray tending to mouse-grey. Palpi darker at sides, antennal tuft darker. Primaries with maculation clearly defined, the ordinary spots blackish and contrasting. T. a. line slender, blackish, single, nearly upright, sometimes a little diffuse outwardly. T. p. line consists of a slender blackish line, followed by a more diffuse

yellowish line, a little outward bent over costa, then slightly bisinuate and nearly parallel with outer margin; very even in course. S. t. line very close to t. p. line, pale, irregular, preceded by a blackish shading which darkens most of the s. t. space. A broad, evenly oblique, somewhat diffuse median shade. A series of black interspaceal terminal lunules. Orbicular small, round; a blackish spot without definite outline. Reniform of good size, kidney-shaped, blackish, without definite outline. Secondaries a little paler and less densely scaled than primaries, with a dull, diffuse antemedian darker shading, an oblique dusky extramedian line followed by a yellowish shading, and a sub-marginal pale line preceded by a dusky shading. There is also a broken, blackish terminal line. Beneath whitish, coarsely powdered with brown; all wings with a narrow blackish discal lunule, a narrow brown extra-median line and a broader dark s. t. shade. Expands 1.04—1.10 inches=26—27 mm.

Habitat—Hampton, N. H., VII, 26 (S. A. Shaw); Cohasset, Mass.,VII. 21 (W. T. Bryant); Sussex Co., New Jersey, VIII. 13 (S. T. Kemp).

Two males and one female; one ♂ in good condition, the others passable only. This species is allied to *flavipunctalis* Geyer, and *exserta* Sm., the course of the lines resembling the former most nearly. It differs from both in the conspicuous dark ordinary spots which are also different in shape from those of its allies.

This makes the third species of *Renia* occurring in the eastern U. S., in which the median lines are even, slender and accompanied by a broader pale shading which renders them somewhat conspicuous. Of these, *flavipunctalis* Geyer, is the most common and widely distributed. Both the others are known to me in few examples only; but it is not at all improbable that they are represented in collections under Geyer's name. Judging by my description in Bull. 48, of the U. S. N. Mus., I had something very like this among the material there listed as *flavipunctalis,* and it will require a re-examination of the types of the species now listed as synonyms to make certain that all the names do really refer to one species.

The description is offered at this time, to warrant the insertion of the name into the forthcoming edition of the list of insects found in New Jersey.

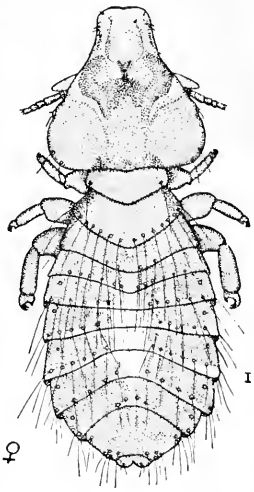
Mallophaga from the Birds of Laysan Island.

By Vernon L. Kellogg and John H. Paine, Stanford University, Cal.

A small lot of Mallophaga collected from maritime birds by Prof. John O. Snyder and Dr. Walter K. Fisher, on the Stanford-Albatross Expedition of 1902, to the Hawaiian and adjacent islands. The specimens were collected immediately after the birds were shot and while the Mallophaga were still alive. In the lot are represented eleven species, one of which being new, is described and figured herewith.

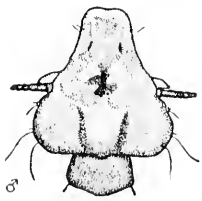
Docophorus snyderi n. sp. (Figs. 1 and 2).

Six specimens from a tern, *Sterna lunata,* (Laysan Isl.). This species greatly resembles *D. melanocephalus,* but may be easily distinguished from it by the rounded but distinct median angle of the posterior margin of the prothorax and by the concave clypeal front.



♀ 1

Female.—Length 1.7 mm., width .64 mm. head, length .6 mm, width .58 mm; clypeus narrower than in *melanocephalus,* concave, transparent in front of signature with a short hair arising near the termination of the colored lateral band and reaching to the margin; another hair arising a little posterior to the anterior angles of the signature and within the signature; two more clypeal hairs at about the middle of the lateral margin, one marginal and the other arising just within the margin; and still another very minute hair in front of the suture; trabeculae narrow, extending to about the middle of the second joint of the antennæ, temporal margins broadly rounded; two hairs, one of which is very short, arising from the eye; three more on the temporal margin, the anterior two being close together, of which two the posterior one is minute. Prothorax with middle of posterior margin strongly though roundly angled; a single long hair arises at the posterior lateral angles. Metathorax with posterior margin nearly parallel to that of the prothorax though the angle is slightly more acute; a row of about sixteen



♂

long hairs on the posterior margin. Abdomen resembles that of *melanocephalus*. The transverse blotches of the first segment meet and those of the fourth segment are shortest; the eighth segment is uniformly colored.

Male.—Length 1.4 mm., width .5 mm.; length of head .54 mm., width .52 mm. Posterior margin of prothorax is angled as in the female. The abdomen is smaller in proportion to the head than in the female.

Nirmus gloriosus Kellogg and Kuwana.

Two specimens, both female, of this handsome species taken from *Sterna lunata*. (Laysan Isl.).

Lipeurus ferox Giebel.

A number of this large *Lipeurus* from several specimens of *Diomedea nigripes* and *Diomedea immutabilis*. (Erben Bank 33 deg. 15 min. N., 132 deg. 30 min. W., and Laysan Isl.).

Lipeurus densus Kellogg.

One female taken from *Diomedea immutabilis*. (Laysan Isl.).

Lipeurus gracilicornis var. **major** Kellogg.

Three females from *Fregata aquila* (Necker Isl.), and one male from *Sterna lunata*. (Laysan Isl.).

Lipeurus confidens Kellogg.

Many specimens from *Diomedea nigripes*. (Erben Bank), and several from *Sterna lunata*. (Laysan Isl.).

Lipeurus concinnus Kellogg and Chapman.

A number of specimens from *Diomedea immutabilis*. (Laysan Isl.).

Lipeurus potens Kellogg and Kuwana.

One male specimen from *Sula piscator*. (Laysan Isl.).

Eurymetopus taurus Nitzsch.

The most abundant species; taken from *Diomedea nigripes*. (Laysan Isl.), and *Diomedea immutabilis*. (Laysan Isl. and Erben Bank).

Ancistrona gigas Piaget.

One male from *Aestrelata hypoleuca*. (Laysan Isl.).

Menopon invadens Kellogg and Chapman

Several specimens from *Acridotheres tristis*. (Molokai).

A New Species of the Genus Trybliophorus (Orthoptera) from Surinam.

By James A. G. Rehn.

Trybliophorus elegans n. sp.

Type: ♀; Surinam, May-September. (Hebard collection). Allied to *T. octomaculata* Serville, from Cayenne, but differing in the larger size and different coloration, while from *T. peruviana* Bruner* it differs in the following particulars†: Slightly smaller, comparatively shorter pronotum with a shorter anterior lobe and more profusely punctate hind lobe, narrower costal field of the tegmina, much slenderer and acuminate valves of the ovipositor, larger and more prominent eyes, less strongly punctured front, paler colored, narrower and more interrupted flavous bands on face, cheeks, sides of pronotum and pleura; more decidedly marked face (yellow) in having the fastigium, upper portion of frontal costa, antennae and upper posterior margins of lateral lobes of pronotum tinged with carmine and in the paler and more strongly serrate hind femora.

Size rather large; form robust; surface generally rugoso-punctate. Head with the occiput arched, distinctly elevated dorsad of the disk of the pronotum, interspace between the eyes hardly more than half the fastigial width; fastigium slightly declivent, produced, longer than broad, apex truncate when viewed from the dorsum, a slightly medio-longitudinal sulcus present, when viewed from the lateral aspect the fastigium is seen to round into the produced dorsal portion of the frontal costa, this produced arcuate portion being distinctly compressed, not sulcate but with a few large punctures near the ocellus, a distinct transverse arcuate depression crosses the face

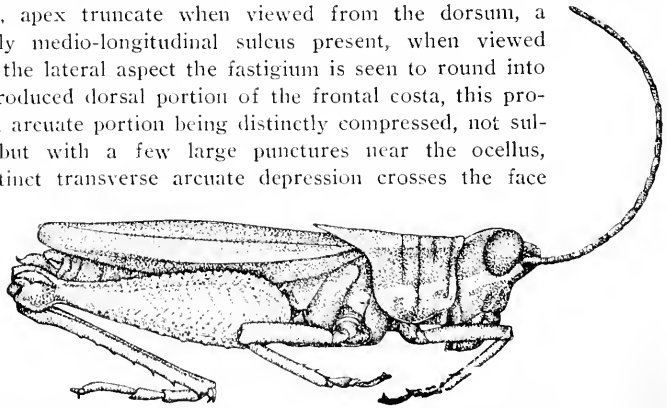


Fig. 1.—*Trybliophorus elegans* n. sp. Lateral view of type (x 2).

* Described on page —.

† Kindly supplied by Prof. Bruner.

ventrad of the ocellus, and ventrad of this line the frontal costa is absent and the face very deeply and irregularly punctate; eyes ovate in shape, quite prominent when viewed from the dorsum, in length almost half again that of the infra-ocular portion of the genæ; antennæ about twice the length of the pronotum, slightly depressed, rather heavy. Pronotum with the greatest dorsal length about one-and-one-half times the greatest dorsal width of the disk; cephalic margin truncate with a very slight and hardly appreciable median emargination, caudal margin produced into an acute-angulate process with a broadly rounded apex; complete transverse sulci three in number, a broken sulcus also present immediately caudad of the cephalic margin, metazona nearly half again as long as the prozona, median and lateral carinæ absent; lateral lobes distinctly longer than deep, cephalic margin slightly sigmoid, ventral margin arcuate with a very slightly cephalic emargination, ventro-caudal angle very broadly rounded; lateral angles of the metazonal disk very slight. Tegmina about twice as long as the greatest length of the pronotum and falling very slightly short of the tips of the caudal femora, coriaceous; costal margin slightly arcuate proximad; sutural margin very slightly arcuate, apex narrowed and evenly rounded; surface punctate with only the principal veins indicated. Wings reaching almost to the tips of the tegmina. Interspace between the mesosternal lobes slightly transverse, the angles slightly rounded; interspace between the metasternal lobes slightly transverse, subcuneiform. Ovipositor jaws each with an accessory shoulder but without distinct sharp teeth on the margins. Cau-

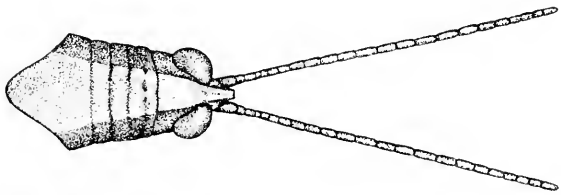


FIG. 2.—*Tryhliophorus elegans* n. sp. Dorsal view of head and pronotum of type (x 2).

dal femora considerably inflated, robust, the greatest width contained about three times in the length, scabrous, dorso-median carina serrato-dentate, lateral face with the pattern partially indicated by the distribution of punctures, ventro-lateral carina with a number of dentiform tubercles, ventro-internal carina minutely serrate, genicular region inflated, arcuate lobes rectangulate; caudal tibiæ distinctly shorter than the femora, robust, supplied on the lateral margin with seven

spines, one of which is apical, and on the internal margin with seven or eight spines; caudal tarsi slightly over half the length of the tibiæ, second joint slightly longer than the first, third joint about as long as the first and second joint together, large arolium present.

General colors green, redbrown and yellow. Head with the postocular region and the lower part of the genæ vandyke brown, an irregular bar of gamboge yellow extending on each side from the insertion of the antennæ along the ventral border of the eye caudad, an expanding area of olive-yellow extending from a point on the fastigium broading caudad and covering the greater portion of the occiput; fastigium with the front and sides carmine, the olive-yellow median area lined laterad with blackish; face burnt carmine with four small but distinct and regularly placed points of yellow; mandibles blackish, each with a proximal yellow point; eyes hazel; antennæ maroon. Pronotum with the continuation of the light dorsal bar of the head regularly expanding caudad and paris green in color, olive-yellowish along the sides and on the margin cephalad; continuation of the postocular bars subequal with those of the head and of similar color but washed with maroon caudad, the transverse sulci carrying the brown color in narrow lines completely across the green dorsum; ventral half of the lateral lobes red brown with the gamboge yellow cephalic bars continued over them in a broken irregular fashion, the yellow being present only on the cicatrix-like nodes and points. Tegmina with slightly more than the sutural half bice green, costal area bay, darker brown mesad, mingling with the green distad, an intermediate proximal area maize yellow, the principal veins dark brown proximad. Wings smoke brown. Venter very dull olive-green; abdomen dull wax yellow. Cephalic and median limbs very dark brownish glaucons, the tibiæ washed with maroon. Caudal femora wax yellow; caudal tibiæ very dull clay color, darker distad, spines touched with black; tarsi buffy touched with reddish.

MEASUREMENTS.

Length of body	34.5 mm
Length of pronotum	10. mm
Length of tegmen	21.2 mm
Length of caudal femur	18.5 mm

The type is unique.

HIS PRINCIPAL FEATURE.—*Scott*—"See that man who just went by? He landed in this city with bare feet and now he's got a million."

Mott—"Great Jupiter! That beats the centipede to a frazzle."

Three New Hemiptera-Heteroptera from the Miocene of Colorado.

By G. W. Kirkaldy.

The following fossils were among some interesting forms sent to me for examination by Prof. Cockerell. I have described them as well as I found possible, but the more accurate determination of Heteroptera will always, apparently, be difficult, as the characters, upon which modern Hemipterology founds genera and species, are rarely visible in fossils. Two of the following belong to the Cimicidae (or Pentatomidae as some authors persist in misnaming it), and the other to the Reduviidae.

TELEOCORIS gen. nov.

The general form is very much like that of certain Tessaratominae (a sub-family very sparsely represented in America), but the head is much larger than anything I know in it; it seems to come into the tribe Halyini of the Pentatominae, but in the absence of a ventral view, it is not certain. The form of the head, in conjunction with that of the pronotum and scutellum, separates the genus from any known to me.

Elongate oval, the head prominent, longer than its width between the eyes, but it is possible that it is exerted from pressure. The central lobe is very slightly longer than the lateral lobes, and converges gradually to the apex where it is acute; the impressed line dividing them extends down as far as the eyes. The lateral lobes are fairly straight, and not much narrowed towards the apex. The antennae are inserted just apical of the eyes (which are somewhat remote from the base of the head), the first segment not quite reaching the apex of the head. The *pronotum* is slightly more than *three times as wide as the base of the head*, and a little more than twice as wide as its length, the basal margin slightly roundedly emarginate, the lateral margins rounded, more prominent anteriorly than posteriorly, and *distinctly laminate*. The scutellum extends to half the length of the abdomen; it is regularly triangular, the hind angles acute, and not at all rounded. The abdomen is

nearly truncate apically, and the specimen seems to be a ♂. The pronotum is strongly and coarsely punctured, the head and abdomen less so.

T. pothetias sp. nov.

Head testaceous, lateral margins and median lobe, as well as the lateral margins basal of the eyes, mostly black. Pronotum testaceous, strongly punctured and clouded with black; scutellum., etc., black, pleurites partly testaceous. Length, 16 mill.; width across shoulders, 7 mill.

Hab.—Miocene shales of Florissant, Colorado, Station 13 B. (*W. P. Cockerell*).

POLIOCORIS gen. nov.

I should have allied this to *Telcoschistus;* had not Scudder stated that the scutellum does not reach halfway to the apex of the abdomen.

Ovoid: Head longer than wide between the eyes, the lobes about equally long, the head rounded apically; the lateral lobes strongly sinuate laterally, the first segment of the antennae reaching just beyond the apex of the head, the second about four times as long as the first. The pronotum is roundly emarginate apically, subtruncate behind, lateral margins rounded and not prominent, the base about three times as wide as the apical margin. The scutellum reaches halfway to the apex of the abdomen, and is apparently somewhat rounded posteriorly; it is closely punctured (as apparently also the pronotum). Tegmina typically Pentatomine, the membrane with many parallel longitudinal veins. Fore tibiae sulcate, the tarsi bi (? tri) segmentate, the apical segment much the longest and thickest.

P. amnesis sp. nov.

More or less dark, how much so is difficult to say. The antennae are apparently banded. Tegmina pale fuscous. Length, 14½ mill.; breadth, 7 mill.

Hab.—Miocene shales of Florissant, Station 14. (*W. P. Cockerell*).

POLIOSPHAGEUS gen. nov.

This seems to agree fairly well with recent species of *Repipta*, but the antennal proportions are different.

mentate, the apical segment much the longest and thickest. but the antennal proportions are different.

The first segment of the antennae is scarcely longer than the head (though extending well beyond it), and the second segment is much longer than the first. The form of the pronotum is as in *Repipta,* and there is a posterolateral spine (about as large as in *R. gracilis*). The tegmina extend far beyond the apex of the abdomen and have much of the form of those of *Repipta,* but are not so much constricted. The hind legs are very long (as in *R. miniata*). The fore femora are rather stouter in proportion than in any species of *Repipta.* The genus seems thus to differ from *Repipta,* or any of its allies with spined pronotum, by the shorter first segment of the antennae, and the long second segment. It has somewhat the appearance of *Spiniger,* but the first segment of the antennae is much longer, and the legs are different.

P. psychrus sp. nov.

Largely dark; antennae pale fuscous; membrane pale, infuscate basally. Length, 16½ mill.; breadth, 4 mill.

Hab.—Miocene shales of Florissant, Station 13 B. (*W. P. Cockerell*).

Vacation For Recreation And Education.—You are familiar with the famous school established years ago by Louis Agassiz on the Island of Penikese. An account of the opening exercises has been perpetuated in the tender, expressive poem, "The Prayer of Agassiz," by John Greenleaf Whittier. The Agassiz Association in honor of that great scientist is, at South Beach, Connecticut, continuing, in name and in spirit, the work begun in his school. The second session will begin June 27th and will include courses for the general public and for children, as well as for technical students. Two daughters and a grandson of Louis Agassiz are among the many members interested in the establishment of this school, and in the other work of The Agassiz Association, and have contributed liberally toward defraying the expenses. President David Starr Jordan, of the Leland Stanford Junior University, California, is one of the trustees of the Agassiz Association and dean of the council. President Jordan was a pupil of Louis Agassiz at the Island of Penikese. The school is established under one very novel condition in that the price of tuition is left for the pupil to decide. The contributions last year ranged from twenty-five cents to one hundred dollars, and the studies that we offered were those easily understood by a kindergartner or by the scientific specialist who came many miles to take special courses. Further particulars may be obtained by addressing The Agassiz Association, Arcadia, Sound Beach, Connecticut.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—EDS.

PHILADELPHIA, PA., MARCH, 1910.

"The value of farm products for 1908-9 was according to Secretary Wilson's report estimated at $8,760,000,000 and if insects take a toll of ten per cent. they destroy in value $876,000,000. This does not include crops in storage, forests and forest products which would probably add another $100,000,000 making the total annual tax chargeable to insects $1,076,000,000."

Now that looks like big money.

Entomologists study insects and they doubtless do some good. They collect them and write about them and classify them. On the whole entomologists are of some benefit. Now suppose one of these entomologists wishes to import a few insects for study what happens? He is called upon to pay duty on them and is annoyed in many ways and very likely the insects are ruined and he at last pays the Government thirty cents which, doubtless, aids in repairing this loss due to injurious insects or else prevents foreign species of insects from competing with home industries. If there is any sense in having a duty on insects, imported for study by an individual, and not for sale, we would like to know what it is. Unfortunately little can be done in the matter as the people controlling such affairs have neither the interest nor intelligence to bother about the thing. We have ample evidence to show that this statement is true.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

Mr. George Willis Kirkaldy died suddenly in San Francisco, February the second in his thirty-sixth year.

The Kosmos Natural Science Establishment of Herkimer, New York, has issued an attractive little catalogue of its entomological wares. Mr. Richard Lohrmann is the manager.

Concerning Scientific Amenities & Entomological Research.—The writer welcomed the recent increase in the subscription price of the *News* because, having always believed that he got more than the worth of his money, he saw no reason to suppose that such a condition not would also prevail in the future. It may be true, as a recent contributor intimated, that the *News* is not always scientific. It is certainly nearly always interesting. No reader will object to the occupying of space (for which in the last analysis, he pays), by notes or articles in which, perhaps, he has but a remote interest, or none at all, because he knows that some among the readers of the magazine are interested and helped by those same articles.

In the case of two articles, however, that have recently appeared under the names of Dr. J. B. Smith and Dr. H. G. Dyar,* the writer feels that he expresses the feeling of many, perhaps a majority of the readers of the *News* in saying that they are neither edifying nor helpful and while he would not presume to attempt to instruct either of the gentlemen in the ordinary amenities of scientific intercourse, he feels that he has a right to protest against the occupying of space in the *News* by such matter if only on the ground that it takes up room that might be occupied by something more worth while, and that he is therefore defrauded to a certain degree of the equivalent for his subscription.

Human interest is purely relative and while it may be intensely interesting to Drs. Smith and Dyar to contest as to who saw a mud puddle first, it is assuming a good deal to believe that the rest of the scientific world is equally interested. Seriously, it is the chance afforded by such things as this that give the newspaper paragrapher his opportunity and contribute to the poor opinion which the ordinary Philistine has of the "bug hunter."

If Dr. Dyar holds Dr. Smith in such low esteem that he cannot feel "at present particularly friendly" toward him, it isn't necessary to occupy valuable space in a scientific journal telling the rest of us about

* Entomological News, December, 1909, page 425, and January, 1910, page 17.

it. Let them both retire behind the barn and settle the matter in the old approved way; or if that seems unscientific, let them draw lots in the presence of seconds, it being agreed that the loser then expose himself, minus his shirt, for one hour to the attentions of *Culex* (*Mansonia*) *perturbans* beside the "ideal spot" near Dublin, N. H. This would make the punishment fit the crime and revive interest in the "American Duel."—J. F. Abbott, *Washington University, St. Louis.*

A Few Records From Northern Michigan in the Order Odonata.—During the summer of 1903, while doing general Entomological work at Pequaming, Baraga Co., Michigan, I made an effort to collect a representative series of the Odonata of that region. Dr. Philip P. Calvert has been very kind in determining Odonata for me, and it is through his kindness that I am able to publish the following records. All specimens are from about Pequaming, unless otherwise stated.

Lestes unguiculatus. Found among high grasses. July 8 and 9, 3 male, 3 female.

Lestes uncatus. July 26, 2 female.

Nehalennia irene. In fields, July 2, 2 pairs; in Great Marsh, July 6 3 male, 6 female.

Enallagma hageni. Field, July 2, 1 pair; Great Marsh, July 6, 1 female.

Aeschna sitchensis. Woods, July 6, 1 male; July 8, 1 female.

Aeschna clepsydra. Woods, July 6, 1 male; Pequaquawaming Point, July 8, 1 female.

Anax junius. End of Point Abbaye, rocky shore, July 7, 3 male, 2 female.

Somatochlora franklini. Near foot of Point Abbaye, pines on shore, July 8, 1 female.

Cordulia shurtleffi. Field, July 4, 2 male; white pine forest on lake shore, July 6, 4 male, 1 female. Near foot of Point Abbaye, pines on shore, July 5 and 8, 2 male, 1 female.

Dorocordulia libera. Woods on shore, July 14, 1 female; near foot of Point Abbaye, pines on shore, July 8, 1 female.

Libellula quadrimaculata. July 4, 1 female; Great Marsh meadow, July 6, 3 male; along lake shore woods, July 6, 4 female.

Nannothemis bella. Foot of Point Abbaye, pines on shore, July 8, 1 female.

Leucorhinia hudsonica. Woods, July 5, 1 male; July 6, 2 males, 2 female; July 8, 1 female; July 10, 2 male; July 14, 1 male. Near foot of Point Abbaye, July 26, 1 male.

Leucorhinia frigida. Field, July 2, 1 female; woods, July 2, 1 female; July 6, 1 female; Great Marsh meadow, July 6, 7 male, 2 female; July 4, 1 female. Near foot of Point Abbaye, pine woods on lake shore, July 8, 1 male, 6 female.

Libellula pulchella. Field, July 2, 1 female; Great Marsh, July 6, 2 male; along wooded lake shore, July 6, 1 male; End of Point Abbaye on rocky shore, July 7, 1 male.

Leucorhinia glacialis. Great Marsh meadow, July 6, 1 female.

Sympetrum rubicundulm. Brook, July 2, 1 female; woods, July 6, 1 female; July 14, 1 female.

S. rubicundulm Var. *assimilatum.* Brook, July 2, 1 female; field, July 4, 1 female; woods, July 6, 1 female.; Great Marsh, July 6, 1 female; July 10, 1 female.

Sympetrum obtrusum. Brook, July 2, 2 male; marshy ground, July 18, 1 pair.—MORGAN HEBARD.

"THE newspaper reports about my trouble on the occasion of my last arrival from Europe with a lot of insects were amusing, but as Mark Twain said of the report of his death, somewhat exaggerated." Sir George Hampson requested me before I started for Europe last fall to bring over with me the types of some two hundred African Noctuidae which I described a number of years ago and which he was unable to recognize among the material at his command, that he might study and figure the same for his work on The Moths of the World. I did this, and I brought back the bundle containing the boxes with me. My belongings were quickly passed at the custom house with the exception of this package. The inspector assigned to me had his doubts, and compelled me to stand on the dock for a half hour while he went to search for an appraiser. A newspaper reporter of the New York Herald, and another one representing the Sun, happened to spy me and asked me what the trouble was, to which I replied that I was the victim of stupidity, that these customs gentlemen did not know the law which makes natural history specimens, the property of a museum, free from duty. When finally, after waiting thirty minutes and being chaffed somewhat unmercifully by my friends, the appraiser turned up, he simply laughed and told me I was right, there was no duty upon my specimens, and that ended the matter, though I and six people who were waiting to accompany me to the hotel lost an hour each out of our time. It was one of those annoying little incidents which sometimes occur, but I do not think I said "damn" as the Sun reporter intimated that I looked as if I would like to say. I think it is simply outrageous that the gentlemen who are in charge of the affairs of the United States government should impose a duty upon the few natural history specimens which individuals import for the purposes of scientific study and research. The thing is to the last degree petty. It is unjust to scholarship. It is putting a burden upon scientific research when carried on by individuals."—DR. W. J. HOLLAND, IN A LETTER TO THE EDITOR.

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), excluding Arachnida and Myriapoda. Articles irrelevant to American entomology, unless treating of new genera, 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, and are all dated the current year unless otherwise noted. This (°) following a record, denotes that the paper in question contains description of a new genus; while this (*), that of a new North American form.

For complete record of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

3—The American Naturalist. **4**—The Canadian Entomologist. **7**—U. S. Department of Agriculture, Bureau of Entomology. **9**—The Entomologist, London. **10**—Nature, London. **11**—Annals and Magazine of Natural History, London. **16**—Bulletin, Societe Nationale d'Acclimation de France, Paris. **20**—Bulletin, Academie Imperilae des Sciences de St. Petersburg. **22**—Zoologischer Anzeiger, Leipzig. **32**—Bulletin, Museum d'Histoire Naturelle, Paris. **37**—Le Naturaliste Canadien, Quebec. **38**—Wiener Entomologische Zeitung. **45**—Deutsche Entomologische Zeitschrift. **50**—Proceedings, U. S. National Museum. **51**—Novitates Zoologicae, Tring, England. **62**—Handlinger, Konglige Svensk Vetenskaps-Akademiens, Stockholm. **67**—Entomologiske Tidskrift, Stockholm. **81**—Biologisches Centralblatt, Erlangen. **85**—Bulletin, Societe des Sciences Naturelles de l'Ouest de la France, Nantes. **96**—Bulletin, Trimestriel, Societe d'Histoire Naturalles de Macon, France. **173**—Die Grossschmetterlinge der Erde, von A. Seitz, Stuttgart. **193**—Entomologische Blatter, Nurnberg. **194**—Genera Insectorum. **195**—Bulletin, Museum of Comparative Zoology at Harvard College, Cambridge, Mass. **196**—Arkiv for Zoologie, Stockholm. **197**—Proceedings, Royal Society, Biological Sciences, Series B., London. **198**—Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass. **199**—Bulletin, Societe Scientifique et Medicale de l'Ouest, Rennes. **200**—Bulletin, Scientifique de la France et de la Belgique, Paris. **201**—Memoires, Societe Entomologique de Belgique. **202**—Annales de Paleontologie, Paris. **203**—Bulletin, Societe des Sciences de Bucarest-Roumanie. **204**—New York State Museum Bulletin. **205**—Kansas State Agricultural College, Experiment Station.

GENERAL SUBJECT. Anon—Anteckningar rorande verksam-

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REVIEWS.

KIRKALDY'S CATALOGUE OF THE HEMIPTERA. An appreciation with digressions.*

The appearance of volume I of Mr. Kirkaldy's Catalogue of the Hemiptera of the world marks an epoch in the study of this group of insects, not alone on account of the quantitative enumeration of the described forms but even more for the foundation it gives us for an up-to-date classification of our Hemiptera. I have ventured to criticise a few features of this catalogue, but I do so not to find fault with a work which is of the highest quality, but as a conservative in matters nomenclatural, I believe a catalogue of this kind should not represent the extreme views of a radical. However, this is but my private opinion and I am well aware that most of our students may prefer the sweeping changes here proposed.

Of greatest interest are the forty pages of introductory matter beginning with a complete but succinct statement of the rules of nomenclature followed by the author. If we cannot agree with all his conclusions we must admit that he has led us a long way toward a stable nomenclature in this order. Following this is a discussion of the classification adopted, a partial Bibliography, an incomplete list of abbreviations and an appendix giving the author's reason for the selection he has made of types for many of the genera, an item of much importance.

The catalogue proper occupies 361 pages and embraces the family Cimicidæ (Pentatomidæ) only. It covers the same ground as volume I of the Lethierry and Severin Catalogue, except that the Thyreocoridæ (Cydnidæ) and Urolabididæ are relegated to the second volume, an unfortunate, although doubtless necessary procedure. Following this catalogue are 23 pages of additions and corrections bringing the list down to the end of 1907, and including most names published in 1908 and 1909. At the end is an index to genera, the specific index being held for the second volume.

* Catalogue of the Hemiptera (Heteroptera) with biological and anatomical references, lists of food plants and parasites, etc. Prefaced by a discussion on nomenclature and an analytical table of Families. By G. W. Kirkaldy. Volume I, Cimicidæ. Berlin, Felix L. Dames, 1909.

On looking over this catalogue one is impressed by the remarkable industry, and by the accuracy as well, of the author, but it is a question if he does not lean too much toward the purely bibliographical side of his work. This is especially noticeable in his selection of geno-types, where, for instance, he practically make Fabricius redescribe his own genus *Acanthia* as *Salda*. We must bear in mind that the earlier entomologists fixed no types for their genera. That was a later invention which came with the multiplicity of generic names, and we have no right to so fix the types of these earlier genera as to change their meaning. Fabricius founded *Acanthia* for the *Cimex lectularius* of Linneus and the name must fall as a synonym of *Cimex*. When he founded *Salda* in 1803 he was simply separating out a group of species from his old genus *Acanthia* which he recognized as generically distinct from *lectularius*. In the same way I must disagree with our author in his use of the name *Cimex*. This was the ancient classical name of the bed bug which Linneus certainly considered representative of his genus and Fabricius had no more right to apply this generic name to *bidens* and its allies than had Latreille to fix *zosterae* as the type of *Acanthia*. We have had no more able student of the Hemiptera than Stal, and he in his mature work uses the name *Cimex* for *lectularius*.

There is one course adopted by my friend Kirkaldy against which I wish to record my strongest protest. He says on page xiv that the names of families, tribes, etc., should be formed from the root of the "oldest generic name in the respective group." This is contrary to the rules of zoological nomenclature now almost universally adopted, and is also contrary to the rule of priority for which our talented author is elsewhere so strong an advocate. The family and tribal names should be formed from the "type genus" which I take to mean the genus considered most characteristic by the founder of the family. For instance, the family name *Capsidae* has priority over *Miridae* and is founded on a more typical genus and there is no valid reason why it should be replaced by the later name. Our author claims that by following this plan "we would have a family *Lygaeidae* which did not contain a genus *Lygaeus*", which is incorrect as Art. 5, of the Code provides that "the name of a family or sub-family is to be changed when the name of its type genus is changed."

In the matter of the emendation of generic names Mr. Kirkaldy has, I think, taken the right stand, but perhaps he has carried it too far when elsewhere he adopts the form *Cyrtoisa* for *Cyrtosia*, when the former was obviously a typographical error. This is taking the responsibility out of the hands of the author and placing it on the typesetter and to be consistent, we should use the name of such typesetter or of the proofreader as authority for the name rather than that of the author.

I wish also here to enter a protest against allowing a name given to the immature form of an insect to replace a later one founded on the adult. If we find an egg or larva new to us we should endeavor to raise it to maturity and learn to what species it belongs. If we have not the ambition or industry to do this we have no right to claim the species. We cannot but admire the strong stand our author has taken on the subject of priority and in the recognition of specific names except as noted above this rule probably cannot be too rigidly applied, but when we come to genera the personal element comes so prominently to the front in the selection of geno-types that it probably is hopeless to look for unanimity. There will be many cases which could well be submitted to an unbiased authoritative commission who could undertake to decide each controverted case upon its merits.

I do not feel competent to discuss the system of classification adopted by Mr. Kirkaldy which differs radically from that of the Lethierry and Severin Catalogue. It is founded on the Schödtean system and is probably the most philosophical thus far proposed. I would, however, like to suggest a few slight changes in the arrangements of the families and in doing this I have restored certain names which I think he has unwarrantably altered. Assuming his phylogeny to be substantially correct, I would list the families as follows:

1. Cydnidæ (Thyreocoridæ).
2. Pentatomidæ (Cimicidæ).
3. Urolabididæ.
4. Aradidæ.
5. Coreidæ.
6. Pyrrhocoridæ.
7. Lygæidæ. (Myodochidæ).
8. Tingidæ.
9. Nabidæ.
10. Gerridæ.
11. Reduviidæ.
12. Phymatidæ (Macrocephalidæ).
13. Enicocephalidæ.
14. Nepidæ.
15. Anthocoridæ.
16. Cimicidæ (Clinocoridæ).
17. Polyctenidæ.
18. Aëpophilidæ.
19. Capsidæ (Miridæ).
20. Dipsocoridæ.
21. Saldidæ (Acanthiidæ).
22. Octeridæ.
23. Naucoridæ.
24. Belostomidæ.
25. Corixidæ.
26. Notonectidæ.

It seems to me that the representation of the relationship between various groups of insects of the same category by a phylogenetic tree, printed in two dimensions of space only, on the page of a book is but litlte more satisfactory than the linear arrangement of a catalogue. A phylogenetic tree to be at all true to nature must be in three dimensions, and in my opinion, many, if not most of its branches, must anastamose at various points with the adjacent branches. This will sound to some like ignoring the principles of evolutionary development, but I do not see how we can escape from this view if we study

the more recent and plastic generic groups where each genus will be found to connect with related genera through intermediate species which may not necessarily have reverted to their parent stock but which do combine the characters of both genera and are characteristic of neither. One student will place such a species in one genus while the next will locate it in another and both may be equally correct. These transition species serve to show us how artificial our generic groups are, and must be if we wish them to be of the greatest service in the classification of our insects.

But to return to the catalogue before us. The enumeration of the genera and species we find to be remarkably complete and accurate and shows a marvelous industry on the part of the author. I have not been over it for omissions or errors and incidentally have noticed but one or two. On page 187 my *Platycoris scutellatus* is listed as a synonym of *Poecilotoma grandicornis*, whereas it is a distinct but closely allied species of that genus, and my *Dictyotus (?) pallidus* (page 43) belongs to Bergroth's recent genus *Eurynannus* (page 204). Under each genus the species are arranged in alphabetical order, a purely artificial method which has its disadvantages but the use of sub-genera and sectional divisions in a measure compensate for this. Under the specific name the full binomial used by the author is given which will be a great convenience to the student. Another very useful feature is the naming of the types for each genus and sub-genus. On the other hand, our author has used "l. c." much too freely for ready reference, and each generic and specific name should have been followed by its authority. We also note that he has given us no table for distinguishing the superfamilies enumerated on page xxi. We are grateful to Mr. Kirkaldy for this first volume of his great catalogue and will look anxiously for the appearance of the later volumes.

Since sending this review to the printer I have learned with deep regret of the untimely death of my friend G. W. Kirkaldy. We have faint hope that someone may be found who can take up the bibliographical work he so ably inaugurated and give us an authoritative catalogue of the Hemiptera of the world.

E. P. Van Duzee.

Ant Communities and How They are Governed—A study in Natural Civics. By Henry Christopher McCook, author of "Nature's Craftsmen," "Tenants of an Old Farm," etc., etc. Illustrated from nature. Harper & Brothers, Publishers, New York and London, 1909.

This is a book of 321 pages and is illustrated by 97 figures. The kind of entomology that is here set forth appeals to everyone as it re-

lates in charming style the wonderful communal life of these very interesting insects. It is natural history divested of all dryness, and yet truly scientific. We also look upon it as a comparative study in civics and firmly believe that important facts have been gleaned that have and will be of benefit to that higher animal—man. We believe that this book should be in the hands of youth as well as those of mature years, as it can't fail to fascinate, instruct and interest all. Entomologists will find it a story told in delightful literary style, and it may induce some to take up similar studies. The last chapter, "A Note in Review", will call forth much thought and reflection, and if our human communities were made up of men like the author of this work how much "law" would we need? Would we not have the ideal community he mentions? The author has been a student of such problems since 1874, when he communicated his first paper to the Trans. Am. Ent. Soc., and during an active and exacting career in the ministry has found time to write twenty-four books and memoirs. He has been honored for his valuable work, having been President of the American Entomological Society, Vice-President of the Academy of Natural Sciences, of Philadelphia, Professor of Entomology in the Pennsylvania Horticultural Society, and in addition to D.D., has received the honorary degrees of Sc.D. and LL.D. We hope to see other interesting works from his facile pen.—H. S.

Doings of Societies.

At a regular meeting of the Feldman Collecting Social, held December 15, 1909, at 1523 South Thirteenth street, Philadelphia, twelve members were present. Mr. W. Beutenmuller, of New York, visitor. President Harbeck in the chair. Minutes of previous meeting read and approved.

Mr. Beutenmuller described "the collection of insects found within a radius of fifty miles of New York" in the American Museum, recently entrusted to the care of the New York Entomological Society.

Mr. Daecke exhibited specimens of *Bruchus bivulneratus* Horn, collected by Mr. A. B. Champlain at Enola, near Harrisburg, Pa., on blossoms of False Solomon's Seal (*Vagnera racemosa* Linn), VI. 12, '09, and stated that Mr. W. S. Fisher had collected this *Bruchus* on blossoms of Swamp Milkweed (*Asclepias incarnata* Linn), VII. 7, '08, at Highspire, Pa., in the evening just before dark. Other members of the social said

that they had always taken this species on a species of *Cassia*. Mr. Daecke also exhibited a very unusual staphylinid; *Trigonodesmus striatus* LeC. It was collected by Mr. W. S. Fisher under driftwood October 14 on the Susquehanna River, at Harrisburg, Pa.

Prof. Smith exhibited strawberry weevils (*Anthonomus signatus* Say) showing color variations, saying the species is injurious to the strawberries in southern New Jersey, but thinks this is not its natural food plant but only attacks it because it is the earliest plant to blossom. It also attacks blackberry and dewberry blossoms. Said that many specimens bred were found to contain a hymenopterous parasite.

Dr. Skinner said he had been questioned as to whether there were any Lepidopterous parasites and believed there was an Australian moth whose larva was parasitic on the roach but could find no reference, but found where larvae of some Epipyropidae were parasitic on Homoptera. Also mentioned a Coleopterous (?) larva supposed to have been blown from the nose of a consumptive person which led to a discussion of articles published by doctors which show a great lack of learning on their part about Entomology.

Mr. Huntington exhibited a small bottle of evaporated milk which contained a very much alive specimen of *Dermestes elongatus* LeC.

Mr. C. T. Greene exhibited the following interesting Diptera: *Platypeza taeniata* Snow, Clementon X. 3, '09; *Eupeitenus ater* Macq., Riverton IV. 9, '05; *Asilus manceі* Hine, Malaga VIII. 4, 07, coll. by Geo. M. Greene; *Hyctodesia pallidula* Cog., Iona V. 16, '09, and *H. varipes* Coq., Iona IX. 12, '09.

Dr. Skinner mentioned a species of *Colydium* which had bred from a board on which was wrapped expensive cloth and eaten its way through the whole bolt, leaving many holes when the cloth was unwrapped.

Mr. Wenzel said the Canadian trip had turned out better than at first supposed and he was working out the material as the authorities up there were going to publish a list and has

identified over 200 species and believes that he will have over 300. Said that they had collected many species which were recorded by Hubbard and Schwarz in their paper on Marquette, Mich., and Lake Superior District. Specially mentioned a species of *Amara* which is represented in the Horn collection by a specimen from Mass. and Europe, also *Cymindis unicolor* Kirby and six species of *Magdalis*. Also recorded *Metachroma lurida* Oliv. from DaCosta, N. J., VII. 4, '09, about fifteen specimens taken on Scrub Oak.

Dr. Skinner said that on January 6th the Brooklyn Entomological Society are to give a testimonial to Mr. Roberts and the Philadelphia entomologists are invited to attend.

GEO. M. GREENE, *Secretary*.

At a regular meeting of the Feldman Collecting Social held November 17, 1909, at 1523 S. 13th Street, Philadelphia, Pa., fourteen members were present. President Harbeck in the chair.

Prof. Smith exhibited two larvae of *Datana ministra* Dru., the heads and last abdominal segment of which were covered with eggs of a Dipteron, *Winthemia IV-pustulata* Fabr. Said he had noticed flies buzzing around a group of these larvae and upon looking closer discovered that the flies were all females and were depositing their eggs. Described the manner of doing this and mentioned how uneasy the larvae seemed as soon as a fly approached.

Mr. Wenzel exhibited some of his Canadian material recently collected by himself and H. A. Wenzel and gave some details of the trip.

Prof. Smith said the New Jersey List would soon be published and contains about 10,500 species, a gain of about 2,000 over the latest.

Mr. Laurent exhibited specimens of *Apion griseum* Smith taken from pods of a species of *Phaseolus* at Anglesea, N. J., XI. 14. Collected about 200 specimens, getting 22 from one pod.

GEO. M. GREENE, *Secretary*.

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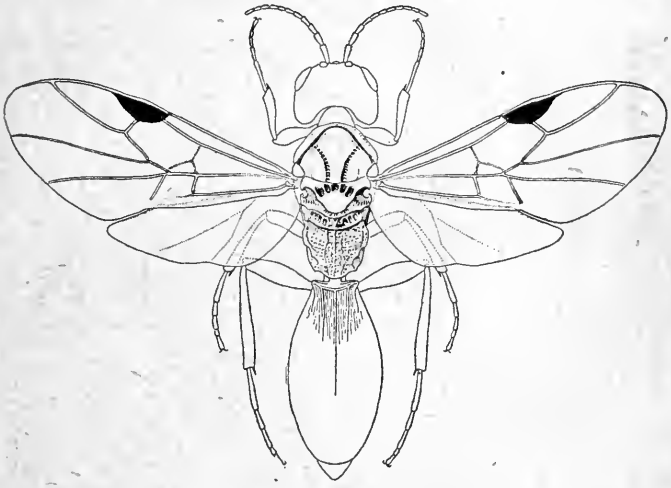

Vanhornia eucnemidarum Crawford.

PHILADELPHIA:
ENTOMOLOGICAL ROOMS OF
THE ACADEMY OF NATURAL SCIENCES,
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This picture was made August 23, 1909, at the meeting of the Agricultural College and Experiment Station workers at Portland, Oregon.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

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CONTENTS:

A List of the Genera Described as New from 1758 to 1909 in the Family Aphididae.

BY H. F. WILSON,

Agent and Expert, U. S. Bureau of Entomology.

This list contains as many of the genera as could be found described as new since 1758. The author takes the liberty to say that Mr. Kirkaldy in his Catalogue of Genera and List of Species described as new since 1885,* missed a number of genera and gave a few incorrect citations.

On account of the many changes in synonomy and arrangement of genera in this group of insects no effort was made to group the genera. If I have missed any citations of genera or given incorrect data, a supplement to this paper will be appreciated.

1. *Abamalekia*, Del. Guer. 1905, Redia, Vol. III, p. 364, t. *lazarew* Del Guercio.
2. *Acanthochermes*, Kollar, 1848, S. B. Akad. Wiss., Wien., I, heft 3, p. 191, t. *quercus* Kollar.
3. *Adactynus* Rafinesque, 1818, Amer. Mon. Mag. and Critic Review, Vol. III, p. 17.

*Canadian Entomologist for 1905 and 1906. Paper in two parts, 1st part 1905, 2nd part 1906.

4. *Adelges,* Vallot, 1836, Compte. Rend. l'Acad., p. 72, t. *laricis* Vol. III.*
5. *Amphorophora,* Buckton, 1876, Mon. Brit. Aphid., Vol. I, p. 187, t. *ampullata* Buckton.
6. *Amycla,* Koch, 1854, Die Pflanz. Aphiden, p. 301, t. *fuscifrons* Koch.
7. *Anisophleba,* Koch, 1854, Die Pflanz. Aphiden, p. 320, t. *hamadryas* Koch.
8. *Anoecia,* Koch, 1854, Die Pflanz. Aphiden, p. 275, t. A. *corni* Fab.
9. *Anuraphis,* Del Guercio, 1907, Redia, Vol. IV, p. 190, t. *A. pyri* Koch.
10. *Aphis,* Linnaeus, 1758, Systema Natura 10th Ed., p. 451, t. *sambuci* Lat. 1802 and *ulmi* Lam. 1801.
11. *Aphioides,* Rondani, 1847, Nouvi Ann. Sci. Nat. Bologna (2) Vol. VIII, p. 439, t. *A. bursaria* Linn.
12. *Aphioides,* Passerini, 1860, Gli Afidi, p. 28, n. n. to replace *Cladobius* Koch, preoccupied.

Note.—Usata gia dal Dejean ne 'Coleotteri, onde preporrei di sostiliurgli Aphoides.

13. *Aphrastasia,* Börner, 1909, Zool. Anz. Vol. XXXIV, p. 498 and 502, t. *C. pectinatae* Cholod.
14. *Aploneura,* Passerini, 1863, Arch. Zool. II, *aphididae italica,* p. 78 t. *lentisci* Pass.
15. *Arctaphis,* Walker, 1870, The Zoologist, p. 2000, t. *Ch. populi* Linn.
16. *Aristaphis,* Kirkaldy, 1905, Canad. Ent. Vol. XXXVII, p. 416, n. n. for *Cladobius* Koch.
17. *Asiphum,* Koch, 1854, Die Pflanz. Aphiden, p. 246, t. *ligustrinellum* Koch.
18. *Astegopterx,* Karsch, 1890, Ber, deutsch. Botan. Ges., Vol. VIII, p. 51, t. *styracophila* Kar.
19. *Atheroides,* Haliday, 1839, Ann. Mag. Nat. Hist., Vol. II, p. 189, t. *serrulatus* Hal.
20. *Boisduvalia,* Signoret, 1868, Ann. Ent. Soc. Fr. Ser. 4, Vol. VIII, p. 400, n. n. for *Cerataphis.*
21. *Boizongia,* Rondani, 1848, Nouv. Annali, Sci. Nat. Rend. Ser. II, Vol. IX, p. ?
22. *Brachycolus,* Buckton, 1879, Mon. Brit. Aphid. Vol. II, p. 146, t. *stellariae* Hardy.
23. *Bucktonia,* Lichtenstein, 1886, Mon. Pucer. Die Peupl. p. 16, t. *P. affinis* Kalt.
24. *Byrsocrypta,* Haliday, 1839, Ann. Nat. Hist. Vol. II, p. 190, t. *bursaria* Linn.=*Brysocrypta,* Westwood, 1839, Intr. Mod. Class Ins. Synopsis, p. 118.

*Comptes Rendus, 1836, in two volumes, Nos. II and III.

25. *Calaphis,* Walsh, 1862, Proc. Ent. Soc. Phil., Vol. I, p. 301, t. *betulella* Walsh.
26. *Callaphis,* Walker, 1870, The Zoologist, Vol. V, p. 2000, t. l. *juglandis* Frisch.
27. *Callipterus,* Koch, 1854, Die Pflanz. Aphiden, p. 208, t. *juglandis* Kalt.
28. *Cerataphis,* Lichtenstein, 1882, Bull. Ent. Soc. Fr. Ser. 6, Vol. II, p. XVI, t. *lataniae* Bois.
29. *Ceratopemphigus,* Schouteden, 1905, Spol. Zeylan., II, p. 187, t. *zehntneri* Schout.
30. *Ceratovacuna,* Zehntner, 1897, Mededl, Proefs Java, n. ser. No. 37, p, 29, t. *lanigera,* Zehnt.
31. *Cerosipha,* Del Guercio, 1900, Nouv. Rel. Staz. Fir., Vol. II, p. 116, t. *passerinina* Del G.
32. *Ceylonia,* Buckton, 1891, Ind. Museum Notes, Vol. II, p. 35, t. *theaccola* Buckton.
33. *Chaitophorus,* Koch, 1854, Die Pflanz. Aphiden, p. 1, t. *populi* Linn. (sometimes printed *Chaetophorus*).
34. *Chelymorpha,* Lane Clark, 1858, The Microscope, p. ?, t. *phyllophora.*
35. *Chermaphis,* Maskell, 1884, New Zealand J. Sci., Vol. II, p. 292, t. *pini* Koch = *Kermaphis,* Maskell, Trans. N. Zealand Inst. Vol. XVII, p. 16.
36. *Chermes,* Linn., 1758, Systema Natura, 10th Ed., p. 453, t. *sambuci* Linn.
37. *Chermes,* (*Dreyfusia*)—sub. gen. Börner, 1908, Arbeit, Kaiserl. Biol. Anst. Land und Forst, p. 138, t. *pireae* Ratz. In same year raised to Genus rank under *Dreyfusia.*
38. *Cholodkovskya,* Börner, 1909, Zool. Anz., Vol. XXXIV, p 498, t. *viridanus* Cholod.
39. *Chromaphis,* Walker, 1870, The Zoologist, Vol. V, p. 2001, t. *juglandicola* Kalt.
40. *Cinara,* Curtis, 1835, Curtis Brit. Entom., part 576, no p. no., t. *pini* Curtis.
41. *Cladobius,* Koch, 1854, Die Pflanz. Aphiden, p. 251, t. *populea* Kalt.
42. *Cladoxus,* Rafinesque, 1817, Amer. Mon. Mag. and Critic Review, Vol. I, p. 362.
43. *Clavigerus,* Szlépligete, 1883, Rovaraszati Lapok, I, p. 4, t. *salicis,* Kalt. (unable to find.)
44. *Cnaphalodes,* Macquart, emind Amyot-Serville, 1843, a. p. Histoire naturelles des Insects, Hemipteres Paris, 1843, p. 595, t. *pini,* Linnaeus.
45. *Colopha,* Monell, 1877, Canad. Ent. Vol. IX, p. 102, t. *ulmicola* Fitch.

46. *Cryptosiphum,* Buckton, 1879, Mon. Brit. Aphides, Vol. II, p. 144, t. *artemisiae* Buck.
47. *Dactylosphaera,* Shimer, 1867, Proc. Ac. Nat. Sci. Phil. Vol. XIX, p. 2, t. *globosum* Shim.
48. *Dactylosphaera,* subg. Börner, 1908, Zool. Anz., Vol. XXXIII, p. 609, t. *D. vitifolie* Fitch.
49. *Dactynotus,* Rafinesque, 1818, Amer. Mon. Mag. and Critic Review, Vol. III, p. 17.
50. *Daktulosphaira,* Shimer, 1866, Vol. 18, Prairie Farmer, XXXIV, p. 365, t. *vitifoliae* Shim.
51. *Dreyfusia,* Börner, 1908, Zool. Anz., Vol. XXXIII, p. 173, t. *piceae* Ratz. raised from rank of sub genus. *Dreyfusia* = *Chermes* (*Dreyfusia*).
52. *Drepanosiphum,* Koch, 1854, Die Pflanz. Aphiden, p. 201, t. *platanoides* Schrank.
53. *Dryobius,* Koch, 1854, Die Pflanz. Aphid., p. 225, t. *roboris* Linn.
54. *Dryopeia,* Kirkaldy, 1904, The Entomologist, Vol. 37, p. 279, n. n. for *Endeis* Koch.
55. *Eriosoma,* Samonelle, 1819, Entom. Useful Comp., p. 232, t. *mali* Sam.
56. *Essigella* Del Guercio, 1909, Rivistadi, Patol. Vegetale, Anno. III, p. 329, t. *L. californicus* Essig.
57. *Euceraphis,* Walk. 1870, The Zoologist, p. 2001, t. *betulae* Linn.
58. *Eulachnus,* Del Guercio, 1909, Rivista, di. Patol. Vegetale, Anno. III, p. 329, no type given.
59. *Forda,* Heyden, 1837, Mus. Senkbg. II, p. 291, t. *formicaria* Heyd.
60. *Geoica,* Hart, 1894, 18th Rept. State Ent. Illinois, p. 101, t. *squamosa* Hart.
61. *Gillettea,* Börner, 1909, Zool. Anz., Vol. XXXIV, pp. 498 and 504, t. *C. coolcyi,* Gill.
62. *Glyphina,* Koch, 1854, Die Pflanz. Aphiden, p. 259, t. *V. betulae* Kalt.
63. *Greenidea,* Schouteden, 1905, Spol. Zeylan., Vol. II, 181, t. *S. artocarpi* Westwood.
64. *Hamadryaphis,* Kirkaldy, 1904, The Entomologist, Vol. 37, p. 279, n. n. for *Kessleria* Licht.
65. *Hamamelistes,* Shimer, 1867, Trans. Amer. Ent. Soc., Vol. I, p. 283, t. *spinosus* Shim.
66. *Holzneria,* Lichtenstein, 1875, Bull. Ent. Soc. Fr., ser. 5, Vol. V., p. LXXVI, t. *poschingeri,* Holzner.
67. *Hormaphis,* Osten Sacken, 1861, Stell. Ent. Zeit., Vol. XXII, p. 422, t. *hamamelidis* Fitch.
68. *Hyadaphis* Kirkaldy, 1904, The Entomologist, Vol. XXXVII, p. 270, t. *hyadaphis* n. n. = *xylostei* Scrk. = *siphocoryne,* Pass. 1863 and others (nat. Pass. 1860) see Canad. Ent. Vol.

69. *Hystrichiella* subg., Börner, 1908, Zool. Anz., Vol. XXXIII, p. 609, t. Ph. *spinulosa* Targ.
70. *Hyalopterus,* Koch., 1854, Die Pflanz. Aphiden, p. 16, t. *A. pruni* Fab. *Hyalopteris,* Hunter misprint.
71. *Idiopterus,* Davis, 1909, Ann. Ent. Soc. Amer., Vol. II, p. 198, t. *nephrelepidis* Davis.
72. *Kallistaphis,* Kirkaldy, 1905, Canad. Ent., Vol. XXXVII, p. 417, t. *A. betulicolae* Kalt.*
73. *Kaltenbachiella,* Schouteden, 1906, Mem. Soc. Ent. Belg., Vol. 12, p. 194, t. *menthae* Schout.
74. *Kessleria,* Lichtenstein, 1886, Mon. Pucer, Du Peupl., p. 16, t. *P. spirothecae* Pass.
75. *Lachnus,* Burmeister, 1835, Handbuch, Entom. II, p. 91, t. *punctatus* Burm.
76. *Leptopteryx,* Zetterstedt, 1840, Ins. Lapp., p. 625, t. *nivalis* Zett.
77. *Liosomaphis,* Walker, 1868, Zoologist, p. 1119, t. *berberidis* Kalt.
78. *Lowia,* Lichtenstein, 1886, Mon. Puceng. r on du Peupl., p. 37, t. *passerini* Signoret.
79. *Loxerates,* Rafinesque, 1817, Amer. Mon. Mag., Vol. I, p. 362, *A. Diervilla-lutea* Raf.
80. *Macchiatiella,* Del Guercio, 1909, Rivista di Patol Vegatali, Anno IV, Num. 1, p. 5, t. a. *rhammi* Boyer.
81 *Macrosiphum,* Passerini, 1860, Gli Afidi, p. 27, t. a. *rosae* Linn.
82. *Macrosiphum,* Oestlund, 1886, Minn. Geol. Surv. Rept. 14, p. 27, *rubicola* Oest.
83. *Mastopoda,* Oestlund, 1886, Minn. Geol. Surv. Rept. 14, p. 52, t. *pteridis* Oest.
84. *Megoura,* Buckton, 1876, Mon. Brit. Aphides, Vol. I, p. 188, t. *viciae* Buckton.
85. *Melanoxanthus,* Buckton, 1879, Mon. Brit. Aphides, Vol. II, p. 21, t. a. *salicis* Linn.
86. *Melanoxatherinum,* Schouteden, 1901, Ann. Soc. Ent. Belg., Vol. XLV, p. 113, n. n. for *Melanoxanthus* (used in 1836 in *Elateridae*).
87. *Melaphis,* Walsh, 1886, Proc. Ent. Soc. Phil., Vol. VI, p. 281, t. *rhois* Fitch.
88. *Microparsus,* Patch, 1909, Ent. News, Vol. XX, p. 337,t. *variabilis* Patch.
89. *Microsiphon,* Del Guercio, 1908, Redia, Vol. IV, p. 192, t. a. *tomentillae* Pass.
90. *Microsiphum,* Cholodkovsky, 1902, Jahr. d. St. Petersburger, Forst. Inst. Lief. 8, p. 53, 1902, Redescribed and figured in Zool. Anz., Vol. XXXIII, p. 687. 1908.

*According to Kirkaldy = Callipterus Buckton, 1881, Mon. Brit. Aphid., Vol. III, p. 12, not containing Koch's type.

91. *Mimaphidius,* Rond, 1844, Nouv. Annal. Sci. Nat. Rend. ser. II, p. ?.
92. *Mindarus,* Koch, 1854, Die Pflanz. Aphiden, p. 277, t. *abietinus* Koch.
93. *Monaphis,* Walker, 1870, The Zoologist, p. 2001, t. a. *antennata* Kalt.
94. *Monellia,* Oestlund, 1887, Minn. Geol. Surv. Bull. 4, p. 44, t. *caryella* Fitch.
95. *Mordwilkoja,* Del Guercio, 1909, Rivista, Pathol. Vegt. Anno. IV, no. i, p. 11, t. P. *vagabundus* Walsh.
96. *Moritziella,* Börner, 1908, Zool. Anz., Vol. XXXIII, p. 608, t. *corticallis* Kalt.
97. *Myzocallis,* Passerini, 1860, Gli Afidi, p. 28, t. *coryli* Goetze. =*Mysocallis* Rondani, 1874, Bull. Ital., Vol. VI, p. 62.
98. *Myzoxile,* Arvilly, 1834, Die *Moyzoxile,* p. I, t. *lanigera* Hausm.
99. *Myzoxyle,* Blot. 1824, Mem. Soc. Linn., Calvados I, p. 114, t. *lanigera* Hausm.
100. *Myzus,* Passerini, 1860, Gli Afidi, p. 27, t. *cerasi* Fab.
101. *Nectarophora,* Oestlund, 1887, Minn. Geol. Surv. Bull. 4, p. 78, n. n. for *Siphonophora* Koch.
102. *Nectarosiphon,* Schouteden, 1901, Annalis Ent. Soc. Belg., Vol. XLV, p. 112, n. n. for *Macrosiphum* Oestlund.
103. *Nipponaphis,* Pergande, 1906, Ent. News, Vol. 17, p. 205, t. *distychii* Perg.
104. *Pachypappa,* Koch, 1854, Die Pflanz. Aphiden, p. 269, t. *marsupialis* Koch.
105. *Panaphis,* Kirkaldy, 1904, The Entomologist, Vol. 37, p. 279, n. n. for *Ptychodes* Buckton.
106. *Paracletus,* Heyden, 1837, Mus. Senkb. II, p. 295, t. *cinciformis* Heyd.
107. *Pemphigus,* Hartig, 1841, Zeit. Ent. III, p. 365, t. *bursarius* Linn. =*Pemphilus* Kalt. 1843, p. 180.
108. *Pentaphis,* Horvath, 1896, Wien. Ent. Zeit., Vol. XV, p. 2, t. F. *marginata* Koch.
109. *Pentaphis,* Del Guercio, 1909, Rivistadi Patol Vegetale, Anno III, p. 332, t. *tychea trivialis* Pass.
110. *Pentalonia,* Coquerel, 1859, Ann. Ent. Soc. Fr. Ser. 3, Vol. VII, p. 239, t. *nigronervosa* Coq.
111. *Pergandea,* Subg. Börner, 1908, Zool. Anz. Vol. XXXIII, p. 610, t. *conica* Shimer.
112. *Pergandeida,* Schouteden, 1903, Zool. Anz., Vol. XXVI, p. 685, t. *ononidis* Schout.
113. *Periphyllus,* Von der Hoeven, 1863, Tijdschr, Ent., Vol. VI, p. 7, t. *testudo.*

114. *Peritymbia,* Westwood, 1867, Gardner's Chronicle, p. 681, t. *vitisana* Westw.
115. *Phorodon,* Passerini, 1860, Gli Afidi, p. 27, t. *humuli* Schrank.
116. *Phloemyzus,* Horvath, 1896, Wien. Ent. Zeit., Vol. XV, p. 5, t. *passerinii* Sign.
117. *Phloeophthridium,* Von der Hoeven, 1850, Haub. Dierkunde, I, p. 509.
118. *Phyllaphis,* Koch, 1854, Die Pflanz. Aphiden, p. 248, t. *fagi* Linn. =*Phillaphis* of others.
119. *Phyllophora,* Fernie, 1852, Morris, Nat., Vol. II, p. 265, t. *testudinacea.*
120. *Phyllophorus,* Thornton, 1852, Proc. Ent. Soc. London, n. s. II, p. 78, t. *testudinatus.*
121. *Phylloxera,* Boyer, 1834, Ann. Ent. Soc. Fr., Vol. III, p. 222, t. *quercus.*
122. *Phylloxera,* subg. Börner, 1908, Zool. Anz., Vol. XXXIII, p. 608, t. Ph. *quercus* Fousc.
123. *Phylloxerina,* Börner, 1908, Zool. Anz., Vol. XXXIII, p. 607, t. Ph. *salicis,* Licht.
124. *Phymatosiphum,* Davis, 1909, Annals Ent. Soc. Amer., Vol. II, p. 196, t. *monelii* Davis.
125. *Pineus,* Shimer, 1869, Trans. Amer. Ent. Soc., Vol. II, p. 383, t. *pinicorticis* Fitch.
126. *Polyocellaria,* Imhof, 1900, Biol. Centralblatt, Vol. XX, p. 527, not a valid Genus.
127. *Prociphilus,* Koch, 1854, Die Pflanz. Aphiden, p. 279, t. *bumeliae* Schrank.
128. *Psylloptera* Ferrari, 1872, Anno. del Museo Civ. de Stor. Nat. di Genova, Vol. III, p. 85, t. *quercina* Fer.
129. *Pterocallis,* Passerini, 1860, Gli Afidi, p. 28, t. *alni* Pass.
130. *Pterochlorus,* Rondani, 1848, Nouv. Ann. Sci. Nat., Bologna, (2) Vol. VIII, p. ?, t. *roboris* Rond.
131. *Pterocomma,* Buckton, 1879, Mon. Brit. Aphid., Vol. II, p. 142, t. *pilosa* Buckton.
132. *Ptychodes,* Buckton, 1881, Mon. Brit. Aphides, Vol. III, p. 39, t. *juglandis* Kalt.
133. *Rhizaphis,* Planchon, 1867, Compt. Rend. Paris, Vol. XVII, p. 588, t. *vastatrix.*
134. *Rhizobius,* Burmeister, 1835, Handb. Entom. II, p. 87, t. *pilosellae* Burm.
135. *Rhizocera,* Kirk, 1897, New Zealand, Dept. Agrl. Leaflets for Gardners no. 20, p. 3; also in Vol. 6, 1898, Rept. Dept. Agrl. N. Zeal., p. 178, n. genus for P. *vastatrix* Plan.

136. *Rhizoctonus,* Mokrezhetsky, 1897, Horae Soc. Ent. Vol. XXX, p. 438, t. *ampelinus* Mokr. See also Horvath Wein, Ent. Zeit. XV, p. 5.
137. *Rhizoniaria,* Hartig, 1857, Thander Forstliches Jahrb. Bd. 5, p. 177, not located in above publication.
138. *Rhizopthiridium,* Von der Hoeven, 1850, Handb. Dierkunde I, p. 508, n. n. for *Rhizobius* Burm.
139. *Rhizoterus,* Hartig, 1841, Zeit. Ent. III, p. 363, t. *vacca* Hartig.
140. *Rhopalosiphum,* Koch, 1854, Die Pflanz. Aphiden, p. 23, t. *cicutae* Koch. = *Rhopalosiphon* Scudder 1882.
141. *Rhizoicus,* Passerini, 1860, Gli Afidi, p. 30, t. *souchi* Pass. nn. for *Rhizobius* Burm.
142. *Sacciphantes,* Curtis, 1844, Ruricola Gardner's Chronicle, Vol. IV, p. 831, t. *abietis* Linn.
143. *Schizoneura,* Hartig, 1841, Germars Zeit. Entom. III, p. 365, t. *ulmi* Linn.
144. *Schlechtendalia,* Lichtenstein, 1883, Stett. Ent. Zeit., Vol. XLIV, p. 240, t. *chinecsis* Licht.
145. *Schoutedenia,* Rubsamen, 1905, Marcellia, Vol. IV, p. 19, t. *ralumensis.*
146. *Sipha,* Passerini, 1860, Gli Afidi, p. 28, t. *glyceriae* Kalt.
147. *Siphocoryne,* Passerini, 1860, Gli Afidi, p. 28, t. *nymphaeae* Linn.
148. *Siphonophora,* Koch, 1854, Die Pflanz. Aphiden, p. 150, t. *diplanterae* Koch.
149. *Smynthurodes,* Westwood, 1849, Gardner's Chronicle, p. 420, t. *betae* Westw.
150. *Stagona,* Koch, 1854, Die Pflanz. Aphiden, p. 284, t. *xylostei* Degeer.
151. *Stomaphis,* Walker, 1870, The Zoologist, Vol. 28, p. 2000, t. *quercus* Linn.
152. *Subcallipterus,* Mordwilko, 1894, Rab. Lab. Zool. Kab. Varch. Univ. (K. Faune Anat. sem Aphid.) p. 63, t. *alni* Fab. (sub genus).
153. *Symdobius,* Mordwilko, 1894, Rab. Lab. Zool. Kab. Varch. Univ. (K. Faune Anat. sem. Aphid., p. 54., t. *oblongus* Heyd.
154. *Termitaphis,* Wasmann, 1902, Tijdschr. Ent., Vol. XLV, p. 105, t. *circumvallata* Wasm.
155. *Tetraneura,* Hartig, 1841, Zeit. Entom. III, p. 365, t. *ulmi* DeGeer.
156. *Tetraphis,* Horvath, 1896, Wien, Ent. Zeit., Vol. XV, p. 6, t. *betulina* Horv.
157. *Thecabius,* Koch, 1854, Die Pflanz. Aphiden, p. 294, t. *populneus* Koch.
158. *Thelaxes,* Westwood, 1840, Intr. Mod. Class Ins. Synopsis, Vol. II, p. 118, t. *quercicola* Westw.

159. *Therioaphis,* Walker, 1870, The Zoologist, p. 1999, t. m. *ononidis* Pass.
160. *Toxoptera,* Koch, 1854, Die Pflanz. Aphiden, p. 253, t. *aurantiae* Koch.
161. *Trama,* Heyden, 1837, Mus. Senkb. II, p. 293, t. *troglodytes* Heyd.
162. *Tranaphis,* Walker, 1870, The Zoologist, Vol. V, p. 1999, t. *salicivora* Walk.
163. *Tricosiphum,* Pergande, 1906, Ent. News, Vol. 17, p. 206, t. *anonae* Perg.
164. *Trifidaphis,* Del Guercio, 1909, Rivista di Patal, Vegetale, Anno. III, p. 332, t. P. *racidicola* Essig.
165. *Trychoides,* Schouteden, 1906, Mem. Ann. Soc. Ent. Belg., Vol. 12, p. 194, n. n. for *Tychea* Pass.
166. *Tychea,* Koch, 1854, Die Pflanz. Aphid., p. 296, t. *graminis* Koch.
167. *Tuberculatus,* Mordwilko, 1894, Rab. Lab. Zool. Kab. Varch. Univ. (K. Faune Anat. Sem. Aphid.) p. 50, t. *quercus* Kalt.
168. *Uraphis,* Del Guercio, 1907, Redia, Vol. IV, p. 192, t. *Aphis genistae* Kalt.
169. *Vacuna,* Heyden, 1837, Mus. Senkb. II, p. 289, t. *coccinea* Heyd.
170. *Viteus,* Shimer, 1867, Proc. Ac. Nat. Sci. Phil., Vol. XIX, p. 6, t. *vitifoliae* Shim.
171. *Xerampelus,* Del Guerecio, 1900, Nouv. Rel. Staz. Fir., Vol. II, p. 80, t. *vastator* Planchon.

SUPPLEMENTARY LIST.

1. *Acanthaphis,* Del Guercio, 1908, Bull. Soc. Ent. Ital. Anno. XXX-VIII, (p. ?) 153-185, Taf. I-III, t. Ph. *spinulosa* Targ.
2. *Börneria,* Grassi and Foa, 1908, Atti. Reale. Accad. nei Lincei. Rend., Vol. XVII, p. 685, t. *danesii,* G. and Foa.
3. *Callipteroides,* Mordwilko, 1908, Annuaire Musee Zool. L'Academ. Imp. Des. Sci, Tome XIII, p. 377, t. *nigritarsis* Heyd.
4. *Chaitophoroides,* Mordwilko, 1908, Annuaire Musee Zool. L'Academ. Im. Des Sci, Tome XIII, p. 382, t. c. *lantanae* Koch.
5. *Euphylloxera,* Del Guercio, 1908, Bull. Soc. Ent. Ital. Anno. XXX-VIII, p. ?,) 153-185 Tom. I-III, t. Ph. *foveola* Pg. Ph. *conica* Pg.
6. *Guercioja,* Mordwilko, 1908, Annuaire Musee Zool. L'Academ. Imp. Des Sci., Tome XIII, p. 361, t. a. *populi,* Del Guer.
7. *Longistigma,* Wilson, 1909, Canad. Ent., Vol. 41, p. 385, t. L. *caryae* Harris.
8. *Notabilia,* Mordwilko, 1908, Annuaire Musee Zool. L'Academ. Imp. Des. Sci., Tome XIII, p. 363, t. Ph. *notabilis* Perg.

9. *Oregma,* Buckton, 1893, Ind. Mus. Notes, Vol. III, p. 87, t. *bambusae* Buck.
10. *Schizolachnus,* Mordwilko, 1908, Annuaire Musee Zool. L'Academ. Imp. Des. Sci., Tome XIII, p. 375.
11. *Tuberolachnus,* Mordwilko, 1908, Annuaire Musee Zool. L'Academ. Imp. Des. Sci., Tome, XIII, p. 374, t. *viminalis* Boyer.

A Handsome Species of Phalangidae.

By Nathan Banks.

Not many of our harvest-men can be called handsome or beautiful, but many are remarkable and curious. Mr. Crosby has sent me for naming a truly handsome species taken by Prof. Comstock in Texas. The other species of the genus occur in Mexico and California.

Eurybunus formosus n. sp.

Dorsum rich dark brown, a median elongate white spot near tip, truncate at base, pointed at tip, and slightly widened in the middle, the side-margins of dorsum just behind legs is also white. Coxae and basal part of venter pale, rest of venter brown. Mandibles pale or brownish, a dark spot each side at base of claw, and apical half of claw black. Palpi pale brownish. Legs with coxae, trochanters, femora, and patellae yellowish white, except patellae II and apical half of femora II which are brown; all tibiae brown, with white tip, tibia II with apical third white; metatarsi also brown, but paler, and with white tips; broader on leg II; tarsi pale brownish to pale yellowish, darkest on basal part.

Dorsal shield rather elongate, slightly constricted over coxae IV; abdomen tapering behind. All of dorsum minutely spinulose; more prominent spinules near the front margin of cephalothorax, and a cluster each side near middle of front, and a transverse row behind the eye-tubercle. Behind this row are about eight rows of spinules. All joints of legs (except tarsi) with rows of large spinules, a few still larger ones near tips of coxae, femora, and patellae. Palpi also spinulose, except apical joint, eye-tubercle with spinules above. Legs rather heavy; the tibiae heavier than the femora; but femora I and III are much heavier than the others; femur II nearly as long as body; femur I much shorter than the width of cephalothorax. Length, 7 mm.

Several examples from near Austin, Texas, taken by Prof. Comstock, through whose kindness and that of Mr. Crosby, I am describing the species.

Eupithecias that appear to be undescribed.

By Richard F. Pearsall, Brooklyn, N. Y.

Eupithecia dolorosata n. sp.

Expanse 16 mm.—In form and color resembling *coagulata* Guen., but lacking the roseate blush of that species. Palpi moderate, stout, dark brown with extreme tip, white. Vertex white. Front pale gray, with a dusky line between antennae, which are ashen, ringed with black at joints and, bifasciculate, the fascicles of hair slender and short, not bushy as in *miserulata Grote*. *Thorax* darkened by a mixture of black scales. A large white scutellae spot and a white dorsal line along anterior segments of abdomen which is uniformly gray above, a narrow black line on either side nearly to tip, beneath soiled white. Ground color of all wings, ashen, sprinkled with black atoms, densely along costa of primaries, where they form six nearly equidistant black clusters, the beginning of cross lines which are hardly traceable beyond centre. Between spots two and three from base pale twin lines, separated by a fine gray line, cross costa above the small faint discal dot, running directly toward it, then turn sharply outward curving around cell, fading out in crossing, with a basal trend but in a direct line to inner margin half way out. From this line the fifth or extra discal is a little more widely separated at costa, but follows the same course, gradually narrowing the space between them toward inner margin. These two lines are more distinct than any others, markedly so near costa and the ground color between them is paler. Beyond extra discal the usual geminate pale lines parallel it, but are fine and faint. Subterminal space very narrow, the white line barely traceable close to margin and ending in a pale dot below vein two at anal angle. Marginal line black broken at veins. Fringe slightly paler than ground color, silken darker in spots opposite veins. The secondaries show only faint traces of intra and extra discal cross lines, with pale space between as in primaries. The geminate pale line is near to outer margin, runs parallel to it, with a strong curve toward base just before it reaches inner margin. Outer margin flattened between veins three and seven. Marginal black line heavy, unbroken. Fringe as in primaries. Discal dots very small and faint. Beneath, paler than above, the entra and extra discal lines faintly reproduced on primaries. In secondaries they are more distinct, the intra discal making a regular basal curve from inner margin to discal dot, thence at right angles, straight to costa at centre, the extra discal and faint line outside it, indicated by spots on veins. Between these the geminate pale lines show plainly; all parallel to outer margin. Marginal lines distinct black, broken narrowly at veins. Fringes as above. Discal dots small jet black, linear on primaries, round on secondaries. Body and legs soiled white, the fore legs heavily washed with black, all tarsi ringed with yellowish white.

Type: A perfect ♂ captured at light in Big Indian Valley, Catskill Mountains. VIII, 12, '09, by the author and in his collection.

Eupithecia adequata n. sp.

Expanse 20-22 mm.—In wing form and somewhat in style of markings, resembles *multiscripta* Hulst, but about one-half as large. Palpi moderate, rather stout, gray and white scales, tipped with white. Front, vertex and thorax above, white with scattering gray scales. The latter nearly clear white centrally, where are clustered at summit a few pale brown scales, the scutellar region tipped with pure white. Antennae slender, silver gray, with dots of black scales dorsally, shortly biciliate in ♂, very short in ♀. Abdomen above white and pale gray, each segment ringed with clear white posteriorly, the second with a narrow ring of jet black anteriorly. All wings above with ground color pure white, overlaid with black and gray scales, forming the cross lines, and having within basal area and outside extra discal line, a band of bright brown scales, the outermost clearly defined. The basal line with outward curve from costa, turns sharply inward to base. Outside this is the brown band a little broadened toward inner margin, then a well marked black line outside it crosses costa about one-third out, turns sharply toward apex and at cell centre, abruptly backward to inner margin touching it barely one mm. from base. A similar intra discal line crosses costa just above discal dot, makes a sharper, longer spur toward apex, and turning, passes backward close beneath discal dot, parallel to previous lines and close to it, broadening and darkening as it reaches inner margin. Beyond this line, a broad, clear space crosses both wings, traversed by four fine parallel gray lines, outwardly defined by heavier black lines parallel to preceding lines, but much waved. The pale central space like a broad band is a conspicuous mark of this species, and has a spur projecting from its costal angle, toward outer margin just below apex. The costal and space above this is darker and dashed with black lateral streaks. The geminate pale lines seem fused into a single broad, wavy white line, and beyond this the brown line clear across wing, waved to just within anal angle. A narrow white line succeeds this and the very narrow submarginal space is gray. Marginal line fine jet black hardly broken at veins. Fringes long, gray, darker at base, traversed centrally by a white line. Discal dots small, linear, jet black. Secondaries, like primaries, have a dark basal area, succeeded by broad pale band, bordered with black at inner margin, and traversed by two fine gray lines, all of which fade out before reaching wing centre. A broad shade line of gray, outside pale band, runs parallel with outer margin, fading out costally and outwardly bordered by the single broad white

line. Submarginal space narrow gray. No brown line, but centrally traversed by a broad, wavy, white line as on primaries. Marginal line and fringe as on primaries. Discal dots barely visible. Beneath the primaries are dusky, the intra and extra discal and a central submarginal line as above, dark and well defined. The central broad, pale band and the geminate pale lines, outside extra discal, are clear white. Secondaries more dusky, the lines as above darker, but crossing wing entire, the extra discal with a strong outward curve about cell, the central space and geminate lines clear white. Body, legs and abdomen beneath white thickly sprinkled with dark brown and gray scales. Discal dots larger and distinct on all wings.

Types ♂ and ♀ taken at Eureka, Utah (Spalding) V. 9, '09 and V. 10, '09. Cotypes from same locality 10 ♂ and 3 ♀ V. 6 to 30, '09, all in author's collection. I have compared this species with *multiscripta* in wing shape and style of markings, but the pale central band with its spur to apex would mark it as an intermediate form between that species and *acutipennis* Hulst and allies.

It is easily identified by this peculiarity and by the bright brown bands on primaries.

Eupithecia increasata n. sp.

Expanse 18-20 mm.—Primaries somewhat produced at apex outer margin strongly sloping inward, the anal angle falling much within the outer curve of secondaries which are rather long but well rounded. Palpi moderate, bushy dark brown. Vertex, front and thorax dark brown and gray scales mixed. Antennae brown, stouter and faintly black ringed in. ♂, flattened and shortly ciliate; slender and without rings in ♀. Abdomen clothed above and beneath with yellow and dark brown scales mingled with whitish. Basal segments above, nearly clear white. No black ring on second, though in the ♂ the dorsal tuft is enlarged giving that appearance—otherwise they are small, black. Body and legs grayish white, thickly sprinkled with dark brown. All wings above gray, thickly sprinkled with dark brown and blackish scales. In ♂ there is strongly apparent, a washing of yellow brown, costally and subterminally on all wings, in ♀ not so distinct. In both the covering is soft, without definite lines. Basally there is a darkened area, outlined by a faint intra discal line which, crossing costa above discal point suddenly curves outward around and beneath it, thence in waves to inner margin over one-half out. Extra discal indicated by a few black dashes centrally on veins, and by a dark spot on costa. Basally on costa, along median vein, and on vein one,

are also scattered dashes of black. Geminate pale line cross costa wide apart. The inner suddenly cuts off the outer at this point, makes a long angle toward apex and crosses. Wing in a single broad, firmly marked white line parallel to outer margin. Subterminal space slightly darkened, traversed centrally by a much broken pale line ending in a white spot between veins 1 and 2, which is accentuated by a cluster of dark scales on inner or basal side. This spot is also present at anal angle on secondaries which are crossed by a single whitish wavy line parallel to outer margin, and forming the inner boundary of the subterminal space, which, as on primaries, is slightly darkened, and centrally traversed by a very indefinite pale line. A few black scales at inner margin toward base. Marginal lines on all wing black widely broken at veins, followed by a fine clear white line at base of fringes, which are long, silken, brownish gray, heavily clouded with black spots opposite veins. Discal dots very small; on primaries slightly linear black, on secondaries barely visible. Beneath the primaries are dusky, toward apex washed as above with yellow brown. The geminate pale lines broad at costa, and outlined across it by black scales. The inner is lost before reaching wing centre, the outer entire and well defined, not wavy, and its angle below costa more obtuse than on upper surface. Secondaries whitish ash, crossed by three lines of dusky spots, outside the discal spot, the two inner parallel with a sharp outward angle opposite cell, are succeeded by the broad pale line as above, and this by a dusky line of spots parallel to outer margin. Discal dots black more apparent than above. Fringes paler with dusky spots large and very distinct.

Type ♂ taken at Princeton Summit, B. C., VII. 9, '09, the ♀ in Skagit Basin, B. C., VII, 19, '09, in author's collection.

In the male of this, and some other species, I have noted that the hind tibiae are short and stout and the upper spurs placed in a depression, which causes it to look twisted. If proven constant this feature may form a basis for grouping by the scientist who will monograph this genus and its allies twenty years hence.

(To be continued)

Schizomyia ipomoeae n. sp.

By E. P. Felt, Albany, N. Y.

The interesting species described below was reared in large numbers by William W. Pattersons, of St. Vincent, B. W. I., from flower buds of Ipomoea. It is most easily distinguished

from American forms by its small size, the reddish brown abdomen and in particular by the varicolored antennae, the segments basally being a more or less distinct yellowish.

Male.—Length, 1.2 mm. Antennae as long as the abdomen, rather thickly haired, dark brown, the segments basally dull yellowish, the fifth segment with a length about six times its diameter, thickly clothed with short, even setae and with heavy, irregular circumfili; terminal segment tapering, with a length seven times its diameter. Palpi; first segment short, stout, irregular, the second a little longer, swollen near the middle, the third half longer than the second, slender, the fourth half longer than the third. Eyes large, black. Mesonotum reddish brown. Scutellum and post-scutellum dark brown. Abdomen a variable reddish brown. Wings hyaline, costa light brown, the third vein uniting with the margin just beyond the apex. Halteres whitish transparent. Coxae, femora and tibiae a variable yellowish or fuscous yellowish, the tarsi slightly darker. Claws long, slender, simple, the pulvilli shorter than the claws. Genitalia; basal clasp segment stout, distally thickly setose; terminal clasp segment subapical, short, stout, irregularly bifid; dorsal plate short, narrowly incised, the lobes obliquely truncate, setose at the angles; ventral plate long, narrow, deeply and narrowly emarginate, the lobes long, slender, tapering; style short, acute.

Female.—Length, 1.75 mm. Antennae nearly as long as the body, thickly clothed with short hairs, dark brown, the basal fourth of segments three to six yellowish, the fifth with a length six times its diameter, thickly clothed with short hairs and with low circumfili near the basal third and apically; 12th segment with a length three times its diameter; 13th with a length half greater than its diameter, the 14th with a length only a little greater than its diameter. Palpi; first segmen short, with a length three times its diameter, the second twice the length of the first, stout, the third and fourth slender, each successively slightly longer. Mesonotum, scutellum, postscutellum and abdomen a little lighter than in the male. Ovipositor when extended as long as the body, the basal portion pale orange yellow, the distal part tapering to an acute apex. Basal plate weakly chitinized. Other characters nearly as in the male.

Exuviae.—Length, 2.5 mm., whitish, stout. Antennal sheaths stout, indistinctly annulate and extending to the second abdominal segment Cephalic horns moderately stout, slightly curved. Wing pads extending to the third abdominal segment, the leg cases to the sixth. The dorsum of abdominal segments 2 to 8 inclusive, with an irregular, narrow, transverse band of heavily chitinized spines.

Type Cecid a2022, N. Y. State Museum.

Two New Aphelinine Parasites of Scale Insects.

By L. O. Howard.

In the course of his almost constant journeying in different parts of the world searching for beneficial insects, Mr. Geo. Compere, Agent of the State Board of Horticulture of California and of the Department of Agriculture of Western Australia, finds many curious and interesting parasitic Hymenoptera. Many of these he sends to the writer for determination, and in a lot received quite recently there occur two new Aphelinines which it seems desirable to name at once. The descriptions follow:

Genus **PHYSCUS** Howard.

Physcus Howard. Bulletin No. 1, Technical Series, Bureau of Entomology, U. S. Department of Agriculture, 1895, page 43. Type *Coccophagus variconis* Howard (Annual Report, Department of Agriculture, 1880, page 360.

Physcus flaviventris n. sp.

Female.—Length 0.97 mm.; expanse 2 mm.; greatest width of fore-wing 0.3 mm.—Somewhat slenderer than *varicornis*. Head and thorax dark brown nearly black. Abdomen above and below orange-yellow, brown at sides. Scape brown; pedicel and all three funicle joints pallid; club brown, pale at tip. Fore femora and base of fore tibiae brown; remainder of front legs and all of middle and hind legs pallid, tinged with yellowish. Wing veins not colored, transparent.

Type No. 12,167, U. S. N. M.

Described from two female specimens reared by George Compere from *Chrysomphalus aurantii* Mask, Manila, P. I.

Genus **PERISSOPTERUS** Howard.

Perissopterus Howard. Technical Series No. 1, Bureau of Entomology, U. S. Dept. Agric., 1895, page 20. Type *Aphelinus pulchellus* Howard, Annual Report, U. S. Dept. Agric., 1880 page 356.

Perissopterus carnesi n. sp.

Female.—Length 0.81 mm.; expanse 1.83 mm.; greatest width of fore-wing 0.198.—Resembles *Perissopterus javensis* Howard (Technical Series No. 12, Part IV, 1907, page 88), but differs in having the tip of the first tarsal joint of the middle legs yellow and the fourth

tarsal joint brown. This tarsus being thus colored, 4th and 5th joints and all of 1st joint except tip brown; 2nd and 3rd and tip of 1st yellow.

Type No. 12,168, U. S. N. M.

Described from three female specimens reared by George Compere from *Lepidosaphes beckii*, China. The specific name is given in honor of Mr. Edward K. Carnes who has charge of the admirable insectary of the California State Board of Horticulture at Sacramento, Cal.

The Genus Trybliophorus Serville, and its Species.

By Lawrence Bruner.

Trybliophorus Serville, Rev. Meth. Orthopt., p. 83 (1831); Ib., Hist. Nat, Orthopt., p. 631 (1839); Stål, Syst. Acrid., p. 43 (1878); Brunner, Rev. Syst. Orthopt., p. 136 (1893); Giglio-Tos, Boll. Mus. Zool. Anat. Comp. Univ. Torino, XIII, No. 311, p. 43 (1898).

Stegastris Gerstaecker, Bemerkens, Orthopt., p. 63 (1888); Brunner, Rev. Syst. Orthopt., p. 136, foot note (1893).

This genus is characterized chiefly by having the disk of the hind lobe of the pronotum flattened and extended in the form of a triangle backwards so as to reach the front edge of the first abdominal segment. The apical joint of the maxillary palpi is ampliate and much flattened, while the antennae are very heavy and elongate.

Recently while studying a small collection of locusts from Peru, South America, that had been submitted to the writer for determination, a single female specimen of the genus *Trybliophorus* was encountered among other interesting forms. An examination of this insect showed it to be an undescribed species. It was accordingly named *T. peruviana*, and a description of it drawn up and sent, along with others, to Prof. Nicholas Iconnicoff, of the University of Moscow, for publication. In the meantime Mr. James A. G. Rehn, of Philadelphia, has submitted to me for examination and description, if I so desired, another specimen of the same genus. The latter insect, also a female, comes from Surinam or Dutch Guinea.

An examination of the several descriptions heretofore pub-

lished, together with the two specimens here referred to, has enabled me to draw up the annexed synoptical table for the separation of the known species:

Synopsis of the species of *Trybliophorus*.

A Sides of the face, pronotum and pleura varied by pallid or yellow lines or maculations.

b Size smaller (♀ 25–28 mm.). The face, cheeks and sides of pronotum and pleura in advance of the insertion of the hind femora adorned by a row of four whitish maculations [Cayenne, French Guiana) . . . . . 1. **octomaculatus** Serv.

bb Size larger (♀ 32–39 mm. or more). The face, cheeks, sides of pronotum and pleura adorned with yellow bands or maculations.

c Size medium (♀ 32–34 mm).

d Hind femora pale coral red, the tibiae dark blood-red with brownish apices and black spines (Fontehoa, Amazonas].
2. **corallipes** Gerst.

dd Hind femora testaceous, the tibiae barely tinged with red, the spines black tipped [Surinam or Dutch Guiana].
3. **elegans** Rehn.

cc Size large (♀ 39 mm. or more).

d Antennae reddish brown. Wings only faintly infuscated [North Central Peru] . . . . . 4. **peruviana** Bruner.

dd Antennae purplish red. Wings blackish [Brazil].
5. **bivittatus** Walk.

AA Sides of the face, pronotum and pleura unadorned by pallid or yellow lines or maculations [Ega, Amazonas] . 6. **volucris** Gerst.

The species *octomaculatus* Serville is, of course, the type of the genus, while *corallipes* Gerstaecker and *elegans* Rehn are both quite nearly related to it. In fact, it is rather difficult to decide just which one of these two should immediately follow the type when the species are arranged in sequence. The species *peruviana* Bruner and *bivittatus* Walker are both larger than the other four, but are also quite similar in general color and markings to the type and Gerstaecker's and Rehn's species just referred to. The species *volucris* Gerstaecker is unique in lacking the pallid maculations on the face, sides of the head, pronotum and pleura. Whether it should precede *octomaculata* in the arrangement of the species or remain at the end of the list has not been definitely decided.

The Macrolepidoptera of the Bermudas.

By Frank Morton Jones, Wilmington, Delaware.

The nearest point of land to the Bermudas is Cape Hatteras, North Carolina, 575 nautical miles distant. Considering the variety of the vegetation, the apparent lack of climatic bars to the establishment of a wide variety of insect life, and the fact that comparatively fragile forms have been known to cross over from the mainland, the fauna is a meager one and the entire absence of many widely distributed groups is remarkable. In 1902 Prof. A. E. Verrill published (Trans. Conn. Acad. Sci., XI) a list of the insects of Bermuda, based on his own collections and on all previously published records. He lists forty species of Macrolepidoptera; of these, however, one species is duplicated as a synonym; three were not positively identified; three others have not been recorded for more than fifty years, the specimens were not seen by Prof. Verrill, and the correctness of their identification requires confirmation; of the remaining thirty-three species several occur as stragglers only and are not established on the islands.

In a stay upon the Islands extending from December 7, 1908, to May 20, 1909, I was able to confirm the presence of many of the previously recorded species and to add materially to the list. Several hundred specimens were collected for me in the summer of 1909, but with the exception of a single species this material duplicated my captures of the winter and spring. I am indebted to Dr. H. G. Dyar, Dr. J. B. Smith and Mr. J. A. Grossbeck for identification of specimens; to Prof. Stewardson Brown for identification of food-plants; to Miss Estelle Jones, Messrs. Louis Mowbray, Clifton Astwood and Francis Hutchings for specimens and notes.

It is of course possible that careful summer collecting will add considerably to the following list:

Agraulis vanillae Linn.—Not heretofore recorded; believed locally to be of recent introduction; now the most abundant butterfly, in all stages throughout the winter; foodplant *Passiflora umbrosa* L.

Danais berenice Cram.—Recorded on previous lists; not seen, 1908-9.

Danais plexippus Linn.—Well established, breeding throughout the year; larvae on (introduced) *Asclepias.*

Vanessa antiopa Linn.—Not seen, 1908-9.

Pyrameis atalanta Linn.—Not abundant; fresh specimens, April and May.

Pyrameis cardui Linn.—Not abundant; fresh specimens, December and March.

Junonia coenia Hbn.—Abundant, all stages throughout the winter; foodplant *plantain.*

Pieris rapae Linn.—Listed by Prof. Verrill as seen but not captured; if established on the Islands, still rare.

Catopsilia eubule Linn.—Probably not permanently established.

Terias lisa Bdv.—Often an abundant summer species; two cases are recorded of vast flocks of this butterfly arriving and spreading over the Islands (Oct. 10, 1847 and Oct. 1, 1874); reported to me as abundant for a few days only, 1909.

Colias philodice Godt.—Not seen, 1908-1909.

Papilio cresphontes Cram.—Prof. Verrill records a single specimen.

Thecla tersa Linn.—In all stages throughout the winter.

Dilophonota ello Linn.—Not rare; larvae on "Joseph's Coat," Poinsettia heterophylla.

Phlegethontius cingulata Fabr.—Present in all stages.

Chlaenogramma jasmincarum Bdv.—Recorded in 1876; probably a straggler.

Lycomorpha pholus Dru.—Also not recorded since 1876.

Utetheisa bella Linn.—Recorded as an abundant summer species; not seen, winter and spring, 1908-9.

Isia isabella S. & A.—Probably a recent introduction; Mr. Mowbray has found several larvae.

Perigea sutor Gn.—Occasional at light.

Perigea circuita Gn.—At light, sugar and bread.

Perigea subaurea Gn.—Recorded by Butler, Challenger Exp., 1884.

Prodenia commelinae S. & A.

Prodenia eridania Cram.—Abundant, all stages; favorite food of larva, castor-oil plant.

Prodenia ornithogalli Gn.—Abundant, all stages.

Laphygma exigua Hbn.—Recorded by Butler.

Agrotis ypsilon Rott.—Not abundant, 1908-9.

Peridroma saucia Hbn.—Bred; well established.

Peridroma incivis Gn.—Bred and at sugar.

Feltia annexa Gn.—Not rare; bred.

Feltia malefida Gn.—Not rare.

Leucania unipuncta Haw.—Well established.

Leucania latiuscula H. S. (*subpunctata* Harv.)—Well established; bred.

Heliothis obsoleta Fab.—(Not found, 1908-9).

Autographa ou Gn.—Abundant; bred; larvae on *Parthenium hysterophorus* L.

Autographa rogationis Gn.—Abundant.

Autographa brassicae Riley.—Not frequent.

Anomis erosa Hbn.

Callopistria floridensis Gn.

Gonitis editrix Gn.—The showy larvae abundant on *Triumfetta semitriloba* Jacq.

Remigia repanda Fabr.—Bred and at sugar; abundant and variable.

Thermesia monstratura Wlk.—Recorded by Butler.

Tetanolita mynesalis Wlk.—Occasional at light.

Bomolocha citata Grt.—Larger and more strongly marked than usual; possibly distinct; larvae abundant on *Sida rhombifolia.*

Percnoptilota fluviata Hbn.—Not rare.

Gypsochroa sitellata Gn.—Not rare.

Cosymbia myrtaria Gn.—Bred; large and dark, like Florida specimens.

Scelolophia purpurissata Grt. (*formosa* Hulst).

Eois laevitaria Hbn. (*floridata* Pack).—This beautiful little Geometer locally abundant, Warwick Marsh, May.

Eois crossii Hulst.—Not rare; bred from larvae on *Lantana odorata.*

Synchlora denticulata Wlk.—Bred; larvae abundant, flowers of *Solidago* and *Vervian.*

Alcis verrillata Dyar.—Abundant;; bred; also at light and sugar. This variable insect is supposed to be exclusively Bermudian. Its larvae are abundant in the winter and spring, doubtless throughout the year, on the Bermuda cedar, *Juniperus bermudiana,* but their protective coloration is so perfect that search for them except by beating is almost hopeless. They are of almost uniform diameter without prominent protuberances; smooth, green in color of the same shades as the younger leaves of the cedar; a light line on the head, following the groove of the clypeus; a light subdorsal line, curved outwardly on the segments; an interrupted pale stigmatal line. Pupation in a thick earthen cocoon; the pupa green, translucent, the abdominal segments brown; in January and February the pupal period lasted eighteen to twenty-two days.

In addition to the foregoing species Professor Verrill included in his list (on the authority of J. Matthew Jones, 1876)

Vanessa io, Vanessa polychloros and *Debis portlandia,* single specimens of each, "taken by Canon Tristram in 1848." The local collectors, as far as I could learn, know nothing of these. Professor Verrill also records an unidentified black *Papilio,* seen but not captured, in 1901.

Of the total area of the Islands (about nineteen square miles) a comparatively small portion remains in anything approaching undisturbed condition. The sand hills and rocky cliffs of the south shore and the marshes are least disturbed by cultivation. The extensive Devonshire marshes have been badly burned over within a few years; those in Warwick Parish are now almost treeless; a deep valley near Paget Parish Church is grown up with palmetto, various shrubs, tall ferns and marsh-grasses, and this is probably the best collecting-ground readily accessible from Hamilton; the Walsingham tract yields a number of plants and a few insects not seen elsewhere; but throughout the Islands, insects, while at times abundant enough in individuals, are of such a limited number of species that collecting is a constant disappointment to the entomologist who expects his captures to accord with the semi-tropical climate and vegetation. Of the fifty-two species on the present list, all but six have been recorded from our own Southern States.

Three New Psenid Wasps from New Jersey.

By S. A. Rohwer, Washington, D. C.

Descriptions of three new wasps belonging to the family Pseniidae are submitted here so they may be included in the forthcoming list of insects found in the State of New Jersey.

Psen (Mimesa) nigrescens n. sp.

Belongs to group *nigra* of Fox, and is related to *mixta* Fox and *lencopa* Jay. The sparsely punctured vertex and orbits, the almost impunctate mesopleuræ with the upper part striated, the transversely striated diamond-shaped area of the enclosure, the elongate abdomen, and simple flagel will help distinguish it from its allies.

♂. Length 7.5 mm. Anterior margin of the clypeus bidentate; front

with close, distinct punctures, vertex and posterior orbits sparsely punctured; frontal carina not reaching the antennæ; ocelli in a triangle, the distance between the lateral ones nearly as great as the distance from one of them to the nearest eye margin; flagel simple, thickening apically, the first joint scarcely longer than the second, the antennæ hardly as long as the head and thorax; dorsulum and scutel with small, widely scattered punctures; the upper part of the mesopleuræ striato-punctate, the rest of it sculptured as the dorsulum; enclosure with slightly oblique striæ, the diamond-shaped area with transverse striæ; the rest of the metathorax with large reticulations; legs rather slender; venation normal for *Mimesa* except the first recurrent is interstitial with the first transverse cubitus; petiole trisulcate, a little shorter than the hind femora; abdomen elongate, narrow, the sutures distinct. Black; flagel beneath and tegulæ dark testaceous; anterior tibiæ and tarsi, the four posterior tarsi, and knees very pale brown. Wings hyaline, strongly iridescent; venation dark brown. The pubescence silvery and not very dense.

One paratype is a little smaller, and in two of them the cubital venation is normal.

Type locality: Clementon, N. J., June 30, 1908. Other localities: Germantown, Pa., July 18, 1908 (Harbeck).

Type No. 12,858 U. S. N. M.

Psen (Mimesa) perplexa n. sp.

Belongs to group *argentifrons* of Fox and is related to *maculipes* Fox.

♀. Length 8 mm. Anterior margin of the clypeus emarginate, its surface with close, but not touching, punctures; front with close, fine punctures, vertex and cheeks with widely separated punctures; anterinal foveæ extending above the antennæ and forming a pit at their extremity; ocelli in a triangle, the distance between the lateral ones about the same as the distance from one of them to the nearest eye margin; third antennal joint but little longer than the fourth; dorsulum and scutel shining with small widely separated punctures; the suture between the scutel and dorsulum foveolate; middle of the mesopleuræ smooth, shining, laterally and dorsally strongly, longitudinally striated; metanotum with strong, slightly obliquely striated, at the apex with a diamond-shaped area which has a remnant of a transverse stria; posterior face with sharply defined reticulations; the metanotum with transverse striæ posteriorly; pygidium well defined, closely granular; petiole robust, short about the length of the rest of the segment, bisulcate. Color black; flagel beneath, tegulæ and tarsi testaceous;

tibiæ dark brown; facial pubescence slightly yellowish; thoracic pubescence silvery; wings slightly dusky iridescent; venation dark brown.

Type locality: Camden County, N. J., August 6, 1890. Collection of W. J. Fox.

Type No. 12,859 U. S. N. M.

On account of the short petiole this species falls in with *basirufa* Cress. and *proxima* Cress., but will be separated at once by the absence of a rufous band on the abdomen. The female of *maculipes* Fox is undescribed, and *perplexa* is very like what we may expect this female to be, yet there are so many differences that *perplexa* seems distinct from the Florida species.

Pemphredon (Cereonus) harbecki n. sp.

Allied to *bipartator* Fox, but may be distinguished by the sparser punctures of the head and dorsulum, the small enclosure of the metanotum, the presence of a furrow on the petiole above, and in having the petiole longer, the emargination of the clypeus is narrower and more sharply defined than in *bipartator* which has the emargination sloping at the base, instead of the basal wall being perpendicular.

♀. Length 7.5 mm. Clypeus with a deep semi-circular emargination; mandibles not punctured basally; clypeus, supraclypeal area, vertex and posterior orbits shining with distinct, well separated punctures; front striato-punctuate; distance between the lateral ocelli distinctly less than the distance from one of them to the nearest orbital point; third antennal joint distinctly longer than the fourth; dorsulum and scutel with widely separated, distinct punctures; mesopleuræ irregularly, transversely striato-punctate; enclosure of the metathorax rather small, with some strong longitudinal striæ laterally, centrally reticulate; the shining area bounding the enclosure large; sides and posterior face of the metathorax punctato-reticulate; petiole two-thirds the length of the hind femora, with separate punctures and a deep middle furrow above; legs and abdomen normal; second recurrent nervure interstitial with the first transverse cubitus. Entirely black; hair gray; wings hyaline, iridescent; venation black.

Type locality: Trenton, N. J., July 5 (H. S. Harbeck).

Type No. 12,867 U. S. N. M.

New Species of Tineina from California.

By Annette F. Braun.

Argyresthia trifasciae n. sp.

Labial palpi, face, head and thorax pale golden. Antennae whitish, with broad brown annulations. Forewings shining white with a faint yellowish tinge, and marked with pale golden as follows: An oblique basal patch, followed by two slightly oblique fasciae nearer the base on the dorsal margin, the second of which lies at the beginning of the dorsal cilia; a third perpendicular fascia, followed by a more indistinct curved golden streak in the apical portion of the wing; extreme apex and cilia golden. There are a few scattered golden scales on the costa between the fasciae. Hind wings pale yellow. Abdomen and legs golden, except the fore tarsi which are brown. Expanse, 7-7.5 mm.

The specimens from which the above description was prepared were collected at Ocean Beach, San Francisco County, May 31, 1908, by Mr. G. R. Pilate.

This species should be placed between *A. quadristrigella* Zeller and *A. thoracella* Busck, being probably more closely related to the latter. Veins 7 and 8 of the forewings are stalked.

Types in my collection.

Argyresthia pilatella n. sp.

Face and head gray, front part of the tuft whitish; basal joint of antennae almost pure white, remainder annulate with black. Thorax dark gray. Forewings with the whitish somewhat shining ground color almost overlaid with brownish gray scales, arranged for the most part along the costal and dorsal margins into narrow strigulae, between which the white ground color is evident. At the middle of the dorsal margin, these scales are collected into a broad and much darker patch, which extends obliquely backward as a curved streak nearly to the costal margin where it meets the apex of a similar but much smaller and less distinct costal streak, thus forming an outwardly angulated more or less distinct fascia. Sometimes the dark scales are almost evenly distributed over the entire surface of the wing except along the costa near the apex, where the strigulae are distinct. Along the apical half of the costa, the white interspaces between the strigulae are broader; sometimes the only dark streak is a conspicuous one just before the apex. A black apical dot, sometimes obsolete. Cilia opposite the strigulae and around the apex gray becoming paler toward the tornus. Hind wings silvery gray, their cilia tinged with

brown. Abdomen and legs gray, tips of the tarsi darker. Expanse, 9.5-10.5 mm.

Nine specimens: Mills College, Cal., May 20, 1908; San Francisco, April 12, 1909; all collected by Mr. G. R. Pilate. A dark indistinctly marked species, apparently not closely related to any of the described American species. Veins 7 and 8 of the forewings are stalked.

Type in my collection; paratypes in the California Academy of Sciences and in Mr. W. D. Kearfott's collection.

Nepticula ceanothi n. sp.

Palpi deep bronze; tuft reddish orange; antennae almost black; eyecaps shining yellow. Thorax and basal third of the forewings with deep purple and blue metallic reflections, becoming brilliant reddish bronze outwardly. A shining golden fascia at one-third, and a second similar one at two-thirds. Beyond the first fascia, the ground color of the wings is dull dark brown. Cilia brown, becoming iridescent gray toward their tips. Hind wings and cilia dark brownish gray. Upper surface of abdomen dark brown; lower surface of body and legs metallic gray with faint bronze reflections. Expanse, 4.5-5 mm.

Three specimens bred from upper side mines on leaves of *Ceanothus divaricatus* Nutt., collected by Mr. G. R. Pilate, at Dutch Flat, Placer Co., California. The mine is a brownish much contorted linear tract with a broad area of frass sometimes nearly as wide as the mine. The mine averages 32 mm. in length with 1 mm. for the greatest breadth. The cocoon is flattened elliptical, somewhat broader toward its anterior end, and densely woven of reddish brown silk. The mines were received in February; the imagoes emerged from the middle of March to the middle of April.

Types in my collection.

Nepticula diffasciae n. sp.

Palpi shining gray, tuft reddish yellow; antennae dark gray, eyecaps shining yellowish white. Thorax and forewings lusterless black, the latter inconspicuously mottled in the apical third. There are two pale fasciae; the first at one-third is pale dull yellowish white; the second at two-thirds is almost pure white, somewhat shining, and usually considerably narrower than the first. Cilia around the apex whitish, becoming gray toward the tornus. Hindwings very pale grayish brown, with gray cilia. Abdomen toward the base concolorous with

the hindwings, shining gray behind. Underside and legs shining gray, faintly tinged with brown. Expanse, 5.5-5.8 mm.

Described from six bred specimens, Dutch Flat, Placer Co., Cal. I have, however, been unable thus far to identify the food plant, which is a shrub with lanceolate yellowish green leaves, densely tomentous beneath. The mine, which is semi-transparent, is a tortuous tract on the upper side of the leaf, with the frass deposited in separate grains throughout its entire breadth. The end of the mine, which is free from frass, is whitish and almost transparent. Cocoon ovoid, not at all flattened, and pale yellowish in color. Mines collected in the early part of March produced imagoes during May.

Types in my collection.

Nepticula variella n. sp.

Palpi yellow gray; tuft yellowish orange; antennae dark gray, eye-caps pale yellow. Thorax dark fuscous. Ground color of the forewings sordid yellowish white, which is in most specimens almost entirely overlaid with fuscous scales, leaving only the apex of the wing and a more or less distinct fascia at the apical third of the pale yellow color. This is the case in about four-fifths of the specimens; in the others, the dusting of the basal two-thirds of the wing varies, in some cases being merely less dense, in others lacking toward the costal or dorsal margins, and in a single specimen entirely lacking, except for a few scattered scales. Cilia fuscous sometimes yellow around the apex. Hindwings gray, with their basal half in the male overlaid with purplish black scales. Dorsal side of the abdomen blackish, lower side and legs yellowish gray. Expanse, 5.5-7.5 mm.

Twenty-one specimens bred from winding mines on the upper side of *Quercus agrifolia* Nee., Mills College, Alameda County, Cal., and one specimen on a deciduous oak from the same locality. The mines on the latter are somewhat longer than on the thicker leaved evergreen oak. The yellowish cocoon is ovoid, not flattened, and slightly broader toward its anterior end. Mines received in January produced imagoes in the latter part of February and in March.

This species exhibits a considerably wider range of variation than is usual in the genus.

Type in my collection; paratypes in the California Academy of Sciences and in Mr. W. D. Kearfott's collection.

Nepticula punctulata n. sp.

Palpi grayish; tuft grayish yellow, antennae gray, eye-caps yellowish white. Thorax gray. Forewings shining grayish, yellowish white, with numerous fuscous scales evenly distributed over their surface, so as to give the wings a finely peppered appearance. Cilia pale gray. Hindwings and cilia pale gray, the latter tinged with yellow. Body and legs pale shining gray, faintly tinged with red. Expanse, 4.5-5.5 mm.

Two specimens bred from upper side mines on leaves of *Ceanothus cuneatus* Nutt., from Dutch Flat, Placer County, Cal. The mine, which in its early stages is not very distinctly visible on the surface of the small thick leaves, usually follows the margin of a leaf, often being bent back on itself. Toward the end it bends into the middle of the leaf, where its apex is suddenly slightly enlarged.

The cocoon is elliptical, much flattened on its lower side, reddish brown in color, with its upper convex side covered with a loose meshwork of paler strands.

The mines were received in the early part of January, the imagoes appeared February 27th. The remarkably even distribution of the dark dusting is a striking characteristic of this species.

Types in my collection.

Bucculatrix ochristrigella n. sp.

Face and head creamy white, with a few grayish brown scales in the tuft; antennae pale grayish. Thorax and forewings creamy white, the latter marked with ocherous patches and dashes as follows: a narrow streak along the basal third of the costa, which is brown at its extreme edge; a basal streak in the fold extending nearly to one-third; just within the costa, an elongate patch at one-third; opposite its end a short streak extends obliquely backward from the middle of the dorsal margin; just behind the middle of the wing, a long oblique transverse streak, broadest on the costa, extends across the wing into the cilia of the termen, where it is flecked with brown scales; a triangular spot on the costa beyond this; an oblique streak from the apex into the apical cilia, this latter and also the triangular spot being sparsely flecked with brown scales, which are continued backward to join the dusting at the end of the transverse streak. Hind wings and cilia very pale ocherous. Abdomen above dark posteriorly, lower side and legs grayish ocherous. Expanse, 11-11.5 mm.

Described from a large number of specimens collected at Mills College, Alameda County, Cal., May 11-20, 1908, by Mr. G. R. Pilate.

The ocherous markings are not always as clearly defined as indicated by the description given above; this is especially true in regard to the streak in the fold.

Type in my collection; paratypes in the California Academy of Sciences and in Mr. W. D. Kearfott's collection.

Bucculatrix albaciliella n. sp.

Face and tuft white, the latter with a few ocherous scales interspersed, antennae gray. Thorax and forewings pure snowy white. Forewings marked with ocherous patches. These markings consist of a streak in the fold near the base; a spot just within the costa before the middle and a spot similarly placed at two-thirds; opposite the space between these two, a short streak in the fold. The yellow patch at two-thirds is more or less connected with an oblique transverse spot running to the termen. There are a few ocherous scales on the costa before the apex. All of these marks are often very faint. Cilia pure white. Hind wings slightly tinged with gray, their cilia white. Body grayish ocherous. Legs whitish except the anterior pair which are gray. Expanse, 7.5-8.5 mm.

Eleven specimens: Mills College, Alameda County, Cal., May 11-20, 1908. In general type of marking, it closely resembles *B. ochristrigella* Braun, but may easily be distinguished from it by the smaller size, pure white color, and the absence of the apical streak into the cilia.

Type in my collection; paratypes in the California Academy of Sciences and in Mr. W. D. Kearfott's collection.

Bucculatrix tetrella n. sp.

Face and tuft creamy white, the latter with brownish yellow scales interspersed. Antennae whitish, narrowly annulate with brownish yellow. Thorax and forewings creamy white. The wings are considerably overlaid with brownish ocherous scales, arranged in rather ill-defined patches and bands. These are four in number; the first is a broad patch near the base of the dorsal margin, not attaining the costa; the second and third are oblique bands, of which the former attains the dorsal margin near the middle, the latter at the tornus; the fourth is a large patch at the apical fourth of the costa extending nearly across the wing. These patches and bands often blend into one another. The

thorax and forewings are sparsely peppered with minute brown dots. On the dorsal margin, at the internal margin of the first band is a small patch of black-tipped raised scales. There are a few black scales at the apex of the wing, and a semi-circle of brown scales in the middle of the apical cilia. Hind wings and cilia pale ocherous. Abdomen and legs pale ocherous, the latter densely dusted outwardly with dark brown scales. Expanse: 8 mm.

Eleven specimens; Mills College, Alameda County, Cal., May 20th to June 17, 1908. This species bears considerable resemblance to some of the Eastern oak-feeding species.

Co-types in the California Academy of Sciences, in Mr. Kearfott's and in my collection.

Bucculatrix variabilis n. sp.

Face and head whitish, the tuft with varying proportions of gray and brown scales, so that in the darker specimens, it is better described as fuscous. Antennae white, annulate with black. Ground color of the thorax and forewings white, more or less dusted with fuscous scales, the wings toward the apex being overlaid with pale yellowish brown scales. In the dark specimens the dusting is so dense that perhaps the wings are more clearly described as fuscous with white costal and dorsal streaks. Just before the middle, is a pair of oblique white streaks meeting at an acute angle nearer the costa. At the apical third is an almost perpendicular white costal streak meeting, in the middle of the wing, the apices of two dorsal streaks, of which the anterior one is oblique pointing backward and parallel to the first dorsal streak, the posterior one oblique pointing forward from beyond the tornus. On the dorsal margin, between the first and second dorsal streaks, the dusting is very dark, almost black, forming a quadrate spot extending nearly half way across the wing. Just preceding the apex are a few white scales, sometimes forming a semi-circular streak enclosing the apex. A black apical dot and a line of dark scales in the cilia around the apex. Sometimes the white ground color predominates; in this case, the dusting below the fold is rather evenly scattered, but a little darker between the first and second white streaks; above the fold the dusting toward the base is altogether lacking; there is a dark streak of scales forming the internal border of the first white costal streak; a similar, but more scattered patch beyond this white streak. The apical part of the wing is more yellowish brown in the light form, due to the comparative absence of the dark dusting. Hind wings varying from very pale to darker gray; their cilia concolorous. Abdomen and legs gray, tarsi white at the bases. Expanse, 6.7-7.8 mm.

Described from four bred specimens and a number of captured specimens; all from Mills College, Cal., the latter were captured March 25, 1908, the bred specimens emerged from April 25th to May 12th. The food plant belongs to the *Amaranthaceae,* and is probably a species of *Cladothrix.*

Type in my collection; paratype in the California Academy of Sciences.

Bucculatrix transversata n. sp.

Face whitish, speckled with brown; tuft brown intermixed with white in front and toward the sides. Antennae grayish broadly annulate with dark brown. Thorax brown. Forewings brown, except along the costal edge and termen, where they are whitish, and dusted with dark fuscous. At the apical third, this dark dusting is a little more dense and extends a little inward onto the brown ground color. Beyond this the dusting is scattered, and just before the apex the white border is enlarged into a triangular undusted spot. On the middle of the dorsal margin is a narrow, half-crescent shaped patch of raised black scales, with one or two white scales before it, and a few scattered black scales behind it. A straight transverse streak of black scales across the apical cilia. Cilia gray. Hind wings and their cilia also gray. Abdomen shining gray, paler beneath. Legs gray, tarsi tipped with black. Expanse: 7 mm.

Described from a specimen bred on leaves of *Ambrosia psylostachya* D. C., collected by Mr. G. R. Pilate at Rivera, Los Angeles County, Cal. The larva feeds on the upper side, consuming irregular patches. Pupation took place the latter part of October, the imago appeared December 5th.

Type in my collection.

Gracilaria reticulata n. sp.

Labial palpi pale yellow with a broad brownish red band in the middle of each of the two last joints. Head yellow with a few brownish red scales. Antennae whitish, annulate with black, the annulations becoming broader toward the tip. Thorax pale yellow, patagia brownish red. Forewings pale yellow, with the costal half reticulated with brownish red. A band of this red color starts at the basal fifth of the costa and crosses the wing obliquely to the fold where it meets a similar band curving up from the base of the dorsum. The band then continues to the dorsum, where it is angulated and returns again to the fold. This band then continues in a slightly wavy outline to the apex, giving off on its dorsal side, three brownish red bars, of which the

first reaches the margin just beyond the middle, the second at the tornus, the third beyond it. The third is also produced to the costa as a much broader bar. Cilia yellowish red opposite the red streaks and bars. Hind wings and cilia pale reddish gray. Abdomen yellowish gray. Anterior legs brownish red, except the tarsi; middle and hind legs pale yellowish shaded with red, all the tarsi whitish, tipped with brown. Expanse, 14.5-15 mm.

Described from five specimens from Mills College, Cal., two of which are bred. The bred specimens emerged January 30-31, 1908; the captured specimens are dated February 9th, March 25th, June 5th, respectively. A very distinct and beautiful species.

The larva rolls under the apex of leaves of *Quercus agrifolia* Nee. The cone, which is formed of a single fold, is often remarkably perfect. Its free edges are securely spun to the under side of the leaf. I have not observed the larva during the leaf-mining period, but have noticed an untenanted mine, on the under side of a leaf, which probably belongs to this species. The cocoon is spun on the upper side of a leaf across the midrib and has numerous strands of silk stretched across above it.

Types in my collection.

Gracilaria palustriella n. sp.

Labial palpi yellowish, dusted with dark brown. Head brownish, antennae whitish, annulate with brown. Thorax brownish. Forewings with the ocherous ground color for the most part overlaid with reddish brown scales, especially in the costal half. These scales are densest around the borders of the pale whitish costal spot. This spot is somewhat produced along the costa toward the apex, and has some reddish scales scattered over it and six or seven black dots on its costal edge. On its dorsal side, a pale indistinct streak curves from it to the dorsal margin, resulting in the internal edge of the spot being convex, the external edge deeply concave. Cilia yellowish, with three or four dark lines running through them from the apex to the tornus. Hind wings gray, their cilia paler and reddish. Abdomen gray. Anterior legs reddish brown, except the tarsi which are whitish, tipped with black. Middle and hind legs grayish. Expanse: 13.7 mm.

Described from a specimen bred from mines on leaves of a species of *Salix*, from Mills College, Cal.; mines collected at

the beginning of June; the imago appeared July 25th. The later larval habits are very similar to those of *G. salicifoliella* Cham. The larva enters the leaf by means of a lunate slit on the under side, and makes a large flat upper surface mine. It later deserts this mine to form a new one. At no period of its larval existence is it a leaf-roller. This sharply distinguishes it from *G. stigmatella* Fab., which the imago in many respects resembles. The larva spins an oval, flat, somewhat glaucous silk cocoon on either the upper or lower side of the leaf.

Type in my collection.

The Larva of Eumaeus atala.

By John L. Healy, Chicago, Ill.

That the larva of so common a butterfly as is *E. atala* about Miami, Florida, should be overlooked is rather remarkable. On the rock ridge, some three miles wide, between Biscayne Bay and the Everglades, where the principal features of the flora are jack-pine and palmetto, this beautiful little black and orange creature is very abundant. My trip to Miami was solely on business and no time was available for strictly entomological pursuit. While on my way to the Everglades to inspect some land in the company of unscientific and unsympathetic persons, I observed such numbers of this species that I prevailed upon my companions to spend a few minutes watching me catch a few. I am always armed with a folding net and a cyanide jar. Noticing the female ovipositing on a species of fern I determined that some brightly colored larvae on the same plant were probably the larvae of *atala*. I secured two, and also three pupas, so closely resembling the larvae that no mistake could be made. Eggs, larvae, pupae and imagoes were all present in great numbers. I had no glass with which to observe the eggs, nor any proper receptacle in which to carry them, so made no detailed observations.

The mature larva is about one inch in length, robust, bright vermilion red in color; thorax much lighter, yellowish, semi-

translucent; head small, in color like thorax; true legs black, prolegs short, yellowish. As a whole the caterpillar is rather slug-like. The first seven abdominal segments have each a pair of clear yellow, ellipsoid, semi-lunate spots, bearing tubercles and spines, these spots being arranged in a double row along the dorsum. There is a second row of tubercles and spines midway between median line and the spiracles.

Pupa is 13 to 15 mm. in length, 3 to 5 mm. in diameter over thoracic and abdominal portions respectively, slightly pitted. When larva-skin is first cast the pupa is of same color as larva, preserving the two rows of bright yellow spots now much more quadrate. In a short time the general color becomes much more mahogany brown and the whole surface except for the rows of spots mentioned, is thickly sprinkled with black dots. Two days before emergence the wing covers become dull black, heralding the approach of the final change. The pupa is suspended by a band of silk fastened on the back at base of thorax, extending to a point opposite the head; abdomen free, not attached. These pupae can be seen fastened to the food plant and also to every plant within 15 inches of the ground. Pupal period, 20 to 22 days.

No opportunity presented itself to secure an identification of the food-plant, owing to my very hurried work. I spent about half an hour and secured the larvae mentioned together with 35 imagoes.

A New Gall-making Psyllid on Hackberry.

By T. D. A. Cockerell.

Pachypsylla rohweri n. sp.

Structure and venation as in *P. celtidis-mamma* Riley, but anterior wings milky-hyaline, with pale yellowish veins and brownish-black markings, consisting of numerous scattered dots, a large irregular spot or patch just below the origin of the radial sector, an oblique band beginning at the end of the stigma and passing downwards and inwards, to end in an enlargement between the branches of the cubitus, and finally a broad band, on which are three hyaline spots, along the outer margin. The area between the two bands may be regarded as a hyaline band

(more or less dotted between the veins), which is broad above and narrows below, and correspond to the light band in *P. celtidis-mamma*. The lower margin is black with hyaline interruptions, somewhat as in *P. celtidis-mamma*. Hind wings milky-hyaline. Head dull, granular, middle of front blackish, sides very broadly dull ochreous, a black dot on each side of the middle; in the middle line, between the antennae, is a dot of scarlet; antennae with the first two joints thickened, the first fuscous; last joint intense black; intermediate joints yellowish-white, white dusty apices; thorax above dull or moderately shining, strongly clouded with brown, with a fine median pale line; legs dull pale grayish-ochreous, the femora slightly marked with darker. Length of anterior wing about 2¼ mm.

Galls crowded on underside of leaf of *Celtis reticulata* Torrey; about 6 mm. diameter, elevated, mammiform, with a long nipple-like protuberance.

Mr. S. A. Rohwer collected the galls at Boulder, Colorado (where I have also found them), and bred the adults August 30, 1907. We both studied them at the time, but lacked some of the necessary literature, which has been kindly supplied by Dr. L. O. Howard.

The only other *Pachypsylla* known from Boulder County is *P. celtidis-gemma*, Riley, determined by Mr. Schwarz. The single specimen was found by my wife squashed in a book borrowed from the Boulder public library; it is therefore just possible that it did not come from Boulder.

Mr. Henry H. Lyman, of Montreal, Canada, has sent us a copy of the "American Examiner" which contains an article on butterflies and he says it is the biggest thing in Newspaper Entomology he has seen. It begins as follows: "Within the past fifty years over a billion dollars worth of butterflies have been caught by butterfly hunters and sold to collectors. So extensive is this industry at the present time that it may be safely asserted that over twenty million dollars a year are spent on these beautiful insects." It then goes on to tell of species worth from one hundred to a thousand dollars each. No wonder there is a duty on insects in this country. In Canada the late Dr. James Fletcher had the duty removed from specimens that were imported for study by entomologists but we in the United States are not so fortunate. We hope that members of Congress won't see the article mentioned the next time the tariff is revised.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted: all this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—EDS.

PHILADELPHIA, PA., APRIL, 1910.

We have received the following letter from a former subscriber and, as it is like some others we have received, it may prove enlightening to comment on it. We are glad to get such letters as we always try to improve the NEWS and please our subscribers whenever it is possible.

"I suppose you would like to know why I have not sent in my subscription for this year. I deeply regret that in the past few years there has been so little in it along the line of my work, Lepidoptera. I have been hoping you would print something on the Noctuidae. It seems to be devoted to orders other than Lepidoptera. I know you can't cater wholly to this branch but if you could give only one plate a month figuring Noctuids not in Holland's Moth Book, especially moths of the eastern United States, it would be a great help to we amateurs who have no State collection or others to help us identify our specimens. I, for one, do not like to bother specialists to name my specimens."

It would be interesting to go over the NEWS for the last five years and see what proportion of the journal has been devoted to Lepidoptera. If there is less on Lepidoptera than formerly that is the fault of the Lepidopterists, as the editors do not write the NEWS but only edit it. Now suppose we take our Eastern Noctuidist seriously and give him a three color half-tone each month. The cost of such a plate would be $50 and the cost for the volume would be $500. Now will our former subscriber

kindly tell us where we are to get the $500 to supply ten colored plates of Noctuidae? If we took so much from the resources of the NEWS, where would the Western Noctuidist come in and the Dipterist and Coleopterist and the other orders of insects? Why, it is quite a feat to make an entomological journal live, let alone supply the wants of each individual. If better support were given it would improve things very materially, but refusing to subscribe does not buy any kind of plates. The proper thing to do would be to have a journal of entomology at a subscription price of $5 a year and then it would be a credit to the study.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

DIXIE'S CRICKETS CHIRRUP ON.—Altoona, Pa., Feb. 5.—The Chirrup of crickets enlivens the night in the vicinity of the Pennsylvania Railroad's big transfer sheds here. There seems to be quite a lot of them. Transfer men believe they were brought here from the South on a freight car.—*Newspaper.*

Crickets hibernate in the adult stage. If you want to find a big lot of big fat crickets—in the winter time, just visit the "Entomologists' Clubhouse," at Anglesea, N. J. In the summer time, there is not one (?) in the house, but just as soon as the nights grow cold they start to come in by ones and twos. "A word to the wise is sufficient" (generally, but not always); don't leave your old flannel shirts and coats in your locker over the winter months. If you wish to hear crickets sing (?) in winter time, go down to the old clubhouse at Anglesea, N. J. Start up the fire in the big stove in the front room; draw up a chair towards the stove; put up your "props"—feet—; lean back in your chair; light up your pipe or cigar, and just about the time you are ready to fall into the arms of Morpheus your alarm clock (crickets) will go off. The house is now warm, and it is about time you woke up and looked after the old flannel shirt and old coat that you placed in your closet last October—every garment a sieve—particularly the flannel shirt—and nothing in the pockets of your old coat except—great, big, fat crickets.—PHILIP LAURENT.

A FEW NOTES ON ORTHOPTERA FOUND DURING THE EARLY SPRING AND LATE FALL ABOUT NEW HAVEN, CONNECTICUT.—As early as the first of June in an average season, I have found that practically no adult specimens of Orthoptera can be found in this region, but by the middle of that month adults of a number of species may be secured.

The following series, collected on June 15th, 1908, may be taken as a fairly good indication of the species which occur the earliest in this region. All were captured on the hillsides, scantily clothed with grasses and raspberry vines, on the Connecticut State rifle range, a few miles from New Haven. At this time other localities revealed no adult Orthoptera.

Eritettix simplex Sc. 6 male, 6 female. All these specimens were fresh, and a number of the females were still soft. In this region this species is very local in distribution, and I have never found it plentiful. This series was taken only by long continued search.

Chloealtis conspersa Harr. 3 nymphs.

Arphia sulphurea Fabr. 3 male, 2 female.

Chortophaga viridifasciata DeG. A few fresh specimens.

Hippiscus tuberculatus Palis. 1 male, 1 female.

Melanoplus minor Sc. 4 male recently emerged from the imago.

After the frosts have begun in the Fall, I have searched about New Haven to discover which species of Orthoptera were the latest to survive. On the steep slopes of West Rock a few specimens of *Melanoplus deletor* Sc. Nowhere else was Orthoptera present except in the grassy flats near the tidal marshes. In this situation, however, the following species were found as late as the end of October.

Chorthippus curtipennis Harr. Plentiful and most of the specimens still in good condition.

Melanoplus femur-rubrum De G. Plentiful but all in somewhat bad shape.

Melanoplus femoratus Burn. Scarce and in very poor condition.

Gryllus luctuosus Serv. In few numbers and all much tattered.

Nemobius fasciatus DeG. Numerous and in good condition.

shape.—Morgan Hebard.

Everes Comyntas and Amyntula Again—A Second Appeal.—Several American Entomologists were kind enough to respond to my appeal last year for specimens and to help in unravelling the distribution of these two insects, but I have not yet got to the bottom of it.

Comyntas appears to fly right across the Continent up to California, for Mr. Williams notes (Ent. News, 1909, p. 70) that he took both *comyntas* and *amyntula* on the same ground near Mount Shasta, and he has written to me confirming this; if the two species are here quite distinct, it is very interesting and points to their definite separation. I should be most grateful for specimens taken off the same ground, especially when flying simultaneously. I am told that *amyntula* only has two broods which are distinct, while *comyntas* has a succession of broods from May to the end of September.

I am very anxious to get a series of each butterfly from Nevada,

Oregon and Utah, in return for which I shall be glad to send European species with a few exotics.

Will observers on your side of the water help me again? I shall be very grateful if they will.—G. T. Bethune-Barker, 19 Clarendon Road, Edgbaston, England.

A Convention of Entomologists at the Home of Dr. Wm. Barnes, Decatur, Ill.—There were just twenty-two persons who enjoyed the hospitality of Dr. Wm. Barnes, at his home, which is in Decatur, Ill., Sunday, January 16, 1910. They came from all directions of the compass; their aim being to view and study the splendid collection of North American Lepidoptera owned by the doctor.

A delegation arrived from St. Louis early Saturday evening. They were Prof. J. F. Abbott, Messrs. Ernst Schwarz, L. M. Dougan, Phil. Rau, and Hermann Schwarz. During the night Prof. R. R. Rowley arrived from Louisiana, Mo. Early Sunday morning this group left the St. Nicholas Hotel, at Decatur, for the doctor's home. There they found Messrs. John L. Healy, Wm. Gerhard, Emil Beer, John Kytlica and Alex. Kwiat, all of Chicago, also Mr. John A. Grossbeck, of New Brunswick, N. J., Richard Lange, of St. Louis, A. F. Porter, Decorah, Iowa, and Messrs. J. McDunnough, and Paul Welch, the last two being the curators of the Barnes collection. Mr. Otho C. Poling, of Quincy, Ill. put in his appearance later in the morning—he having been reluctantly detained at the hotel by Morpheus who simply would not let him depart from his generous embrace, until aroused by a sense of duty to his fellow-men he tore himself loose with main and might and thus made his dramatic appearance amongst us.

There was plenty to talk about and much to see, so the morning passed all too fast. A luncheon prepared and served under the able direction of the amiable mistress of the house, Mrs. Barnes, was enjoyed royally at the noon hour. Exit dining room—we enter the library and museum where, under the influence of the glorious aroma of good cigars, we are made to feel the happiness and bliss which comes from a close association of men whose aims are of a like character.

At this stage enter the delegation from the Illinois State University, which is in Urbana, Ill., consisting of Messrs. Chas. A. Hart, James Zetek, R. A. Glasgow and J. Douglas Hood, also Prof. T. W. Galloway, of Millican University of Decatur.

It was suggested that a formal session be held. Everybody present concurred in this opinion.

MINUTES.

Mr. John L. Healy was unanimously elected chairman and Hermann Schwarz secretary. The session was opened at 2.45 P. M. Upon opening the session all present signified by a rising vote their thanks to Dr. Barnes for the courtesies extended.

It was agreed that each one present report on the work and progress

of the organization he represents or on the investigations he may have made or is making at the present time. Prof. J. F. Abbott was called and spoke on the work done by the Entomological Section of the Academy of Science of St. Louis. He also urged the need of joint field meets and moved that a committee of three be appointed by the chair to arrange for a meeting during the summer of 1910. The chair appointed Prof. J. F. Abbott of St. Louis, Mr. Alex. Kwiat of Chicago, and Prof. R. R. Rowley of Louisiana, Mo. to serve on this committee. Mr. Alex. Kwiat spoke on the work of the Entomological Section of the Chicago Academy of Science. Mr. Chas. A. Hart made a few remarks regarding the work done at the Illinois State University. Mr. John A. Grossbeck enlightened those present on the happy and prosperous condition of the New York and Brooklyn Entomological Societies.

Prof. R. R. Rowley gave vent to his good feelings with regard to the meeting. He urged the need of good field work as well as the accurate recording of observations while breeding insects. Mr. John L. Healy spoke along the same line. Mr. A. F. Porter spoke of his work done at Decorah, Iowa, during the past five years. Mr. Otho C. Poling made some remarks touching his work in Arizona. He also suggested that the field meet of 1910 be held at Quincy Ill., setting forth the advantages of his home town in more ways than one. Mr. J. McDunnough advocated that more work be done in observing and recording the life histories of insects in America, stating that a great deal of that work is being done at the present time by Entomologists in Germany. Mr. Hermann Schwarz outlined the manner of meetings and work of the St. Louis Entomological Club. Dr. Wm. Barnes gave it as his opinion, that a good many of the descriptions of insects made today are inaccurate and deplored the inconsistency of some authorities in identifying material. Messrs. Healy, Poling and Kwiat urged that collectors place unique types in the hands of some one who has a secure, fire-proof place for storing them. Mr. Phil. Rau gave an outline of his work on *Samia cecropia*, stating that the Academy of Science of St. Louis is at present publishing his results. Prof. T. W. Galloway told of his work done at the Millican University of Decatur, Ill., with which he is connected. It was voted that a copy of the minutes of this meeting be sent to the ENTOMOLOGICAL NEWS for publication. No further business the session adjourned at 4.45 P. M.

In closing it must be mentioned that to cap the climax of the generosity on the part of Dr. Barnes, he threw open the cases containing duplicates and invited everyone to help himself. Late Sunday evening the guests departed for home, conscious of having spent a happy day among most congenial colleagues and with a most hospitable and amiable host and hostess.—HERMANN SCHWARZ.

A NEW TRUST.

By C. N. Ainslee.

We are getting used to paying
For to keep the hens a laying,
And to help the Beef, Oil, Sugar Trusts to live;
But it comes a good deal harder
Than to fill a high-priced larder,
When for "bug lore" we a double price must give!

Even chinch bugs work for small pay
So do green bugs, hoppers, and they
Never strike for shorter hours or better use:—
But this man whose name is Skinner,
Is a fierce financial sinner,
And he makes us pay two prices for Ent. News.
(But we have to have it.)

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), excluding Arachnida and Myriapoda. Articles irrelevant to American entomology, unless treating of new genera, 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, and are all dated the current year unless otherwise noted. This (°) following a record, denotes that the paper in question contains description of a new genus; while this (*), that of a new North American form.

For complete record of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

4—The Canadian Entomologist. **5**—Psyche, Cambridge, Mass. **7**—U. S. Department of Agriculture, Bureau of Entomology. **8**—The Entomologist's Monthly Magazine, Lond. **9**—The Entomologist, London. **10**—Nature, London. **11**—Annals and Magazine of Natural History, London. **12**—Comptes Rendus, L'Academie des Sciences, Paris. **19**—Horae Societatis Entomologiae Rossicae. **22**—Zoologischer Anzeiger, Leipzig. **24**—Berliner Entomologische Zeitschrift. **25**—Bolletino, Musei di Zoologia ed Anatomia Comparata d. R. Universita di Torino. **35**—Annalen, Societe Entomologique de Belgique. **38**—Wiener Entomologische Zeitung. **40**—Societas Entomologica, Zurich. **44**—Verhandlungen, K. k. zoologisch-botanischen Gesellschaft in Wien. **50**—Proceedings, U.

S. National Museum. **55**—Le Naturaliste, Paris. **69**—Bolletino, Societa Italiana Entomologica. **81**—Biologisches Centralblatt, Erlangen. **84**—Entomologische Rundschau. **92**—Zeitschrift fur wissenschaftliche Insektenbiologie, Berlin. **97**—Zeitschrift fur wissenchaftliche Zoologie, Leipzig. **167**—O Entomologista Brasileiro, S. Paulo, Brizil. **179**—Journal of Economic Entomology. **180**—Annals, Entomological Society of America. **193**—Entomologische Blater, Nurnberg. **204**—New York State Museum Bulletin. **206**—Annals, Scottish Natural History, Edinburgh. **207**—Anales, Academia de Ciencias Medicas, Fisicas y Naturales de la Habana, Revista Cientifica. **208**—Boletin, Real Sociedad Espanola de Historia Natural, Madrid. **209**—Transactions, Zoological Society of London. **210**—Transactions and Proceedings, Royal Society of South Australia. **211**—Popular Science Monthly, Lancaster, Pa. **212**—Casopis, Acta Societatis Entomologicae Bohemiae. **213**—Transactions, Natural History Society of Northumberland, Durham, and New Castle-upon-Tyne, (new series). **214**—Naturwissenschaftliche Zeitschrift fur Forst-und Landwirtschaft, Stuttgart. **215**—Bulletin, Georgia State Board of Entomology. **216**—Entomologische Zeitschrift, Stuttgart. **217**—Bulletin, Societe Entomologique d'Egypte. **218**—Mikrokosmos. Zeitschrift fur die praktische Betatigung aller Naturfreunde. Stuttgart. **219**—Abhandlungen, Math.—Physik. Klasse d. Konig. Bayerischen Akad. der Wissenschaft, Munchen. **220**—New Jersey Agricultural Experiment Station, New Brunswick, N. J.

GENERAL SUBJECT. Anon.—De destruicao das pragas de gafanhotos, lagartas, etc., **167**, ii, 370, 1909. **Banks, N.**—A list of works on No. American Entomology, **7**, Bull. No. 81. **Britton, W. E.**—The official Entomologist and the farmer, **179**, iii, 12. **Felt, E. P.**—Control of flies and other household insects, **204**, No. 136. **Fiske, W. F.**—Superparasitism: an important factor in the natural control of insects, **179**, iii, 88. **Handlirsch, A.**—Die fossilen insekten und die Phylogenie der rezenten formen, **24**, liv, 145, 1909. **Holdhaus, K.**—Die siebetecknik zum aufsammeln der Terricolfauna (nebst bemerkungen ueber die Oekologie der im Erdboden lebenden Tierwelt), **92**, vi, 1, 44. **Ihering, R. von**—Necessidades do estudo dos insectos uteis e damninhos, **167**, iii, 1. **Kleine, R.**—Kleine mitteilungen aus meinem vivarium. (Notes on parasitism), **40**, xxiv, 161, 169. **Kuster, E.**—Ueber organoide Gallen, **81**, xxx, 116. **Lewis, A. C.**—Apple insects, **215**, No. 30, 21, 1909. **M., P.**—Os insectos nocivos. O Gafanhoto, **167**, ii, 362, 1909. **Phillips, J. L.**—Seventh report of the State Entomologist and Plant Pathologist of Virginia, 1908-09, Richmond, Va. **Rothke, M.**—Ein Fruhlingstag im pennsylvanischen Walde, **216**, xxii, 185, 189, 193, 198. **Shaw, N.**

E.—Increasing the demand for orchard inspection, **179,** iii, 77. **Smith, J. B.**—Insects and Entomologists: their relations to the community at large, **211,** lxxxvi, 209; **180,** iii, 12. Insects injurious to sweet potatoes in New Jersey, **220,** Bulletin, No. 229. **Waase, K. O.**—Die flugorgane der Insekten, **218,** iii, 216. **Washburn, F. L.**—The work of the Association of Horticultural Inspectors, **179,** iii, 69. **Worsham, E. L.**—Peach insects, **215,** No. 30, 104, 1909.

APTERA. Bagnall, R. S.—On some new and little-known exotic Thysanoptera, **213,** iii, 524, 1909 (°). **Becker, E.**—Zum bau des postantennalorgan der Collembolen, **97,** xciv, 327. **Mitzmain, M. B.**—Some new facts on the bionomics of the California rodent fleas, **180,** iii, 61.

NEUROPTERA. Banks, N.—Myrmeleonidae from Australia, **180,** iii, 40 (°). **Enderlein, G.**—Ueber die phylogenie und klassifikation der Mecopteren unter berucksichtigung der fossilen formen, **22,** xxxv, 385 (°). **Forster, F.**—Beitrage zu den Gattungen und arten der Libellen, **38,** xxix, 51 (°). **Leger et Hesse**—Cnidosporidies des larves d'Ephemeres. (Note), **12,** 1910, 411. **McDunnough, J.**—Ueber den bau des darms und seiner anhange von Chrysopa perla, **19,** lxxv, 313, 1909. **Reis, O. M.**—Handlirschia gelasii nov. gen. et spec. aus dem Schaumkalk Frankens, **219,** xxiii, 661, 1909 (°). **Wasmann, E.**—Ueber das wesen und den ursprung der Symphilie (173 Beitrag zur kenntnis der Myrmekophilen und Termitophilen), **81,** xxx, 97.

ORTHOPTERA. Borelli, A.—Forficole nuove o poco note di Costa Rica, **25,** xxiv, No. 611 (*). **Rosenfeld, A. H.**—Blattid notes, **179,** iii, 100. **Zacher, F.**—Zur Morphologie und Systematik der Dermapteren. (Continued), **84,** xxvii, 24, 29.

HEMIPTERA. Bergroth, E.—On some Miridae from French Guiana, **35,** liv, 60 (°). **Cockerell, T. D. A.**—A new wax-scale from Argentine, **4,** xlii, 74. **Cooley, R. A.**—Notes on spraying experiments for the oyster shell scale in Montana, **179,** iii, 57. **Distant, W. L.**—Some undescribed Gerrinae, **11,** v, 140 (°). **Ihering, R. von**—Phloca paradoxa ou Phoca longirostris, **167,** iii, 18. **Kershaw, J. C. W.**—On the metamorphoses of two Coptosomine Hemiptera from Macao, **35,** liv, 69. **Kirkaldy, G. W.**—A note on Mr. Jackson's synopsis of the genus Pemphigus, **4,** xlii, 83. **Nusslin, O.**—Neuere ergebenisse der Chermes forschung, **214,** viii, 65. **Severin, H. H. P.**—The San Jose scale and its relation to climatic districts or life zones in Wisconsin, **179,** iii, 101.

LEPIDOPTERA. Ainslie, G. G.—The larger corn stalk-borer (Diatiaea saccharalis), **7,** Circular, No. 116. **Atwood, G. G.**—Brown-tail moth on imported nursery stock, **179,** iii, 71. **Burgeff, H.**—Beitrage zur biologie der gattung Zygaena, **92,** v, 39. **Burgess,**

A. F.—Some insecticide methods used in combating the gypsy moth, **179**, iii, 38. **Chittenden, F. H.**—Control of the Mediterranean flour moth by hydrocyanic-acid gas fumigation, **7**, Circular, No. 112. **Cockle, J. W.**—Syntomid moths with bananas, **4**, xlii, 95. **Dampf, A.**—Ueber Agrotis tecta und "var. (ab.)" cinerea, **24**, liv, 128, 1909. **Fruthslorfer, H.**—Die Grossschmetterlinge der Erde Fauna indo-australica. (Parelodina) n. g. Hauptteil 2, Exotica Abeteil. 2, Leif. 22. **Gillette, C. P.**—New sprays for the codling moth, **179**, iii, 29. **Heron, F. A.**—Ruwenzori Expedition reports. 12. Lepidoptera Rhopalocera, **209**, xix, 141, 1909 (°). **Meyrick, E.**—Change of name of genus Epibactra to Parabactra, **8**, xxi, 72. **Morton, R. J.**—Life-history of Drepanepteryx phalaenoides, **8**, xxi, 55. **Rane, F. W.**—Present conditions of the gypsy and brown-tail moth work in Mass., **179**, iii, 36. **Rangnow, H.**—Zur kenntnis der lebenweise von Pamphila silvius, **24**, liv, 227, 1909. **Reiff, W.**—Notes on Hemileuca lucina, **5**, xvii, 29. **Strand, E.**—Schmetterlinge aus dem Sambesi-Gebiet, gesammelt und dem Berliner Museum geschenkt von Herrn F. Seiner, **19**, lxxv, 375, 1909 (°). **Taylor, G. W.**—Descriptions of new species of Eupithecia from Eastern America, **4**, xlii, 77 (*). On some new species of Mesoleuca allied to M. hersilata, **4**, xlii, 85 (*).

DIPTERA. Bezzi, M.—Brasilianische Lonchaeiden gesammelt von A. A. Barbiellini, **167**, iii, 20. **Brues, C. T.**—A peculiar type of Phoridae from Natal, **5**, xvii, 33, (°.) **Corti, E.**—Contributo alla conascenza del gruppo delle "Crassisete in Italia," **69**, xl, 121, 1909. **Felt, E. P.**—Observations on the house-fly, **179**, iii, 24. **Hendel, F.**—Ueber acalyptrate Musciden, **38**, xxix, 101 (°). **Hermann et. Villeneuve**—Bibliographie des travaux entomologiques relatifs a l'Egypte. Dipteres, **217**, 1909, 138 (°). **Johnson, C. W.**—A revision of the species of Agathomyia of the Eastern U. S., **5**, xvii, 7. **Lanhoffer, A.**—Blutenbiologische beobachtungen an Dipteren, **92**, vi, 14, 57. **Malloch, J. R.**—Scottish Phoridae, with tables of all the British species, and notes of localities. (Continued), **206**, 1910, 15 (°). **Pazos, J. H.**—Descripcion de nuevas especies de mosquitos de Cuba, **207**, xlv, 417, 1908 (*). **Sanderson, E. D.**—Controlling the black-fly in the White Mountains, **179**, iii, 27. **Stein, P.**—Die von Thomson beschriebenen Anthomyiden der Eugenies Resa, **38**, xxix, 66. **Villeneuve, J.**—Etudes dipterologiques, III A propos de quel ques Tabanus types de Brauer, **38**, xxix, 79. Dipteres nouveaux (Calanemorilla n. g.), **38**, xxix, 87 (°). **Vimmerz, A.**—Larva bedlobytky Cordyla fusca, **212**, vi, 148, 1909. **Wellman, F. C.**—Unusual parasitic habits of an African Ephydrid (translation), **5**, xvii, 8. **Williams, F. X.**—The anatomy of the larva of Cecidomyia resinicoloides, **180**, iii, 45.

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HYMENOPTERA. Cameron, P.—On some Asiatic species of the sub-families Spathiinae, Doryctinae, Rhogadinae, Cardiochilinae and Macrocentrinae in the Royal Berlin Zoological Museum, **38,** xxix, 93 (°). **Cockerell, T. D. A.**—New American bees.—IX, **9,** xliii, 90. A tertiary leaf-cutting bee. **10,** lxxxii, 429. Some bees of the genus Augochlora from the West Indies, **50,** xxxvii, 489. **Girault and Sanders**—The Chalcidoid parasites of the common house or typhoid fly (Musca domestica) and its allies (continued), **5,** xvii, 9. **Kleine, R.**—Ichneumoniden in den eiersacken von Arachnoiden, **24,** liv, 117, 1909. **Morley, C.**—On the Hymenopterous parasites of Coccidae (continued), **9,** xliii, 94. **Rohrwer, S. A.**—Notes on Tenthredinoidea, with descriptions of new species, **4,** xlii, 88 (*). **Ruggles, A. G.**—The larch saw-fly (Lygaeonematus erichsonii) in Minnesota, **4,** xlii, 93. **Schmidt, H.**—Beitrag zur biologie der Steinobst-Blattwespe (Lyda nemoralis), **92,** vi, 17. **Schmeideknecht, O.**—Opuscula Ichneumonologica. Fasc. 24. **Viehmeyer, H.**—Bemerkungen zu Wasmanns neuester Arbeit:

Ueber den ursprung des sozialen parasitismus, der sklaverei und der myrmecophilie bei den Ameisen, **22,** xxxv, 450. **Webster & Reeves**—The western grass-stem saw-fly (Caphus occidentalis), **7,** Circular, No. 117.

Doings of Societies.

The twenty-second annual meeting of the American Association of Economic Entomologists was held at the Harvard Medical School, (Brookline) Boston, Mass., December 28 and 29, 1909. The first session was called to order by President W. E. Britton, of New Haven, Conn., who presided throughout the meeting and who delivered the annual address on "The Official Entomologist and the Farmer." The program was crowded with papers which were of great economic importance to the entomologist and the agriculturist, although a few were more technical in character and dealt with some of the fundamental principles of scientific investigation of entomological matters. A discussion of different methods used in research work was of particular interest, as were also the reports of the progress that is being made in the field and parasite work in New England for the purpose of controlling the gypsy and brown-tail moths. A report by Dr. W. P. Headden, of Colorado, concerning the injury to fruit trees caused by arsenical spraying and the discussions that followed brought out many new ideas on this important subject. An exhibit made by the local entomologists and members which was held in an adjoining room contained samples of apparatus and breeding devices, as well as insect collections, which added much interest to the meeting. On Tuesday evening the association and the Entomological Society of America were the guests of the Cambridge Entomological Club, and on Thursday morning the members had the opportunity of witnessing a spraying demonstration at Arlington with high-power sprayers, as the guests of Mr. H. L. Frost.

The attendance at each session numbered over 100 members and visitors, nearly every section of the United States and Canada being represented.

The association commended the work which is being done to control the gypsy and brown-tail moths in New England, endorsed the bill before Congress to provide for the establishment of standards of purity of insecticides and fungicides, and advocated the passage by Congress of a national law to prevent the importation of dangerously injurious insects and fungus diseases from foreign countries.

The report of the secretary showed that the association was increasing in membership and was in good financial condition. The *Journal of Economic Entomology*, which is the official organ of the association, was also reported by the business manager to be in a thriving condition.

The following officers were elected for the ensuing year: President, Prof. E. D. Sanderson, Durham, N. H.; first vice-president, Dr. H. T. Fernald, Amherst Mass.; second vice-president, Prof. P. J. Parrott, Geneva, N. Y.; secretary, A. F. Burgess, Washington, D. C.

The annual meeting of the Brooklyn Entomological Society was held at 55 Stuyvesant Street, Brooklyn, N. Y., January 6th, with sixteen members and five visitors present.

The following officers were elected unanimously: President, John B. Smith; vice-president, Geo. P. Engelhardt; treasurer, Chris. E. Olsen; corresponding secretary, A. C. Weeks; recording secretary, R. P. Dow; librarian, F. M. Schott; curator, Geo. Franck. John B. Smith was re-appointed delegate to the New York Academy of Sciences.

It was voted to amend the by-laws, making the meetings on the second Thursday after the first Tuesday of each month. This change makes the meeting full nine days later than those of the New York Entomological Society, whereas in the past the meetings were two days apart.

Robert Schmaltz reported that he had mated a *cynthia* and *cecropia* moth, obtaining several hundred fertile eggs. The larvae were distinctive, but all save two died when about half grown. One died in cocoon and one is still alive.

Mr. Dow exhibited three specimens of *Cicindela* from Sullivan County, N. Y., which are greenish brown and which are either a local race of *ancocisconensis* or between that species and *repanda*. No attempt will be made to give it varietal rank until additional material is secured. They are not uncommon but confined to one mountain side. From the same region but 500 feet lower a race of *C. harrisii* was found, many of which were so bronze hued as to suggest a natural hybrid with *purpurea*.

Following the meeting a supper was served and a silver loving cup presented to Christopher H. Roberts, who retired as treasurer after thirty-one years of service.

R. P. Dow, *Recording Secretary*.

The Brooklyn Entomological Society met at 55 Stuyvesant Avenue, February 10th, with eighteen members and three visitors present.

A. E. Allen, a lepidopterist, was elected an active member.

F. H. Wolly Dod, of Calgary, Canada, spoke of his collecting experiences there covering a period of sixteen years. He spoke particularly of *Argynnis astarte*, the fastest flyer of the genus. The males frequent the mountains above the timber line and probably above the limits of growth of violets.

C. H. Roberts read a paper on *Colymbetes*. The genus is divided into three groups, divided by appearance of front and middle tarsi: First, with three rows of hairs and no pallets, *paykulli, longulus, seminiger, obscuratus* (not seen by Leconte, Sharp or Roberts); the second has two rows of pallets and one row of hairs and includes *strigatus, crotchii, exaratus,* and one species from the Yellowstone not yet described; the third group has four rows of pallets and no hairs; it includes *sculptilis, rugipennis, dolobratus, groenlandicus, thomsoni* and three species still undescribed. The tarsal claws present a character by which alone every species can be accurately determined.

R. P. Dow, *Recording Secretary*.

Stockhausen, Printer, 53-55 N. 7th Street, Philadelphia.

MAY, 1910.

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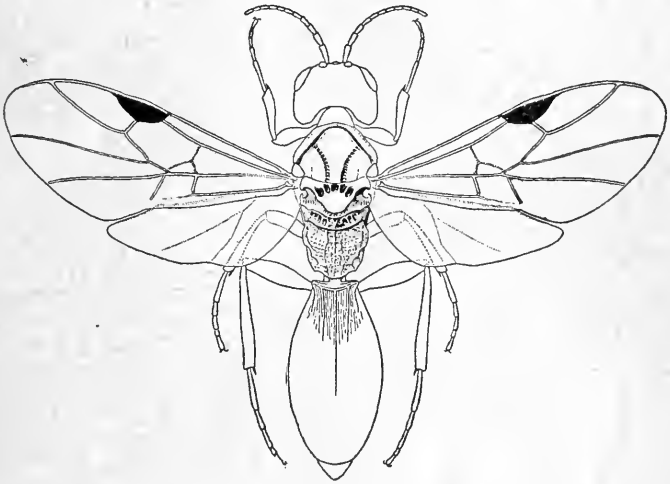

Vanhornia eucnemidarum Crawford.

PHILADELPHIA:
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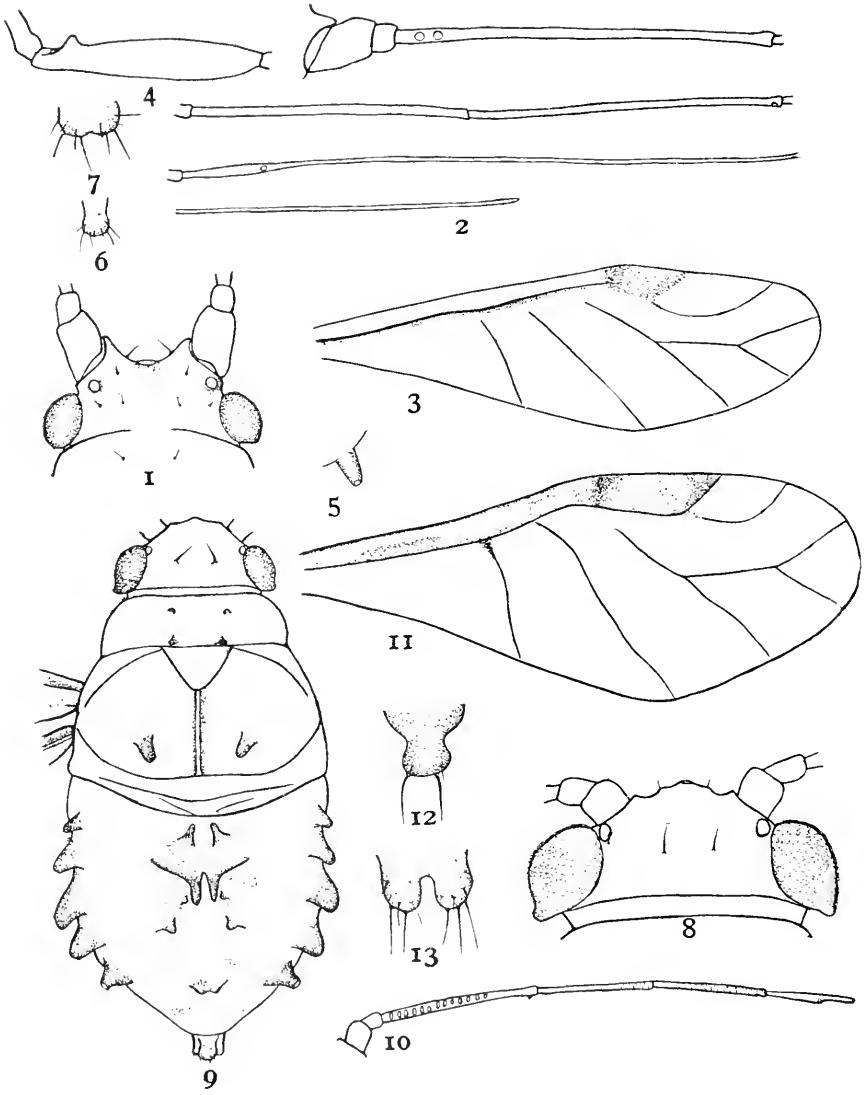

DAVIS ON APHIDIDAE.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXI. MAY, 1910. No. 5.

CONTENTS:

Two Curious Species of Aphididae from Illinois.

BY JOHN J. DAVIS,

Office of the State Entomologist, Urbana, Illinois.

(Plate VIII)

The Inconspicuous Maple Aphid (**Drepanaphis ? minutus** n. sp.).

This interesting little species was found rather common on the under surfaces of the leaves of hard maple (*Acer saccharum*) in a natural forest two and a half miles west of Glencoe, Illinois. The individuals appeared as dark specks on the leaves, this because of the conspicuous dark head and thorax on the pale greenish background, the abdomen being pale and rather inconspicuous. They are capable of jumping, are quite active when disturbed, and live sporadically. All of the adults found were winged.

This fall (1909) I had the opportunity, through the courtesy of Mr. J. T. Monell, of examining some aphids collected by him on a small maple (*Acer nigra* ?) near Mine Lamotte, Missouri, August 13, 1890. They proved to be identical with the species here described. Mr. Monell has kindly permitted me to use his notes which I give in full at the end of the description.

Inasmuch as my specimens were collected in a natural forest some distance from artificial plantings, and further that the Monell specimens were also collected in a natural timber, the indications are that it is a native of the United States.

This species is especially interesting because it is closely related to *Drepanaphis* Del Guercio* and *Callipterus* Koch, and is apparently the connecting link between the two genera. The size and general appearance of the insect places it in the genus *Callipetrus,* while the antennal tubercles, antennae and legs are those of *Drepanaphis.* The style and wings and its habits are characteristic of both genera, while the cornicles are intermediate.

Winged vipiparous female—Head (Pl. VIII, fig. 1), and the thorax brownish (nearly black in old individuals), abdomen pale yellowish with a slight greenish tint. Eyes red. Ocelli conspicuous. Antennæ with the two basal segments concolorous with the head, and the remaining segments whitish; set on rather conspicuous tubercles; very long and thread-like, being fully three times the length of the body; segment I stout and robust, more than twice as long and one-half broader than II; filament VI is extremely long and thread-like, and easily broken, about two and one-half times as long as III and nearly fourteen times the length of base VI; III nearly one-half longer than IV; IV and V subequal, V being invariably slightly the longer; two (occasionally one or three) comparatively large circular sensoria near the base of III, the usual one at apex of V and several at apex of base VI; the transition between base and filament of VI gradual. (Pl. VIII, fig. 2). Beak not reaching the coxae of the second pair of legs. Wings callipterous-like, hyaline, and with pale brown veins; the first and second discoidal branching at a distance varying from one-third to nearly one-half (more often the former) the distance from where the third branches to the tip of the wing; stigmal vein curved at the base, then runs straight to the margin of the wing. (Pl. VIII, fig. 3). Legs frail and entirely whit-

*_Drepanaphis_ n. g. was described by Dr. G. Del Guercio in the "Revista di Patologia Vegetale," Anno IV, no. 4, August, 1909, from specimens of the so-called *Drephanosiphum acerifolii* Thos., sent him by the writer. *Phymatosiphum* n. g. was proposed by the writer for the same genus in the Annals of the Entomological Society of America, September, 1909, not knowing of Del Guercio's description the month previous.

ish; the fore femur bears a prominent projection or tubercle near the distal end. (Pl. VIII, fig. 4). Abdomen with no dorsal tubercles. Cornicles concolorous with the abdomen, small, broadest at the base and gradually narrowing towards the apex, the opening comparatively small and the tip more or less rounded; the length about twice the breadth. (Pl. VIII, fig. 5). This form of cornicles, unknown to me in any other aphid, is a gradation between those of *Drepanaphis* and *Callipterus*. Style callipterus-like, it being knobbed but only slightly constricted near the base. (Pl. VIII, fig. 6). The anal plate is bifid. (Pl. VIII, fig. 7).

Measurements (from specimens mounted in balsam)—Length of body, 0.98-1.236, av., 1.1124 mm.; 0.3272-0.436, av., 0.378 mm.; length of wing, 1.78-1.999, av., 1.898 mm.; width, 0.6545-0.7272, av., 0.6908 mm.; antenna I, 0.0815; II, 0.0326; III, 0.6094-0.7072, av., 0.6452; IV, 0.3912-0.5053, av., 0.4433; V, 0.4238-0.5605, av., 0.489; VI, base, 0.0978-0.1304, av., 0.1157; VI, filament, 1.4544-1.78, av., 1.5922; average, total, 3.3995 mm.; style, av., 0.065 mm.; cornicles, av., 0.048 mm.; hind tarsus, av., 0.927 mm.

Described from 24 individuals collected at Glencoe, Ill., September 2, 1909, mounted in balsam on 8 slides. Types preserved in the Illinois State Laboratory of Natural History as Acc. No. 43,267; in the U. S. National Museum, and in the writer's collection.

Habitat.—Glencoe, Ill., and Mine Lamotte, Mo.

Pupa entirely pale yellowish or greenish yellow, and bearing capitate hairs.

The following notes were made by Mr. Monell:

"189°—424x. *Callipterus* on maple. On small maple (*A. nigra* ?) growing on Mine creek, about 500 yards from the furnaces of Mine la Motte, Mo., August 12, 1890. Abundant living sporadic, Callipterus fashion. Head and thorax brownish or fuscous. Abdomen pale yellowish or usual Callipterus color. One winged had head and thorax like abdomen, but this one probably just acquired wings. Apterous is entirely pale greenish yellow.

"Examined slide 424x on October 26, 1908. The wings are now hyaline, not shaded, and the stigmal vein is still plainly seen its entire length. No tubercles on dorsum. Pupa with funnel-mouthed hairs on dorsum. Antennae of winged are

now very hyaline, and hard to measure, the transition between 6 and 7 very gradual. Antennal measurements as follows:

III	IV	V	VI	VII	Nectaries
0.585	0.442	0.471	0.142	0.928	0.042 mm.
0.585	0.414	0.428	0.142	1.285	mm.
				1.170	mm.

"Glycerine jelly mounts, with edges hardened with bichromate."

The Tuberculate Hickory Plant-Louse (**Callipterus caryaefoliae** n. sp).

This characteristic aphid was found rather common on the upper surfaces, and occasionally on the under surfaces, of the leaves of hickory at Lake Forest, Illinois, June 24, 1909. It is sporadic, is very active and easily disturbed, moves about quite rapidly, and has a remarkable ability for leaping. Only winged adults were found.

The writer recently had the privilege of examining specimens of a hickory plant-louse in the collections of Mr. Monell, which proved to be the species here described. These specimens were collected by Mr. Monell on hickory at Mine Lamotte, Missouri, 18 years ago. He has kindly offered the use of his notes which I give in full at the end of the description.

It is with some doubt that I place this species in the genus *Callipterus*, which, except for the comparative length of antennal segment VI filament, might belong to Mordvilko's genus *Tuberculatus*. In Dr. Mordvilko's table* this species runs down to *Callipterus*.

Winged viviparous female—Entire body, including head, velvety black or dark brownish, usually the former. Immediately after mounting in balsam the body appears brownish or light brown, and the tubercles show up as black markings. On the thorax are two small white pulverulent spots. Also on the abdomen near the anterior part are two similar white spots, and at the posterior end is a mass of white pulverulence. In addition, there were several inconspicuous dots on the abdomen. The head bears two inconspicuous tubercles on the dorsum, one on each side of the median. (Pl. VIII, fig. 8). On the prothoracic segment are two pairs of dorsal tubercles, the anterior pair being similar to that on the head and the posterior pair larger. On

*Tables for the determination of groups and genera of Aphididæ. Ann. Rep. Zool. Museum, Imperial Acad of Learning, St. Petersburg, Vol. XIII, 1908.

each side of the abdomen anterior to the cornicles are four large, conspicuous lobes, or tubercles, which project laterally from the sides. The anterior one is smaller, and ofttimes concealed. They appear as fleshy lobes or flabellæ. Along each side of the dorsal median of the abdomen is a longitudinal row of tubercles, which tubercles are quite irregular in shape and size. The first pair, anteriorly, are conspicuous and separate; the second pair are finger-like projections, larger than the preceding pair, and joined at the base; the third pair smaller than either of the two preceding pairs, and more widely separated; fourth pair smaller, and more widely separated than the third; fifth pair, which are on the segment bearing the cornicles, are represented by almost imperceptible elevations. (Pl. VIII, fig. 9). Antennæ: Segments I and II black, the remaining segments pale brownish, excepting the distal ends of IV and V and all of VI, which are blackish; 11-19, usually 13, transverse sensoria in a row on the basal three-fourths of Segment III, and the usual ones at the tips of V and base VI; nearly or just reaching the base of the cornicles; Segment III the longest, it being one-half longer than IV, IV and V subequal, but IV invariably slightly the longer, VI about one-half the length of III, the basal portion about two-fifths longer than the filament. (Pl. VIII, fig. 10). Eyes dark red. Ocelli prominent in specimens mounted in balsam. Legs blackish excepting the middle portion of the tibiæ; the posterior femora greatly developed for jumping; the two hind femora with numerous small circular paler areas (differing from sensoria in that they are internal rather than external). Wings hyaline, veins, brownish, typical of the genus *Callipterus,* the first and second discoidals branching at about one-half the distance from where the third branches to the tip of the wing. (Pl. VIII, fig. 11). Cornicles black and tuberculate. Style of the globular type but slightly flattened as shown in the figure. (Pl. VIII, figs. 12 and 13).

Measurements (from speicmens mounted in balsam)—Length of body, 1.49 mm.; width, 0.78 mm.; length of wing, 2.07 mm.; width, 0.86 mm.; antenna I, 0.05; II, 0.049; III, 0.3912-0.4890, av., 0.4290; IV, 0.2526-0.3260, av., 0.2835; V, 0.2282-0.2934, av., 0.2542; VI, base, 0.1141-0.1385, av., 0.1287; VI, filament, 0.0733-0.1059, av., 0.0929; average total, 1.2873 mm.; cornicles, av., 0.066 mm.; style, av., 0.09 mm.; hind tarsus, av., 0.114 mm.

Described from 9 specimens collected at Lake Forest, Ill., June 24, 1909, mounted in balsam on five slides. Types in the U. S. National Museum, in the State Laboratory of Natural History as Acc. No. 43,266, and in the writer's collection.

Type locality, northern Illinois.

Monell's notes on this species are as follows:

"195°—437x. Mainly on the upper sides of leaves, but also on the lower sides. Very abundant on many hickory trees, on hill back of the furnaces, Mine Lamotte, Mo., May 27, 1891. Exceeding quick and active, sporadic, fully as active as the maple *Drephanosiphum*. (Under 20-dia. objective of the dissecting microscope by daylight.) Winged viviparous female (3 specimens examined): Head and thorax dark brownish. Eyes distinctly red. General fundamental color of abdomen yellowish. Markings on abdomen as in sketch, text, Fig. 1, the enclosures representing dark brown, and the crosses white pulverulent spots. There are other lesser markings. Row of tubercles near margin of abdomen, also dark brown. The front two closely adjacent white spots are on base of thorax and these, together with the inverted "T" white mark, patent to the naked eye. Apterous viviparous female (1 specimen examined): Yellowish to greenish yellow, with four rows of longitudinal dots foreshadowing markings of the winged female. Pupa (1 specimen) same as apterous female, but wing-covers greenish.

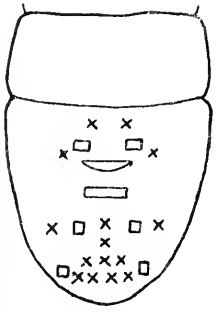

Fig. 1.

"195°, May 30, 1891.—Resumé. To naked eyes, whole in-

"195°, May 30, 1891.—Resumé. To naked eyes, whole in-sect appears dusky with two small white spots at base of thorax and an inverted T-shaped white mark on abdomen under the lens. Head and thorax dark brownish. The abdomen has, for the fundamental color, brownish yellow to light brown, with the nectaries and the series of tubercles black or dark brown. The insect has a number of pulverulent spots, the principal of which are noted above. On some winged, but not all, even saw some trifling pulverulence on neck at base of head.

"Immature mites, a species of *Erythraeus,* were found on the aphid."

EXPLANATION OF PLATE VIII.

Drepanaphis? minutus n. sp.: Figure 1, head; 2, antenna; 3, fore wing; 4, fore femur; 5, cornicle; 6, style; 7, anal plate; *Callipterus caryaefoliae* n. sp. 8, head; 9, body showing position of tubercles and dusky markings; 10, antenna; 11, wing; 12, style; 13, anal plate. Camera lucida drawings, figures 1, 2, 4, 5, 6, 7, 8, 12, 13, with one-inch eye piece and two-third obj.; 3 and 11 with one-inch eye piece and one and one-half-inch obj., giving a magnification a little less than one-half the two-third obj.; 9 and 10 with two-inch eye piece and two-third obj., giving a magnification slightly more than the two-third obj., with one-inch eye piece.

Carabidae from Harrisburg and vicinity, with notes.

By A. B. Champlain and H. B. Kirk, Harrisburg, Pa.

During the past two years, 1908 and 1909, we turned our attention to collecting insects, especially Coleoptera. The regions about Harrisburg are ideal for Carabidae and very rich in species of that family. We made an especial effort to turn up as many as possible and in this way brought together not only an interesting collection of specimens but notes and data that may be of interest to others. The collecting of Carabidae, although requiring more effort and actual labor than do most insects, is nevertheless just as interesting. During a day's collecting we would turn over a few tons of stones and it was seldom that we did not find some rare or interesting species. We found a great number of species in the early part of the year when the hibernating and emerging forms were most plentiful under stones, logs, the debris of the last year's vegetation, etc. One of the most interesting means of collecting was at night with our acetylene light. It would be a revelation to those who have not tried this plan to see the great numbers that can be taken in this way, especially on mud flats, banks or shores of streams; there you will find them feeding, running about. For this reason it should be understood that the turning over of stones and logs at night was not resorted to. A number of species were taken on the trunks of various trees and running along the paths in most any situation at night. We also found the electric lights or arcs worth our while.

The numerous islands in the Susquehanna River in this vicinity were also visited. The island on which we did most of our collecting is usually submerged during the winter months and other high water periods.

The majority of the determinations were made by Mr. Charles Liebeck, of Philadelphia, Pa., to whom we express our thanks for this and many suggestions that have been of help to us. Other members of the little band of local collectors and entomologists have turned up species that we have been unable to find; their names will be given in each instance, but in all

cases where the collector's name is not given, the records can be accredited to the authors.

There were 199 species and three varieties (the latter belonging to the genus Harpalus) collected within a radius of ten miles of Harrisburg. The localities are as follows:

Camphill .....C.	Linglestown .....L.
Enola .....E.	Middletown .....M
Eberlys Mill .....E.M.	New Cumberland .....N.C.
Harrisburg .....H.	New Market, York Co. ....N.M.
Rockville or Fort Hunter .....R.	

OMOPHRON Latr.

O. americanum Dej.—H., IV, 15, dug from the bank of the Susquehanna river, IV, 18, on sandy and muddy shores at night, X, 1, under stones. Common.

O. tessellatum Web.—H., V, 15 to 24, on sandy shores of island at night; rare.

CYCHRUS Fabr.

C. stenostomus Web.—From all localities, II, III, IV, and again IX, X, XI. Mostly under stones singly or in pairs, XI, 27 taken from a dead log in swamp; observed mating XI, 6. These localities abound with snails upon which we observed this species feeding and which probably accounts for its being so plentiful.

C. viduus Dej.—R., III, 20 (Coll. by E. Craighead). E., III, 31 in cell under stone, also in the mountains, VII, 3 under log.

CARABUS Linn.

C. sylvosus Say.—R., IX, 18 to X, 10 under stones; local and rare.

C. serratus Say.—R., E., H., II, III, under stones; IV, 11, 18 running along path at night; IX, 18 under stones; not uncommon.

C. limbatus Say.—R., E., throughout the year under stones; common.

C. vinctus Web.—IX, 21 dug from cells in dead logs and under stones in swampy places; common.

CALOSOMA Web.

C. Scrutator Lec.—R., III, 21 from cell under stone; H., VII, 6 to 30 at arc lights; common.

C. willcoxi Lec.—H., V, 16 to 18 (Coll. by Chas. Anderson) at arc lights; not common.

C. calidum Fab.—H., IV under log; V and VI on tree trunks at night; common.

ELAPHRUS Fab.

E. riparius Linn.—H., V, 14 at night on mud flat. 1 specimen.

E. ruscarius Say.—H., IV, 3 under leaves along edge of stream; IV, 16 to 30 at night running on muddy shore of stream; common.

NOTIOPHILUS Dum.

N. aeneus Hbst.—N. C., XI. R., II, III, IV, V, 23, XI, 28, under stones; not uncommon.

N. novemstriatus Lec.—E. M., IV, 7. R., II, III, IV, V, 23, XI, 3, under stones; not uncommon.

N. semistriatus Say.—R., X, 10; M., XI, 6, under stones; rare.

NEBRIA Latr.

N. pallipes Say.—all localities, V. 14 to X; common.

PASIMACHUS Bon.

P. depressus Fab.—L., V, 23 under stones (Coll. by W. R. Walton); rare.

SCARITES Fabr.

S. subterraneus Fab.—R., II, 21, H., IV, V, VI, 8 under stones in damp places; common.

DYSCHIRIUS Bon.

D. globulosus Say.—R., III. N. C., II, IV, V under stones along the Susquehanna. H., VI, 28 (Coll. by P. R. Myers); common.

D. brevispinus? Lec.—H., VI, 19, one specimen (Coll. by P. R. Myers).

CLIVINA Latr.

C. dentipes Dej.—N. C., V, VI, 20 under small stones along shore of Susquehanna; rare.

C. impressifrons Lec.—N. C., H., V, 11th to 15th along river shore under small stones. V, 13 at arc lights; not uncommon.

C. bipustulata Fabr.—H., IV, 9 under stones; V, 13 at arc lights; VI, 3 under stone; common.

SCHIZOGENIUS Putz.

The species of this genus were taken under small stones along the Susquehanna river.

S. lineolatus Say.—N. C., V, VI, VII, 10; common.

S. ferrugineus Putz.—H., V, 22; not common.

S. amphibius Hald.—H., V, 29; not common.

ARDISTOMIS Putz.

A. viridis Say.—N. C., H., V, 15 to 29 under stones along river shore and running on mud banks at night; not uncommon.

PANAGAEUS Latr.

P. fasciatus Say.—H., V, 18 (Coll. by Charles Anderson); E., XI, 7 under stones among ants. Highspire, VIII, 4 under board (Coll. by W. S. Fisher).

BEMBIDIUM Latr.

All the species of this genus were taken most plentifully at night running on mud flats or shores of streams.

B. laevigatum Say.—H., III, 27; X, 12. Taken during day time only under stones and debris along river shore; locally common.

B. inaequale Say.—H., IV, 16 to 30 at night on mud flats; very common.

B. punctatostriatum Say.—H., V, 15 to 24 on island shore at night; rare.

B. confusum Hayw.—H., with the preceding, though more abundant.

B. americanum Dej.—H., V, 7 to 24 on mud flats and island shore at night; not common.

B. honestum Say.—N. C., H.,V, 15 to 24 under small stones along river shore; common.

B. chalceum Dej.—with preceding, N. C., II, 13 under stones; common.

B. rufotinctum Chaud.—R., II, 21 under stone, one specimen.

B. nigrum Say.—H., IV, 16 Pond bank at night; not uncommon.

B. grandiceps Hayw.—N. C., H., V, 15 to 24 under small stones along river shore; common.

B. fugax Lec.—with the preceding R., II, III, XI under stones H., XII, 5; common.

B. ustulatum Linn.—H., III, IV, 30 at night and under stones; very common.

B. graciliforme Hayw.—H., IV, 3 to V, 15 under leaves on muddy bank along creeks in swamp, also at night, XI, 28 under stone; locally common.

B. postfasciatum Ham.—with the preceeding.

B. fraternum? Lec.—H., III, 1. One specimen.

B. variegatum Say.—H., IV, 3 to V, 15; very common.

B. pedicellatum Lec.—N. C., IV, 17 under stone. One specimen.

B. quadrimaculatum Linn.—N. C., H., IV, common under stones, leaves, etc.

B. affine Say.—H., IV at night on muddy shore of stream; not common.

TACHYS, Schaum.

T. nanus Gyll.—E., IV, 24. H., XI, 13 under bark of dead trees; common.

T. flavicauda Say.—E., IX, 3 (Coll. by H. S. Adams).

T. granarius Dej.—H., R., II, III.

T. incurvus Say.—H., IV under stones.

T. tripunctatus Say.—H., N. C., V along river shores under stones.

T. ferrugineus Dej.—E., IV, 24 under bark of dead tree.

T. frontalis Hayw.—H., V, 22.

T. proximus Say.—N. C, V, 15. H., IX, 13; not common.

T. scitulus Lec.—IV, V, common everywhere, under stones, etc., near water.

PATROBUS Dej.

P. longicornis Say.—Common in all localities, II, III, IV, V, VI, IX, and X, usually under stones in damp places.

MYAS Dej.

M. coracinus Say.—R., IX, 18, X, 17 under stones at foot of mountain; rare. R., IX, 23 (Coll. by W. S. Fisher).

PTEROSTICHUS Bon.

P. adoxus Say.—N. C., X, 16. On mountains VI, 20; not common.

P. lachrymosus Newm.—E., III, 27 under stone on mountain; rare.

P. coracinus Newm.—H., XI, 1. One specimen.

P. stygicus Say.—Very common in all localities, II, III, IV, and X, under stones, etc.

P. moestus Say.—Common in all localities, in dead logs, occasionally under stones, V, VII, IX, X, XI.

P. sayi Brulle.—N. M., V; rare.

P. lucublandus Say.—Common everywhere under stones, III, IV, V.

P. ebeninus Dej.—H., IV, 9. Several from rotten log in swamp. XII, 4.

P. caudicalis Say.—H., N. C., IV, V, XI under stones; common.

P. luctuosus Dej.—H., X and XI in swamp, under stones, etc.; not uncommon.

P. corvinus Dej.—II, IV and XI under stones; common.

P. purpuratus Lec.—C., IX to XI in grassy places under stones on hillside overlooking creek; locally common.

P. mutus Say.—Common in all localities throughout the year.

P. erythropus Dej.—H., XI, 19 to 28 under debris in swamp; not common.

P. patruelis Dej.—With the preceding but more abundant.

P. femoralis Kirby.—H., IV, 9. One specimen.

EVARTHRUS Lec.

E. sigillatus Say.—E., III, 21 under stone.

E. furtivus Lec.—H., III, IV and V under stones and at night on mud bank; common

AMARA Bon.

A. pennsylvanica Hayw.—R., X, 10 under board. N. M., X, 30 under stones; not common.

A. avida Say.—H., IV, 11, under stones; not common.

A. exarata Dej.—R., II, 22, IX, 23 under stones; common.

A. angustata Say.—H., III and IV under stones, VI, 14 at arc light. N. C., V, 23. R., III, 21.

A. impuncticollis Say.—R., III, 13 under stones. N. C., V, 5.

A. cupreolata Putz.—R., II, 28. H., III, 1.

A. fallax Lec.—N. C., III and IV. R., III, under stones; common.

A. polita Lec.—H., XI, 19.

A. obesa Say.—N. M., X, 30 under stones; not common.

A. rubrica Hald.—N. C., II, 13. E., XI, 7 under stones; not common.

DIPLOCHILA Brulle.

D. laticollis Lec.—H., II, 16, XI, 28 and XII, 12 from cells in rotten log. N. C., II, 6. N. M., X, 30; common.

DICAELUS Bon.

In all localities where the species of this genus are taken snails are abundant and several species have been observed feeding upon them.

D. dilatatus Say.—N. C., IV. R., V. L., IX, 19. C., IX, 25 under stones; common.

D. purpuratus Bon.—R., IV, 18 under stones. E., IX, 3 (Coll. by H. S. Adams); rare.

D. ovalis Lec.—N. C., H., IV. R., and C., IX under stones; common.

D. elongatus Bon.—Very common in all localities, III, IV, V and IX.

D. teter Bon.—With preceding; common.

D. politus Dej.—With preceding; common.

BADISTER Clairv.

B. notatus Hald.—E. M., II, 6 (Coll. by H. S. Adams). H., III,27 under stones, XII, 18 sifting. N. C., IV, V, X, 16, under stones. usually in single specimen.

CALATHUS Bon.

C. gregarius Say.—Common in all localities throughout the year under stones.

C. opaculus Lec.—E., III, 20. R., X, 10. H., XI and XII under stone and logs; not uncommon.

PLATYNUS Bon.

P. sinuatus Dej.—H., throughout the year, under stones, IV at night running along shore of stream; common.

P. cincticollis Say.—H., throughout the year, in logs and under stones, also taken at arc lights.

P. extensicollis Say.—Common everywhere, IV, V, and X.

P. decorus Say.—H., II, III, IV, and V under stones in swamp; not common.

P. anchomenoides Rand.—H., V. 5 along river shore under stones. X and XI under stones; not common.

P. moerens Dej.—H., IX to XI in log; rare.

P. melanarius Dej.—H., N. C., IV, XI and XII common in dead logs, under leaves and stones, in swampy places, also at night.

P. affinis Kirby.—H., R., II, and XI in swamp.

P. cupripennis Say.—R., III, 13 under stones. N. C., III, 21 and X, 16 under stones along lane; common.

P. excavatus Dej.—H., IV and V at night along shore of creek; not uncommon.

P. ferreus Hald.—With the preceding; more common.

P. nutans Say.—R., II, 28. N. M., X, 30 under stones; rare.

P. octopunctatus Fabr.—R., III, and VI under stones; locally common.

P. placidus Say.—Common in all localities throughout the year.

P. bogemanni Gyll.—N. C., H., V, 15 to 20, VII, 12 along river shore under stone. H., VII, 29 at arc light.

P. aeruginosus Dej.—R., II, 28.

P. crenistriatus Lec.—E., III, 20. R., N. C., N. M, X under stones; common.

P. punctiformis Say.—C., XI, 6. One specimen under stone.

P. picipennis Kirby.—H., IV and XI under logs and stones; very common.

P. lutulentus Lec.—R., II, III and X. H., XI, 13 under stones and in dead logs; not uncommon.

OLISTHOPUS Dej.

O. parmatus Say.—H., II, 12, XI and XII under dry leaves; rare.

ATRANUS Lec.

A. pubescens Dej.—H., C., IV and XI in and under dead logs; not common.

CASNONIA Latr.

C. pennsylvanica Linn.—All localities; common. II, V, IX and XI.

GALERITA Fabr.

G. janus Fabr.—Common everywhere throughout the year.

G. bicolor Dru.—H., VIII, 1; not common.

TETRAGONODERUS Dej.

T. fasciatus Hald.—E. M., IV, 19 under stones in sand near creek. H., VI, 14 running in sand along river shore (Coll. by W. R. Walton). N. C., XI, 7 under stone; not common.

LEBIA Latr.

L. grandis Hentz.—Common under stones and logs in all localities, from September to beginning of April.

L. atriventris Say.—H., III, and IV, with the preceding; not common.

L. viridis Say.—Common in all localities on flowers, especially golden rod, from April to September inclusive.

L. pumila Dej.—L., IX, 12 on flowers of golden rod.

L. viridipennis Dej.—H., II, 12. E., III, 27. N. C., V, 23, under stones and logs; not common.

L. ornata Say.—L., IX, 19 on flowers of golden rod; not common.

L. scapularis Dej.—R., II, 21, IV, 11, under stones. C., V, 31 flying; rather rare.

COPTODERA Dej.

C. aerata Dej.—H., VI, 30 to VII, 14 taken only at night running over trunks of dying and infested hickory trees; rare.

APRISTUS Chd.

A. cordicollis Lec.—E., V, 29. Running about in day time on shale-bank. (Coll. by W. R. Walton).

BLECHRUS Mots.

B pusio Lec.—N. C., II, 13 under stones.

METABLETUS Schm.-Goeb.

M. americanus Dej.—H., R., II, III, and XI, 28 under logs and stones.

PLOCHIONUS Dej.

P. timidus Hald.—N. C., XI, 16. Highspire, III, 30; XI, 29 under bark of hickory and fallen oak trees. (Coll. by W. S. Fisher).

PINACODERA Schaum.

P. limbata Dej.—Common in all localities under stones and leaves, II, III, V, IX, and XI.

P. platicollis Say.—Same as the preceding.

CYMINDIS Latr.

C. americana Dej.—All localities, always taken singly under stones, in dead logs, etc. From October to beginning of May.

C. pilosa Say.—R., VII, 4, X, 10; E., XI, 7 under stones. H., VII, 1 to 13 at arc lights; common.

C. neglecta Hald.—R., all year around under stones; not rare locally. E., III, 27.

APENES Lec.

A. lucidula Dej.—All localities, singly under stones, III, IV, VI and XI. H., VI, 14 at arcs.

A. sinuata Say.—N. C., II, 13. R., II, and III. L., IV, 18. Under stones. H., VI, 21 at arc lights; not common.

HELLUOMORPHA Lap.

H. bicolor Harr.—R., V, 8; IX, 18 under stones at foot of mountain; two specimens.

BRACHYNUS Web.

B. perplexus Dej.—H., II, 27, IV and V under stones.

B. fumans Fab.—H., R., IV and V.

B. cordicollis Dej.—H., V, 11th.

CHLAENIUS Bon.

C. sericeus Forst.—Common in all localities III, IV, IX and XI. Under stones early in the season. In May plentiful at night along shores of streams mating and feeding.

C. laticolis Say.—N. M., V, 8 and X, 30, under stones along small stream.

C. aestivus Say.—Very common in all localities throughout the year.

C. prasinus Dej.—H., N. C., V, 15 to 30 under stones and running along river shore at night. IX, 12 to 23 under stones; locally common.

C. leucoscelis Chev.—Same as preceding; very plentiful.

C. nemoralis Say.—N. C., III, 21 under stones. H., IV, 3 under stones, VII, 31 at arc lights; common.

C. tricolor Dej.—N. C., III, 21. H., IV, V, under stones.

C. pennsylvanicus Say.—With the preceding; both common.

C. impunctifrons Say.—H., IV, V under stones and at night on muddy banks of creek in swamp; locally common.

C. tomentosus Say.—N. C., III, 13 under stones. H., V, VI at arc lights; common.

ANOMOGLOSSUS Chd.

A. emarginatus Say.—Common in all localities throughout the year under stones, logs, etc.

BRACHYLOBUS Chd.

B. lithophilus Say.—H., IV under leaves and at night running along muddy banks of stream in swamp, mating, feeding, etc.; locally common. N. C., V, 30; one specimen.

LACHNOCREPIS Lec.

L. parallelus Say.—H., IV, 3 to 22 under leaves and stones along bank of stream, IX, 28 and XI, 27 under stones in swamp. Usually in single specimens; not common.

OODES Bon.

O. fluvialis Lec.—H., XI and XII several from cells in dead log in swamp. H., IV, 4 (Coll. by W. S. Fisher).

GEOPINUS Lec.

G. incrassatus Lec.—H., V, 22 dug in numbers from sandy shore of island and seemed more plentiful at roots of a certain plant, V, 24 at night running along island shore, X, 2 under stones in sand, VI, 21 at arc lights in city.

CRATACANTHUS Dej.

C. dubius Beauv.—H., VIII, 19 (Coll. by Charles Anderson).

AGONODERUS Dej.

A. lineola Fab.—H., VI under stones and at arc lights; not uncommon.

H. caliginosus Fabr.—Common everywhere. H., VI and VII at arc IV to VII, XI and XII.

A. partiarius Say.—E., V, 13. N. C., V, 7 to 23; not uncommon.

HARPALUS Latr.

H. dichrous Dej.—Common in all localities under stones, II to V, IX and XI.

H. vulpeculus Say.—Same as preceding.

H autumnalis Say.—E., III, 27, IV, 4. H., IV, 16, V, 13. R., IV, 18 under stones.

H. viridiaeneus Beauv.—H., V, 13. One specimen, (Coll. by E. Daecke).

H. caliginosus Fabr.—Common everywhere. H., VI and VII at arc lights.

H. faunus Say.—N. M., X, 30.

H. convivus? Lec.—R., IV, 11th. N. M., V, 8. L., IX, 19.

H. vagans Lec.—N. M., X, 30.

H. pennsylvanicus DeG.—Common everywhere.

var. compar Lec.—N. C., IV, 25. H., VI, 23.

var. longior Kirby.—R., V, 23, IX, 18.

var. erythropus Dej.—Common in all localities, V to VII and IX to XI.

H. spadiceus Dej.—R., IV, 18, X, 10 under stones; not common.

H. herbivagus Say.—N. C., II, 27. H., V, 13; X, 12. N. M., X, 30.

H. nitidulus Chd.—N. C., IV, 17, 2 specimens.

SELENOPHORUS Dej.

S. opalinus Lec.—H., V and VI. E., IX, 26. L., VI, 6; not uncommon.

STENOLOPHUS Dej.

S. fuliginosus Dej.—N. M., X, 30. H., IX, XI. R., XI. Under stones; rather common.

S. plebeius Dej.—R., X and IX in swamp.

S. conjunctus Say.—Common in all localities under stones, etc. II, III, and XI.

S. ochropezus Say.—Common in all localities IV and XI.

ACUPALPUS Latr.

A. carus Lec.—H., XI under stones in swamp.

BRADYCELLUS Er.

B. rupestris Say.—N. C., II and V. E., V, 13. H., III and IV. Common under stones.

TACHYSCELLUS Moraw.

T. atrimedius Say.—R., II, III and XI. H., IX, 13. C., XI, 6. Under stones; rather common.

T. badiipennis Hald.—R., II, IV, X, XI. N. C., IV. E., IV; not uncommon.

ANISODACTYLUS Dej.

A. rusticus Say.—R., III, 21. H., V, 5. Under stones, VII, 31 at arc lights. L., IV, 27.; common.

A. carbonarius Say.—H., VII, 13. N. M., X, 30; not common.

A. agricola Say.—C., X, 2; XI, 14 (Coll. by W. S. Fisher).

A. harrisii Lec.—H., V, 9.

A. nigerrimus Dej.—Common in all localities, II to V and IX, X, and XII.

A. melanopus Hald.—H., II, 12; IV, 22.

A. discoideus Dej.—Common everywhere, under stones and at arc lights. IV to VI and IX to XII.

A. baltimorensis Say.—R., II, III, IV and X under stones. H., XI and XII from dead logs in swamp; common.

A. verticalis Lec.—H., V, 22. One specimen.

A. terminatus Say.—H., VII, common at arc lights. N. M., X, 30 under stones.

A. nitidipennis Lec.—Common in all localities, II to VI and IX to XI under stones sometimes in small cell.

A. lugubris Dej.— H., II, 16. E., III, 27. R., III and IX, 23. Under stones.

A interstitialis Say.—Common in all localities, II, IV, V, IX and XI.

On the Classification of the Lyttidae (Meloidae s. Cantharidae auctt.).

By Creighton Wellman.

As a result of some study of the Coleopterous family known as the Meloidae or Cantharidae I have decided upon a grouping of these insects which seems to me to express many of the natural characters of the family in so far as these can be shown in a linear table. In order that the final arrangement may be acceptable to the greater part of those scientists who work with the group, I am publishing the following outline of

my classification in the hope of receiving criticisms and suggestions which will help in perfecting it. I will be under great obligations to all entomologists who will write me their views both regarding the general idea and the detailed carrying out of it as laid down in this essay.

Before taking up the question of arrangement it should be said that the name which should be used to designate the blister beetles is Lyttidae. The reasons for this are evident. No one with material before him from all parts of the world can escape the conviction that the genus *Lytta* F. (*Cantharis* Aucct.), with its allies, is the typical one of the family and the one from which the student should start in his study of the phylogeny of the whole group. The family name Meloidae is entirely inappropriate, as the genus *Meloe* L. is nearly as atypical as any genus so far described. The long accepted family name Cantharidae already exists in the literature, and if we follow the International Code of Zoological Nomenclature* we should, on the substitution of *Lytta* F. for *Cantharis* Geoffr., regard Lyttidae as *ipse facto* becoming the proper designation of the family. Such terms as "Vesicants," etc., are to be considered as having no nomenclatorial status whatever. Thus we have:

Fam. Lyttidae,
Type Genus Lytta Fabricius (1775).
Synn. Meloidae Auctt.
Cantharidae Auctt.

Various groups not belonging to the family have by various authors been included in it. One of these (*Cephaloon* Newm. and its allies) has been regarded until recently as being blister beetles, but an examination of the larva of *Cephaloon* shows that it has nothing to do with our family. In the case of the true Lyttidae the usual difficulties of classification are greatly enhanced by the wonderful effects of peculiar parasitic habits evinced in the hypermetamorphosis of the earlier stages no

*Art. 5. "The name of a family or sub-family is to be changed when the name of its type genus is changed."

less than in the remarkable degenerations and specializations of certain of the adults. We have widely differing opinions as to the value of some of the characters used in classification. Were it not for intermediate forms any systematist would put in different families an apterous *Meloe* with reduced, dehiscent, imbricate elytra and a *Nemognatha* with normal elytra, wings and maxillary lobes as long as its body. It cannot be too strongly emphasized that the forms from the western hemisphere must be largely taken into account in deciding upon a general classification of the entire family.

In presenting my own ideas on the grouping of the Lyttidae it will be well to recall briefly some of the attempts* which have already been made to provide a classification.

Linné (Systema Naturae, 1758) included the insects described by him and belonging to this family under his genus *Meloe,* and even in the last edition of the work mentioned he introduced no further sub-divisions of the group.

Geoffroy (Histoire abregée des Insectes, 1761) adopted Linné's genus *Meloe,* restricting it to include only the wingless blister beetles with dehiscent elytra, and creating two new genera for the remaining species then known.

Latreille (Charactères génériques des Insectes, 1796; Histoire naturelle des Crustacées et des Insectes, 1804; Considerations generales sur l'Ordre naturelle des Animaux, 1809; Règne animal de Cuvier, 1817, also last edition, 1829, etc.) proposed several arrangements of the existing genera and added other genera. Latreille showed wonderful acumen in his work on the group and his writings are still of value. To the last he persisted in regarding *Horia* and *Cissites* as distinct from the other members of the family.

Leach (Edinburgh Encyclopedia, 1815) divided the blister beetles into three families, viz., 1. Cerocomatidae (*Cerocoma, Mylabris*), 2. Meloidae (*Oenas, Meloe*), 3. Cantharidae (*Cantharis, Zonitis, Nemognatha, Apalus*). This is the first at-

*An excellent resumé of these and other classifications, covering the period from 1758 to 1859, is to be found in Mulsant, Histoire naturelle des Coléoptéres de France, Vésicants, pp. 14-27.

tempt to introduce sub-divisions into the group, and is of much historical interest.

Castelnau (Histoire naturelle des Insectes Coléoptères, 1840) also proposed three groups, but as follows: 1. Meloites (*Meloe*), 2. Mylabrites (*Cerocoma, Mylabris, Lydus*), 3. Cantharidites (*Oenas, Cantharis, Lytta, Zonitis, Apalus, Sitaris*), 4. *Nemognatha.*

Redtenbacher (Die Gattungen der Deutschen Käfer nach der analytischen Methode bearbeitet, 1845) without adopting the names of any of the previously proposed subdivisions, devised the best systematic tables for the genera and species ever published up to his time.

Motschulsky (Coléoptères recus d'un Voyage de M. Handschuh dans le midi de l'Espagne, 1849) put forth three divisions of the family, viz.: 1. Obesicornes (*Mylabris, Dices*), 2. Lobaticornes (*Meloe*), 3. Gracilicornes (*Zonitis*, etc.).

Mulsant (Histoire naturelle des Coléoptères de France, 1857) attempted a detailed grouping of the family with the following result: I. Meloidiens (*Meloe*), II. Mylabriens (1. Cerocomaires, *Cerocoma;* 2. Mylabriaires, *Hycleus, Mylabris*); III. Cantharidiens (1. Cantharidiaires, a. Alosimates, *Alosimus;* b. Cantharidiates, *Cantharis, Epicauta* 2. Zonitaires, a. Zonitates, *Zonitis, Nemognatha, Apalus;* b. Sitarates, *Stenoria, Sitaris*).

Lacordaire (Genera des Coléoptéres, 1865) proposed two subfamilies under the last of which he placed five tribes, thus: I. Meloides vrais (*Meloe, Cysteodemus, Henous*); II. Cantharides (1. Horiides, *Horia, Cissites,* 2. Mylabrides, *Cerocoma, Mylabris,* 3. Cantharides vrais, *Eletica, Tetraonyx, Phodaga, Tegrodera, Cantharis, Spastica, Oenas, Lydus, Sybaris, Cephaloon, Palaestra, Tmesidera, Zonidis, Apalus, Palaestrida,* 4. Sitarides, *Sitaris, Onychtenus, Sitarida,* 5. Nemognathides, *Nemognatha, Gnathium*). Lacordaire's work had a wide influence and his ideas have been followed by most entomologists since.

Le Conte (Classification of the Coleoptera in the Smithsonian Miscellaneous Collection, 1862) and LeConte and Horn

(Classification of the Coleoptera of North America, 1883) adopted a scheme similar to Lacordaire's which has colored the views of most American coleopterologists. In its final form it consisted of: I. Meloini (*Cysteodemus, Megetra, Meloe, Henous, Porcospasta*), II. Cantharini (1. Horiini, *Horia, Tricrania*), 2. Nemognathini (*Nemognatha, Gnathium, Zonitis*), 3. Sitarini (*Hornia, Leonia*), 4. Mylabrini (*Cordylospasta*), 5. Cantharini genuini (a. Macrobases, *Macrobasis,* b. Cantharides, *Tetraonyx, Pleuropompha, Gnathospasta, Epicauta, Pyrota, Pomphopoea, Cantharis, Calospasta, Tegrodera,* c. Eupomphae, *Eupompha,* d. Phodagae, *Phodaga*).

Fairmaire (Genere des Coléoptères d'Europe, 1863) has arranged the family in this manner: I. Meloites, II. Cantharites, 1. Mylabrites (*Cerocoma, Coryna, Mylabris*), 2. Cantharites propres (*Oenas, Lydus, Cabalia, Lytta, Lagorina, Cantharis*), 3. Sitarites (*Stenodera, Hapalus, Sitaris, Ctenopus*), 4. Zonitites (*Zonitis, Nemognatha, Leptopalpus*).

Gemminger and Harold (Catalogus Coleopterorum, 1870) employed no subdivisions whatever in their arrangement of the family. They accepted forty-two of the genera which had been proposed, disposed in the following order: *Meloe, Nomaspis, Pseudomeloe, Cysteodemus, Henous, Gynapteryx, Horia, Tricrania, Apteropasta, Cissites, Rhampholyssa, Cerocoma, Diaphorocera, Coryna, Mylabris, Iletica, Tetraonyx, Jodema, Phodaga, Calospasta, Tegrodera, Eupompha, Cantharis, Spastica, Oenas, Lydus, Halosimus, Sybaris, Cephaloon, Palaestra, Tmesidera, Zonitis, Hapalus, Palaestrida, Sitaris, Sitarida, Onychtenus, Goetymes, Ctenopus, Nemognatha, Gnathium.*

Beauregard (Les Insectes Vésicants, 1890) arrived at the following classification: 1. Zonitites (*Nemognatha, Gnathium, Zonitoides, Zonitis, Stenodera, Hapalus, Leptopalpus*), 2. Sitarites (*Ctenopus, Onyctenus, Stenoria, Sitaris, Sitarida, Goetymes, Sitarobrachys, Hornia, Leonia*), 3. Meloites (*Meloe, Pseudomeloe, Porcospasta, Megetra, Cysteodemus, Nomaspis, Gynapteryx*), 4. Cantharites, a. Horiides (*Horia, Cissites, Tricrania*), b. Cantharides (*Tetraonyx, Spastica, Cantharis*), 5. Lyttites (*Henous, Apterospasta, Macrobasis, Epicauta, Pyrota,*

Iletica, Calospasta, Isclma, Phodaga, Eupompha), 6. Mylabrites (*Lydus, Alosimus, Oenas, Mylabris, Cerocoma, Cephaloon, Sybaris, Rampholyssa, Diaphorocera, Cordylospasta*). Beauregard's work is epoch-making, more from its method and influence than from its actual conclusions however. He was the first to base divisions on larval as well as adult characters and, while his interpretations are not so important as his data, his monograph is a foundation stone of a natural classification.

Champion (Biologia Centrali-Americana, 1893) adopted the following groups: 1. Meloinae (*Meloe, Henous, Cysteodemus, Megetra*), 2. Cantharinae, a. Horniides (*Leonia*), b. Horiides (*Horia*), c. Nemognathides (*Nemognatha, Gnathium, Zonitis*), d. Cantharides (*Tetraonyx, Eupompha, Calospasta, Macrobasis, Gnathospasta, Epicauta, Pyrota, Cantharis*).

Escherich (Bestimmungs-Tabelle der europäischen Coleopteren, 1897) proposed the following grouping: 1. Meloidae (s. str.), a. Meloini, b. Lyttini, 2. Zonitidae, a. Cephaloonini, b. Zonitini. Escherich deserves the credit of being the first to see that the family falls naturally into two great divisions, one of which is typified by the genus Zonitis.

Von Heyden, Reitter and Weise (Catalogus Coleopterorum Europae, etc., 1906) put forth the following: 1. Meloini (*Meloe, Proscarabaeus, Sitarobrachys*), 2. Lyttini (sic)* (*Cerocoma, Rampholyssa, Zonabris* (*Hycleus*), *Oenas, Calydus, Lydus* (*Halosimus*), 3. Lyttini (*Lytta* (*Teratolytta*), *Lagorina, Cabalia, Epicauta, Zonitis, Euzonitis, Cochliophorus, Stenodera, Nemognatha, Leptopalpus, Hapalpus* (*Criolus*), (*Stenoria*), *Sitaris, Ctenopus*).

Ganglbaur (Verh. zool.-bot. Gesellsch. Wien, 1907) modified Escherich's (1897) idea as follows: 1. Meloinae, a. Lyttini (*Epiacuta, Lytta, Lagorina, Cabalia, Lydus, Calydus, Oenas, Mylabris, Cerocoma, Rampholyssa*), b. Meloini (*Meloe, Sitarobrachys*), 2. Zonitinae (*Hapalus, Stenoria, Sitaris, Ctenopus, Stenodera, Cochliophorus, Leptopalpus, Zonitis, Nemognatha*).

Before presenting my own classification which lays stress upon phylogeny, as against pure taxonomy, for a guiding

*Probably a *lapsus calami* for Zonabrini.

principle, it may be well to remark on some of the crucial genera upon which turn the groupings adopted. It will be seen that I regard some genera formerly considered to be closely allied as widely separate, and *vice versa*. The chief character relied on by Lacordaire and his followers in dividing the family into two unequal groups is the length of the metasternum, which in *Meloe* et al. is very short, allowing the middle coxae to overlap the hind coxae. This is entirely an artificial character in this connection and is of course due to atrophic changes following on the loss of the insect's wings in the course of evolution. Occasional absence of wings in a family is not so important a character in the Coleoptera as has been supposed. This is well illustrated in the Carabidae. In that family I have even had brought to my notice by Dr. Walther Horn of Berlin a single apterous specimen of a usually winged species (*Calosoma reticulatum*).* The weakness of the received classification of the blister beetles is well illustrated by such forms as *Henous* (an apterous *Lytta*), *Apterospasta* (an apterous *Macrobasis*) and especially by the insect known as *Calospasta opaca* G. H. Horn, which I have tried to fit in Fairmaire and Germain's genus *Gynapteryx*, but for which I now propose a new genus, viz.:

GYNAECOMELOË Wellm. gen. nov.

♂ with general form as in *Tetraonyx* Latr. and some species of *Calospasta* Lec. Elytra as long or longer than the body, provided with wings, metasternum long, mesocoxae not overlapping hind coxae.

♀ with general form as in *Meloe* L., elytra much shorter (often less than half) than the body, apterous, metasternum short, mesocoxae overlapping hind coxae.

Claws and other characters as in *Calospasta* Lec.

*Since this was written, Dr. E. C. Van Dyke has called my attention to other equally interesting instances of wing degeneration in the genus *Calosoma* from the Galapagos Islands, among the Scarabaeidae from the same region and especially in the Family Tenebrionidae, from the Pacific Coast region.

Type species *Calospasta opaca* G. H. Horn.

This genus cannot be confused with any other. From *Gynapteryx* Fairm. et Germ. (which is a *Henous* with winged ♂ ♂) it can easily be told by its unequal claws and short elytra of the ♀.

Other apterous forms occur in various divisions of the family, such as *Hornia* and *Leonidia* (Sitarini) and *Tricrania* (Horiini), but should not have too much stress laid on them from the standpoint of general classification, although the presence or absence of wings among the Lyttidae is usually a good generic character.

Taking up now in order some of the genera helpful in deciding on a scheme of classification I may say that *Sybaris* should probably be regarded as related to the *Mylabris* group, although its claws have the superior division pectinate. This relation can be traced through *Alosimus, Lydus* and *Oenas* to *Mylabris*. The mouth parts of *Oenas* and *Alosimus* are very like *Mylabris* (the mandibles being dissimilar, i. e., the right and left mandible different), *Lydus* being a little farther removed in this respect. *Cordylospasta* is to be considered as also rather near *Mylabris,* although its generalized features are not so like as its appearance suggests, and the antennal and other common characters may possibly be due simply to parallel development. Its claws, etc., place *Cordylospasta* near *Cystodemus, Megetra* and the *Calospasta* group of genera. The larval no less than the adult characters of the *Cerocoma* and *Mylabris* groups place them close tokether. *Eletica,* while having some points in common with the Mylabrines, is by virtue of its having mouth parts like *Pyrota* (i. e., with all the parts differentiated and isolable) is a link between the group last mentioned and the Lyttines.

The gradations in the *Lytta* division (through the series of genera allied to *Calospasta*) toward the Meloines are gradual and evident. The genera *Henous, Gynapteryx, Gynaecomeloë,* etc., have already been mentioned in this connection.

Between the *Meloe* forms and the *Sitaris* tribe the break is on the whole greatest and it is here that I propose to divide

the genera composing the family into two divisions. Still there are not wanting suggestions of relation, such apterous genera as *Hornia* and *Sitarobrachys* (with short metasterna and overlapping coxae) distinctly recalling Meloine forms.

From the genera last mentioned with their allies we come without great gaps through the Sitarine group to the Zonitines, such genera as *Onychtenus* and *Stenodera* furnishing the passage.

In the *Zonitis* group I should mention *Deridea* and probably *Iselma,* remarkable on account of their non-pectinate claws. The other genera here are close together, *Palaestra* for instance being only a *Zonitis*-mimicry of a *Lycus,* and *Nemognatha* a *Zonitis* with specially developed mouth parts. Gradations of both these last forms occur.

The mouth parts, episterna and claws all unite to connect the Zonitines with the *Horia* group, although the absence of vesicating properties and other features make these last rather distinct.

The peculiar little group of species now included under the genus *Tricrania* Lec. is of great significance in any classification of the family. In some of their features recalling the Sitarini, they are obviously allied to *Horia* and *Zonitis.* The claws of *Tricrania sanguinipennis* are those of a *Cissites,* while those of *stansburii* strongly suggest *Zonitis.* A new genus is required for the proper expression of the relation which these insects hold to the groups mentioned, namely,

TRICRANIODES Wellm. gen. nov.

Allied to *Tricrania* Lec., from which it differs by the claws being simply pectinate with longish regular teeth instead of a double row of short tubercles, and also by the body being winged (it is apterous in *sanguinipennis* Say., the first described species of the group, and which may now be regarded as the type of *Tricrania* Lec. s. str.)

Other characters as in *Tricrania* Lec.

Type species *Tricrania stansburii* Hald.

The genus is easily distinguished from *Tricrania* by the absence of wings in the latter.

These two allied genera are to be regarded as connecting the Horiines (through the *Zonitis* group) with the rest of the Lyttidae.

To sum up in a word what has been said regarding the various genera, the family Lyttidae contains two chief and fairly homogenous divisions which are related to each other principally through the *Sitaris* and *Meloe* groups of genera.

On the ground of the foregoing and many other considerations I am dividing the blister beetles into two sub-families which I separate as follows:

Fam. **LYTTIDAE** (Cantharidae s. Meloidae Auctt.)

A. Pseudochrysalis not confined in exuvia of preceding larval instar, ♂ genitalia disposed vertically or obliquely in abdomen ..... **Lyttinae** nov.

AA. Pseudochrysalis confined in exuvia of preceding larval instar, ♂ genitalia disposed horizontally in abdomen, **Zonitinae** Ganglb.

Under these sub-families six tribes should be recognized as follows:

Subfam. **Lyttinae** nov.

A. Wings present, elytra normal.

a. Antennae usually clavate, mandibles often dissimilar, **Mylabrini** nov.

aa. Antennae never clavate, mandibles similar.....**Lyttini** Lec.

AA. Wings absent at least in ♀, elytra usually dehiscent, sometimes imbricate .....**Meloini** Esch. s. str.

Subfam. **Zonitinae** Ganglb.

A. Labrum distinct.

a. Elytra reduced or dehiscent, maxillary lobes normal, **Sitarini** nov.

aa. Elytra normal, maxillary lobes sometimes greatly produced, **Zonitini** Esch. s. str.

AA. Labrum small, sometimes hardly visible.....**Horiini** Lec.

In conclusion I give my grouping of the genera known to me, which is as yet tentative in some parts, and on which I especially invite criticisms and suggestions.

Fam. LYTTIDAE.

Subfam. LYTTINAE.

Trib. **Mylabrini**

Group *Sybarides.*

Sybaris.

Lydomorphus, Lydus, Alosimus, Oenas, (Paroenas).

Group *Cordylospastides.*

Cordylospasta.

Group *Cerocomides.*

Rampholyssa, Cerocoma, Diaphorocera.

Group *Mylabrides.*

(Lydoceras, Ceroctis), Mylabris, (Decapotoma, Coryna, Actenodia).

Group *Eleticides.*

Eletica.

Trib. **Lyttini.**

Group *Lyttides.*

Pyrota, Epicauta, (Macrobasis, Causima), Lytta, (Teratolytta, Lagorina, Cabalia), Pleuropomph, Gnathospasta, Lyttonyx, Spastica, Tetraonyx.

Group *Calospastides.*

Phodaga, Negalius, Eupompha, Tegrodera, Pleuropasta, Calospasta.

Trib. **Meloini.**

Group *Gynaecomelodides.*

Gynaecomeloe.

Group *Cysteodemides.*

Cysteodemus, Megetra.

Group *Apterospastides.*

Poreospasta, Apterospasta, Gynapteryx, Henous.

Group *Meloides.*

Melöe, Meloëtyphlus.

Subfam. ZONITINAE.

Trib. **Sitarini.**

Group *Horniides.*

Hornia, Leonidia, Sitarobrachys, Sitarida.

Group *Sitarides.*

Sitaromorpha, Glasnuvia, Sitaris, Stenoria, Ctenopus, Onyctenus.

Trib. **Zonitini**
Group *Derideides.*

Deridea, Iselma.

Group *Zonitides.*

Stenodera, Palaestra, (Tmesidera), Cochliophorus, Zonitis, (Euzonitis), Zonitoides.

Group *Nemognathides.*

Gnathium, Nemognatha, Leptopalpus.

Trib. **Horiini**
Group *Tricraniides.*

Tricraniodes, Tricrania.

Group *Horiides.*

Cissites, (Synhoria), Horia.

The Genus Copestylum.

By J. M. Aldrich, Moscow, Idaho.

The genus under consideration belongs to the dipterous family Syrphidæ, and is closely related to *Volucella,* an immense assemblage of mostly rather large flies having a Southern range. The only generic character which sets off *Copestylum* is the structure of the arista, which is covered, especially above and toward the apex below, with closely set, short, black, flattened hairs, giving it under the microscope a little the appearance of a black ostrich plume. In *Volucella* the arista is of ordinary structure, more or less plumose with the usual long, thin, tapering hairs.

The first member of this genus to become known to science was *marginatum,* described as a *Volucella* by Say (a). His material was from Mexico, and from the wording must have consisted of a single specimen of each sex.

Macquart (b) described the genus and founded it upon the species *flaviventris,* from Colombia. He mentions two females.

Osten Sacken (c) recognized Say's species (as a *Volucella*) from Waco, Texas, in a single specimen; in (d) he correctly places *marginatum* under the genus *Copestylum,* and suggests that *flaviventris* may be a synonym.

Williston (e) puts Macquart's species as a synonym of *mar-*

ginatum, of which he identified thirty specimens from Texas, Arizona, Montana and California. The specimens showed great variation; nine from Montana might be distinct, of smaller size; one variety, *lentum,* he designates by a name. A single additional specimen from the Isthmus of Tehuantepec, he believed to be distinct and named it *C. limbipennis.* In (f) he identifies additional specimens of *marginatum* from Central America, and of both sexes of *limbipennis* from three Mexican localities. Later in (g) he records the rearing of *marginatum* from larvae boring in the tissues of *Opuntia,* a common cactus of the arid regions.

From this summary of Williston's work on the genus it will be seen that he examined large numbers of specimens, probably as many as sixty, and could make out but two species.

Giglio-Tos, the Italian entomologist, who worked for some years on Mexican Diptera, described two new species in (h), which he called *simile* and *parvum;* later in the same year (i) he reprinted these descriptions and separated a third species, *distinctum,* from *marginatum* on account of the smaller size of the latter (with other slight differences); he redescribes *marginatum,* and figures both it and *distinctum.* All four of his species were collected at Tehuacan, Mexico, and *simile* also at Meztillan. He had 7 *marginatum,* 11 *distinctum,* 2 *simile,* 1 *parvum.*

In (j) Mr. C. H. Tyler Townsend reported on a lot of Diptera from Lower California, among which he identified a number of species of *Volucella,* mostly new, but mentioned no species of *Copestylum.* His type material was deposited in the collection of the California Academy of Sciences at San Francisco, where I made a careful examination of it only a few weeks before it was entirely destroyed by the freat fire. To my surprise, I found that his *Volucella estebana, lucasana, sodomis* and *tolteca* were all *Copestylums.* The specimens of *tolteca* were not the types, and in looking up the original description in another paper (k), I found another series of species, *fax, inops* and *tolteca,* so connected together in the descriptions as to leave scarcely a doubt that they are all *Copestylums.* The

first one of the series, *fax*, is said to have the "arista thickly plumose above, and a little on apex below," which corresponds with the expression used in describing *estebana*—"arista densely short plumose above." The three species are closely interwoven in the descriptions, and the third I found to be a *Copestylum* by examining material identified by Townsend himself; hence I feel certain that *fax* and *inops* may be added to the list to be transferred to *Copestylum*. In (l) Townsend for the first time in print identifies a species of *Copestylum*, mentioning a specimen of *marginatum* from New Mexico. All of Townsend's species are based on meagre materials—in fact, he hade seven species out of a total of eleven specimens.

Snow (m) placed all three of Giglio-Tos's species as doubtful synonyms of *marginatum*.

In my catalogue (n), I allowed *limbipennis*, *parvum* and *simile* to stand as valid species, not that I had any opinion on the subject, but merely giving them the benefit of the doubt. *Distinctum*, however, seemed to me to come well within the range of variation of *marginatum*, so I placed it as a synonym of that species. I had not at that time examined Townsend's material, so I put all his species in the genus to which he assigned them.

The specific names to be considered under the genus *Copestylum* appear to be the following: *Marginatum* of Say; *flaviventris* of Macquart; *limbipennis* of Williston; *distinctum*, *parvum* and *simile* of Giglio-Tos; *estebana*, *lucasana*, *sodomis*, *tolteca*, *inops* and *fax* of Townsend.

Bigot does not mention any Copestylums, and among the numerous descriptions of Volucellas given by him I have searched in vain for any mention of an antennal character indicating a *Copestylum;* still the omission signifies little, and it is not unlikely that an examination of his types will disclose several species of this genus.

We are now at the threshold of the main question, which is, how many species of *Copestylum* actually exist, and which names apply to them? But here I regret to say I must stop. I have gathered up the threads so as to simplify the problem

a little, but the material within my reach is far too meagre to enable me to form a satisfactory conclusion.

Probably Melander and Brues examined more material in the genus than has been accessible to any other dipterists, as in their two years' stay in Texas they collected about a hundred specimens, most of which they distributed in exchange. Out of this number, a single one was classified as *lentum*, all the rest as *marginatum*. I am indebted to Prof. Melander for this suggestive item.

(a) Say, Jour. Acad. Nat. Sci. Phil., VI, 167, 1829; reprinted in Complete Works, II, 360.
(b) Macquart, Dipt. Exotiques, Suppl. I, 252 (sep. 124), 1846; pl. X, fig. 16.
(c) Osten Sacken, Western Dipt., 333, 1877.
(d) Osten Sacken, Catalogue of N. A. Diptera, 2d edition, 1878, 130.
(e) Williston, Synopsis N. A. Syrphidae (Bull. 31, U. S. Natl. Mus.), 151, pl. VII, f. 1; 1886.
(f) Williston, Biologia Cent. Amer., Dipt. III, 56, 1891.
(g) Williston, Entomological News, II, 162, 1891.
(h) Giglio-Tos, Boll. Mus. Zool. Anat. Comp. R. Univ. Torino, VII, No. 123, p. 2; 1892.
(i) Giglio-Tos, Ditteri del Messico (Mem. R. Acad. Sci. di Torino, ser. II, tom. XLIII, 1892), 40-43, pl. I, f. 14, 15.
(j) Townsend, Proc. Cal. Acad. Sci., 2d ser., IV, 612-616, 1895.
(k) Townsend, Trans. Amer. Ent. Soc., XXII, 42-45, 1895.
(l) Townsend, Psyche, 1898, 267.
(m) Snow, Suppl. List N. A. Syrph. (Kans. Univ. Quart., III, 1895), 257.
(n) Aldrich, Catalogue N. A. Diptera (Smithsonian, 1905), 376.

Dr. Edwin C. Van Dyke and Dr. F. E. Blaisdell, of San Francisco, expect to make a collecting trip to the high middle Sierras of California. Coleoptera are warned to steer clear of the district they visit.

The Lake Laboratory of the Ohio State University, located on Cedar Point, near Sandusky, will open June 20, and close July 29. The laboratory is close to the waters of Lake Erie and Sandusky Bay. There will be a course on entomology. Any information may be obtained from Prof. F. L. Landacre, Ohio State University, Columbus, Ohio.

Notes on Oncideres texana Horn in Georgia: Oviposition.

By A. A. Girault.

The following notes may be useful:

On October 14, 1906, at Myrtle, Georgia, on a large plantation, a row of three-year-old pecan trees, in a small grove, was noticed to have occasional branches neatly cut off, resembling the work of a beaver in miniature. A single specimen of the forementioned Cerambycid was found at work, already having partially girdled a branch. These branches already cut off were found under the trees, on the ground. They measured in diameter 11 and 12 mm. (14 branches). Each branch, and also the one in process of being cut off, contained a number of isolated, small, roundish cavities, leading to the egg and which opened into longitudinal, flat grooves just beneath the bark, measuring on the average 4.20 mm. in length, not very much longer than the egg itself. These egg cavities were generally placed at the nodes, to one side of the leaf insertion and the last one was at the top end of the severed branch, or near it. There was but a single egg cavity at each node and under each cavity, generally, there were many, short, transverse cuts in the bark resembling transverse striae. These branches found on the ground, all recently severed, contained from 10 to 18 eggs, according to their length; usually there were no egg cavities at those nodes which were near to the basal or severed end of the branches. The cavities were closed with some mucilaginous substance, which may have been exuded sap. A few other girdled branches, containing eggs, as with those found on the ground, were still hanging to the trees, but were completely girdled and dead or dying. In many cases (one direct observation), a noticeable denuded area was found at the upper end of the girdled twig *eaten* by the female beetle during resting periods. This area sometimes extended out onto the petioles of the terminal leaves.

In regard to the eggs themselves. Eleven (11) eggs deposited on October 13 and 14, contained perfect embryos and were hatching on November 24 and 25, making a period of embry-

onic development of about one and one-third months. After hatching had occurred, borings are usually to be noticed at the mouth of the egg cavity.

The eggs are deposited into the branch and the latter, then girdled, not the other way round as has been stated in the literature; at least this was true in the cases of two direct observations, one of which has already been stated. This, a female, was found feeding at the apical or top end of a branch, and crawling slowly back and forth between the top and bottom ends of it, on October 15 in the afternoon. Egg cavities containing eggs were then present. She continued these indolent movements through the morning of the 16th, but at 1 P. M. that day, she began to girdle the branch, working continuously throughout the afternoon and evening until at least up to 11 P. M., when the observation was discontinued; the day had been windy and cloudy. By the following morning (17th), a half of the circuit had been completed; from 6 A. M. to 1 P. M. of the 17th, the female was either at rest, motionless or else feeding at the apex of the branch, eating the bark; it began again on the girdle at nearly the same hour as on the previous day (1 P. M.), working continuously nearly up to midnight, by which time the girdle was almost completed; the day had been cloudy with a drizzling rain. At 7 A. M., October 18th, she was found resting at the upper end of the branch; the girdle was nearly complete. At 12.30 P. M. that day, she renewed her operations, working to windward, head downward, clutching the branch which was then leaning somewhat from the action of the wind. At 1 P. M., she was working in a driving rain; about an hour afterwards the branch fell over, blown by the wind, and the female abandoned it. Plainly, in this case, girdling followed oviposition. During the time of observation, the female worked during definite periods, the last half of the day and the first half of the night.

The two beetles observed were very slow and deliberate in their actions. They would spend hours alternately feeding, resting or crawling slowly up and down the length of the branch upon which they were at work. Their locomotion, dur-

ing the wandering periods, was slow, like an automaton, and the long antennae were nearly always held then so as to embrace, more or less, the branch. They were not curled around the branch but while in their natural positions held down against it, so that the proximal half of each antennae touched the branch on each side at some point along its length.

Questions and Answers from a Final Examination in Entomology—I.

(Sent to the NEWS by the Professor of Entomology in a university in one of the Western States.)

1. What special senses do insects possess?

"Insects can measure electrical currents with their feet, and can either see or have some method of communication through walls. The sense of direction is well shown as when it has gathered enough honey it will go straight to the hive."

2. Define parasitic, predaceous, secondary and tertiary parasitism.

"Parasitic means the form of a disease which almost all of the insects are infested."

"Parasitic means insects that are dependent upon other insects and plants for their food. The insects and plants they live on are called the host."

"Predaceous means that the insects must live on vegetation."

"An insect is predaceous if it takes the food away from another insect."

"Predaceous, regards food habit, it means very vicious food habit, being always hungry."

"Secondary parasitism is feeding on one host and partly on others."

"Secondary and tertiary parasitism mean the different forms of parasitic disease."

3. Why do insects moult?

"Insects moult in order to become more perfect. Every time an insect moults it is further developed."

4. Name the typical stages in complete metamorphosis.

"The typical stages in complete metamorphosis are egg; larva, pulpa and adult. When hatched from the egg it enters the larva state where it crawls around for awhile like a worm. It finally enters the pulpa stage where legs are formed and wings and as soon as these are formed it becomes an adult."

5. Define elytron, cercus and tegmina.

"Elytron is the hard, black portion on the back of the beetle."

"Cercus—sort of a spike-like projection at tip of abdomen in female."

"Cercus is an appendage on the end of the abdomen of the grasshopper used in carrying things and for fighting."

"Tegmina, the opaque cell on the front edge of the wing near the outer end."

6. Give four types of Hymenoptera.

"Hymenoptera—Squash bug, assassin bug, potato bug, Giant water bug."

7. Discuss methods of insect dispersal. (100-200 words).

"There are different methods of insect dispersal. One way is by wind, being carried a great distance by a hard windstorm. They are also carried by water the insect laying an egg and this being fastened to a piece of wood that is carried by the water to a great distance. Sometimes the insect is carried also in the same method as the egg is carried. Insects are carried from one place to another by birds and by this method they are scattered over different countries as birds are known to fly from one country to another. Animals also carry them about to different localities. The importation of grains and fruits and other products from the different countries have brought into the country to which the goods were shipped many insects that are not known to the country."

8. Discuss possible rapidity of reproduction in insects, and the natural checks which hold them within bounds.

"Insects are about the rapidest in reproduction of the different things known. To show how many insects could be formed in one year, take two flies and if the female fly laid 100 eggs during its life and half of those were female and each one of the female laid 100 eggs and so on at the end of the year there would be about eighty million bushel of flies. It is the same with nearly all insects that the reproduction is very rapid. The *tergites* are very fast reproducing insects, the female laying about 50 to 100 a second, and at that rate there would be a great many of these insects produced in a year. If it was not for the different natural methods of checking the increase the countries would be over-run by them."

"There is a fungi disease that affect different insects, and it is this fungi that kills the grasshopper and keeps it from increasing so rapidly."

"Insects are not comparable to man in their reproduction since there are scarcely any insect which produce only one other insect in a year. On the contrary, insects produce many eggs which hatch and produce several hundred insects which in turn produce several hundred more."

"The grasshopper can produce one species in the spring and in the fall that species will produce another species, and it runs on like that until several hundred species may be produced."

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., MAY, 1910.

The NEWS is not always scientific. This statement has been made from time to time, and in the past we have several times referred to it. We suppose that some people think that anything that is not dryasdust reading, like the dictionary, is not scientific. Science, very broadly speaking, is knowledge. One of Webster's definitions of science is as follows: "Accumulated and established knowledge, which has been systematized and formulated with reference to the discovery of general truths or the operation of general laws; knowledge classified and made available in work, life, or the search for truth; comprehensive, profound, or philosophical knowledge." Some scientists are born such, and when they grow up they read the descriptions of new species and like matters with the avidity that the small boy shows for his dime novel. Next there is the scientist that is made. He has taken up scientific studies from a profound love of Nature, and is fond of the glorious sunshine, the shady woods, the wild-flowers, the multiplicity of life out of doors and the desire to investigate these wonders. He is here by a process of evolution. At one time he may have been a boy who collected insects and someone told him there was a journal devoted to the study of such creatures. If on procuring his journal he finds it entirely devoted to descriptions of new Bombycidae and Culicidae his heart would be chilled, as he was not born a great scientist, but is one by later

development. The NEWS, if supported only by the born scientists, and the professionals, would die like a gnat in the cyanide jar. The majority of our subscribers are collectors, amateurs and lovers of Nature, and we believe that they believe that science is knowledge, and that knowledge is not necessarily dry science. When all our subscribers, through time and reading the NEWS, have become sufficiently scientific to dote on descriptions of new species and lists of genera in the Coccidae and Culicidae, we will gladly supply such things alone. We believe that the great success of the NEWS could be materially increased by articles that present knowledge, scientific knowledge, but in a more attractive form. We would still cater to our born scientist, but we would not discourage everybody else, especially the embryo scientist who is now only a collector and a lover of Nature.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

MR. A. F. BURGESS, expert in charge of breeding experiments in regard to the prevention of spread of the Gypsy Moth, 6 Beacon street, Boston, Mass., would like data in regard to *Calosoma* and *Carabus*, and living specimens of these beetles will be much appreciated if sent to him.

THE EDITOR "News."

Dear Sir: Is anything being done by representative Entomologists in the East with regard to customs duty on insects? The trouble here is not so much the actual fact that I have to pay a few dollars to the United States Treasury (or wherever they go), as the fact that there is always great delay and difference of opinion in assessing the value of specimens.

A friend, say in South America, sends me as a present a number of pinned Hemiptera, who is to judge what their value is? How can the value be appraised?

It is such a petty matter, anyhow, that the total abolishment could not make any difference to the Treasury. As it is, it depends entirely where one is, how much one pays and how much trouble one has.

In several instances I have had to decline offers made by European museums and other extra-American people to examine material (which I much wanted to do), because of the expense and trouble involved.

G. W. KIRKALDY, Honolulu, T. H.

Mr. Robert Dickson, of Pittsburgh, Pennsylvania, is doing good work in blown larvæ of the Lepidoptera. The specimens of inflated caterpillars, mounted on their food plants, are admirable.

Dr. Wm. A. Riley, of Cornell University, says, "In these days no one seems to have a good word for the house fly. But Moufet said that 'they show and set forth the omnipotency of God; and execute His justice; they improve the diligence and providential wisdom of man; all of which reminds one strongly of David Harum's defense of dog fleas."

An Interesting report to Mr. Gershom Smith, Comptroller of the Pennsylvania Steel Company has been sent from The Spanish-American Iron Company at Daiquri, Cuba., which shows the value of economic entomology. The report of the work is by Mr. Bruno Fox, Sanitary Inspector in charge.

In 1902 there were 1,362 cases of malaria and since that time there has been a gradual reduction. In 1909 the cases numbered only 234. During the year there were 1,391 men on the pay-roll and the average number of patients in the hospital daily was fourteen, in other words there was only one per cent. of the force on the sick list.

The work of the Sanitary Squad consists of the daily collection and burning of all household rubbish, the care and cleaning of the barracks, a house to house inspection of sanitary conditions, care of water tanks and water barrels in the mine cuts, petrolization of standing water, general cleaning of the villages and camps and, fist, last, and all the time war on the mosquito. The men themselves, who looked on the whole matter of mosquito fighting as a joke and were thoroughly indifferent, are now beginning to appreciate the results, and are quick to call attention when the wire-gauze covers to the water barrels in the mine cuts are worn out or broken.

The cost of the work for the year was approximately one thousand dollars a month. The value of this work is difficult to estimate in figures. The greatest value is contingent and appears in general cleanliness, health, cheerfulness and efficiency. But there is one point where its value in dollars and cents can be figured. With our present force, it means at least ten men less in the hospital each day. Instead of being a charge on the work, these ten men produce during the year 8,000 to 9,000 tons of ore, which far more than repay the expenditure for sanitation. From the low motive of selfishness, therefore, it pays and from every higher point of view the result would warrant the expenditure, if there were no financial return." The above is a brief extract from this interesting report.

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), excluding Arachnida and Myriapoda. Articles irrelevant to American entomology, unless treating of new genera, 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, and are all dated the current year unless otherwise noted. This (°) following a record, denotes that the paper in question contains description of a new genus; while this (*), that of a new North American form.

For complete record of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

1—Proceedings, Academy of Natural Sciences of Philadelphia. **5**—Psyche, Cambridge, Mass. **7**—U. S. Department of Agriculture, Bureau of Entomology. **8**—The Entomologist's Monthly Magazine, London. **9**—The Entomologist, London. **10**—Nature, London. **11**—Annals and Magazine of Natural History, London. **16**—Bulletin, Societe Nationale d'Acclimation de France, Paris. **40**—Societas Entomologica Zurich. **45**—Deutsche Entomologische Zeitschrift. **51**—Novitates Zoologicae, Tring, England. **59**—Sitzungsberichte, Gesellschaft der naturforschenden Freunde, Berlin. **73**—Archives, Zoologie Experimentale et Generale serie 5, Paris. **83**—Notes from the Leyden Museum. **86**—Annales, Societe Entomologique de France, Paris. **89**—Zoologische Jahrbucher, Jena. **102**—Proceedings, Entomological Society of Washington. **108**—The Agricultural Journal, Department of Agriculture, Cape of Good Hope, Cape Town. **128**—Proceedings, Linnean Society of New South Wales, Sidney. **143**—Ohio Naturalist, Columbia, **153**—Bulletin, American Museum of Natural History, New York. **163**—American Journal of Science, New Haven, Connecticut. **166**—Internationale Entomologische Zeitschrift, Guben. **192**—The Cairo Scientific Journal, Alexandria. **216**—Entomologische Zeitschrift, Stuttgart. **221**—New Hampshire Agricultural Experiment Station, Durham, N. H. **222**—Purdue University Agricultural Experiment Station, Lafayette, Ind. **223**—Broteria, Revista de Sciencias Naturaes do Collegio de S. Fiel. (Ser. Zoologica). **224**—Bulletin, Buffalo Society of Natural Sciences. **225**—Bericht, Naturwissenschaftlich—Medizinischer Verein in Innsbruck. **226**—Transactions, Academy of Sciences of St. Louis. **227**—Memorias, Instituto Oswaldo Cruz, Rio de Janeiro. **228**—Georgia State Board of Entomology, Atlanta. **229**—Trabajos, Laboratorio de Investigaciones Biologicas de la Universidad de Madrid. **230**—Revista. Museo de la Plata, Buenos Aires. **231**—Annuaire, Musee Zoologique de l'Academie Imperiale des Sciences de St. Petersburg. **232**—Philippine Journal of Science, General Science, Manila. **233**—Iowa State College of

Agricultural and Mechanical Arts, Experiment Station, Ames.

GENERAL SUBJECT. American Economic Entomology, **10** lxxxiii, 47. **Cockerell, T. D. A.**—Some insects collected in northwestern Colorado in 1909, The University of Colorado Studies, vii, 126. **Cook, M. T.**—Cecidology in America, Botanical Gazette xlix, 219. **Iches, L.**—Les insectes ennemis des cotonniers dans l'Argentine et leurs parasites, **16,** lvii, 64. **Needham, J. G.**—General Biology; a book of outlines and practical studies for the general students (includes much on insects). Ithaca. The Comstock Publishing Co. 1910. **Thayer, G. H.**—Concealing-coloration in the animal Kingdom. (Insects page 183). New York. The Macmillan Co. 1909.

APTERA. **Rothschild, N. C.**—A new flea from California, **8** xxi, 88 (*). Chiastopsylla, a new genus of Siphonaptera, **9,** xliii, 105, (°).

NEUROPTERA. **Bugnion, Ed.**—Le Termite noir de Ceylan (Entermes monoceros), **86,** lxxviii: 271 .**Martynou, A.**—Les Trichopteres due Tibet oriental et du T saidam d'apres les materiaux collectionnes par l'expedition de la Societe Imperiale Geographiques Russe. (New descriptions in English and Russian), **231,** xiv, 256, 1909, (°). **Navas, R. P. L.**—Crisopidos nuevos, **223,** ix, 38, (°). **Tillyard, R. J.**—Studies in the life-histories of Australian Odonata, **128,** xxxiv, 256, 370, 1909.

ORTHOPTERA. **Allard, H. A.**—Musical crickets and locusts in North Georgia. **102,** xii, 32 **Burr, M.**—The fauna of British India including Ceylon and Burma. Dermaptera. London, Taylor & Francis, 1910. **Morse, A. P.**—A hopperdozer for rough ground, **5,** xvii, 79. **Rehn, J. A. G.**—On some Orthoptera from Porto Rico, Culebra and Vieques Islands, **153,** xxviii, 73 (*). **Rehn & Hebard.**—An Orthopterological reconnoissance of the Southwestern U. S. Part III. California and Nevada, **1,** lxi, 409, 1909, (*). **Van Ryneveld, A.**—Locust destruction, 1909-1910. Invasion by brown locust (Pachylylus sulcicollis), **108,** xxxvi, 158.

HEMIPTERA. **Banks, C. S.**—Rhynchota Palawanica, Part I Heteroptera, **232,** iv, 553, 1909 (°). **Breddin, G.**—Beitrage zur Systematik der Pentatomiden Sudamerikas. Viertes Stuck, **59,** 1909, 615. **Cockerell, T. D. A.**—A new mealy-bug (Coccidae) from S. America, **9,** xliii, 113. **Oshanin, B.**—Verzeichnis der palaearktischen Hemipteren. Heteroptera, 1. Band, III, Lieferung, 1909. **Van Duzee, E. P.**—Monograph of genus Crophius, **224,** ix, 389, 1909 (*). **Webster, R. L.**—The apple-leaf hopper (Empoasca mali), **233,** Bull. No. 111. **Wilson, H. F.**—Notes on the two papers on Aphididae by Rafinesque, **102,** xii, 27. **Woodbury, C. G.**—The San Jose scale. Some sprays for its control, **222,** Bull, No. 138. **Worsham & Chase.**—The San Jose Scale and some experiments for its control, **228,** Bulletin, No. 31.

LEPIDOPTERA. **Busk, A.**—Two new American species of the genus Ethmia, **102,** xii, 53 (*). A correction. (Socorypha should be Isocorypha), **102,** xii, 26. **Dyar, H. G.**—The larva and food-

plant of Glyptocera consobrinella, **102,** xii, 52. A new Euclea (E. trichathdota), **102,** xii, 26, (*). Two new species of Laetilia, **102,** xii, 54 (*). **Haensch, R.**—Die Grossschmetterlinge der Erde, II., Hauptteil. Exotica, 1, Abteil. Fauna Americana, 20 Lief. **Hoffmann, F.**—Wie soll man sich die theoretischen Kenntnisse der einzelnen Schmetterlingsgruppen aneigen? **216,** xxiii, 225, 230. **Rau, P.**—Observations on the duration of life, on copulation, and on oviposition in Samia cecropia, **226,** xix, 21. **Reiff, W.**—On the resistance of gypsy-moth eggs (Liparis dispar) to cold and other conditions, **5,** xvii, 69. Einige Flacheri-Experimente mit der "Gypsy moth" (Liparis dispar), **40,** xxiv, 178. Die lebenweise der raupe von catocala pacta im freien, **166,** iii, 379, 1909. **Rothschild, W.**—Catalogue of the Arctianae in the Tring museum, with notes and descriptions of new species, **51,** xvii, 1. **Sanderson, E. D.**—The codling moth and how to control it by spraying. **221,** Bulletin, No. 143. **Strand, E.**—Zwei neue afrikanische Hesperiiden, **166,** iii, 402, 1909, (°). **Turner, A. J.**—New Australian Lepidoptera belonging to the family Noctuidae, **128,** xxxiv, 341, 1909, (°). **Walsingham, Lord**—Biologia Centrali-Americana. Lepidoptera Heterocera. Vol. IV. pp. 1-24, (*).

DIPTERA. Becker, R.—Zur kenntmis der mundteile und des kopfes der Dipteren-larven, **89,** xxix, 281. **Boyce, R. W.**—Mosquito or man? The conquest of the tropical world. New York. E. P. Dutton & Co., 1909. **Cajal, S. R.**— Nota sobre la estructura de la retina de la mosca (M. vomitoria), **229,** vii, 217, 1909. **Dickinson, H. E.**—Mosquitos and fish, **192,** iv 19. **Hine, J. S.**—A comparative study of four genera of horseflies, **143,** x, 149. **Johnson, C. W.**—A note on the species of Fucellia of eastern No. America, **5,** xvii, 76. **Lutz, A.**—Contributcao para o conhecimento das especies brazileiras do genero "Simulium. Beitrag zur kenntniss der brasilianischen Simuliumarten, **227,** 1, 124, 1909. **Melander, A. L.**—The genus Tachydromia, **5,** xvii, 41, (*). **Perez, C.**—Recherches histologiques sur la metamorphose des muscides (Calliphora erythrocephala), **73,** iv, 1. **Thibault, J. K.**—Notes on the mosquitoes of Arkansas, **102,** xii, 13.

COLEOPTERA. Bourgeois, J.—Malacodermes et Lymexylonides de Ceylan, **86,** lxxviii, 422, (°). **Bruch, C.**—Nuevas especies de los generos Philochloenia y Demodema (Coleopteros Lamelicornios), **230,** xvi, 340, 1909. **Bugnion, Ed.**—Les metamorphoses de l'Eumorphus pulchripes de Ceylan, **86,** lxxviii, 283. **Champion, G. C.**—Biologia Centrali-Americana, Coleoptera. Vol. IV. part 7, pp. 49-78, pl. iii, (*). **Chapman, J. W.**—The introduction of a European Scolytid (the smaller elm barkbeetle, Scolytus multistriatus) into Massachusetts, **5,** xvii, 63. **Chase, W. W.**—The plum circulio and methods for its control, **228,** Bulletin, No. 31, Part 1. **Gillet, J. J. E.**—Especes nouvelles du genre Copris releve synonymique des especes decrites a ce jour, **83,** xxxii, 1. **Hofender,**

K.—Mengenilla n. g. Chobautii n. sp. Eine neue Strepsiptere aus Nordafrika, **225**, xxxii, 33, (°). **Horn, W.**—Megacephala (Phaeoxantha) tremolerasi, n. sp., **230**, xvi, 32, 1909. **Leveille, A.**—Coleopterorum catalogus. Pars 11. Temnochilidae. **Ohaus, F.**—Neue Coleoptera lamellicornia aus Argentinien, **45**, 1910, 173, (°). **Olivier, E.**—Description d'un Lampyride nouveau de la Republique Argentine, **230**, xvi, 50, 1909. **Pic, M.**—Description de deux Coleopteres de l'Amerique meridionale, **230**, xvi, 37, 1909. **Ross, E.**—Deliathis incana, eine Lamiini de aus Yucatan im hafen von Neufahrwasser bei Danzig, **166**, iii, 446, 1909. **Webster, F. M.**—The clover root-borer (Hylastinus obscurus), **7**, circular No. 119. **Wickham, H. F.**—New fossil Coleoptera from Florissant with notes on some already described, **163**, xxix, 47. A list of the Van Duzee collection of Florida beetles, **224**, ix, 399, 1909.

HYMENOPTERA. Cockerell, T. D. A.—Descriptions and records of bees, **11**, v., 256, (*). **Ferton, C.**—Notes detachees sur l'instinct des Hymenopteres melliferes et ravisseurs. (5th Serie), **86**, lxxviii, 401. **Friese and Wagner.**—Zooligische studien an Hummeln. 1. Die Hummeln der deutschen Fauna, **89** xxix, 1. **Kieffer, J. J.**—Description de nouveaux micro-hymenopteres du Bresil, **86**, lxxviii, 287, (°). **Morley, C.**—On the Hymenopterous parasites of Coccidae, (continued) **9**, xliii, 110. **Rohrwer, S. A.**—A new genus of sawflies from Chile, **102**, xii, 30 (°). Some new wasps from New Jersey, **102**, xii, 49, (*). **Schrottky, C.**—Beitrag zur kenntnis der Scoliidae and Eliddae aus Argentinien und Paraguay, **45**, 1910, 195. Nuevos Himenopteros Sudamericanos, **230**, xvi, 137, 1909, (°). **Schulthefs Rechberg, A.**—Ueber einige neue und weiniger bekannte Eumeniden, **45**, 1910, 187 (°). **Wheeler, W. M.**—Small artificial ant-nests of novel patterns, **5**, xvii, 73. Ants; their structure, development and behavior. New York. The Columbia University Press., 1910.

REVIEWS.

General Biology. * * * A Book of Outlines and Practical Studies for the General Student, by James G. Needham, Ph.D., Assistant Professor of Limnology and General Biology in Cornell University, with 64 Practical Studies, 287 Text Figures, and 9 portraits, Ithaca, N. Y. The Comstock Publishing Co. Price, $2.00.

This work contains a considerable amount of entomology. The following illustrate the character of some of the studies: "Flowers adapted to insect visitation; insects adapted to visiting flowers; the relative fitness of different visitors to one kind of flower; an examination of all the flowers visited by some common insect; a case of precise adaptation; a study of common galls; observations on ants and

aphids." There is a chapter on the veins in the wings of insects and considerable space is devoted to the life cycle and transformations of insects. Under adjustment of organisms to environment, insects are also treated. This work will appeal to the student of entomology, who also wishes to have a general review of the lives and activities of animals other than insects, and plants. Prof. Needham being an entomologist as well as a general biologist has introduced more on insects than is usually found in such works.

Ants, their Structure, Development and Behavior, by William Morton Wheeler, Ph. D., Professor of Economic Entomology, Harvard University; Honorary Curator Social Insects, American Museum of Natural History. New York, Columbia University Press, 1910. Price, $5.00. The author of the work says:

"If an excuse was required for its publication, one might be found in the fact that for many years no comprehensive treatise on the ants has appeared in the English language." The extent of the literature of Entomology, possibly nearly fifty per cent. of Zoological literature, and its scattered and often fragmentary character militate against the study of the subject. When a master gives us not only a digest of this but also the benefit of his own studies and original observations we should indeed be grateful.

The subject is covered in the most thorough manner and could probably not be more complete without going into detail beyond the limits of the work. There are thirty chapters and valuable appendices. The chapters are divided into a number of parts, each taking up some special subject. Some idea of the contents may be obtained from the chapter headings as follows. As dominant insects; the external structure; the internal structure; the development; polymorphism; the history of myrmecology and the classification; the distribution; fossil ants; general habits; nests; ponerine ants; driver and legionary ants; harvesting ants; the relations of ants to vascular plants; fungus growing ants; the relations to plant-lice, scale-insects tree-hoppers and caterpillars; honey ants; persecuted and tolerated guests; true guests, ecto, and entoparasites; compound nests; temporary social parasites; sanguinary ants, or faculative slave-makers; amazons, or obligatory slave-makers; the degenerative slave-makers; the degenerative slave-makers and permanent social parasites; the sensations of ants; the instinctive behavior of ants; the plastic behavior. The appendices take up the following subjects: Methods of collecting, mounting and studying ants; key to the subfamilies, genera and subgenera of the North Ameri-

can Formicidae, for the identification of the workers; a list of described North American ants; methods of exterminating noxious ants; literature. There are 286 excellent figures and photographs, most of which are original. The typography of the work is all that can be desired and the arrangement of the matter very good.

It will be many years before this work outgrows its usefulness and at the present time it is badly needed. These insects, on account of their many interesting habits make them fascinating objects of study and a book like this will undoubtedly lead many to take a new interest in the subject and may be the means of inducing others to investigate the Formicidae for themselves. Dr. Wheeler has given us a work of unusual value and one of which he may well be proud, and the entomologists of America may congratulate themselves on having among their number one who is such a painstaking, earnest and able student. No entomological library can be complete without this book and as already mentioned it will long be authoritative. The keys, list of described species and the bibliography are especially useful and will appeal to a number of students who are not specialists.

Doings of Societies.

The twenty-second annual meeting of the Feldman Collecting Social was held January 19, 1910, at 1523 S. Thirteenth Street, Philadelphia, and ten members were present, President Harbeck in the chair. He read his annual adddress, which was ordered to be incorporated in the minutes.

The officers of the previous year were nominated and elected to serve during the present year as follows: H. S. Harbeck, President; F. Haimbach, Vice-President; H. W. Wenzel, Treasurer; Geo. M. Greene, Secretary, and C. T. Greene, Assistant Secretary.

Prof. Smith spoke of the fauna of Mexico.

Mr. Wenzel spoke of the fine opportunity for breeding small insects from the many twigs which were broken off during the recent heavy snow storm.

Mr. Daecke exhibited two specimens of *Dicymolomia julianalis* Wlk. and stated that on September 14, 1909, Mr. A. F. Satterthwait collected near Middleton, Pa., a number of cattails from the cat-tail rush. Examining these, Mr. S. noticed

infestation and soon after specimens of *D. julianalis* began to appear and are still emerging at this date, January 19, 1910. A number of Ichneumon flies were also bred from this cage.

Prof. Smith spoke of the "wood leopard moth" around Harvard University and said it seems as though there is nothing done to stop the ravages of this insect in that locality. (Life of larva is about two years.) He said the English sparrow is the only bird that keeps down the moth here and on account of the numerous gray squirrels on the campus the sparrows are absent and consequently the moth breeds there.

Adjourned to the annex.

CHAS. T. GREENE, *Assistant Secretary.*

At a regular meeting of the Feldman Collecting Social, held February 16, 1910, at 1523 S. Thirteenth Street, Philadelphia, eleven members were present, President Harbeck in the chair.

After reading an extract from a letter sent by Mr. Manee at Southern Pines, N. C., saying that on October 27 and November 22, 1909, he had split from pitch pine cord wood fresh imagoes of *Buprestis striata* Fabr., a species which is in the open in April and May, proving thereby that it must remain in the adult for several months, Mr. Wenzel made many interesting remarks on this genus.

Mr. Daecke exhibited three species of Scenopinidae and stated that the window fly, common in Philadelphia, is *S. glabrifrons* and not *fenestralis* as is usually supposed. *S. fenestralis* seems to be more common in Harrisburg. A pair of *Metatrichia bulbosa* O. S. which he collected on top of the Blue Mountains near Harrisburg, August 8, 1909, adds a new species and a new genus to the State. It was previously recorded from Missouri. He exhibited also specimens of *Traginops irrorata* Coq., a rather rare Agromyzid, and stated that a great many were found on running sap of an oak tree on top of the Blue Mountains near Harrisburg, August 8, 1909. He also exhibited a fly, *Pterodontia flavipes* Gray, collected by H. A. Wenzel in beating pine at Calandar, Ontario, July 19,

1909. There is one specimen in the Amer. Ent. Soc. collection from Georgia.

Dr. Skinner mentioned a moth, *Gastropacha americana* Harr., bred inside and brought to the Academy alive, which had laid eggs. He said if they should prove to be fertile the male moth must have emerged at this time of year too. He described the larva and told how hard it was to see, as its markings are ranged in exact duplicate of those on the bark where it rests. This led to a discussion on protective mimicry.

Mr. Haimbach said he had collected a small moth in pot of lamp-black where he found larvae feeding.

Adjourned to the annex.

GEO. M. GREENE, *Secretary.*

OBITUARY.

GEORGE WILLIS KIRKALDY.

1873-1910.

The fulfillment of sad duties is the lot of man. To me has come that of making known the death in the flower of his manhood, of George Willis Kirkaldy, my good friend.

After a separation of some months from his wife and little one, whom he worshipped, he went to San Francisco, where they were, to spend the Christmas holidays with him. While there, he was induced to submit to a fifth operation on an old fracture of the leg and although it was successful he grew gradually weaker and weaker, and less than a week later, on the 2d of February, he breathed his last. That acute intellect, that ceaseless, untiring worker was at rest! His course was run, and he fell ere he grasped the bays that were to crown his achievement.

George Willis Kirkaldy was born at Clapham, in 1873, and was therefore in his 37th year. From his youth he evinced a great love for natural history, but after finishing his studies in the City of London School, he went into the city, where he remained until 1903, when he accepted a position in Honolulu, with the Hawaiian Department of Forestry and Agriculture.

Then began the happiest and most productive period of his life, and there also he met with the accident that eventually was to deprive the world of the most promising of the younger generation of scientific hemipterologists. Shortly after his arrival in Honolulu, while out riding, he forgot the American rule of the road, and turned his horse, after the English fashion, to the left as he came to a turn in the road, and crashed into a carriage coming in the opposite direction. His horse fell on him and crushed his leg. This was badly set, and after the bones had knit, it had to be broken again and reset. This operation was repeated at intervals no less than four times, the last with fatal results. There, too, he met the lady who became his wife; there his little ones were born, and his little son, George, the first and best beloved, died in infancy.

Freed from the sordid details of clerical work, in his new position, he was in his element. He did not, indeed, care greatly to work on other groups of insects, and at times the daily routine of the economic entomologist was irksome, but nevertheless, whatever he did was done well, and he found time to dedicate to his researches in the Hemiptera, although nearly all the work he did was done at home in the evenings, after the day's task was done. Yet, in spite of the limited time at his command, he was able to produce enormous quantities of work of the highest character. At some time in the near future, I hope to be able to give at greater length an account of his work. For the present, I shall merely mention his great work on the Jassidae in connection with the Sugar Planters' Association work on the parasites of the sugar cane, and the general Catalogue of the Hemiptera, now in course of publication, both of which mark epochs in Hemipterology. Like every earnest worker in the Hemiptera, the nomenclatorial chaos into which the order had fallen soon forced itself upon his notice, and much as he disliked to neglect the biological phases of the group, he was impelled to endeavor to place this important branch of the subject on a stable basis. In the pursuit of this laudable object, he was compelled by the sheer logic of the circumstances, to take radical and iconoclastic measures, but

he regretted just as keenly as any of his opponents and critics the necessity of doing away with many a name hallowed, as it were, by long usage.

Kirkaldy had all the vivacity and ardor of the Celt, which may at times have led him to accept perhaps too quickly and maintain too enthusiastically views which a more mature judgment showed to be untenable. Joined to this was a relentless Scotch logical temperament, which drove him inexorably and unswervingly to conclusions which at times were opposed to his natural inclination, yet which his passion for truth compelled him to accept and battle for. Above all things he hated sham; he loathed that spirit of pompous and self-sufficient importance which curses some small men. A constant and tireless worker, a minute, patient, resourceful student, he ever looked singly to the advancement of the knowledge of the Heteroptera, that group so sadly and shamefully neglected in comparison with other orders. In that bright galaxy where shine the illustrious names of Fabricius, Burmeister, Dufour, Amyot, Fieber, Stål, and in our days, most happily still with us, of Reuter, Horváth, Montadon, Bergroth, his is not the dimmest, and had Azrael held his hand, he had shone among the most brilliant.

As for me, I have lost a dear friend, an inspiration and a lode star; one who encouraged me when I was faint; who helped me when I fell; to whose constant words of cheer I owe what little success I may have achieved. Our minds moved in harmonious accord; our gifts were complementary to each other, and in so far as one so insignificant might, I helped my friend in my small way, a feeble return for his many kindnesses.

Better than any, perhaps, I can gauge the loss to science by his untimely death. His worked planned, outlined in many a letter, carried out with his enthusiasm, his thoroughness, his energy, was destined to place him on the same lofty, still eminence where sits Stål alone, beyond the reach of the petty bickerings and disputes of the pseudo-great.

"And so the grim reaper reapeth among the flowers."

J. R. Torre de la Bueno.

Stockhausen, Printer, 53-55 N. 7th Street, Philadelphia.

JUNE, 1910.

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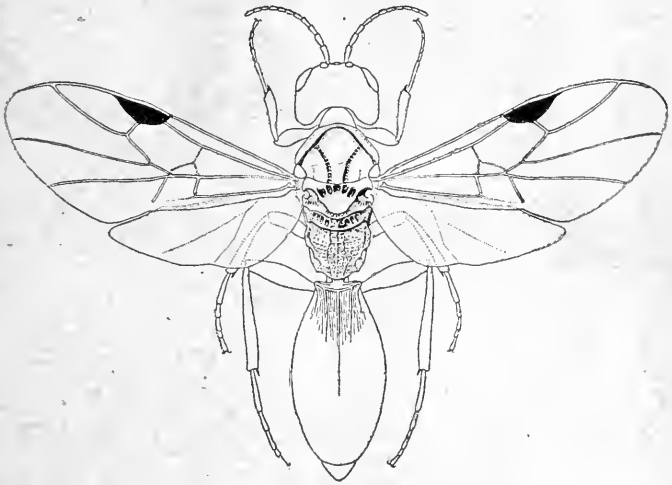

Vanhornia eucnemidarum Crawford.

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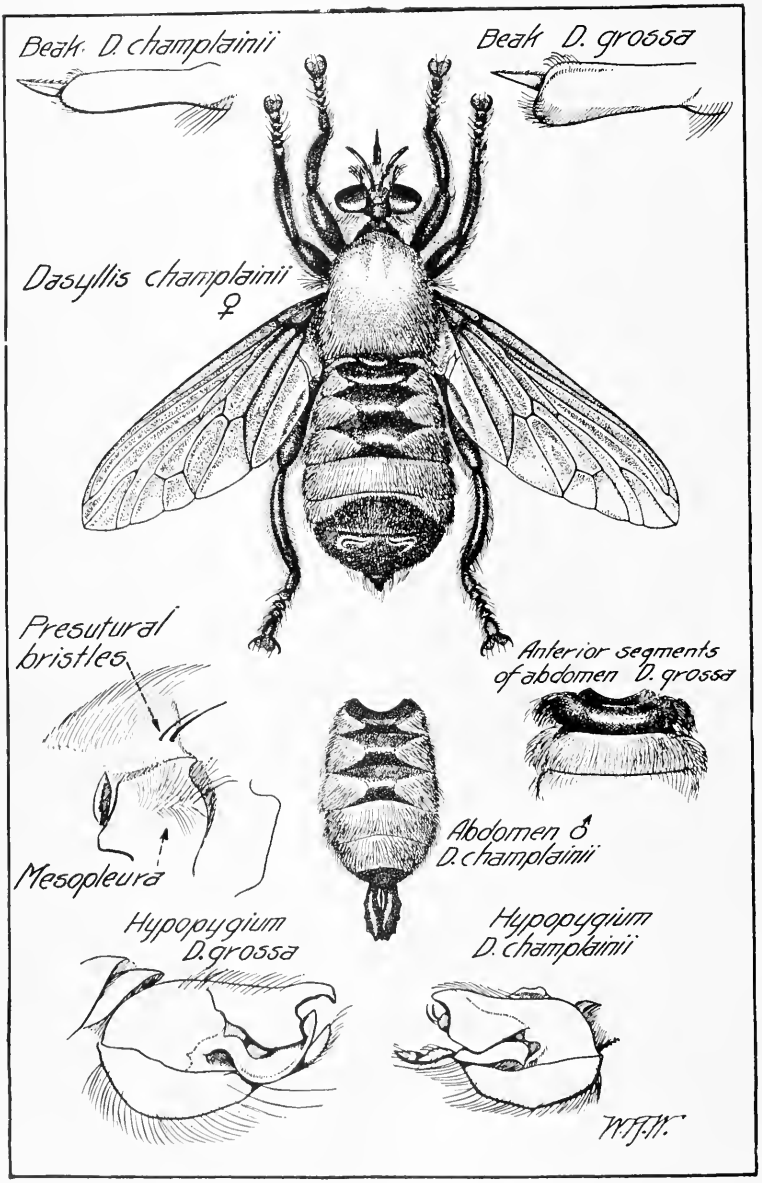

A NEW DASYLLIS FROM PENNSYLVANIA—WALTON.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXI. JUNE, 1910. No. 6.

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A New Species of Dasyllis from Pennsylvania.

W. R. WALTON, Harrisburg, Pa.

(Plate IX)

While collecting at Carlisle Junction, Pa., at the base of the South Mountain on June 22, 1909, the writer collected two *Asilids* which then seemed to be *Dasyllis grossa* Fabr.

When examined at leisure, however, important differences became apparent and Mr. E. Daecke, to whom they were shown, declared that in his opinion it was a new species.

On the following July 1st, an attempt was made to secure additional specimens, which resulted in the acquisition of three more individuals, two of which were males.

Upon comparing these specimens with the species already in the literature I, too, am convinced that it is new to science.

Dasyllis champlainii sp. nov.

Length 19 to 24 mm. Moustache and beard pale yellow (lemon-yellow) to tawney (pale brown ochre). Bristles of the mystax distinct and black. Dorsum of thorax covered with prostrate, rather short, pale yellow to tawney, pile. Pile and bristles of the mesopleura black or at most with a very slight sprinkling of yellowish hair near the upper edge. Scutellum black, shining, thinly covered with small, black, prostrate bristles. Abdomen; first segment black, somewhat shining, with a triangular spot of yellow to tawney pile on the lateral hind margins enclosing a black, somewhat anvil shaped spot, which is shining and thinly covered with black hair. Anterior lateral margins bearing

black hairs. Second and third segments similar to the first, but without black hair of anterior lateral margins and with the black spot on the disc of slightly less width. Fourth segment in both sexes completely covered with yellow to tawney pile. Fifth segment in the male usually covered with yellow to tawney pile. In the female with a triangular spot of yellow pile on the lateral margins, the remainder of the segment being black. Sixth segment in both sexes black, with black prostrate hairs and pile. Hypopygium in the male prominent and narrowly connected with abdomen. Wings brownish, darker along the nervures. Front and middle coxae, front, middle and usually hind tibiae and all tarsi with yellow to tawney pile. The light colored pile being confined to the outer surfaces of the tibiae and is mixed with black hair. The pile of the hind legs becomes almost entirely black in the darker colored individuals. There are usually present one or two rather strong, black, presutural bristles which project nearly at right angles with the pleura. When two of these are present, the more caudad is the stronger. The length of the second antennal joint is contained in the third about four times.

I take pleasure in naming this proposed species in honor of Mr. Alfred B. Champlain, who has added a great deal, in a very short time, to our knowledge of the *Diptera* and *Coleoptera* of this immediate region.

Five specimens, Carlisle Junction, Pa., collected by the author; one specimen, Colemansville, Pa., P. H. Hertzog; one specimen, Lyme, Conn., A. B. Champain. Type male and female deposited in the U. S. National Museum, Washington, D. C.

The species described above resembles most nearly *Dasyllis grossa* Fabr, but differs in the following details:

Third joint of antenna somewhat shorter. There are apparently no presutural bristles of the character mentioned above in *D. grossa*. First abdominal segment in *D. grossa* separated from the second by a deep incision, is somewhat swollen at the sides and almost if not entirely black. In *D. champlainii* this is not the case. The proboscis sheath in *D. grossa* is terminated abruptly and incrassated or clubbed; in *D. champlainii* it is much less so.

There exists also a very distinct difference in the structure of the hypopygium and color markings of the abdomen, both of which are shown on the accompanying plate.

Aphis aquaticus Jackson vs. Rhopalosiphum nymphaeae Linnaeus.

By JOHN J. DAVIS, Office of the State Entomologist, Urbana, Ill.

In the January, 1907, number of the "Ohio Naturalist," Mr. C. F. Jackson describes as new a species of *Aphis* under the name *A. aquaticus*. Mr. Jackson has very kindly sent me specimens of his new species, and, comparing them with aphids which I have collected on water plants in Illinois, find the two identical. Also it agrees reasonably well with the various descriptions of *Rhopalosiphum nympaeae* Linn.

R. nymphaeae, an European species, was first determined as such from specimens collected in this country, by Mr. J. T. Monell, and was first reported by Messrs. Osburn and Sirrine* as occurring in Iowa on *Nymphaea odorata* (pond lily), and probably the same species on *Sagittaria variabilis*. Later Mr. J. H. Cowen† mentioned *R. nymphaeae* (?) *from Colorado* on *Sagittaria varibilis*. In 1905, Professor Theo. D. A. Cockerell‡ gave a detailed description of this aphid which he collected in Colorado on *Myriophyllum verticillatum*. Mr. Monell writes me that he has found it in Southern Missouri on native *Sagittaria* and in the public parks of St. Louis on exotic water lily and other water plants. In Illinois we have taken it on *Sagittaria, Lemna,* and pickerel grass, out-of-doors, and on *Philotria canadense* and calla, on which it often becomes quite troublesome, in conservatories.

As stated above, I have compared the American specimens with the descriptions of *Rhopalosiphum nymphaeae* Linn., given by Kaltenbach, Koch and Buchton, and find no appreciable difference. In addition, I have made a careful com-

*Notes on Aphididae. (Proc. Iowa Acad. Sciences f. 1892, vol. I., pt. 3, p. 98. Also Insect Life, Vol. 5, Apr. 1893, p. 236.

† A preliminary list of the Hemiptera of Colorado (Bull. Agr. Exp. Sta., Colo. Tech. Ser. 1, 1895, p. 123.

‡ A lactustrine aphid (*Rhopalosiphum nymphaeae.*) (Science, Vol. 22, Dec. 8, 1905, p. 764.

parison with an excellent original sketch of the wingless viviparous female which Dr. G. Del Guercio has very kindly sent me. It agrees in every respect even unto the relative lengths of the antennal segments, cornicles and style. The antennal tubercles as shown in this sketch are scarcely perceptible, not more than in some of our specimens, in which this character varies, and in the illustrations given by Jackson. The species seems to better belong under the genus *Siphocoryne,* but this is a contestable point owing to the variations in the antennal tubercles. Another peculiar character in which the American and European forms agree, adding proof to the identity of the two, is the wax glands, mentioned and figured by Jackson. Kaltenbach speaks of these glands as "ein Strich unter dem Thoraxrande weissbestaubt." From these studies I have concluded that *Aphis aquaticus* is synonymous with the European "semi-aquatic" aphid, *R. nymphaeae.*

I herewith give a translation of Kaltenbach's description of this species, as given in his "Monographie der Familien der Pflanzenlause."

"One finds these plant lice on various water plants in strong populated colonies,; on the white water-lily (*Nymphaa lutea, alba*) in the flowers; on the water-plantain (*Alisma plantago*) on the flower buds and at the top of the stocks; on the water-gladiole (*Butomus umbellatus*) along the stalks and on the leaves; on the pond-weed (*Potamogeton natans*)in the rolled-up young leaves and on the peduncle of the same. July to September.

Wingless female: The antennæ are blackish brown, the two basal segments brownish, the third pale. The eyes are brownsh red. The beak reaching to the third pair of legs, is thick, greenish, the two terminal segments blackish brown. The head is yellowish brown; the third segment of the thorax plainly separated, the abdominal segments combined as one. The whole dorsal surface is olive green with darker marbling, however, there is a longitudinal line along the dorsal median which is moderately constant. The cornicles are moderately long (2-3—¾ of the normal size), at the base yellowish, towards the distal end brown and before the end somewhat thick. The style is narrow, curved, short, scarcely 1-3 the length of the cornicles and, has the

posterior segments, dark green to black. The under surface of the body is covered with short hairs, dull, olive green with darker marbling; two longitudinal lines along the neutral median moderately constant. The legs are brownish green, the basal portions of the femora and the tibiæ usually somewhat lighter, yellowish green. The style and a line under the edge of the thorax dusky white.

Winged female: The antennæ are shorter than the body, black, first and third basal segments yellowish. The eyes are brown; the beak reaches to the third pair of legs, is yellowish green, the tip and enlarged basal portion of the same, brown. The neck-ring is brown, anteriorly and posteriorly to which is margined with yellow, somewhat covered with hairs. Head and chest shining black; the dorsum of the abdomen shining olive green. The cornicles somewhat long, club shaped; the distal half thick and brown, the basal half thin and greenish yellow. The curved style is small, scarcely 1-3 the cornicles in length, and has the posterior segments blackish brown. The belly is dull olive green with two longitudinal median lines. The legs are dark brown to black, the base of the femora, and also, often the tibiæ of the fore legs dirty-yellowish green. The wings are transparent with dark brown veins; the base of the wings, the stigma and the subcostal vein yellowish brown.

Fulton County (New York) Tipulidae—I.

By Charles P. Alexander, Ithaca, N. Y.

During the season of 1909, a large number of more or less interesting crane-flies were collected by the writer at various localities in Fulton County, N. Y. Of the great amount of material collected, comparatively few specimens have been determined, and these are mentioned herewith. The species, *Erioptera dulcis* O. S., *Limnophila lenta* O. S., *Hexatoma megacera* O. S., *Pachyrhina macrocera* Say, *Tipula trivittata* Say, and *T. flavicans* Fabr., are not recorded in Prof. Needham's list of the New York crane-flies (23d Report of New York State Entomologist, Bull. 124 of the State Museum). Many of the species are comparatively uncommon.

The New York Tipulidae have been sadly neglected by the majority of collectors. The two most important collections made in the State are those of Baron Osten Sacken and Professor Needham.

Fulton County, in which all of my collecting was done, contains about all of the varied situations in which the different crane-flies occur. The Adirondack Mountains, with their scores of little lakes, occupy the northern half of the county; a river flows through the northeast corner; while great tracts of marshland (the Vlei) lie in the eastern part. The altitude ranges from about 500 feet up to 2,700 feet. My main collecting grounds are as follows:

1. The Woodworth's Lake and Canada Lake country, in the central, or west central, portion of the county. Small mountain lakes, lying between 1,500 and 1,600 feet above sea level. The character of the fauna and flora is typically Canadian. Most of the species of Tipulidae secured by Osten Sacken at Trenton Falls, and by Needham at Old Forge, occur here.

2. The Sacandaga Park country, in the extreme northeast of the county, is on the Sacandaga River, a branch of the Hudson. Sport Island, in the river, is about half a mile in length, and several hundred feet in width. The ground is mostly low, with grassy fields in the center, the margins of the island being overgrown with rank shrubbery, ferns, etc., forming choice haunts for many insects. The island is connected with the mainland (Sacandaga Park) at the northwest end, by a large wooden bridge. There is a broad strip of low land bordering the northeast coast of the island for several hundred feet. On each side of the island is a dam of about six feet drop, skirting the east shore of the island from the dam by several hundred feet to the south, are broad, pebbly beaches. On the southeast side of the island is a deep indentation into the land, an offshoot of the main stream, but filled with quiet water; this is called the "bayou." The altitude of the island is about 875 feet. The fauna and flora shows an intermingling of Canadian and Transition forms.

3. Gloversville, N. Y., in south-central part of the county; altitude, 900 feet.

4. Johnstown, N. Y., in southern part of the county; altitude, 700 feet.

These last two localities are in the township of Johnstown. Both cities are situated on the Cayudetta Creek, and only three miles apart. The fauna is mainly Transition.

The determinations have all been made, or confirmed by, Professors C. W. Johnson and J. G. Needham, to whom my sincere thanks are due.

1. **Rhipidia maculata** Meigen.

Woodworth's Lake (Bleecker township); altitude 1,600 feet; August 24, 1909; a few specimens, hovering about the crevices in a small cliff.

2. **Discobola argus** Say.

Canada Lake (Caroga township); altitude 1,550 feet; July 10, 1909; one in a spider's web, still alive. Woodworth's Lake (Bleecker township), altitude about 1,625 feet, August 22, 1909; one specimen, swept from rank, palustral vegetation.

3. **Limnobia parietina** O. S.

One fine specimen, Woodworth's Lake, August 20, 1909, from a small cliff along the outlet. My field notebook says, "From a crevice high up on the face of the cliff, I drove out a large crane-fly. It flew out of the cranny with sluggish, lumbering flight and lit on the top of a hemlock tree a foot or two away. By jumping up, I managed to sweep the specimen into my net."

4. **Toxorrhina muliebris** O. S.

I swept one specimen from tall, rank vegetation at Sacandaga Park. It was taken along the railroad embankment, north of the railroad station, about sunset, July 5, 1909.

5. **Rhamphidia flavipes** Macq.

Two specimens at Mountain Lake Bog Pond (Johnstown township); altitude 1,580 feet, June 26, 1909. One specimen swept from rank grasses at Sport Island, Sacandaga River, June 20, 1909. One specimen, southeast of Johnstown, N. Y., September 6, 1909.

6. **Cladura indivisa** O. S.

Woodworth's Lake, August 24, 1909, two specimens flying about in the woods. Johnstown, N. Y., September 12, 1909,

one specimen. It was extraordinarily abundant in a woods near Gloversville, N. Y., on September 22, 1909. The following is from my field notes:

"I went to Simmon's Woods, southeast of Gloversville, N. Y., this afternoon, and was very agreeably surprised at the occurrence, in large numbers, of this usually uncommon insect. Near the entrance of the woods, where Simmon's Brook emerges, the insects were found in numbers.

"At each step they flew out of the bushes to others farther away. They are wary insects, and when sitting on the upper side of a leaf, slip over the edge and hang inverted from the lower side when alarmed by an observer.

"They present a very characteristic attitude, sitting on the leaf of a tree, with their wings folded flat over the abdomen, and the six long legs stretched out over the leaf. A few were taken in copulation; these were all hanging on the under side of a leaf. Their habit of clinging to the under surface of a leaf is quite remarkable and I found several by looking for them there.

"There were hundreds of specimens in the low bushes of the woods, usually on the broad leaves of deciduous trees at a height of two or three feet. Sometimes they would alight on hemlock, and, occasionally, in ferns near the ground. It was the only Tipulid observed here to-day."

7. **Rhypholophus monticola** O. S.

Woodworth's Lake (Bleecker township), August 24, 1909. Several specimens flying about a small cliff along the outlet.

8. **Rhypholophus rubellus** O. S.

Along the Mountain Lake Railroad track, about two miles north of Gloversville, N. Y. One specimen, July 3, 1909, swept from ferns, in a damp woodland (Power House Woods).

9. **Erioptera (Mesocyphona) caloptera** Say.

Very common about Johnstown, N. Y.; first taken on the evening of June 1, 1909, several specimens swept from tall meadow grass. Very common throughout the summer, into September, in similar habitats. Sacandaga Park (Northampton township), July 5, 1909, a few specimens taken.

10. **Erioptera (Mesocyphona) dulcis** O. S.

One specimen in company with the last, which it somewhat resembles.

11. **Erioptera (Hoplolabis) armata** O. S.

Not at all rare about Johnstown, N. Y., from May and June until September 12, 1909, when I took a few specimens. It frequents shady places, such as gullies. Power House Woods (see *R. rubellus*), July 3, 1909, a few. Sport Island, Sacandaga R., July 5, 1909, very common.

12. **Molophilus hirtipennis** O. S.

Johnstown, N. Y., June 30, 1909, at twilight; July 1, 1909, one flew to a lamp in my house; not rare during the summer months.

13. **Goniomyia subcinerea** O. S.

Taken at the same time and place as *Rhypholophus rubellus* O. S. (No. 8); two specimens.

14. **Trichocera crumalis** Fitch.

Very common at times during the winter months. During November and in February and March it is found on cellar windows and, on warm days, out of doors. In late March and April it occurs in small swarms in sunny places in woods and along the edges of brush lots. On May 12, 1909, a very large swarm was observed at Johnstown, N. Y., hovering over a large fallen beech trunk. My latest record is May 19, 1909, one specimen at Johnstown, N. Y.

15. **Limnophila macrocera** Say.

Sacandaga Park, very common on damp vegetation along the railroad embankment north of the station. It was taken in large numbers on June 20 and 21, 1909. One specimen was taken near the Johnstown cemetery on July 2, 1909, and another on September 12, 1909. These are my only records. The species is generally not very common.

16. **Limnophila adusta** O. S.

East of Johnstown, N. Y., June 20, 1909, one specimen.

17. **Limnophila lenta** O. S.

Woodworth's Lake (Bleecker township), August 24, 1909.

It was not uncommon in the cool woods along the outlet of the lake.

18. **Limnophila (Dactylolabis) montana** O. S.

On May 16, 1907, I found this species very abundant around a stone quarry near the Gloversville Reservoir. The flies lurked in the crevices of the rocks and large numbers were collected as they hung inverted from the roof of the crannies. This is the only Limnophila that I have taken in such a situation. (This is mentioned in Needham's list, quoted before.)

19. **Hexatoma megacera** O. S.

This remarkable little species was not at all rare on Sport Island, Sacandaga R., June 6, 1909. It occurred on semi-palustral grasses along the northeast coast of the island and along the "bayou." It was very sluggish and not at all difficult to capture. A large number were secured.

20. **Eriocera longicornis** Walker.

Of this remarkable species I secured a single male specimen on May 18, 1907, flying at twilight over a grassy field near Gloversville, N. Y. On June 6, 1909, it occurred in large numbers on Sport Island, Sacandaga River. In the late afternoon a few scattered individuals were observed. Just after sunset the insect became very abundant along the north end of the island, hovering in small swarms over the water's edge and dancing about like many of our smaller Tipulids. Toward dusk, many species of may-flies and caddice-flies joined the little companies of dancing flies. Of the specimens secured, the males slightly predominated in numbers.

21. **Tricyphona (Amalopis) inconstans** O. S.

Canada Lake (Caroga township), July 10, 1909, two specimens. Not at all rare about Woodworth's Lake in August. Johnstown, N. Y., in June, July, August and, especially, early September.

22. **Liogma nodicornis** O. S.

Mountain Lake Bog Pond (Johnstown township), altitude 1,585 feet, June 26, 1909. It was very common toward sunset

on rank, semipalustral vegetation. One specimen in the cemetery gully, Johnstown, N. Y., June 15, 1909.

23. **Phalacrocera tipulina** O. S.

East end of Canada Lake (Caroga township), altitude 1,550 feet; one specimen only on July 10, 1909.

24. **Dolichopeza americana** Needham.

One specimen under the bridge at the outlet of the Mountain Lake Bog Pond (Johnstown township), altitude 1,585 feet. It was taken during a rainstorm, in company with Bittacomorpha, on June 13, 1909.

25. **Pachyrhina macrocera** Say.

One specimen in the gully on the north side of the Johnstown cemetery, June 30, 1909.

26. **Pachyrhina incurva** Loew.

Two specimens, male and female, in Johnstown cemetery gully on June 30, 1909.

27. **Pachyrhina ferruginea** Fabricus.

Two specimens near Johnstown, N. Y., June 24, 1909.

28. **Tipula abdominalis** Say.

Very common along the Park side of Sacandaga River from July 6 to 16, 1906. It was kindly determined by Prof. E. P. Felt.

29. **Tipula trivittata** Say.

Two specimens on Sport Island, Sacandaga River, June 12, 1909 (northeast coast). One specimen on Sport Island, June 20, 1909.

30. **Tipula flavicans** Fabr.

In early September this species became very common in most of the grassy fields and scanty brush lots about Johnstown, N. Y. Specimens were secured from September 3 until September 22, 1909, when I left that locality.

31. **Bittacomorpha clavipes** Fabr.

The phantom crane-fly is one of the most striking of our Tipuloidea. It is abundant and very widely distributed in the county. I have taken it in marshy woodland about Glovers-

ville (Cold Spring Woods) and near Johnstown, from June throughout August. It occurred at the Mountain Lake Bog Pond, June 13, 1909 (altitude 1,585 feet). It is a very common species at Sacandaga Park, frequenting the rank vegetation growing along the bottom of the railroad embankment. Specimens were observed June 20 to 22, 1909.

32. **Ptychoptera rufocincta** O. S.

One specimen in the Power House Woods near the government shooting range, north of Gloversville, N. Y., July 3, 1909.

33. **Idioplasta fitchii** O. S.

This was probably the most interesting species taken. Over half a century has elapsed since the discovery of this wonderful crane-fly by Asa Fitch.

I secured five specimens on Sport Island, Sacandaga River (Northampton township) from June 6 to 19, 1909. All five specimens were swept from the rank, tall vegetation along the northeast coast of the island, exactly opposite Wolf Island. The first two specimens were taken on June 6, two more on June 12, and the last on June 19. The beautiful ocellate markings on the wings are quite variable in shape and character. They are, however, generally arranged in three bands, a basal one, a medial one and a sub-terminal one, with a few scattered rounded apical marks. In one specimen the bands are almost complete, there being but one detached apical spot. In another specimen (June 12, 1909) the marks are separated, rounded spots, about three apical ones, five sub-apical ones, six medial ones, and three or four basal ones. These separated spots are usually contiguous but separable by their light color with a broad dark ring surrounding the marking.

The markings of the wings of my specimens are very conspicuous and, as Prof. Johnson suggests, bear a great superficial resemblance to those of *Epiphragma fascipennis.*

Hiram—"Josiah bet Siras a dollar that he could pick up a hornet and carry it across the street."

Siram—"Which won?"

Hiram—"Well, Josiah got across with the hornet, but Siras argues that the hornet lifted him about 20 foot o' the way."

On a New Species of the Saturnidae.

By J. Henry Watson, Manchester, England.

Cricula andrei (Jord.).

The genus *Cricula* consists of three species all confined to the Indomalayan district. The species included under *Cricula* by Sonthonnax in "Etudes de la Lepidopteres producteur de Soie" from Central and South America being now referable to *Copaxa*.

The species are *C. trifenestrata* (Helfer), well known to me only by the plate; *C. drepanoides* (Moore), and the species responsible for this article, *C. andrei* (Jord.). *C. trifenestrata*, which is the best known, is a very common species found in India, Ceylon, Java and as far East as the Philippines. In Assam, according to Mons. A. Wailly, the cocoons are so common and found in such large masses that they rot in the jungles for want of gathering; though this negligence may be explained, I think, more likely by M. Fredrick Moore's note in Trans. Ent. Socy., London, 1862, part 4, page 322, where, speaking of this species, he quotes: "Found in Assam feeding on the soon tree, and in Moulmein upon the cashew-nut tree, *Anacardium orientale* this is the Haumpottonee of the Assamese, noted by M. Hugon as being very common in Assam. He states that the silk can be spun like the Eria,* but the natives do not use it *on account of its silk causing a severe itching when weaving*. In Java the larva feeds on *Protium javanum, Canarium commune* and *Mangifera ingas*." To which I can add that certainly the larval spines are urticating and they will feed on oak, privet (*Ligustrum oralifolium*), *Rhododendron ponticum*. The cocoons are spun in masses; I have one containing at least 200 cocoons, which was bad in the center, and I fail to see how the moths could eclose from the center of the mass.

In the Entomological News for March, page 101, Dr. Stebbins gives us the life history of this species in a very complete manner and which I can corroborate, and makes in

* *Philosamia ricinii*.

the footnote, on page 103, the statement that Mr. I. English's results were different from his. At the time of writing I have not seen Mr. English's article in Entomologische Zeitschrift, September 25, 1909, Stuttgart, but *under the circumstances* these results were only what was to be expected as the life history there given is, as pointed out by Dr. Jordan, that of this new species, *Cricula andrei* (Jordan), Novitates Zoological, December, 1909: "On the species of *Cricula*, a genus of Saturnidae." In the course of my working out the life histories of Saturnidae, in which, as some of my American friends know, I have been engaged intermittently for some years, I have been fortunate enough to rear this new species, contemporaneously as it appears with Mons. E. André in France, after whom the species was named, and Mr. I. English. I had been receiving cocoons of *C. trifenestrata* from three sources in India, having in all four to five hundred cocoons from North Assam, Bangalore and Calcutta, and could not determine the exact locality, but know it was not Bangalore and feel sure it was North Assam. A few of these cocoons were solitary, of a darker color than the usual golden yellows of *trifenestrata*, and a few commenced to emerge in February, 1909, one female being a lovely cherry red with heliotrope suffusions over the borders of the wings.* It, however, was not until I was definitely able to know that these varieties were emerging from the darker cocoons that I separated them and got two pairings later on in May. Knowing that *trifenestrata* was a very variable insect, I thought it merely a richly colored large variety, and although the larvae were *green* with *black* heads I imagined they would change to black with red bands as they grew up; but as soon as I sent one or two with their parents to Dr. Jordan he pronounced it a new species and named it after Mons. André who had also sent him a fine blown larva a little previously. Dr. Jordan described the life history as far as known and which I am pleased to supplement with the other stages.

* This I now find is the usual color of ♀ Andrei, the ♂ being tawny gold.

C. andrei was first described by Westwood in "Cabinet of Oriental Entomology 1848." Plate XII, Fig. 1 ♂; from a single ♂ specimen under the name of *Saturnia zulcika*, which specific name was already given to *Saturnia* (now *Rinaca*) *zulcika* by Rev. F. W. Hope. Trans. Linn Socy., Lond., Vol. XIX, Pl. XI, page 132; the *figure being by Westwood himself.* The type of *Westwood's zulçika* ♂ and which is now referable to *andrei* ♂, is in the Hope Museum at Oxford and when I last saw it was the second specimen in the row of *C. trifenestrata;* as pointed out by Dr. Jordan the ♀ of *S. zulcika* of Westwood is a male of *trifenestrata.* Westwood evidently led to think that the *trifenestrata* having a less falcate contour than his male *zulcika (andrei)* (♂) was the female.

Egg.—Slightly larger if anything than *trifenestrata* laid in even rows where possible or in little masses of 8-15—with a small distinct black micropyle as in *Caligula simla* and *japonica.*

Larva. 1st Stage:—When hatched 3-16 inch long, body pale greenish yellow not changing to blackish brown as in *trifenstrata.* Head shining black with a few fine greenish hairs on skull pointing downwards. They are gregarious when young; 6 rows (2 dorsal) of black spots from the prothoracic carapace, which has 2 lateral ones, to the 11th segment, which is larger. Anal segment and legs brownish red; 2 dorsal and 4 lateral tubercles emitting a small tuft of black spines from the apex. Length on hatching from the egg 3-16 inch long. When ready to moult ¼ inch long.

2nd Stage:—Now a pale straw color with 5 fine black lines on dorsal and sides; head and legs shining black; two black spots on sides of prothoracic carapace, with a black spot on 11th and another on last segment and anal prolegs. The usual Saturninae rows of tubercles; from the apices of which are some coarse spines and fine black hairs ending with wavy white tips. During the second ecdysis the larvae become very transparent. Length ½ inch in length.

3rd Stage:—Colors and markings are the same as the 2nd. except that the lateral black lines are nearly obliterated; the double row of dorsal tubercles previously black, are now of a dull orange with black spines, and are long, black, bristle tipped, 1-3 of its length white. Head and feet shining black also spots on carapace and anal segment. The whole space between the tubercles is *regularly* and *systematically* covered with cream colored shining slightly raised shining tubercles, which now give the larva a very striking appearance in great contradistinction to *trifenestrata* as there the white tubercles are confined

to a band round each segment with a clear interspace between. This is noticeable in the illustration of *trifenestrata* larva plate II. The larvae prefer to feed head downwards. Length 1½ inches.

4th *Stage*:—There is practically no difference in this age except that the spots on tubercles are brighter apricot red and more raised on a slight mound than previously; the head still black is quite pubescent with greyish hairs. Color slightly more greenish and with a pronounced lateral ruga or longitudinal fold of skin along the sides, length 2½ inches and the larva rather slender, the spines on tubercles on thorax quite urticating enough to raise a slight blister.

5th Stage:—There is no change of note except that the lateral ruga is more pronounced and the anal tubercle is larger proportionately than before. The larva has a very soft and weak feel, but sticks tenaciously to anything it touches. Length about 3 to 3½ inches long, according to sex apparently. They are now feeding mostly solitary. They were all fed on oak.

They commenced to spin up August and some emerged in September and October. I had some pairings and these eggs commenced to hatch in October; some I sent to the cold store here, temperature 38-40 deg. F. These I have just put in a warm room, but have not hatched March 22nd. As it was a new species I did not wish to lose it and I distributed eggs over the continent within a few days' journey. Some sent to the Zoological Gardens, London, were reared and the 4 cocoons sent me back are darker russet brown than the original ones, while some reared on Privet and Rhododendron are pale greenish yellow. At the time of writing, March 22nd, I have one feeding on Rhododendron. This species will stand cold and frost occasionally.

Pupa closely covered with large punctures which are darker colored and larger and more numerous than *trifenestrata*. Pupal skin is a dull yellow whilst in *trifenestrata*, the color is darker and with finer punctures.

The moths of the third generation (the winter brood) have just commenced to emerge and are of a darker color than the other broods. I have one male of a bright reddish pink with pink costa to forewings.

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The Genus Mansonia.

By Harrison G. Dyar and Frederick Knab.

Those who have followed the literature on the Culicidae have doubtless been surprised that we have referred the common *Culex perturbans* of Walker to the genus *Mansonia*. Our conclusion was based essentially on the structure of the male genitalia of *perturbans* as compared with those of the type species of the genus *Mansonia*, *Culex titillans* Walker. The male genitalia of these two forms agree very closely, and show a most peculiar character, the thick chitinous rod inserted upon the side piece. Felt has figured three forms with this structure* *Culex perturbans* Walker, *Taeniorhynchus brevicellulus* Theobald and *T. aurites* Theobald, and has based his definition of the genus *Taeniorhynchus* upon it. In short the genera *Mansonia* and *Taeniorhynchus* (if we exclude the incongruous elements), in spite of the diversity in the form of the wing-scales, are identical.

We are aware that the structure of the genitalia alone might appear unconvincing to the uninitiated, and we are gratified to find our views confirmed by the recent discovery of the larva of *Mansonia titillans* by Mr. H. W. B. Moore, of Demerara, British Guiana. The early stages of *Mansonia perturbans* are now familiar through the writings of Dyar and Currie† and Smith and Grossbeck.‡ In an earlier work, Goeldi made known the young larva of *Taeniorhynchus fasciolatus* Arrib. and *T. arribalzagae* Theob., and it is clear from his figures that they are in every respect like the larva of our *Mansonia perturbans*.|| The larva of *Mansonia titillans* now proves in every essential the same, both as regards structure and habits. In "The Daily Argosy" of Demerara, January 27 and February 3, 1910, Mr. Moore speaks of this mosquito and his discovery of the larva as follows:

Goeldi, iv, 106, pl. G, 1905.

* Bull. 97, N. Y. State Mus., 487, pl. 15, fig. 2, Pl. 16 ff 1, 2, 1905.

† Proc. Ent. Soc. Wash., vi, 218, 1904.

‡ Ent. News, xix, 22, 473, 1908.

|| Os mosq. no Pará, Boll. Pará Mus. 27, 1902, and Mem. Mus.

"*Mansonia titillans* is one of the commonest mosquitoes of tropical South America, abounding especially in coast regions and along the banks of rivers. It is present with us throughout the year in greater or less numbers. Even in the height of the dry season it is here to annoy us. The larva has remained unknown. I had been hunting for it, and had searched to no purpose swamps, trenches and water-holes at morning, noon and evening. I also had tried over a dozen times to get the larvae from eggs by allowing the mosquitoes to suck my blood and then enclosing them in jars. In no instance did even one so much as deposit eggs. Now it happened that I was dipping with a calabash in one of the Kitty sweet-water canals for larvae of two other mosquitoes, which can always be found there. The water was pretty thickly coated with the aquatic plants Salvinia and Pistia. One of my dippings brought up a portion of Pistia, which I threw back. After pouring out most of the water I noticed a large stout whitish brown larva wriggling at the bottom of the calabash among the thick rust brown stuff dislodged from the roots of the plant. At first sight I thought it was a dragonfly larva, but, its actions making me suspicious, I turned it into my collecting tin for further examination. On arriving at the museum a cursory examination showed it was a mosquito larva new to me, and the biggest I had as yet come across. Next afternoon I returned to the same trench and soon discovered that by taking up Pistia and shaking the roots vigorously in water in my calabash that I could get in a short time quite a number of these big brown larvae. Last week the adult mosquito began coming out and it is *Mansonia titillans*.

"The siphon of the larva is characteristic, being short, conical, tapering to a point, black at the apex, and almost in a straight line with the length of the body. Its resting position is also characteristic, it hangs vertical, it likes to suspend itself among the roots of the green rosette-like plant Pistia and its general rusty brown color harmonizes well with the color of the muck about the roots. In lifting the plant from the

water the larvae come up with it entangled in the roots. The pupa has peculiar long siphons, that curve forwards and then outwards, and end in a point."

Mr. Moore has been kind enough to send us preserved larvae and pupae. It is clear from their structure that both the larva and pupa are attached to the roots of the Pistia from which they get their air. The apical portion of the breathing tube of the larva of *Mansonia titillans* is shorter and stouter than in *M. perturbans*, but essentially the same in character. This portion of the tube is a modification of the closing apparatus of the ordinary Culicid type of tube; it is provided, however, with serrations for piercing the tissues of the plant and with terminal hooks for retaining its hold. The pupae also greatly resemble those of *perturbans*. As in that species, the stellate hair-tuft of the first abdominal segment, which in floating pupae serves to lock them to the surface film, is here obsolete, while the anal paddles are narrow and cleft at the apex. The breathing tubes are long and in their terminal portion are each provided with a long strongly chitinized hook for insertion into the roots of the water-plant. Theobald has given a poor figure of what appears to be this pupa, furnished him by Dr. Low.* It is attributed to *Mansonia uniformis*, but as that species is oriental and Dr. Low worked largely in tropical America, we think the identification is probably due to a mistake.

Some points in the life-history of *Mansonia* still remain to be cleared up. Nothing is known of the mode of eclosion of the imago. To judge from the fact that the pupal skins are not found floating upon the surface of the water, the process must be unusual. The egg of *Mansonia titillans* remains unknown. We have already pointed out† that the eggs figured by Goeldi cannot be of this species, but belong to some species of *Aedes*, but the error persists, having been quoted by Theobald and others who naturally turn to this work. It will be seen from the above quotation that Mr. Moore failed in re-

* Mon. Culic., iii, 270, 1903.

† Can. ent., xl., 312, 1908.

peated efforts to obtain eggs. There may be some peculiarity in this respect connected with the chitinous hooks upon the eighth abdominal segment of the female adult, although it is probable that the eggs are laid in boat-shaped masses.

It may be stated that *Mansonia titillans* occurs in the United States. We have specimens taken by Dr. J. Hobart Egbert in the Everglades of Florida. As Pistia, the plant upon which the larvae occur, is widely distributed through the Southern States, occurring as far northward as North Carolina, this mosquito may be looked for in other favorable localities.

Another statement regarding *Mansonia* which has passed unchallenged is that the receptacula seminis of the female are but two in number. In fact, in all the species which typically pertain to this genus there are three receptacula. The statement is due to Neveu-Lemaire, who found two receptacula in an oriental species, *Mansonia uniformis* Theob.* It is probable that all the Old World species placed in *Mansonia* have but two receptacula seminis. Besides *Mansonia uniformis*, we have examined *M. annulifera* Theob. and find it has but two receptacula. We are at present unable to point out any tangible generic character, except the number of receptacula, to differentiate these forms. The eighth abdominal segment of the female shows the same series of hooks mentioned above as present in *M. titillans*, though it seems strange that the two groups should be congeneric with a different number of receptacula. It appears that the males of all the oriental *Mansonia* are unknown and the same is true of the larvae. The eggs of one of the forms have been figured by Theobald from a photograph furnished him by Dr. Daniels.† They show a long slender neck at one end and are stated by Theobald to be laid singly. This last statement, however, we are inclined to doubt, both from the appearance of the eggs and of the female abdomen; at all events the eggs have not been obtained under natural conditions. We refrain at present from designating a generic name for these forms. Probably one of the numer-

* Bull. Soc. Ent. France, xxii., 172, 1902.

† Mon. Culic., i., 21, 1901.

ous genera proposed by Theobald will be available for them. Such, perhaps, may be *Mansonioides;* but this question must be left open until the Oriental mosquitoes are carefully revised.

To summarize, *Mansonia,* properly understood, includes species which have been placed in at least three different genera by recent workers, *Mansonia, Taeniorhynchus* and *Chrysoconops.* All three of these genera have been founded upon scale characaters and are composite in character. We have just shown this in the case of *Mansonia.* In the case of *Taeniorhynchus,* if the species have been correctly identified, the genus was heterogeneous from its inception. *Taeniorhynchus confinnis* Arrib. belongs to *Aedes* in the broader sense. *Culex fulvus* Wiedemann, which was placed in *Taeniorhynchus* by Theobald, was afterward made the type of the genus *Chrysoconops goeldi.* It is an *Aedes,* and closely related to *Aedes bimaculatus* Coquillett. The oldest of the three generic names is *Taeniorhynchus,* but it is not available in this connection. Arribalzaga included in his genus *Taeniorhynchus* three species, *taeniorhynchus* Wiedemann and two other new species, *fasciolatus* and *confinnis.* By the rule of tautonomy, *taeniorhynchus* Wied. becomes the type, and, as this is an *Aedes,* the name falls as a synonym of *Aedes.* Theobald has complicated the situation by raising the question of the identification of Arribalzaga's specimens. He claims that Arribalgaza's *taeniorhynchus* was really *titilians* Walker, for which he proposed a new generic name, *Panoplites* (later changed to *Mansonia* by Blanchard on account of pre-occupation and designated *fasciolatus* as the type of the genus *Taeniorhynchus.* As we understand the rules, the "first reviser" principle does not apply until the other means of determining the type are exhausted. So Theobald was not justified in specifying *fasciolatus* as the type, which was already *taeniorhynchus* by tautonomy. Neither was he justified in questioning the identity of Arribalzaga's specimens. We consider that stability can only be secured by taking the names of type species at their face value without regard to questions of identification

or whether the generic diagnosis agrees with the type species or not. The important matter is to have a known type species for the genus and when an "old" species is mentioned as the type that species should be so taken whatever the author may have thought that species to be. A diagnosis is not necessary to establish a genus, and a diagnosis may be wrong without invalidating the genus. It is therefore not particularly important and should not be considered as against a statement or fixation of the type.

It should be stated that what we once gave as a definition of the larval characters of *Mansonia** is in reality a characterization of the genus *Bancroftia* Lutz. At that time we had not studied the adults, and the error came through the determination of *Bancroftia fascipes* as a species of *Mansonia*, by Mr. Coquillett, who followed the Theobaldian scale system.

The species of which we now know the male genitalia or the larvae, or which on other grounds we can place with certainty in *Mansonia* are the following:

Mansonia titillans Walker (tropical America).
Mansonia fasciolatus Arribalzaga (tropical America).
Mansonia arribalzagae Theobald (South America).
Mansonia flavcolus Coquillett (Lesser Antilles).
Mansonia coticula Dyar & Knab (Panama).
Mansonia nigricans Coquillett (Panama).
Mansonia juxtamansonia Peryassu (Brazil).
Mansonia perturbans Walker (North America).
Mansonia ochropus Dyar & Knab (New Hampshire).
Mansonia brevicellulus Theobald (Oriental Region).
Mansonia aurites Theobald (Africa).
Mansonia chrysogona Knab (Philippines).

A Plant-dwelling Odonate Larva.—A larva collected December 17, 1909, in the water among the leaf-bases of a Bromeliad growing at about twelve feet above the ground on a tree at Juan Vinas, Costa Rica, and brought to Cartago, where it has been kept continuously since, in a tumbler of water, transformed April 4, 1910, as *Mecistogaster modestus* Selys. I hope to publish detailed descriptions later.—Philip P. Calvert, Cartago, C. R., April 5, 1910.

* Journ. N. Y. Ent. Soc., xiv., 184, 1906.

Notes on Three Species of Jassidae.

By R. L. Webster, Ames, Iowa.

During the past year (1909), while making a study of the life history of the apple leaf hopper, *Empoasca mali,* some notes were made on two allied species also. Those observations concerning the apple leaf hopper will appear more at length in a forthcoming bulletin of the Iowa Agricultural Experiment Station, and hence will be given only brief attention here. The two other species under observation were *Empoasca obtusa* and *Typhlocyba rosae.* The notes were made mostly during May, 1909, at Shenandoah, Iowa.

Empoasca obtusa Walsh.

Early in May, Jassid egg pouches were found in the bark of Carolina poplar trees at Shenandoah. These pouches closely resembled those of *Empoasca mali* and were supposed to belong to that species until the rearing of the insects proved otherwise. The pouches were found in wood two or three years old, which on poplar trees is comparatively soft wood.

On May 12, and for several days following, the first nymphs were found on these trees. In one instance the head of a dead nymph was seen protruding from one of the egg pouches. The young nymphs were characterized by dull reddish tibiae and tarsi. The eyes and antennae were red brown, the body was pale and the abdomen yellowish. They differ considerably from the nymphs of *Empoasca mali,* which are entirely pale when first born. The first stage nymphs of that species are also slightly smaller than those of the species under consideration. Older nymphs found upon poplar showed plainly brownish marks on the three thoracic segments, on either side of the meson.

Several nymphs from the poplar trees were taken to the insectary at Ames and placed in cages on willow twigs. Nymphs became adult May 31 and June 1, and were determined as the above species.

On a clump of willow trees near Shenandoah, May 13, I found nymphs of *Empoasca obtusa* in large numbers hatching

from eggs deposited in the twigs. Upon observing closely I found several nymphs in the act of emerging from the eggs in the bark. On the willow bark there was little or no protuberence or blister to make the presence of the eggs known. In fact, I could not have detected the eggs had not the nymphs been emerging from them at the time. A single egg which had not yet hatched I could detect through a slight crevice in the bark. After a nymph had emerged from an egg in the bark the hole appeared only as a natural opening. The eggs were placed in last year's wood, so far as I could determine from those which I saw hatching at the time.

The nymphs were extremely abundant on the leaves and twigs of the willow trees. When disturbed they would all hurry down the main twig towards the trunk of the tree. They were most active creatures in this respect. Nearly all of the nymphs were of the first stage; some few were older than that stage.

These nymphs were like those on the poplar, although they averaged somewhat more pale in color. The older stages showed plainly the brownish bars on the thorax, as did these nymphs on poplar.

Nymphs from the willow trees were brought to the insectary and reared to maturity upon willow twigs. Adults were found in the cages from May 30 to June 15.

No hibernating adults of this species were found on poplar or willow trees in the spring, and so I have no data to add in that respect.

Empoasca mali LeBaron.

In Iowa the apple leaf hopper winters both in the adult and in the egg stages. Hibernating adults have been found in the southern part of the State, at Shenandoah, and also in the central part, at Ames. The species also winters in the egg stage in all parts of the State. So far as it is known, these eggs are placed only in the bark of apple trees.

These egg pouches appear as tiny blisters in the bark, barely visible to the naked eye. They are more or less cylindrical in

outline, frequently slightly crescentic, and measure about .72 mm. long by .21 mm. broad (average of 20 specimens). The egg itself is slightly smaller, .63 mm. by .18 mm. It is elongate, white and delicate, slightly curved in at the middle portion.

In the summer eggs are deposited in a large number of plants, in the petiole or in the larger veins of the leaves. In June, 1909, I cut through petioles of apple leaves and found the eggs imbedded therein. They were placed immediately under the surface of the petiole, lying longitudinally, with the curved ends outward.

The newly hatched leaf hopper is almost entirely pale, and measures about .8 mm. long. After food is taken into the body the abdomen becomes dull yellowish. Leaf hoppers in any certain stage were found to vary considerable in measurement from day to day. Averages from 10 specimens of each stage were made and these results were obtained: Stage I, 1.00 mm.; II, 1.26 mm.; III, 1.56 mm.; IV, 1.86 mm.; V, 2.26 mm. The adults were 3.41 mm. long (average from 20 specimens).

In Iowa there are four rather definite generations of this species. The first generation comes on during May, and comprises only nymphs hatching from eggs in apple bark. During June the second generation appears, this generation being composed of the progeny of the first and also of the hibernating adults. The generations appear about a month apart, the last one coming out the latter part of August. Straggling nymphs are found well into October. Winter eggs have been found in apple bark as early as September 10.

Typhlocyba rosae Linn.

Egg pouches were found at Shenandoah on elm trees, in wood two or three years old. They were not uncommon and had the same appearance as those of *Empoasca mali* on apple or of *Empoasca obtusa* on poplar. A few days later young pale nymphs were found on these elm trees, as well as on soft maple trees, on which no egg pouches were found. It seems probable, however, that there were also eggs deposited in the maple bark. No traces of any adults aside from those of *Em-*

poasca mali were found on these trees at this time. These nymphs were more pale than those of *Empoasca mali* and lacked the yellowish tinge. Young nymphs were also found on elm leaves at Charles City, Iowa, May 22, and on maple leaves at Ames, May 31.

Nymphs from both elm and maple leaves were reared to maturity in the insectary, adults being found May 31 to June 15, and the species was then determined as *Typhlocyba rosae.*

On June 11 many of the older nymphs and adults, as well as a few newly hatched nymphs of this species were found on elm leaves at Ames. These youngest nymphs may have been the first of a second generation. The species has been found commonly throughout the summer on apple leaves.

Prof. Herbert Osborn kindly looked over some of the bred material of the three species while he was in Ames during June, 1909, and made tentative determinations for me at that time.

West Indian Cecidomyiidae.

By E. P. Felt, Albany, N. Y.

Cecidomyia manihot n. sp.

This yellowish brown species, only about 1 mm. long, was reared from leaf galls on *Cassava, Manihot utilissima,* by William H. Patterson, Agricultural School, St. Vincent, W. I. The male may be recognized most easily by the long, deeply and roundly emarginate ventral plate and the short stems separating the antennal enlargements.

Male.—Length 1 mm. Antennæ ½ longer than the body, thickly haired, fuscous yellowish; 14 segments, the fifth binodose, the basal stem with a length equal to its diameter, the distal portion of the stem with a length twice its diameter, the basal enlargement subglobose, the distal enlargement with a length ½ greater than its diameter, the three circumfili with rather long, sparse loops. Palpi; basal segment subquadrate, the second with a length four times its diameter, the third as long as the second, the fourth a little longer than the third. Mesonotum fuscous yellowish, the median area lighter. Scutellum yellowish, postscutellum darker. Abdomen yellowish brown, the genitalia yellowish. Costa reddish straw, subcosta at the basal third, the third vein at

the apex. Halteres yellowish. Coxae pale yellowish; femora and tibiae pale straw, the tarsi fuscous straw; claws long, slender, simple, the pulvilli rudimentary; basal clasp segment rather long, stout; terminal clasp segment long, slightly curved; dorsal plate long, broad, deeply and narrowly incised, the lobes truncate, setose; ventral plate long, deeply and roundly emarginate, the lobes stout, roundly truncate; style long.

Female.—Length 1.25 mm. Antennæ nearly as long as the body, sparsely haired, pale straw; 14 segments, the fifth with a stem about ½ the length of the subcylindric basal enlargement, which latter has a length twice its diameter; subbasal and subapical whorls sparse. Mesonotum reddish brown, the submedian area yellowish. Scutellum and postscutellum yellowish. Abdomen reddish brown, darker basally. Costa reddish brown. Coxae and femora basally yellowish, distal portion of femora, tibiæ and basal tarsal segments pale straw, the distal tarsal segments darker. Ovipositor short, the terminal lobes narrowly oval, thickly setose, minor lobes short, broad. Other characters nearly as in the opposite sex.

Type.—Cecid. 1380, N. Y. State Museum.

In this connection it may be well to note that *Clinodiplosis brasiliensis* Rubs. has been described from larvae occurring in leaf galls of *Manihot utilissima*. The two cannot be identical if Rubsaamen's generic reference is correct.

Camptoneuromyia meridionalis n. sp.

This West Indian form may be separated from known American species by the reddish brown abdomen and the nineteen antennal segments, the fifth having a length about equal to its diameter. This species was received from William H. Patterson, of the Agricultural School, St. Vincent, W. I., and was evidently reared March 3, 1910 with *Schizomyia ipomocae* Felt, from flower buds of *Ipomoea*.

Female.—Length .75 mm. Antennæ ¾ the length of the body, thickly haired, dark brown; 19 segments, the fifth with a length about equal to its diameter; terminal segment slightly produced, with a length ½ greater than its diameter. Palpi; first segment probably short, the second with a length three times its diameter, the third as long as the second, more slender, the fourth ½ longer than the third, dilated. Mesonotum dark brown, the submedian lines sparsely haired. Scutellum yellowish brown, postscutellum dark brown. Abdomen reddish brown; ovipositor probably as long as the abdomen, the terminal lobes

long, slender, thickly setose. Wings broad, basal half of subcosta thickly scaled, dark brown, subcosta indistinct, the third vein sparsely scaled and uniting with costa at the basal half. Halteres yellowish. Coxæ and femora basally yellowish, the distal portion of femora and tibiae fuscous yellowish, tarsi fuscous; claws long, slender, the pulvilli short.

Type.—Cecid. 1379, N. Y. State Museum.

Schizomyia ipomoeae Felt.

Examples of the larvae having been received, it is briefly described as follows:

Larva, length 3 mm., rather stout, yellowish or yellowish orange. Head small; antennae rather long, stout; breast-bone well chitinized, bidentate, tapering and somewhat obsolescent. Skin coarsely shagreened. Posterior extremity broadly rounded.

New and Little-known Western Bees.

By T. D. A. Cockerell.

Chelynia cusackae sp. nov.

♀. Length about 9½ mm., parallel-sided, of the usual form; blue-black, very faintly metallic, the prothorax and area of metathorax shining green, the pleura and posterior side of middle femora also green; pubescence long and coarse, entirely black; antennæ dark, the flagellum, except near base, faintly brownish beneath; tegulæ black; wings strongly dusky, brown-stained, the nervures fuscous; spurs of hind tibiæ stout and black. The sculpture is as in other species; the venation also is normal, except that the second s. m. is very long, very much longer than the first. The b. n. goes a little basad of t.m. Related to *C. pavonina* Ckll., but easily known by its dark color, narrower form, paler nervures and longer second submarginal cell. The ventral surface of the abdomen is brilliantly green and purplish.

Hab.—Cusack Ranch, Wet Mountain Valley, Colorado, June (*Cockerell*). The species is dedicated to the memory of Mrs. M. E. Cusack, an excellent botantist, who was resident at the type locality; her herbarium is now incorporated with the collections at Kew. Type in British Museum, where it has been for the last twenty years, unnamed.

Osmia integra Cresson.

West Cliff, Colorado, May 19, 1889 (*Cockerell*); Brit. Museum, ♂. This species must be rare, as I have not taken it in recent years. According to the characters given by Robert-

son, it falls in *Leucosmia*. The following characters readily distinguish it: General aspect of *O. viridior* Ckll., but abdomen broader and more hairy, and head larger; antennae not very long, the flagellum not at all crenulate; dense hair covering clypeus brilliant white; hair of vertex long and all light, of cheeks mixed with black; hair of thorax above all light, with a strong ochreous tint on scutellum; hair of pleura and sides of metathorax all light; legs without metallic tints, their hair, except on front legs behind, mainly black; abdomen with first two dorsal segments covered with long white hair, the others with black; sixth segment entire, broadly subtruncate; *seventh narrow, with a shallow emargination only;* third ventral with an emargination conspicuously bordered with light orange hair. I took two specimens, flying close to *Aragallus lamberti*. In the Boulder County *Osmia* table this runs to 24, and runs out as follows:

Larger; first two dorsal abdominal segments with long hair; margin of sixth segment entire ..... **O. integra** Cress.
Smaller; only first abdominal segment with long hair; margin of sixth segment notched..... **O. wheeleri** Ckll. and **O. cyaneonitens** Ckll.

Osmia quadriceps Cresson.

Mountains near Claremont, California (Baker); Claremont, Cal. (Baker).

Osmia cara sp. nov.

♀. Length about 12 mm.; robust, brilliant deep purple blue, the pubescence entirely black, except that it is pale reddish on under side of head, inclined to be dark reddish on tarsi, and there are some very small and scanty, hardly visible, white hairs near the margins of the abdominal segments, only plainly visible in the subdorsal region of the second, and then only in lateral view; abdomen dullish compared with the related species, short. Very close to *O. gabrielis* Ckll., appearing very distinct by the broader, shorter and rather duller abdomen, but this is partly deceptive owing to the fact that the type of *gabrielis* has the abdomen unusually extended. Other differences from *gabrielis* are as follows: ocelli closer together; sides of vertex with very irregular punctures of various sizes on a shining ground (densely, confluently punctured in *gabrielis*); brushes of hair under clypeal margin orange; mandibles extremely broad (very broad at base), with four well-developed teeth; maxillæ dark reddish (black in *gabrielis*); ab-

domen more strongly sculptured; last dorsal segment much more vertical, less depressed, surpassing last ventral (the reverse is true of *gabrielis*); legs black without metallic colors.

Hab.—Claremont, California (Baker).

Osmia casta sp. nov.

♀. Length about 11 mm., robust, head and thorax dark greenish-blue, abdomen rather greener than blue, very shiny; pubescence all black, except for some reddish on anterior tarsi, and a very slight admixture of glittering white hairs on scutellum and mesothorax; mandibles tridentate, the inner tooth a mere angle; no light hair under margin of clypeus; wings strongly infuscated. This may be a race of *O. artocyanea* Ckll., with which it agrees in most respects, differing by the densely confluently punctured mesothorax, and the total absence of white hair on the metathorax and first abdominal segment; the apical tooth of the mandibles is very well developed. The legs are black without metallic tints.

Habitat.—Claremont, California (Baker).

Osmia putata sp. nov.

♀. Length about 11 mm., robust, brilliant deep indigo blue, the mesothorax darker and bronzy; pubescence black. Very like *O. casta*, but separated as follows: abdomen blue with hind margins purplish; dorsum of thorax without light hairs; tufts of orange hair under margin of clypeus (none in *casta*); mandibles quadridentate, but the two inner teeth short and blunt; hair of cheeks and abdomen much shorter; hind spur of hind tibia thicker, and not much curved (strongly curved in *casta*); second r. n. joining second s. m. at least two-thirds as far from apex as first from base (about half as far from apex as first from base in *casta*); eyes longer, and apparently differently colored.

Hab.—Mountains near Claremont, California (Baker).

Osmia nassa sp. nov.

♀ Length 11-12 mm., robust deep indigo blue, the abdomen shining; pubescence black. Superficially like *O. casta* and *putata*, but easily separated by the clypeus, which is convex, shining, with very strong well-separated punctures, whereas in the others it is minutely and extremely densely punctate, so as to appear granular; no light hair under clypeal margin; mandibles long, quadridentate, the cutting margin very oblique (thus the inner angle is much less prominent than in *O. cara*); sides of vertex and middle of mesothorax with very strong well-separated punctures; abdomen smoother and less closely punctured than in *O. casta* or *putata;* hind spur very straight, with hardly any curve; wings very brown; legs without metallic color.

Hab.—Claremont, California (Baker); also mountains near Claremont (Baker). The following table separates a series of females of medium size (about 11 mm. or over), of a deep blue or purplish color, with the hair either all black or black with a slight admixture, easily overlooked, of light.

Clypeus longitudinally concave, the greatest part smooth, shining and impunctate; legs not metallic ..... **O. quadriceps** Cress.
Clypeus normal 1
1. Legs at least partly metallic 2
Legs black, not metallic 3
2. Punctures of mesothorax strong, large, separate..**O. ribifloris** Ckll.
Punctures of mesothrax small, extremely dense..**O. gabrielis** Ckll.
3. First abdominal segment with some pale hair; punctures of mesothorax not confluent ..... **O. atrocyanea** Ckll.
First abdominal segment without any pale hair 4
4. Clypeus shining, with large well separated punctures; thorax above wholly without light hair ..... **O. nassa** Ckll.
Clypeus granular from minute dense punctures 5
5. Mandibles tridentate ..... **O. casta** Ckll.
Mandibles quadridentate 6
6. Abdomen deep purple, dullish ..... **O. cara** Ckll.
Abdomen rather steel-blue, shining ..... **O. putata** Ckll.

These are all species of the Pacific Coast region except *O. ribifloris*, which comes from New Mexico.

We are very glad to be able to state that Dr. Philip P. Calvert, Associate Editor of this journal, is safe. Dr. Calvert and Mrs. Calvert have been nearly a year in Costa Rica, where Dr. Calvert has been studying the Odonata of that country. Cartago, where the Doctor made his headquarters, was destroyed by an earthquake on May 4th and over a thousand lives were lost.

Seventh Annual Session.—The Puget Sound Marine Station, Friday Harbor, Washington, June 28th to August 8th, under the direction of Prof. Trevor Kincaid, University of Washington. This is a region unsurpassed for the study of marine life. There will be courses in Zoology and Botany by competent professors. The station is located in the midst of the picturesque group of islands known as the San Juan Archipelago, in the northern part of Puget Sound. The total expense for board and tuition for the six weeks will be fifty dollars.

"Go to the ant, thou sluggard," quoted the Wise Guy. "I don't have to," retorted the Simple Mug; "all I have to do is to go to a picnic and the ant will come to me."

The Butterflies of the Lake Tahoe Region.

By E. J. Newcomer, Palo Alto, Cal.

Lake Tahoe is situated in the Sierra Nevada Mountains, on the boundary between California and Nevada, just at the point where the boundary line bends to the southeast. The name, which in Indian parlance signifies "big water," very accurately describes the lake, twenty-two miles long and half as wide, and situated at an elevation of over six thousand feet, with mountains piled about it that rise to ten thousand feet and more. The lake is drained by the famous Truckee River, which flows from the northwestern corner. The mountains sloping up from the eastern shores of the lake are now barren, having been stripped of timber, it is said, in the days of the Comstock Mines. Those to the west, however, are covered with pines and firs except at very high elevations, and are for the most part guaranteed protection by being included in the Tahoe Forest Reserve. There are numbers of summer resorts about the lake, owing their existence to the beautiful scenery, excellent fishing, and opportunities for mountain climbing of a moderate sort.

The territory described in this article is that immediately surrounding Lake Tahoe, particularly that part situated in California. It extends westward to the divide at the summit of the Sierras, which is the western limit of the Tahoe Basin. The territory is roughly about thirty miles long and from ten to fifteen miles wide. It includes portions of Placer and Eldorado counties. The region is all above six thousand feet elevation, and it lies in the Boreal life zones. The Canadian zone includes the country up to about eight thousand feet, and is mostly rather heavily forested with conifers. The canyon floors are ordinarily open and meadowy or rocky. In places the hillsides are too steep to afford a foothold for trees, and only a little underbrush grows among the rocks. As to the trees the Tamarack (*Pinus murrayana*), the Jeffrey Pine (*Pinus jeffreyi*), and two firs, *Abies concolor* and *A. magnifica* are the commonest. The Mountain Pine (*P. monticola*), the

Sugar Pine (*P. lambertiana*), *Libocedrus decurrens,* and *Juniperus occidentalis* also occur in some numbers, being, however, not so generally distributed. Among the shrubs, a maple (*Acer glabrum*), and an oak (*Quercus vaccinifolia*), are characteristic. In the open grassy places flowers of all sorts grow in profusion, and willows and poplars are common along the streams. The great majority of butterflies occurring in this region are, of course, most common in the Canadian zone, but the following may be mentioned as peculiar to it: *Argynnis monticola, Vanessa antiopa, Thecla saepium, Lycaena anna,* and all the Chrysophanids.

The Hudsonian zone, characterized by the Alpine Hemlock (*Tsuga emrtensiana*), and the White-barked Pine (*Pinus albicaulis*), is more open and rocky, and extends to the timber line. *Pinus monticola, Juniperus occidentalis* and *Abies magnifica* reach into this zone. There are many lakes at this elevation, and open hillsides solidly in bloom by August. Although large numbers of butterflies frequent this zone, few are typical. *Parnassius behrii* breeds here and is rarely seen below. *Papilio indra* also appears to breed exclusively at this elevation, though the males are often seen in the Canadian zone. *Chionobas ivallda* is practically never seen in the lower zone, and *Lycaena enoptes* is commonest in the Hudsonian.

The Alpine zone is scarcely represented, as the peaks are not high enough to form typical Alpine "islands." Vegetation at this altitude is confined to low shrubs and hardy plants, and the snow lies most of the summer in sheltered spots. The butterfly life of the high summits is always interesting. Large numbers of butterflies, probably brought from lower levels by wind currents, gather about the highest rocks, flying in processions back and forth, and up and down, occasionally stopping to sun themselves in sheltered spots. The commonest species here are *Papilio zolicaon, P. indra, Pieris sisymbri, P. occidentalis, Argynnis egleis, Grapta zephyrus, Vanessa milberti, Satyrus charon,* and *Chionobas ivallda.* Some of these, such as *P. zolicaon, P. indra* and *Ch. ivallda* breed above 9000 feet elevation.

The writer collected at Glen Alpine Springs during July and August, 1907, and at Deer Park Springs from the middle of May until the middle of August, 1908, and during July and part of August, 1909. Glen Alpine Springs is about seven miles west of the southern end of Lake Tahoe, in one of the most picturesque regions of the Sierras. There are numerous deep, mountain lakes in this region, and a number of high peaks, including Mt. Tallac (9785 ft.), and Pyramid Peak (10,020 ft.). Deer Park Springs is located on Bear Creek, a small tributary of the Truckee River, about six miles from the outlet of the lake, and some twenty miles north of Glen Alpine. Here the peaks are lower, the highest, Squaw Peak, having an elevation of 8960 feet, and lakes are less numerous. The region between has the same general characteristics as the two localities mentioned.

The climatic conditions of this region are very favorable for collecting. At the lower altitudes the winter snow is largely melted by the middle of May, and there are many warm, sunny days in May and June, with some cold weather bringing snow or rain. During July and August the weather is warm and clear, with an occasional thunderstorm. The nights, however, are cold, and frost is not unusual, even in midsummer. The first light snowfalls occur in September and October, and continued cold weather begins soon after. There is little collecting in the higher regions before July, but when the snow is once melted, the plants come out remarkably fast, and the butterflies with them.

The accompanying annotated list is certainly not complete, but it is an attempt to bring into general knowledge the butterfly life of the region under consideration, and by so doing, to help in working out the distribution of species. In making up this list, I have used not only my own notes, but have had help from a list of species collected about Glen Alpine by Mr. F. X. Williams, of San Francisco, during a two weeks' visit to that region in July, 1909, and from the data from some butterflies taken also at Glen Alpine, for Mr. F. Grinnell, Jr., of Pasadena, mostly in 1906 and 1907. I have, besides, noted the published reports of Tahoe captures by other collectors, when these

were of interest. I am greatly indebted to Mr. Williams and Mr. Grinnell for their lists and for other help, and also to Mr. E. A. McGregor, of Stanford University, who very kindly identified a number of plants for me.

1. **Danais plexippus** L.

Not very common at Deer Park during July and August. I took a female at Five Lakes (7540 ft.), above Deer Park, on June 7, 1908, flying over the snow.

2. **Argynnis leto** Behr.

I took several specimens of this fine Argynnid about the middle of August at Glen Alpine (6800 ft.). Mr. Grinnell has a female taken at Fallen Leaf Lake, in the Glen Alpine region, on July 15, and Mr. Williams noted a few in July. *Leto* is always on the alert, and is as difficult to capture as any butterfly I know.

3. **Argynnis monticola** Behr.

This is very common in the Canadian zone from July until September, and is easily taken on flowers or about the edges of streams.

4. **Argynnis coronis** Behr.

Not very common, and found in the Canadian zone during July and August. Curiously, all my specimens are females.

5. **Argynnis egleis** Bdv.

Egleis is even commoner than *monticola*, and occurs at all elevations. It may be found from June until September. The spots of the under side in both sexes may be either buff or silvered, and the ground color varies somewhat.

6. **Argynnis epithore** Bdv.

Not a very common species. Occurs from early June until August in the Canadian zone.

7. **Melitaea macglashanii** Rivers.

The types of this species came from Truckee (fifteen miles north of Lake Tahoe), where it is quite common. I took several males and one female at Deer Park (6200 ft.) during June and July. I also took a male on Squaw Peak (8200 ft.), July 16.

(To be continued)

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., JUNE, 1910.

The problem of the entomological journal in America is an interesting one. The activity of the economic entomologists and the fact that there is such a demand for trained economic entomologists and the necessity for the study of all insects from an economic standpoint has brought about a new condition of affairs. The old type of collector of the orders Coleoptera and Lepidoptera is growing restless over the amount of more or less technical literature devoted to the other orders and he would like to see the day when a journal is devoted to his particular hobby alone. Now that entomology has become a profession for so many it is going to be difficult to get persons in the future who will give their services gratuitously to the journals of the future. The American Association of Economic Entomologists has partially solved the problem as it has its official journal, but the work has not gotten beyond the stage of a labor of love. The Entomological Society of America could probably do nothing better than to establish a monthly journal of entomology. Such a journal would receive the support of a majority of persons in this country seriously interested in the study. The time will come when we can have a journal devoted to each order, but it is in the dim future. A number of entomological journals have dropped by the wayside from one cause or another, and it will be necessary for

the future journal to appeal to all and have mutual support, and this is the reason for thinking the Entomological Society of America should father the project. As in the past the local societies would have their proceedings and transactions, but the monthly journal should be the official organ of the entomologists of America. The opinion expressed is a disinterested one, as ENTOMOLOGICAL NEWS was never more successful than it is to-day, but we consider the problem from the standpoint of the future.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

MR. FRANK M. JONES, of Wilmington, Delaware, has been spending several months in collecting at Biloxi, Mississippi. He is sure to find things of interest and doubtless the NEWS readers will learn of them sooner or later.

WHILE ACTING as Surgeon of the Revenue Cutter "Bear," cruising in Alaskan waters during the summer of 1909, I collected a series of fleas from ground squirrels (*Citellus nebulicola*), which are identical with the *Ceratophyllus idahoensis* described by Baker from the *Spermophilus columbianus* at Moscow, Idaho. The Alaskan specimens were taken in June, 1909, on Nagai Island.—CARROLL FOX, P. A. Surgeon, P. H. & M. H. S.

IN MY LIST *of the* Lepidoptera of the Mt. Shasta Region. (ENT. NEWS, pp. 62-75, Feb., '09). No. 31 of the Papilonoidea should be *Thecla spinetorum* Bdv. and not *Thecla m-album* Bdv. Lec. The note following concerning Boisduval should therefore be omitted.

Melicleptria fimbria described by me in ENT. NEWS, pp. 237-8, Sept., '05 is a synonym of *Melanoporphyria prorupta*, Grt.

Anthocharis lanceolata Bdv. Of several pupae of this insect obtained by me in Shasta County, Cal., during the summer of 1907, two produced imagines in May and June of 1908; another emerged in 1909, and the last pupa developed to such a degree in March, 1910, that the full colors of the wings of the enclosed insect could be seen, and the butterfly would doubtless have emerged, had there been sufficient moisture during the period of critical development when it was packed away in a trunk. It is easy to see from this instance how some insects can and do hold over in the pupae stage, in especially dry seasons.—FRANCIS X. WILLIAMS.

Mr. Fordyce Grinnell, Jr., of Pasadena, is conducting a summer camp in the San Gabriel Mountains. It is called The Behr Natural History Summer Laboratory, and is located in the Arroyo Seco Canyon, twelve miles from Pasadena, California. The session will last from June 20th to August 1st. The locality is an interesting one for both the Zoologist and Botanist. Particulars may be obtained from Mr. Grinnell, Pasadena, California.

Entomological Literature.

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

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), excluding Arachnida and Myriapoda. Articles irrelevant to American entomology, unless treating of new genera, 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, and are all dated the current year unless otherwise noted. This (°) following a record, denotes that the paper in question contains description of a new genus; while this (*), that of a new North American form.

For complete record of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

4—The Canadian Entomologist. **6**—Journal, New York Entomological Society. **7**—U. S. Department of Agriculture, Bureau of Entomology. **11**—Annals and Magazine of Natural History, London. **13**—Comptes Rendus, Societe de Biologie. Paris. **18**—Ottawa Naturalist. **22**—Zoologischer Anzeiger, Leipzig. **35**—Annalen, Societe Entomologique de Belgique. **36**—Transactions, Entomological Society of London. **43**—La Cellule. **49**—Annales historico-naturales Musei Nationalis Hungarici. Budapest. **50**—Proceedings, U. S. National Museum. **55**—Le Naturaliste, Paris. **58**—Revista Chilena de Historia Natural. **60**—Anales, Museo Nacional de Buenos Aires. **74**—Naturwissenschaftliche Wochenschrift. Berlin. **89**—Zoologische Jahrbucher, Jena. **92**—Zeitschrift fur wissenschaftliche Insektenbiologie, Berlin. **131**—Proceedings, South London Entomological and Natural History Society. **136**—Stettiner Entomologische Zeitung. **153**—Bulletin, American Museum of Natural History, New York. **161**—Proceedings, Biological Society of Washington. **179**—Journal of Economic Entomology. **186**—Journal of Economic Biology. London. **189**—Pomona Journal of Entomology. Claremont, Cala. **193**—Entomologische Blatter, Nurnberg. **198**—Biological Bulletin, Marine Biological Laboratory, Woods

Hole, Mass. **200**—Bulletin Scientifique de la France et de la Belgique, Paris. **203**—Bulletin, Societe des Sciences de Bucarest-Roumanie. **206**—Annals, Scottish Natural History. Edinburgh. **208**—Boletin, Real Sociedad Espanola de Historia Natural, Madrid. **211**—Popular Science Monthly, Lancaster, Pa. **234**—Records, Indian Museum, Calcutta. **235**—Memoire, R. Accademia dei Lincei. 5th series. Roma. **236**—Boletin, Sociedad Aragonesa de Ciencias Naturales. Zaragoza. **237**—University of Colorado Studies. Boulder. **238**—Anales, Sociedad Cientifica Argentina. Buenos Aires. **239**—Annales, Biologie Lacustre. Brussels. **240**—Maine Agricultural Experiment Station. Orono. **241**—Marcellia. Rivista Internazionale di Cecidologia. Avellino. **242**—Transactions, Royal Society of Canada. 3d series. Ottawa. **243**—Yearbook, Department of Agriculture. Washington, D. C. **244**—Zeitschrift, Induktive Abstammungs und Vererbungslehre. Berlin. **245**—Zeitschrift, Naturwissenschaften, Halle. **246**—Bulletin International, Academie des Science de Cracovie. Ser. B. Sciences Naturelles. **247**—Sitzungberichte, Gesellschaft zur Beforderung der gesamten Naturwissenschaften zu Marburg. **248**—Hawaii Agricultural Experiment Station. Honolulu. **250**—Delaware College Agricultural Experiment Station. Nebraska.

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ington,) page 69. **Crawford, D. L.**—Thysanoptera of Southern California, II; of Mexico and the South, II, **189,** ii, 149, 153 (*). **Fox, C.**—The flea and its relation to plague. (The rat and its relation to the public health, Treasury Dept., Public Health & Marine Hospital Service, Washington,) pp. 123. **Rothschild, N. C.**—A new flea from Chili, **58,** xiii, 104, 1909. A new species of Stephanocircus from Chile, **58,** xiii, 181, 1909.

NEUROPTERA. Betten, C.—Notes on the Trichoptera in the collection of the Indian Museum, **234,** iii, 231, (°). **Enderlein, S.**—Eine neue Sialis aus Columbien, **136,** lxxi, 380. Klassifikation der Mantispiden nach dem material des Stettiner Zoologischen Museums, **136,** lxxi, 341 (°). **Essig, E. O.**—The natural enemies of the citrus mealy bug, 1. (Sympherobius angustatus), **189,** ii, 141. **Needham, J. G.**—Notes on the Neuroptera in the collection of the Indian Museum, **234,** iii, 185, (°).

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REVIEW.

The Fungus Gnats of North America. Part I. Bulletin No. 172 Maine Agricultural College Experiment Station. The Mycetophilidæ of North America. By O. A. Johannsen.

This is an important paper on a group of Diptera that have been little studied. These insects have an economic bearing and in addition to the anatomy, the habits and economic relations are given. It would have been of value to the workers of the future had the author mentioned where the types of his new species are deposited.

Fishes in their Relation to the Mosquito Problem. By William P. Seal. From the Bulletin of the Bureau of Fisheries, Vol. XXVIII, 1908. Washington, D. C. Document No. 683, April, 1910.

The author says "Some phases of the mosquito problem are extremely simple and easy of solution, but there are others that have not as yet attracted much attention and that, in the opinion of the writer, will not be so easily solved. The class of mosquitoes represented by the rain-barrel wigglers constitutes, with the salt-marsh species, the most of the mosquitoes, and the most pestiverous of them as annoyances. The problem of dealing with these is one of simple engineering, filling and draining, with the oil barrel as an auxiliary. But the *Anopheles* mosquito is altogether in another class and will require a very different and more complex sort of treatment. It is in fact, to a great extent a separate problem."

Mr. Seal is an authority on matters of this kind and he has had a large experience and has presented a thoughtful and suggestive paper.

THE RAT AND ITS RELATION TO THE PUBLIC HEALTH.—By various authors, the Treasury Department, Public Health and Marine Hospital Service, Washington, 1910.

This is a most interesting resumé of the subject, and contains the following articles relating to insects: Ectoparasites of the Rat, by Nathan Banks; The Flea and its Relation to Plague, by Carroll Fox.

Doings of Societies.

At a meeting of the Hawaiian Entomological Society held March 3, 1910, a committee was appointed to draft resolutions expressing sorrow upon the death of its late president, and begs to report as follows:

That this society desires to record its deep sorrow and keen sense of loss experienced through the untimely death of Mr. G. W. Kirkaldy, its late president, and one of its most enthusiastic members.

The deceased was in his thirty-seventh year, and his unexpected demise was the result of an unfortunate riding accident involving a broken leg, some five years ago. Repeated local operations were unsuccessful, and whilst enjoying a brief vacation in San Francisco last January Mr. Kirkaldy decided to undergo another operation; at first everything seemed satisfactory, but soon gangrene developed, proving fatal on February 2d.

Mr. Kirkaldy was born in London of Scotch parentage, and while still a boy he exhibited a keen love for natural history. He was educated at the City of London School, and contrary to his tastes he entered a shipping firm. During this most uncongenial period he assiduously occupied his spare time with entomology, finally concentrating his attention upon aquatic Hemiptera, publishing his first paper, "A Revision of the Notonectidae," in 1897. Two years later he commenced the working out of the hemipterous portion of the zoological material collected by Dr. R. C. L. Perkins in the Hawaiian Islands, the results of which are published as the "Fauna Hawaiiensis." In 1903 the Hawaiian sugar planters' cane crop was menaced by a recently introduced Fulgorid, which had

acquired most formidable proportions, and it was in conjunction with these studies of the native fauna that an examination of this insect resulted in its proving new to science, and its consequent fixation in entomological nomenclature as *Perkinsiella saccharicida* Kirkaldy.

In the summer of 1903 the deceased was engaged as assistant entomologist conjointly by the Hawaiian Territorial Board of Agriculture and Forestry and the Hawaiian Sugar Planters' Association; later continuing his studies upon the hemipterous material (especially Fulgoridae) collected by the traveling entomologists of the association during their quest for beneficial insects, the results being published in various bulletins issued by the association.

For some years Mr. Kirkaldy had devoted much attention to bibliography, many of his numerous papers being emendations in nomenclature. A staunch supporter of nomenclatorial "priority," he frequently became involved in polemics with coworkers of opposite views. Although considered by some an extremist in this respect, he was supported by many leading entomologists, and his views were undoubtedly logical, although perhaps appearing heterodox to the entomological classicist. At the time of his death he was engaged upon a "Catalogue of the Hemiptera," which was to have embraced the whole order, and would have occupied him many years. This catalogue was to have been in many respects unique, and much more exhaustive than the usual type. Unfortunately only Volume I (Cimicidae) is published, and it is understood that only a portion of Volume II is complete. It is sad to realize that he did not live to see even the beginning of this, his life work.

A "Natural History of the Hemiptera" was also planned for future publication. A voluminous writer, and wide reader, a staunch friend and genial companion, he was always ready to give others the benefit of his wide bibliographical knowledge, and his untimely demise is greatly to be deplored, not only as a severe loss to hemipterology, but his optimistic and

kindly personality will be greatly missed by his friends and colleagues. He was a fellow of the Entomological Society, London, since 1893, a member of the American Association of Economic Entomologists, and several other entomological societies, and was for several years associated as a sub-editor with the "London Entomologist."

In expressing our keen realization of a great loss we desire to extend our sympathy to the widow and relatives who must still more deeply feel their heavy bereavement.

The deceased leaves a wife, little daughter and aged mother to mourn his loss.

F. W. TERRY,
EDW. M. EHRHORN,
DAVID T. FULLAWAY,
Committee.

A monthly meeting of the Heink Entomological Club was held January 28, 1910, at the residence of Mr. Julius Meyer. All members present. President Heink in the chair.

Messrs. Henry Graf and E. F. Meiners were elected as members of the club.

Election of officers for the following year resulted as follows: President, Mr. Chas. L. Heink; Secretary, Mr. Edwin P. Meiners; Treasurer, Mr. Julius Meyer; Librarian, Mr. Geo. Graf.

EDWIN P. MEINERS, *Recording Secretary.*

A meeting of the Heink Entomological Club was held February 24, 1910, at the residence of Mr. Geo. Graf. All members present. President Heink in the chair.

EDWIN P. MEINERS, *Recording Secretary.*

A meeting of the Heink Entomological Club was held March 28, 1910, at the residence of Mr. E. F. Meiners. Four members present. President Heink in the chair.

Mr. Heink approached the subject of a field day, which it was the custom of the club to hold once a year. He proposed

that a field day be held once a month during the collecting season. Motion made and carried to adopt said resolution, and April 24th was set for the first field day to be held at Merrimac Highlands, Mo.

EDWIN P. MEINERS, *Recording Secretary.*

OBITUARY.

LANCASTER THOMAS.

Mr. Lancaster Thomas died at his home in Philadelphia on April the second. He was born in Quaktertown, Pa., October 27th, 1838, and when he was about nineteen years of age came to Philadelphia and engaged in the drug business. He soon became the proprietor of a number of stores and was very successful. Mr. Thomas was always an enthusiastic devotee of the sciences and cultivated a number of them with marked success, having been particularly interested in physics, mineralogy, astronomy, electricity, entomology and those peculiar forms of life known as myxomycetes. Some years ago he retired from business and had leisure to devote to these pursuits. For a number of years he spent his summers in the mountains of North Carolina where he collected actively, giving particular attention to the lepidoptera. The special localities visited were Cranberry, Linville, Roan Mountain station and Blowing Rock. He published some very interesting additions to the list of Cranberry, N. C., butterflies in this journal in 1899, p. 128. He held membership in the Academy of Natural Sciences of Philadelphia, the American Entomological Society, The Franklin Institute, Philadelphia, and the American Association for the Advancement of Science. His sister, Miss Thomas, has presented to the Academy of Natural Sciences, in his name, a fine set of cut-glass models of crystals and the large series of butterflies he collected at Cranberry, N. C.

Mr. Thomas was a pleasant companion and devoted to a circle of scientific friends who greatly deplore his loss.

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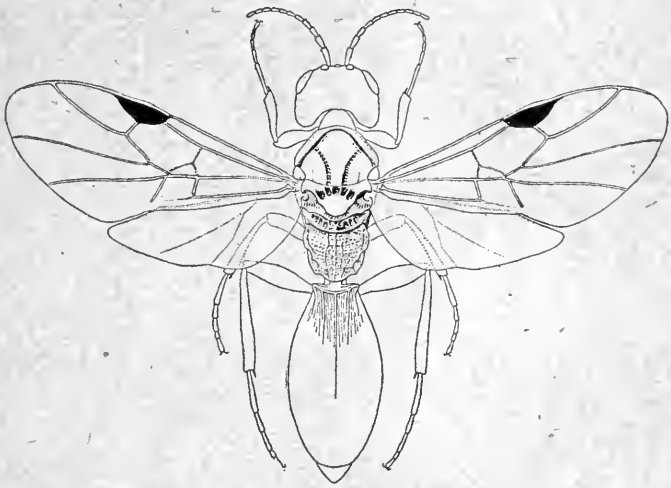

Vanhornia eucnemidarum Crawford.

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CONTENTS:

Conocephalus fusco-striatus in North Georgia.

By H. A. ALLARD, Washington, D. C.

The careful observer of insect stridulations who visits the upper Piedmont region of Georgia in March or April, will hear, during warm evenings, a loud, continuous, noisy buzz sometimes in the tallest pines and oaks, or again in the weeds and low herbage of fields. This is the stridulation of a cone-headed grasshopper known as *Conocephalus fusco-striatus,* Redt.

In this region the notes of this interesting locust together with the familiar trillings of the ubiquitous field cricket, *Gryllus pennsylvanicus,* Burm., are among the earliest insect stridulations to be heard in spring. Here it is the only *Conocephalus* to be heard in early spring, and judging from the individuals in song during warm evenings, it is a fairly common species. At Thompson's Mills, Gwinnett County, where the writer has observed this cone-headed grasshopper for several years, the first singers of the season, appearing in March or April, are usually located in the crowns of pine trees throughout the settlement. Later in the season the young foliage of oaks and other deciduous trees afford them sufficient concealment, and with the appearance of green herbage in the fields and meadows, they become more terrestrial in their habits and

may be heard in the rank growths of oats, wheat and alfalfa in fields throughout the region.

Conocephalus fusco-striatus is strictly a nocturnal insect and stridulates most freely during warm, moonlight evenings. It is not musical during cold nights. Owing to its habit of appearing as soon as spring opens, this locust is frequently subjected to severe spells of weather approaching wintry conditions. Throughout Northern Georgia and other portions of the South there occurred in late April, 1910, phenomenal spells of cold weather, together with remarkable falls of sleet and snow. For a long period there were almost no signs of musical insect-life, but with the final appearance of warm nights following, *C. fusco-striatus* was again as noisy in the trees and shrubs as before.

The stridulation of this *Conocephalus* is a loud, harsh, snappy z-z-z-z-z-z continued for many minutes at a time. Within a few feet of the stridulating insect a strong, penetrating buzzing hum is noticeable, attended by almost continuous harsh, snappy, unmusical crepitations which are audible for long distances, and constitute the notes usually heard by the distant observer. It is somewhat difficult, especially for those who have not studied insect-stridulations, to locate one of these insects in a big field. Its powerful, penetrating notes seem to permeate the herbage on every hand, frequently causing no little bewilderment in the mind of one who attempts to locate the musician too carelessly.

C. fusco-striatus is a very shy insect and cannot readily be captured unless approached with considerable care. It takes to wing readily, and flies very freely long distances in the fields or from tree to tree. The writer's observations in the upper Piedmont region of Georgia seem to indicate that this is the only species of *Conocephalus* appearing much before midsummer. It is evident that *C. fusco-striatus* is characteristically an early spring species, for its season of stridulation is at its height in April and early May. Somewhat later in the season this *Conocephalus* becomes silent, and other species become musical with the passing of midsummer. It is probable that few of our common species of *Conocephalus* are as arboreal in their habits as *C. fusco-striatus*.

A List of Mosquitoes Collected in the Vicinity of Chicago, Ill.

By Wm. J. Gerhard, Chicago, Ill.

During the past few years some attention was given by the writer to the mosquitoes in the vicinity of Chicago, the acquisition of a representative series of the local species for the Field Museum's collection being the main reason for the interest taken in these insects. As only a limited amount of time could be devoted to collecting, it is of course quite evident that the following list is by no means a complete one, and that a number of additional species will eventually be found in this section of the state. But, since even the mere recording of the more common species, not before listed from the region, seems desirable, it is hoped that the accompanying records may be of some value, at least of sufficient interest to justify their publication.

In the vicinity of Chicago the mosquito problem is neither a serious nor a difficult one. Fortunately there is no apparent danger to be feared from the disease transmitting *Aedes calopus*, for this section of the state is far beyond the northern range of this species. While the presence of the carriers of malaria always suggests an element of danger, they are not so abundant that they should be considered a serious menace. There is, however, no justifiable excuse for permitting the Anopheles larvae to breed so commonly in many pools and ditches within the limits of the city.

But more abundant than the disease-transmitting species are those mosquitoes which attract attention on account of their annoying habits. Since the greater part of Chicago is located on low land, over which the waters of the lake formerly extended, suitable breeding places for these species are not wanting. Many pools and ditches, favorable for the development of the larvae, are found in the vicinity of the marsh areas and in the limited, low tracts of woodland that still remain in the outskirts of the city. Even in some of the built-up sections are found neglected drains, useless ditches and vacant lots with

disregarded pools of water, nearly all of them containing wigglers during a part of the summer, and all of them attesting the prevailing indifference that is still shown concerning the relation of these places to the supply of local mosquitoes. Notwithstanding the recent publicity given to the various phases of the mosquito problem, no apparent individual or united efforts have been made to control or eliminate the local breeding areas. But despite the lack of attention given to the matter, there is some consolation in the belief that many of the most prolific breeding places will eventually be removed by the city's rapid progress of improvements.

Beyond the region, over which the lake formerly extended, the land is higher, somewhat undulating, and more extensively covered with tracts of woodland. Corresponding to this change of environment, there is a difference in the species of mosquitoes, as is shown by the records of those taken at Glen Ellyn, Willow Springs, Lemont, Beverly Hills, and Palos Park, Ill., localities, which contain tracts of varied woodland and which, being within twenty-five miles of the city, are frequently visited by the local collectors.

In addition to the localities already mentioned and those within the limits of the city, collecting was also done at the following places: Beach, a region on the lake shore near Waukegan; Riverdale, a district just south of Chicago; and Hessville, Ind. The last locality is near the state line and within the region known as the "Chicago Area."

Anopheles punctipennis Say.

As the accompanying records may indicate, the above mosquito is by no means rare in this vicinity. Specimens were bred from larvae collected within the limits of the city as follows: In a roadside ditch, So. Chicago (July 22, 1906); drainage ditch, 88 St. and Stony Id. Ave. (Sept. 9, 1906); roadside and marsh ditches, Eighty-second Street and Cottage Grove Avenue (September 16 and 30, 1906; August 11, 1907); and in a lot pool at Sixty-third Street and Prairie Avenue (September 8, 1907). Adults were also reared from larvae taken

in spring-like water at Lemont, Ill. (July 1, 1906), and in a man-hole at Beverly Hills (August 18, 1907). Adults were either collected or observed at Beverly Hills (August 25, 1907; at light, September 7, 1907; August 27, 1908); Palos Park, Ill. (at light, September 5, 1908; September 4, 1909); and Hessville, Ind. (at light, July 4, 1908).

Anopheles quadrimaculatus Say.

This mosquito, to which, it is claimed, the name *maculipennis* should no longer be applied, is less common than the preceding species. On the south side of the city larvae were found at least at three places, namely, in a drainage ditch at Eighty-eighth Street and Stony Id. Avenue (September 9, 1906), roadside ditch at Sixty-second Street and Cottage Grove Avenue (September 30, 1906); and in a lot pool at Sixty-third street and Prairie Avenue (September 9, 1907). Adults were collected in Chicago (at light, September 8, 1909), and at Willow Springs (July 14, 1908).

Anopheles walkeri Theob.

The specimens determined as the above species closely resemble *quadrimaculatus,* but differ mainly in having all of the joints of the palpi distinctly tipped with white.

Aggressive females were collected in the meadows near Beach, Ill., late in the afternoon of August 23, 1908. They were also taken at Palos Park, Ill. (at light, July 4, 1909), and at Hessville, Ind. (September 22, 1907; at light, July 4, 1908).

Psorophora ciliata Fabr.

No larvae of this conspicuous mosquito were obtained either in the city or in the nearby region. The adults were likewise quite rare: Chicago (August 16, 1903); Beverly Hills (August 14, 1903), and Hessville, Ind. (August 30, 1907). In the southern part of the State (Olive Branch) this species apparently is much more abundant, blood-thirsty females having been seen there as late as October 9.

Mansonia perturbans Walk.

On the south side of the city this species was rarely observed (at light, June 5 and 9, 1906, June 19, 1908), but in the tracts of woodland in the following localities it was both common and annoying: Palos Park (at light, June 20, July 20, 1908); Beverly Hills (at light, June 27, 1908); Glen Ellyn (August 2, 1908), and Hessville, Ind. (at light, July 4 and August 29, 1908).

Aedes bimaculatus Coq.

Only one specimen, a female, of this easily recognized, Southern species can be recorded. It was collected by Mr. Alex. Kwiat, at light, at Hessville, Ind., on July 4, 1908.

Aedes canadensis Theob.

Although this mosquito no doubt breeds in most of the tracts of woodland near Chicago, adults were collected only at Glen Ellyn, on May 30, 1908.

Aedes curriei Coq.

This mosquito was not often observed within the limits of the city (at light, August 26, 1906, June 16, 1907; at light, June 1, 1909), but in the open fields near Riverdale, just south of Chicago, on two occasions (September 4, 1907; May 17, 1908), it was both abundant and aggressive.

Even in a series of adults of this species taken at the same place and on the same day there is found a considerable variation in the color of the thorax. On some specimens the median and the lateral brown stripes are barely discernible; on others they are broad and prominent. The color of the upper surface of the abdomen is likewise variable. On one or two specimens the abdomen is covered entirely with silvery white scales, with barely a trace of black on each side of the four basal segments, while on others the black scales are present on the side of all the segments excepting the last one.

Aedes fitchii F. and Y.

The larvae of this species were collected in a ditch at the side of the railroad at Palos, Ill., on May 10, 1908. Some

adults, apparently referable to the above species, were taken near the same place (May 30, and July 4, 1909), and at Hessville, Ind. (July 12, 1908).

Aedes fuscus O. S.

Females of the above mosquito were taken in woodland at Glen Ellyn, Ill., on May 30, 1908.

Aedes lutzii Theob.

Several aggressive females were collected in woodland at Willow Springs, Ill. (June 14, and July 14, 1908), and at Hessville, Ind. (July 12, 1908).

Aedes pretans Grossb.

One female taken at Glen Ellyn, Ill. (May 30, 1908), and two at Willow Springs, Ill. (June 14, 1908), are the only specimens that can be recorded for this region.

Aedes subcantans Felt.

As there appear to be no available characters, excepting those found on the larvae, whereby this species may be readily separated from several closely allied forms, no records are given of those adults which were taken in the vicinity of Chicago, although they apparently represent the above mosquito.

The larvae were collected at two, not widely separated places on the south side of the city during the fore part of three consecutive years. They were found in stagnant water in woodland ditches, which were dry during the greater part of the summer, near Eighty-second Street and Stony Id. Avenue (April 29, 1906; April 28, 1907; April 19, 1908), and in a roadside ditch in a semi-woodland tract near Seventy-ninth Street and East Avenue (May 6, 1906; April 28, 1907; April 19, 1908).

Aedes sylvestris Theob.

This is the most common mosquito found in the vicinity of Chicago, and, inasmuch as it flies several miles from its breeding place, thus entering the built-up sections of the city for a considerable distance, it likewise ranks as the most an-

noying species. Not only during the latter part of the summer does it become troublesome around the houses and the parks, but even as early as the month of June (1908), it has been found in the city in large numbers.

So frequently have the larvae been collected in roadside ditches, in marsh pools, and in other situations within the limits of the city, and so commonly have the adults been observed in this region, that a page of local records could be given, were it necessary. As the habits of this mosquito are well known, it will suffice to say that the earliest record for the adults is May 16; the latest, October 6.

Aedes sylvicola Gross.

One male was bred from some larvae which were collected in a ditch in a semi-woodland tract near Seventy-ninth Street and East Avenue, on April 28, 1907. This specimen and another taken at Palos Park, on May 30, 1907, are the only representatives of this species that can be recorded.

Aedes taeniorhynchus Wied.

One specimen, a female, was collected May 18, 1906, on the south side of the city, by Mr. Charles A. Hill. This is the only mosquito with a white-banded beak that was taken in this region.

Aedes triseriatus Say.

Specimens of this aggressive but rather rare woodland mosquito were collected at Beverly Hills (August 18 and 25, September 1, 1907), and near Bowmanville, a suburb in the northern part of Chicago (October 6, 1907).

Aedes trivittatus Coq.

Not observed within the limits of the city, but in the tracts of woodland near the following places the adults were sometimes rather common and always ready to bite, occasionally being quite persistent in their attacks: Beverly Hills (August 18 and 25, 1907; July 13, 1908); Willow Springs (July 14, 1908); Palos Park (July 15, 1908; at light, September 4, 1909); Glen Ellyn (August 2, 1908), and Hessville, Ind. (July 12, 1908; August 29, 1909).

Culiseta consobrinus Desv.

All but one of the specimens obtained were bred from larvae collected on the south side of the city. The wigglers were found in a woodland ditch with stagnant water near Eighty-second Street and Stony Id. Avenue (April 28, 1907), in a roadside ditch near Seventy-ninth Street and East Avenue (June 2, 1907), in a pool of foul water at Sixty-third Street and Cottage Grove Avenue (September 8, 1907), and in a ditch, with apparently fresh water, at West Pullman (May 17, 1908).

Culex restuans Theob.

Adults of this species were bred from larvae collected in fresh water at Willow Springs (June 24, 1906), and at Lemont (July 1, 1906). The immature stages, as well as a few adults, were also taken in Chicago. The records for this mosquito, however, are so few in number that there is a good reason for believing that it was generally mistaken for the common *C. pipiens*, especially since it appears to be fairly abundant in other sections of the country.

Culex territans Walk.

The only specimens obtained are those which were bred from larvae collected in various parts of the south side of the city. The larvae were found in a ditch at the edge of a marsh along South Chicago Avenue (August 5, 1906); in a marsh hole near Eighty-eighth Street and Stony Id. Avenue (September 9, 1906); in a drainage ditch near Eighty-second Street and Cottage Grove Avenue (September 16, 1907), and in lot pools at Sixty-third Street and Prairie Avenue (September 8, 1907), and Fortieth and Wallace Streets (September 15, 1907).

Culex pipiens Linn.

As might be expected both the larvae and the adults of this widely distributed species were found quite commonly in various parts of the city, as well as in the surrounding region. Many local records could be given for this mosquito, but they would add nothing new to what is already known

concerning its habits. That this species will breed throughout the year, if the conditions are favorable, seems evident from the fact that the larvae were found in tubs of water in hothouses, on March 14, 1908. The latest outdoor record for the wigglers is November 3.

Bancroftia signifer Coq.

A rather rare, apparently harmless, woodland species, which was always found resting on the bark of trees, and which was observed only at two places: Beverly Hills (August 18, September 1, 1907; July 13, 1908), and Glen Ellyn (August 2, 1908).

Uranotaenia sapphirina O. S.

This prettily marked, little mosquito breeds quite commonly in the outskirts of the city, but at no time has it been observed trying to bite. Larvae were collected in a roadside ditch near the edge of a marsh along South Chicago Avenue (August 5, and September 9, 1906; August 4, 1907); in ditches along Cottage Grove Avenue, near Eightieth Street (September 16, 1906; August 11, 1907), and in lot pools at Sixty-third Street and Prairie Avenue (September 8, 1907).. Adults were taken in woodland at Beverly Hills (August 25, 1907; at light, September 7, 1907; August 27, 1908), and at Hessville, Ind. (at light, August 29, 1908).

Sayomyia albipes John.

The interesting larvae of this species were found in a series of ditches in a lot at Sixty-third Street and Prairie Avenue, on September 8, November 3 and 28, 1907. Dredging was possible on the last mentioned date, only after a thin coating of ice had been broken. At the same place, on March 24 and April 12, 1908, some more larvae were collected. The immature stages were also found in a railroad ditch near Palos Park, on May 10, 1908.

On some Acridioidea from Puerto Bertoni, Paraguay.

By Lawrence Bruner, University of Nebraska.

The following named locusts were submitted to the writer recently for determination. They were taken by Arnold de Winkelried Bertoni, of Puerto Bertoni, Paraguay. Although the collection is a comparatively small one, it is nevertheless of more than usual interest since it contains at least three apparently new species. In it are also represented two or three other forms of more than ordinary interest.

Orphula pagana Stal.

This species is represented by both sexes (♂, No. 710 and ♀, No. 717). They are of the normal size and color.

Orphula gracilicornis n. sp.

A moderately robust, medium sized, variably colored insect with long, slender and but little flattened antennae and in which the wings are more or less smoky with all the veins bright ochraceous.

Head large, a trifle wider than the front edge of the pronotum, shorter than the latter, the occiput and vertex ascendent, the latter in front of the eyes about as wide as long (♀) or a little longer than wide (♂), more or less acuminate in front, the lateral walls sharp and bordered internally by a deep groove. Eyes fairly prominent, more or less acuminate above, with their anterior edge almost straight, about as long as that portion of the cheek below them, separated above by a space fully twice as great as the width of the frontal costa between the antennae. The latter 18 or 19 jointed, rather elongate, in the female about equalling the combined length of the head and the pronotum, in the male almost a half longer or nearly as long as the hind femora, the joints of the basal half flattened, of the outer half cylindrical, in nowise ensiform as in the typical species of the genus. Frontal costa prominent, a little expanding from the ocellus downward and a very little contracting just above, quite deeply sulcate throughout in the ♀, but in the ♂ sometimes nearly plane between the antennae. Pronotum a very little expanding posteriorly, the lateral carinae fully as prominent as the median and parallel to the last transverse sulci, beyond this point more widely separated, a little less prominent and plainly divergent to the hind margin; hind edge of disk obtusangulate, the surface of the hind lobe both on the disk and

sides rather finely granulose and more or less punctulate, the anterior lobe comparatively smooth. Tegmina and wings about equalling (♀) or a little surpassing (♂) the apex of the abdomen; the former coreaceous and irregularly and closely veined on basal half, the apical portion somewhat membranous and more evenly and sparsely veined, their apex obliquely truncate; the latter moderately narrow, in the males provided with a prominent vitreous fenestrate area crossed by about 10 nearly parallel nervures. Hind femora about normal, in the male extending beyond the tip of the abdomen by the length of the geniculae, in the female just about or not quite reaching the apex of the abdomen. Hind tibiae with 11-12 spines on both the outer and inner edges. Lobes of the mesosternum separated by a space very slightly transverse, their inner edges rounded and gently divergent posteriorly.

Color above varying from plain grass-green on vertex, top of head, disk of pronotum and dorsal portion of tegmina to dark brown with still darker fleckings on the latter; sides of head, pronotum, pleura and discal and costal fields of tegmina varying from castaneous to dark brown; face and legs together with abdomen and venter varying from dull ochreous to dirty testaceous or even pale brown, on the hind femora the upper carinæ marked with fuscous or black, the knees dusky, the hind tibiæ strongly infuscated with pale black-tipped spines. Antennæ testaceous basally, infuscated apically. Upper edge of sides of pronotum lined with deep black, the line crossing over to the outer edges of disk on the hind lobe.

Length of body, ♂, 17 mm., ♀, 24 mm. of pronotum, ♂, 3.4 mm., ♀, 5 mm.; of tegmina, ♂, 14 mm.; ♀, 17 mm.; of hind femora, ♂, 11 mm., ♀, 14.5 mm.

Habitat.—Two males (No. 709) and three females (Nos. 718, 707), Puerto Bertoni, Paraguay, where they were taken during the month of January. A. de Winkelried Bertoni collector.

Orphulella punctata De Geer.

This very widely distributed and variable tropical American locust is represented by several specimens embracing both sexes (Nos. 708, 711, 713 and 727).

Ommexecha virens Serville.

The collection contains a single female specimen of a species of *Ommexecha* that I have no hesitancy in referring to Serville's *virens*. It is very similar in form to the next spe-

cies, but has narrower and more pointed tegmina, and in addition appears less rugose of pronotum. It bore no number.

Ommexecha servillei Blanchard.

This insect is represented by both sexes which are numbered 394. They are typical.

Amblytropidia robusta Bruner.

A single female specimen of this species is at hand. It is of a uniformly dark color and bears the number 728.

Elaeochlora viridicata (Serville).

A single male specimen bearing the number 399 is referred here.

Diponthus crassus n. sp.

A comparatively small, but very robust species without banded hind femora in which the base and disk of the wings are flavous or hyaline instead of red or roseate.

Head short and deeply set into the anterior edge of the pronotum, about as wide as high; the vertex broad, nearly as wide as the shortest diameter of one of the eyes, the fastigium depressed, widely and shallowly sulcate, the surface sparsely punctate; frontal costa gradually merged into the vertex and at its upper extremity nearly as wide, gradually narrowing below, deeply sulcate at ocellus and below, nearly plane above but provided with a few scattered punctures. Antennæ with the segments flattened or compressed nearly or quite one-half longer than the combined length of the head and pronotum 22-jointed. Pronotum expanding but little posteriorly, the anterior lobe coarsely and the hind one densely and deeply punctulate, the two lobes about equal in length, the transverse sulci, especially the hind ones, profound; anterior edge roundly emarginate at middle, the hind margin of disk widely and roundly angulate. Tegmina and wings somewhat abbreviated, not quite reaching the apex of the abdomen or the tips of the hind femora, the veins and veinlets testaceous and the background dull black. Hind femora rather slender their lower sulcus inner side and outer disk together with the genicular lunules black or piceous. Hind tibiæ 9-11 spined externally and 14 spined internally, the lower and inner faces infuscated, externally and above dark vinaceous. Prosternal spine large compressed, straight, the apex rounded. Interspace between the mesosternal lobes wider than the lobes themselves.

General color dull brunneo-piceous, the frontal costa, vertex, a line on occiput and middle of pronotum to its apex testaceous; pos-

terior and anterior edges of lateral lobes of latter likewise testaceous as are also the anterior and middle legs and portion of the hind femora.

Length of body, ♀, 34 mm., of pronotum, 8 mm., of tegmina, 22 mm., of hind femora, 19 mm., of antennæ 16.5 mm.

Habitat.—The type comes from Puerto Bertoni, Paraguay, where it was taken in November, 1909, by A. de Winkelried Bertoni. It was submitted under the number 400.

This form may be separated from the previously described species by the subjoined table.

TABLE FOR DETERMINING THE SPECIES OF DIPONTHUS.

A. Tubercle of the prosternum acuminate, retroarcuate.
  b. General color green or olive; tegmina immaculate, the margins pale.
    c. Grass-green; wings greenish-hyaline. Posterior femora on outer face not dotted with black.....**electus** Serv.
    cc. Olive green; tegmina dilute fuscous; wings subhyaline, rose-color basally, the nervures brown. Posterior femora on the outer face with two bands and the condyle black or blackish; hind tibiæ with base, apex and spines black .....**dispar** Gerst.
  bb. General color ochraceous or fuscous; tegmina maculate.
    c. Wings blue, the apex bordered with brown; hind tibiæ black and yellow annulate, not black-dotted. **festivus** Gerst.
    cc. Wings rose color, tesselate with black; hind tibiæ yellow, dotted with black apex and base dusky.
      clarazianus Pict. et Sauss.

AA. Tubercle of the prosternum straight, not retroarcuate.
  b. Pronotum with the pale lines percurrent, three dorsal, straight; two lateral, suboblique. Body and legs yellow, black and red; tegmina black tesselate with yellow
    puelchus Pict. et Sauss.
  bb. Pronotum with the pale lines not percurrent, except the dorsal one alone in some instances.
    c. Larger (male, 40, female 51 mm.) Testaceous conspersed with black .....**nigro-conspersus** Stal.
    cc. Smaller (male, 24-29, female, 30-40 mm.) Color variable.
      d. General form very robust, the tegmina and wings not quite reaching the tip of abdomen or apex of hind femora. Wings hyaline or flavous, without a tinge of red or roseate. Hind femora not banded or fasciate
        crassus N. Sp.

dd. General form only moderately robust, the tegmina and wings reaching or surpassing the tip of the abdomen or apex of hind femora. Wings with a varying portion more or less red or roseate. The hind femora fasciate.

e. Body and legs not black spotted.

f. Tegmina for the most part olivaceous or greenish, but slightly maculate with dusky ..... **permistus** Serv.

ff. Tegmina decidedly obscure maculate.

g. Anterior and middle legs not largely black; general color dull testaceous, inclining to brown.

paraguayensis Brunner.

gg. Anterior and middle legs largely black.

h. Pronotum for the most part black, the bands bright yellow, head and knees ornamented with red.

schulzi Brunner.

hh. Pronotum when black only so on the anterior lobe, the bands testaceous. Head and knees without red.

argentinus Pict. et Sauss.

ee. Body and legs conspicuously conspersed with black.

f. Body and legs strongly tinged with rufous or red. Antennæ unicolorous, black **pycnostictus** Pict. et Sauss.

ff. Body and legs along with tegmina greenish or olivaceous. Antennæ annulate with pale. .... **communis** Bruner.

Leptysma filiformis Serville.

A single male locust bearing the number 403 is referred here with some doubt, but by referring to the table for separating certain South American species of the genus (Proc. U. S. Nat. Mus., xxx, p. 658), it will be found that the specimen at hand falls in with what has been accepted as the above species.

Adimantus ornatissimus Burmeister.

A very beautifully marked female locust numbered 409 is placed as Burmeister's *Oxya ornatissimus*. It agrees well with other specimens in the writer's collection that have been called the *Acridium vitticeps* Blanchard. (See Paraguayan Locusts, Proc. U. S. Nat. Mus., xxx, p. 666).

Schistocerca paranensis (Burmeister).

A female specimen of this destructive migratory species is included without a number and indicates that Puerto Bertoni is within its range.

Schistocerca flavofasciata (De Geer).

A male specimen of this genus bearing the number 729 is referred here. It is quite normal.

Dichroplus punctulatus (Thunberg).

This insect, the most widely distributed species of the genus *Dichroplus*, is represented by a typical female specimen under the number 714.

Dichroplus bergi Stal.

There are two specimens, a pair, of a locust belonging to the genus *Dichroplus* at hand, that are referred to Stal's *D. bergi* with some doubt. They come nearest to his variety b. but are not quite typical. They are numbered ♀ 723, ♂ 726, the former collected in January, the latter during December.

Parascopas sanguineus n. sp.

Very similar to *Parascopas* (*Scopas*) *obesus* Giglio-Tos in size and general appearance, but differing from that insect in being somewhat slender and in lacking the blood-red lower sulcus and inner face of hind femora. The present species also differs from *obesus and chapadensis* Rehn, in having the entire lower surface including the meso- and metasternum together with the last ventral segment of the male abdomen rich blood-red. The hind tibiæ are also much deeper blue-green than in the other two known species. The cerci of the present species are similar to those of *obesus* but less abruptly bent upwards than there. The supra-anal plate is largely pallid not at all sulcate at middle, while the preceding segment has its marginal apophyses almost entirely obliterated, being present only as very minute tooth-like projections. The tegmina slender elongate oval, their apices reaching about to the middle of the second abdominal segment, their upper half being light olive-green, and the lower portion piceous.

Length of body, ♂, 22 mm., of pronotum, 4.6, of tegmina, 3.5 mm., of hind femora, 12 mm.

Habitat.—The single male specimen at hand, the type, comes from Puerto Bertoni, Paraguay, where it was taken during the month of January, by A. de Winkelried Bertoni. It is numbered 712.

This insect is to be recognized also by its very deeply sulcate fastigium and frontal costa and by the ferruginous antennae that become strongly infuscated apically, while the

specimens at hand of both *obesus* and *chapad* have them pallid. The annexed table will aid in separating the species of the genus.

SYNOPSIS OF THE SPECIES OF PARASCOPAS.

A. Body rather obese, the transverse sulci of the pronotum profound. Lower edge and lower half of inner face of hind femora blood-red ..... **obesus** Gig.-Tos.

AA. Body more elongate, the transverse sulci of the pronotum not profound but still well defined. Lower edge and inner face of hind femora flavous.

b. Entire under surface of body blood-red. Cerci of male with the apical two-thirds very slender, equal, directed upwards and a little to the rear; supra-anal plate scarcely sulcate and largely pallid. ..... **sanguineus** N. Sp.

bb. Entire under side flavous. Cerci of male with the apical two-thirds moderately heavy, sigmoid, flattened, the apex directed to the rear; supra-anal plate largely infuscated, deeply sulcate at middle. ..**chapadensis** Rehn.

Osmilia violacea (Thunberg).

Specimens of the genus Osmilia (No. 404) are referred to Thunberg's *violacea*. They are typical of those with bluish wings found throughout Southern Brazil, Paraguay and Northern Argentina. Whether or not they are distinct from the *coelestis* Burmeister I am not prepared to state at this time.

Rhipipteryx brullei Serville.

The collection at hand also contained two specimens of this little gryllid. It was numbered 395.

THE CLASSIFICATION OF THE MELOIDAE:—I note that Dr. Wellman, in his very interesting paper on this group, uses the subfamily name Zonitinae, proposed by Ganglbaur in 1907. The name Zonitinae has however been long in use for a subfamily of Mollusca, of which the genus *Zonites* is the type. I suggest that the Coleopterous Zonitinae be called Nemognathinae, with *Nemognatha* as the type genus. The tribe Zonitini then takes the name Nemognathini, proposed in 1862 by LeConte. With regard to the name of the family, I am altogether disposed to adhere to Meloidae, which seems to be justifiable historically and on the grounds of long usage.—T. D. A. COCKERELL, Boulder, Colorado.

Two New Trypetidae from China.

By D. W. Coquillett.

Trypeta quinaria n. sp.

Yellowish, the metanotum largely black. Lower front corner of the third antennal joint produced in the form of a sharp tooth, arista short-plumose. Body somewhat polished. Wings hyaline, marked with five brown crossbands, all except the first two crossing the wing; the first band is at the humeral cross vein; the second begins at the apex of the auxiliary vein and extends to the sixth vein; the third begins at the apex of the first vein, passes over the small cross vein, ending just beyond the tip of the sixth vein; it is connected with the preceding band by the brown stigma; the fourth band begins at a point midway between the apices of the first and second veins and passes over the hind cross vein; the fifth band extends from the tip of the second vein to the middle of the second posterior cell, leaving the broad apex of the first posterior cell in the hyaline portion; third vein bristly to the last brown band; small cross vein near the middle of the discal cell. Length, 5 to 7 mm.

Hongkong, China. A specimen of each sex collected in 1908 by Mr. George Compere. Type No. 12,992, U. S. National Museum.

Oxyphora fenestella n. sp.

Head yellow, antennal grooves chiefly brown, a brown spot connects them on the upper part of the face; antennae yellow, the third joint brown, its lower front corner produced in the form of a sharp tooth; arista long-plumose; proboscis brown, palpi yellow. Thorax yellow, opaque gray pruinose, the center of the mesonotum and lower part of the pleura brown; scutellum yellow and with a basal triangular brown spot, four scutellar bristles. Abdomen yellow, a median spot on the first segment, a dorsal pair on the second, third and fourth, and the basal segment of the ovipositor, black. Legs yellow, the femora largely brown. Wings brown, rather sparsely covered with hyaline spots and dots; stigma brown, its apex yellowish hyaline; between apices of the first and second veins are two hyaline spots; between the apices of the second and third veins is only one hyaline spot, situated just beyond the tip of the second vein; the first posterior cell contains two hyaline dots alternating with two transverse pairs of hyaline dots; the hyaline dot in the apex of this cell is nearly one-third as wide as the cell; the discal cell contains three transverse pairs of hyaline dots; the ground color of the wings is of several shades of brown, and is varied by a few rather large yellowish spots; third vein bristly nearly to its tip, small cross vein near the middle of the discal cell. Length, 5 mm.

Hongkong, China. A female specimen collected in 1908 by Mr. George Compere. Type No. 12,993, U. S. National Museum.

The Butterflies of the Lake Tahoe Region.

By E. J. NEWCOMER, Palo Alto, Cal.

(Continued from p. 277)

8. **Melitaea anicia** Db. & Hew.

One ♀ at Deer Park (6500 ft.), June 10. Common about Glen Alpine in July and August, below 7000 feet. The form here is very much like Wright's *sierra,* which, I think, is at most a variety of *anicia* with the markings of the female blurred.

9. **Melitaea editha** Bdv.

Mr. Wright, in his "Butterflies of the West Coast," figures this species from Lake Tahoe. I did not take it.

10. **Melitaea whitneyii** Behr.

This is one of the commonest butterflies of the Canadian zone, gathering in large numbers about moist spots in the soil. It flies from early June until the middle of August. This butterfly, as Hy. Edwards has already said,* would appear to be the mountain form of *palla.* It differs from *palla* in being generally freer from black on the upper side. I have taken no black females of *whitneyii,* though the female of *palla* is much commoner than the red, in my experience. Behr distinguished *whitneyii* from *palla* chiefly by the absence of eye-spots in the submarginal band on the under side of the secondaries of the former. However, several of my mountain specimens have distinct eye-spots, and if one were to call these a different species from those without the spots, he would have two almost indistinguishable species flying in the same region, and would be splitting hairs besides. I have a number of specimens of *whitneyii* which aproach *hoffmani* in the concentration of the black markings on the upper surface.

11. **Melitaea hoffmani** Behr.

Not as common as the preceding, and occurring with it. The ground color of this species is more of a yellow, while that of *whitneyii* is fulvous.

* Rep. Wheeler Exp., V, 759.

12. **Phyciodes pratensis** Behr.

Mr. Williams reports this species from the Glen Alpine region.

13. **Phyciodes montana** Behr.

Quite as abundant as *Melitaea whitneyii,* and flying with it. This species resembles *mylitta,* but is larger. The dark markings are heavier in the male than those of *mylitta,* and in the female there is more yellow, and all the markings are more blurred than in the same sex of *mylitta.*

14. **Grapta zephyrus** Edw.

This species is not particularly common, but occurs from May until late August, and at all elevations.

15. **Vanessa californica** Bdv.

A rather common species in August below 8,500 feet. I noted an occasional specimen during July, and several in May, which latter had probably hibernated. Mr. Williams took the larvae on a species of *Ceanothus.*

16. **Vanessa antiopa** L.

Rather common in the Canadian Zone, appearing in May. Larvae comon on willows.

17. **Vanessa milberti** Godt.

Not common, but occurring all summer and at all elevations. I found the gregarious larvae on nettle (*Urtica gracilis*).

18. **Pyrameis huntera** F.

Occasional, July and August, Deer Park, from 6,200 to 8,500 feet elevation.

19. **Pyrameis cardui** L.

Fairly common from May until August at the same altitudes as the preceding. Larvae on *Carduus.*

20. **Pyrameis caryae** Hbn.

Rather abundant all summer up to at least 9,000 feet. I found the larvae on *Sidalcea spicata* Greene, a malvaceous plant.

21. **Junonia coenia** Hbn.

One specimen, July 3, and one, August 6, 1909, at Deer Park (6,500 feet).

22. **Limenitis lorquini** Bdv.

Commonest along the streams, but found on the mountain sides occasionally, up to 8,500 feet. It occurs from early June to September.

23. **Heterochroa bredowii** var. **californica** Butl.

A few seen at Deer Park along the creek in July and August.

24. **Satyrus silvestris** var. **charon** Edw.

This species is common on peaks above 7,500 feet, in July and August, and is often seen in the canyons below. I took no specimens that could be referred to *silvestris*.

25. **Chionobas ivallda** Mead.

A rather common butterfly at all elevations above 7,500 feet, particularly on rocky slopes and peaks. It is difficult to capture on account of its wariness and the character of the ground it frequents. Some of Mead's types came from Mt. Tallac and Freel's Peak, both near the southern end of Lake Tahoe.

26. **Thecla grunus** Bdv.

This is frequently seen about the scrub oak in August.

27. **Thecla californica** Edw.

Common in July and August below 8,500 feet.

28. **Thecla saepium** Bdv.

Very common in the Canadian Zone in July and August. I found the females more abundant than the males.

29. **Thecla nelsoni** Bdv.

I took several specimens of this beautiful little species in early July, 1907, at Glen Alpine Springs (6,800 feet), flying about the scrub oak.

30. **Thecla behrii** Edw.

A very common species in the Canadian Zone, particularly about the flowers of *Eriogonum;* occasional at higher elevations. Found in July and August.

31. **Thecla iroides** Bdv.

Occasional in July in the Canadian Zone.

32. **Thecla eryphon** Bdv.

Even rarer than the last. I have one taken June 26, and one July 11, at Deer Park (6,500 feet). Mr. Grinnell and Mr. Williams both have specimens from the Glen Alpine region, taken in July, and I noted one there in August.

33. **Thecla dumetorum** Bdv.

One, June 12, 1908, 6,500 feet, and one, July 23, 1909, 7,900 feet, both near Deer Park. Mr. Williams reports it from Glen Alpine.

34. **Chrysophanus virginiensis** Edw.

July and August, in the lower part of the Canadian Zone. Quite common along the dry beds of small streams.

35. **Chrysophanus editha** Mead.

Common after the middle of July in the canyons. The type specimens were taken near Carnelian Bay, at the northern end of Lake Tahoe. Mead says* the species appeared "in considerable numbers on the flowers of yarrow (*Achillea millefolium*)."

36. **Chrysophanus gorgon** Bdv.

One male, July 10, and one female, July 12, 1908, at Deer Park (6,500 feet).

37. **Chrysophanus mariposa** Reak.

Mr. Williams took several specimens about July 20, in a meadow near Fallen Leaf Lake (6,540 feet), in the Glen Alpine region.

38. **Chrysophanus zeroe** Bdv.

Very common in the Canadian Zone, appearing late in June. I obtained a number of eggs by confining the female in a gauze bag over the food plant, which is *Polygonum douglasii* Greene.

* Can. Ent., X, 198, 1878.

39. **Chrysophanus helloides** Bdv.

Occasional, June to August, Deer Park (6,200 feet).

40. **Chrysophanus cupreus** Edw.

Never abundant anywhere; found in the lower Canadian Zone. It appears in June, and only a few tattered specimens can be found at the end of July. It has a decided preference for the flowers of the pussy paws (*Spraguea umbellata* Torr.).

41. **Lycaena fuliginosa** Edw.

Found at all altitudes below 8,500 feet; commonest at the higher altitudes. I did not take it before the middle of July.

42. **Lycaena heteronea** Bdv.

Fairly common in July and August at the lower elevations.

43. **Lycaena fulla** Edw.

The commonest *Lycaena* in the region. It occurs below 8,500 feet from the middle of June until September. There is some variation, particularly as to the size of the spots on the under surface. The larval food plant is *Lupinus meioanthus* Gray.

44. **Lycaena daedalus** Behr.

Quite common on the grassy canyon floors most of the summer. The larvae eat the flowers and green seeds of *Trifolium variegatum* Nuttall, and *T. cyathiferum* Lindl.

45. **Lycaena antiacis** var. **behrii** Edw.

I have a single specimen, taken at Deer Park June 25, 1908, at 6,500 feet, which is nearer *behrii* than anything else. It is, I think, the same form that Mr. Williams took at Shasta, in Northern California.* Mr. Williams found this species also at Glen Alpine at high altitudes.

46. **Lycaena sagittigera** Feld.

One specimen, Deer Park, July 14, 1909, at 6,200 feet. Mr. Williams has one from Glen Alpine, taken in July.

47. **Lycaena podarce** Feld.

Mr. Williams took a few specimens of *podarce* about Glen

* Ent. News, XX, 69, 1909.

Alpine, in the Canadian Zone in July. I have one female from Deer Park, July 15, 1909, elevation 6,200 feet, which has a very striking appearance on the upper surface, the ground color being broken by distinct whitish spots, corresponding to the median row of spots beneath.

48. **Lycaena enoptes** Bdv.

Fairly common at all altitudes, particularly on rocky peaks about *Eriogonum umbellatum* Torr., which, I think, is its larval food plant. Occurs from June to August, and probably September. In the males, the width of the marginal band varies considerably, as does the appearance of the orange stripe on the secondaries of the females.

49. **Lycaena shasta** Edw.

Mr. Williams took several males at 8,000 feet, near Glen Alpine.

50. **Lycaena acmon** Db. & Hew.

Quite common at all altitudes; June to August. It varies somewhat here as elsewhere. The food plant of the larvae is *Eriogonum umbellatum* Torr.

51. **Lycaena anna** Edw.

Rather common in the canyons, July and August.

52. **Lycaena pseudargiolus** var. **piasus** Bdv.

Common in the canyons. It appears as soon as the snow melts, and is in evidence until the middle of July or later.

53. **Neophasia menapia** Feld.

I saw this butterfly only at Deer Park (6,500 feet), and this is possibly its southern limit, as it has not been reported south of here. It appears about the middle of August, and may become abundant later. I took a pupal shell attached to a leaf of *Pinus jeffreyi*. There were also the remains of several parasitized larvae on the same tree.

54. **Pieris sisymbri** Bdv.

Flies from early June until August, and occurs oftenest above the Canadian Zone. I took several larvae on *Arabis glabra* Bruh.

55. **Pieris occidentalis** Reak.

Rather common everywhere in July and August. Mr. Grinnell has a male of the variety *calyce* Edw., taken July 25, 1907, near Glen Alpine Springs (6,540 ft.), and Wright reports this variety from Tahoe.

56. **Pieris rapae** L.

Quite common in the canyon at Deer Park during July and August.

57. **Anthocharis ausonides** Bdv.

This species occurs in some numbers from June until the last of July, and at least to 9,000 feet elevation. The individuals average smaller than those taken about San Francisco Bay.

58. **Anthocharis sara** var. **reakirtii** Edw.

A rather common butterfly below 8,500 feet elevation; flies from the middle of May until the last of July. The specimens in this region are of the form *stella* Edw., in which the females are yellow instead of white. The males also have a yellowish tinge. The larvae of this and the preceding species feed on a number of cruciferous plants, particularly *Arabis glabra* (L.) Bruh., *A. lyallii* Wats., and *A. duriuscula* Greene.

59. **Colias eurytheme** Bdv.

This occurs all summer and is found in proper season at all elevations, the commonest in the Canadian Zone. I took the variety *eriphyle* Edw. at Deer Park, in July and August, below 7,000 feet elevation.

60. **Parnassius clodius** Mén.

This species is common at the lower elevations from early June until August, and probably later. The variety *ménétriesii* Hy. Edw. also occurs. I have several specimens with the spots pinkish yellow, which would bring them near the variety *altaurus* Dyar. They are worn specimens, however, and may have faded.

61. **Parnassius smintheus** Db. & Hew.

Wright reports the synonym *sayii* Edw., from "near Lake Tahoe." The variety *behrii* Edw. is not rare at altitudes of

8,000 to 9,500 feet in July and August. I took the eggs on and near *Sedum stenopetalum* Pursh., at 8,500 feet.

62. **Papilio zolicaon** Bdv.

This butterfly is frequently seen at all elevations, being found on even the highest peaks after the snow has melted. In the canyons it appears early in June.

63. **Papilio indra** Reak.

Never common anywhere, but found usually about the summits of rocky peaks. The males are frequently seen in the canyons about damp places, particularly in the vicinity of mineral springs, where one may often take specimens of all four Papilios. Away from these gathering places, it is very difficult to capture. It occasionally alights on flowers, but keeps its eyes open for the net. The females are quite rare. I took one at an elevation of 7,000 feet, which had just emerged from its chrysalis. The larvae of both *zolicaon* and *indra* feed on umbelliferous plants.

64. **Papilio eurymedon** Bdv.

Quite common from June to September in the Canadian Zone and occasionally above 8,000 feet. The specimens are mostly darker than those from near sea level.

65. **Papilio rutulus** Bdv.

Common in the Canadian Zone all summer, flying with the preceding species along the stream courses. The larvae feed on willows.

66. **Pamphila comma** L.

A rather common species at all elevations, June to August. My specimens, according to Dyar's "Review," are the variety *colorado* Scudd.

67. **Pamphila sylvanoides** Bdv.

Not rare in the Canadian Zone, and found sparingly in the Hudsonian, July and August.

68. **Pamphila agricola** Bdv.

Several specimens in August, Deer Park (6,500 feet).

69. **Pamphila sabuleti** var. **tecumseh** Grinnell.

This small species occurs rather abundantly in grassy places in the Canadian Zone. Found from June to August. Mr. Grinnell tells me my specimens are "perfectly typical."

70. **Pyrgus tessellata** Scudd.

A very common species below 8,500 feet, June to August. Larvae on *Sidalcea spicata* Greene.

71. **Pyrgus caespitalis** Bdv.

Not so common; Canadian Zone, June and July.

72. **Nisoniades persius** Scudd.

Not rare, from June to August.

73. **Nisoniades propertius** Lint.

Mr. Williams took this species at Glen Alpine. I have one specimen, July 28, Deer Park (6,200 feet).

74. **Nisoniades tristis** Bdv.

Mr. Grinnell has several specimens from Fallen Leaf Lake, June 25-27.

75. **Eudamus mexicana** H. S.

Rather common in the Canadian Zone, late June to August.

Dates of Koch's Genera as Published in Die Pflanzenläuse.

By O. W. Oestlund, University of Minnesota.

There appears to be a lack of uniformity among writers on aphids in assigning dates to the genera established by Koch in his monographic work, issued in parts extending over the years 1854-1857. While some use the first or last date alone for all genera, others use both combined. Hunter, in his list of the Aphididae of North America, published as Bulletin 60 of the Iowa Experiment Station in 1901, gives the dates 1855-1857 for the whole work and assigns Heften 1-4, pp. 1-134 to 1855; Heften 5-7, pp. 135-236 to 1857. On what facts this is based is not clear. The citation may be from Hagen with the omission of the earlier date (1854), and of parts 8 and 9, and with the misplacement of the dates 1855 and 1857 in connec-

tion with the parts to which they properly belong. That the work was issued in nine parts or Heften is apparent from the remarks of Kaltenbach in his Nachträgliche Bemerkungen on page 329 (328 of later copies) of the work itself.

Carus, in Bibliotheca Zoologica of 1861, gives the dates 1854-1857 for the whole work and assigns pages and plates to each of the nine parts, as will be given in the following, but does not give the year for the individual parts. Hagen gives the dates for the parts in the Bibliotheca Entomologica as follows: Parts 1-4, pp. 1-134; 24 plates, 1854. Parts 5-7, pp. 135-236; 18 plates, 1855. Parts 8 and 9, pp. 237-336; 12 plates, 1857.

The number of copies distributed in parts was probably small and on the completion of the work in 1857 the greater part of the edition was united into one with a new title page dated Nürnberg, 1857, in which condition most of the copies now to be had are found. A copy in the Department Library of Animal Biology of the University of Minnesota bears evidence of one that was issued in the nine original parts though later bound into one. The plates of this copy, as probably all that were issued as separate parts, are much superior to any of the later copies that I have examined. The copy bears the title page, dated Nürnberg, 1857, which was probably issued with the last part, but following this it also has the title page of the Ersten Heft dated Nürnberg, 1854. The copy also shows the torn off covers of the original parts between many of them as given by Hagen. A second copy in my possession has been separated into the nine parts as originally printed based upon the evidence of the printer, the binder, and Carus' and Hagen's data, which give further evidence of how the work was published. It is a well known fact that bookmakers will not print a sheet of less than 16 pages except at the end of a work or for other good reasons. The presence of an incomplete sheet at the end of each part, except one, therefore, gives additional evidence that the part was completed before the following was undertaken. All the facts as far as known

to me are indicated in the following distribution of parts and dates:

Parts 1-4 were issued in 1854 (Hagen).

Heft I, pp. 1-8 and 1-36. Plates 1-6, 1854:

Sheets 1 and 2 are complete, but sheet 3 has only four pages. The title page to this part is also known, dated Nürnberg, 1854.

Heft II, pp. 37-72. Plates 7-12, 1854:

Sheets 4 and 5 are complete, sheet 6 has only four pages.

Heft III, pp. 73-100. Plates 13-18, 1854:

Sheet 7 is complete, sheet 8 of twelve pages.

Heft IV, pp. 101-134. Plates 19-24, 1854:

Sheets 9 and 10 complete, sheet 11 of only two pages. New genera described in these four parts that should bear the date 1854 are: *Chaitophorus, Hyalopterus* and *Rhopalosiphum.*

Parts 5-7 were issued in 1855 (Hagen).

Heft V, pp. 135-166. Plates 25-30, 1855:

Sheets 12 and 13 both complete.

Heft VI, pp. 167-196. Plates 31-36, 1855:

Sheet 14 complete, sheet 15 of fourteen pages and a blank leaf present in two copies that I have seen.

Heft VII, pp. 197-236. Plates 37-42, 1855:

Sheets 16 and 17 are complete, sheet 18 of eight pages. New genera that are described in these three parts that should bear the date 1855 are: *Siphonophora, Drepanosiphum, Callipterus* and *Dryobius.*

Parts 8 and 9 were issued in 1857 (Hagen).

Heft VIII, pp. 237-274. Plates 43-48, 1857:

Sheets 19 and 20 complete, sheet 21 of six pages and in one copy seen also the bnak leaf to complete the half sheet.

Heft IX, pp. 275-336. Plates 49-54, 1857:

Contains sheets 22-25. New genera described in these two parts that should bear the date 1857 are: *Asiphum, Phyllaphis, Gladobius, Toxoptera, Glyphina, Pachypappa, Anoecia, Mindarus, Prociphilus, Stagona, Thecabius, Tychea, Amycla, Endeis* and *Anisophleba.*

Description of a new Genus and four new Species of North American Cleridae.

By A. B. Wolcott, Chicago, Ill.

The few species here made known have been carefully chosen, the object in view being to select only such species as are very distinct from their nearest allies, hence no confusion should arise as a result of describing them at this time.

Cymatodera cognata sp. nov.

Piceous, subopaque, antennæ and an irregular, obscure median fascia rufo-piceous, sparsely pubescent. Head densely confluently and rather coarsely punctate; eyes feebly prominent. Antennæ slightly longer than head and thorax, joints two to ten subequal, slender, eleventh a little longer. Thorax nearly one-half longer than wide, moderately constricted in front of middle, strongly compressed at sides behind, base narrower than apex, surface moderately coarsely but not very densely punctate, ante-scutellar impression distinct, limited each side by a prominent tubercle. Elytra nearly twice as wide as base of thorax, humeri distinct, sides slightly divergent posteriorly, apices conjointly rounded, disk with striæ of moderately fine punctures, those of the sutural striæ extending scarcely to middle, the lateral striæ much longer, an obscure, irregular fascia at middle scarcely attains the suture. Body beneath finely and sparsely punctate, abdomen and legs subrugose. Length 8-9.5 mm.

Male.—Fifth ventral segment feebly emarginate, longitudinally carinate at middle from base to apex; sixth oval, feebly emarginate; last dorsal oval, shorter and narrower than the corresponding ventral, subtruncate at apex.

Female.—Fifth ventral broadly, feebly emarginate, feebly carinate at middle; sixth oval, incised at apex; last dorsal elongate oval, broadly triangularly emarginate at apex.

Las Vegas, Nevada (type ♂); Stockton, Utah (type ♀). Both specimens were collected by Mr. Tom Spaulding, and were sent me by Mr. Warren Knaus, to whom my thanks are due for one of the types.

This species is of the form of *inornata*, but less slender, and with elytral sculpture nearly as in *fuscula*. It is nearest allied to the species of the *belfragei* group (*belfragei, morosa, flavosignata* and *umbrina*), from all of which it differs in secondary sexual characters of the abdomen and in other details.

Mr. Charles J. Gahan, in his recent valuable contribution: "Notes on Cleridæ and Descriptions of some new Genera and Species of this Family of Coleoptera." (Ann. Mag. Nat. Hist., Lond., Ser. 8, Vol. V, Jan., 1910, pp. 55-78), calls attention to the fact that the North American species, *Thanerocleruus sanguineus* Say. differs from the genus type (*E. buquetti* Lefebvre) in several important details of structure; these differences are of sufficient moment to necessitate the erection of the following new genus:

ZENODOSUS gen. nov.

Eyes oval, finely granulate, entire; front coxal cavities open behind; flanks of prothorax non-carinate.

Type of the genus *Zenodosus* (*Thanerocleruus*) *sanguineus* Say.

In *Thanerocleruus* Lef., the eyes are small, feebly emarginate, round and coarsely granulated, the flanks of the prothorax distinctly carinate, and the front coxal cavities closed behind.

An examination of material in my collection shows, however, that the Cuban species (*T. girodi* Chevrolat), is a true *Thanerocleruus*.

Clerus ichneumoneus Fabr. var. **knabi** nov.

Form, size and sculpture as in typical form, the markings and color also similar, but with the apical fourth of elytra pale reddish testaceous, each elytron with a rather large, ante-apical, black maculation. Length 11.5 mm.

Marion Co., Florida.

This variety, if indeed such it be, was sent me several years ago by Mr. Frederick Knab, since which time I have examined not less than four hundred specimens of *ichneumoneus* without finding another individual either identical with, or intermediate between this and the typical form, hence *knabi* may eventually prove to be a distinct species.

Hydnocera maritima sp. nov.

Elongate, feebly shining, olive-green; head and thorax æneous; antennae, labrum, palpi, knees, tibiae and tarsi testaceous. Head (including the moderately prominent eyes) very slightly wider than the thorax, coarsely, densely rugose. Thorax one-third wider than long,

apical constriction strong; sides broadly, strongly dilated, posteriorly feebly convergent; subapical transverse impressed line deep, middle of disk anteriorly with a short but distinct longitudinal sulcus, basal impressed line distinct, near the flanks turning obliquely forward; lateral foveae small, but deep and distinct; surface coarsely, densely punctate. Elytra rather depressed, fully covering the abdomen, slightly wider than the head; humeri obtuse; sides parallel; surface coarsely, densely punctate, somewhat scabrous toward apices, the latter obtusely rounded, not serrate but irregular in outline, dehiscent at suture. Upper parts rather densely clothed with short, recumbent, whitish pubescence, with longer, erect dark hairs intermixed; ventral surface and legs clothed in like manner but more sparsely. Length 5-5.5 mm.

Truro, Mass., June, '92. "On beach grass, seems to be a seashore species." (Fredk. Blanchard, *in litt.*). Two specimens, ♂ and ♀..

Maritima bears a slight resemblance to *subfasciata* Lec., but differs from that species in many details; in the present species the form is more elongate, the prothorax proportionately broader, the sculpture and color decidedly different, and the elytral apices are non-serrate.

I am indebted to Mr. Frederick Blanchard for the type (♂) specimen, a cotype (♀) is in Mr. Blanchard's collection. Truro, Mass., is a town on Cape Cod peninsula.

Hydnocera tibialis sp. nov.

Elongate, dark green with slight metallic reflections; head, thorax and elytra varying from bright green with faint metallic lustre, to bright blue; antennæ (club slightly infuscate at tip), palpi, tibiae and tarsi (outer joints of latter infuscate) pale testaceous; pubescence whitish, erect, moderately dense and long. Head including the large prominent eyes scarcely narrower than elytra at base, finely, transversely rugose. Thorax wider than long, distinctly transversely rugulose, subapical and transverse impressed lines only moderately distinct, lateral foveae feebly impressed. Elytra very slightly convex, fully covering the abdomen, humeri moderately prominent, sides very feebly sinuate and subparallel, apices separately rounded and rather strongly serrate, dehiscent at suture, surface coarsely, very densely punctate, punctuation toward apices a little more dense, apices not at all tumid. Body beneath and legs shining, conspicuously clothed with moderately long whitish hairs. Length 4-4.8 mm.

Pine Ridge, Nebraska. Types (♂ and ♀) in my collec-

tion; cotypes (three) in the collection of the University of Nebraska.

For the privilege of examining the above specimens, as well as the other Clerid material in the collection of the University of Nebraska, I am under deep obligations to Prof. L. Bruner and Mr. Charles H. Gable.

Hydnocera gerhardi sp. nov.

Very slender, shining, sparsely clothed with short, fine pubscence, black, head and thorax rufo-piceous, apical and basal margins of the latter dull rufous, lower part of front, mouth, antennae, elytra, legs and last abdominal segment pale yellow. Head (including the very prominent eyes) as wide as elytra at base, nearly smooth (very finely and very sparsely punctulate). Thorax much longer than wide, subcylindrical, subapical constriction moderate, surface alutaceous, disk at middle very finely rugulose. Elytra elongate, humeri feeble, parallel, not shorter than the abdomen, entirely pale yellow, coarsely, deeply, rather densely, partially confluently punctate, apices separately, rather acutely rounded, strongly serrate, dehiscent at suture. Legs elongate, pale yellow, outer joints of tarsi fuscous, posterior femora extending to tip of elytra. Length 4.8 mm.

Yuma, Arizona. Collected by Wesley D. Lipe.

A very elongate species, in fact more slender than any other known to me; it is perhaps nearest allied to *bicolor* Lec., from which it is, however, very distinct, the size being very nearly twice as large, the head not at all rugose, the elytra densely, not sparsely punctate, the apices not tumid, and the coloration is different.

Named in honor of my friend Mr. William J. Gerhard.

FLATTERED.—First Fly—"Have you seen that new encyclopedia?"
Second Fly—"No. Is there anything about us in it?"
First Fly—"Certainly; an entire page is devoted to us—the fly-leaf."
—Newspaper.

Mr. JAMES CANTLIE, hon. secretary of the Pellagra Commission, has received, as we learn from the London *Times*, the following telegram from Dr. Sambon, dated Rome, May 13: "The pellagra field commission has definitely proved that maize is not the cause of Pellagra. The parasitic conveyor is the *Simulium reptans*."—(*From Science.*)

Four new Reduviidae.

By Nathan Banks.

Of the four species described below, two have been in my collection for years and are taken in the Eastern States, the other two are from Arizona and sent in recent years by Mr. Biederman.

Pnirontis modesta n. sp.

Pale greyish yellow, with a faint median dark line on the pronotum, four black dots on each lateral margin of the venter and sometimes a black spot in front of each eye. Four large spines under femur I, the basal one short, the next about as long as width of the joint, third still longer, and fourth the longest; the third is a little nearer to the fourth than to the second; tibia I has on the inner side three long spines (closer together than in *Pn. languida*) and near the last one on the lower side is a long, erect, stout spur or spine. Tip of abdomen forked as in *Pn. languida*, but the lobes are more divaricate and broader at the tips than in that species. Length 11 mm.

From Falls Church, Va., and Glencarlyn, Va., in June and July. Resembles *Pn. languida*, but is smaller, and readily separated by the longer spines on femur I, and the long spur on tibia I.

Spiniger arizonica n. sp.

Shining deep black; the posterior margin of the pronotum narrowly reddish, broader at the humeri, and from thence extends inwards and forwards a narrow red line to the transverse furrow, lower lateral margin narrowly reddish, lateral ends of the collar also reddish, scutellar spine mostly reddish; dorsum of abdomen red, a black spot at apex of each segment on the connexivium; venter black, with a broad median red stripe reaching to middle of the penultimate segment, and the lateral margins rather broadly red, almost interrupted with black on the apical third of most of the segments. Anterior lobe of the pronotum smooth, a deep median groove, and two grooves each side reaching only one-half way forward. Posterior lobe depressed on middle basal part, and here strongly, transversely rugose, growing weaker behind; humeri moderately prominent, right-angled; the scutellum margined, spine cylindrical oblique, and nearly as long as the scutellum; meso and metapleura vertically, coarsely striate; in front and rather between bases of antennæ are two short, slightly divergent ridges; legs and antennæ all finely, densely hairy; ventral segments of abdomen finely transversely striate; male genital lobe smooth on sides, hairy below and behind, rounded, with a slight apical swelling containing a median

depression. Wings reaching beyond tip of the abdomen. None of the femora are swollen, and there are no spines on the pronotum. Length 22 mm.

From Palmerlee, Arizona (Biederman).

Zelus ferox n. sp.

Pale yellow; sides of head in front and behind the eyes dark; anterior lobe of pronotum with black on sides, and a narrow incurved stripe each side nearly connected to each other behind middle; posterior lobe broadly dark on sides, black at humeri; basal part of wings black; dorsum of abdomen reddish; below on prosternum is a black spot in front of each coxa I; all femora with a band beyond middle, and one toward tip dark, sometimes a faint band near base of tibia, and sometimes the hind and middle femora have a band before middle. Head short (shorter than in *Z. exsanguis*) with a distinct black-tipped tubercle over base of each antenna; ocelli not two diameters apart; a broad deep furrow on middle of pronotum, fading out toward hind margin, humeri acute, upturned, but scarcely produced; a faint tubercle each side nearer hind edge of pronotum; pronotum and basal part of wings with many fine, short, yellowish hairs; wings extend beyond tip of the abdomen. Length 13 mm.

From Palmerlee, Arizona (Biederman).

Zelus audax n. sp.

Brownish yellow; head with broad black stripe behind each eye, leaving a narrow, median, yellow line, also blackish in front and between eyes; anterior lobe of pronotum black each side and on the lateral margin, posterior part of the posterior lobe blackish; abdomen reddish above, black on sides at tips of the segments. Venter pale, a black spot behind coxa I and also a smaller spot in front, a spot each side at base of each ventral segment, larger near the base of the abdomen; coxæ mostly dark; a broad band beyond middle, and one before tip of each femur; also two or three fainter bands on the tibiæ; second joint of antennæ with broad band near middle, and the tip dark, rest of antennæ mostly dark, sometimes pale at base of third joint. Head long and slender, ocelli more than two diameters apart, no tubercles over base of the antennæ; anterior lobe of the pronotum with a deep median groove; posterior lobe with middle and lateral depressions, the ridges terminating behind in four large, subequal conical tubercles, the lateral ones at the humeri. Wings extend beyond tip of abdomen; body slender. Length 12 mm.

From Sea Cliff, N. Y., in cedar trees, also Falls Church, Va.

Related to *Zelus* (*Pindus*) *socius*, but not as dark, and legs differently marked.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., JULY, 1910.

Under the heading of the Doings of Societies this month, we publish the Preliminary Program of the First International Entomological Congress. We consider this Congress a very great event as it is evidence of the wonderful strides our study has made and the world-wide recognition of the pursuit of entomology, otherwise it would probably not be possible to successfully conduct an International Congress.

The study is no longer classed as one of doubtful value and the individual who pursues it is no longer considered non compos mentis. The study of insects is destined to become, in many ways, the most important natural history work known to man. Insects at the present time play a very important part in their relation to human beings and other animals and while recognition of this fact is becoming more and more apparent, we believe that even now there are but few who see the stupendous importance of medical entomology and the vast value of the complete solution of some of the economic problems, like the destruction of the mosquito and the house-fly, as annoying pests alone, irrespective of their danger as carriers of disease. Instead of being a small and insignificant branch of zoology, entomolgy will far outweigh in importance many other branches of the study of living organisms.

Perhaps some day we may receive a notice of an Entomological Congress containing a statement that sectional meetings will be held to consider other branches of zoology.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

FEMALE OF AESHNASOMA RIVERTONENSIS Johnson.—Like the male with these exceptions:—Form slightly more robust.—Wings a little wider and 22 mm. long. Legs.—Front and middle pairs vary as follows:—femur 13 to 16 mm.; tibiae 13 to 15 mm.; metatarsus 19 to 22 mm. Hind pair:—femur 18 mm.; tibiae 20 mm.; metatarsus 28 mm. One specimen taken at Riverton, N. J., VII, 12.08 by C. T. Greene and in his collection.

For description of male see Proc. Boston Soc. Nat. Hist., Vol. 34, No. 5—pp. 115 and 116.—CHAS. T. GREENE.

DR. HENRY SKINNER, PROF. HERBERT OSBORN AND DR. W. J. HOLLAND, have been appointed delegates to the First International Entomological Congress and the Eighth International Zoological Congress, as representatives of the Entomological Society of America. The Entomological Congress meets in Brussels, Belgium, from the first to the sixth of August, and the Zoological Congress, in Gratz, Austria, from August fifteenth to the twentieth. Dr. Skinner has also been delegated to represent the Academy of Natural Sciences, of Philadelphia, and the American Entomological Society, at the Entomological Congress.

FURTHER NOTE ON LARVA OF EUMAEAS ATALA.*—At the time of writing description of larva of Eumaeas atala, I had an opportunity to indentify the food plant. Subsequently in April, I re-visited Miami, Fla., and learned more of it. The plant upon which these handsome larvae swarm is known to the natives as "Compte," and the butterfly is known as the "Compte-fly". I was gravely informed that these "worms" made the butterfly, but nobody could account for the presence of the worm. This "Compte" is a variety of Cassava or arrow-root, and its botanical name may be found somewhere in the following list of synonyms: Janiyha manihot, Manihot utilissima, Jatropha manihot, Manihot aipi, Manihot loeflingi, Manihot palmata. It is exceedingly common on the high ground about Miami and southward, and some effort has been made to employ it commercially in the manufacture of cassava or tapioca starch.—J. L. HEALY.

*See Scudder; Mem. Boston Soc., N. H., 2, 413, 1875. Schwarz, Insect Life, 1, 37, 1888.

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), excluding Arachnida and Myriapoda. Articles irrelevant to American entomology, unless treating of new genera, 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, and are all dated the current year unless otherwise noted. This (°) following a record, denotes that the paper in question contains description of a new genus; while this (*), that of a new North American form.

For complete record of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

1—Proceedings, Academy of Natural Sciences of Philadelphia. **4**—The Canadian Entomologist. **7**—U. S. Department of Agriculture, Bureau of Entomology. **9**—The Entomologist, London. **11**—Annals and Magazine of Natural History, London. **19**—Horae Societatis Entomologiae Rossicae. **22**—Zoologischer Anzeiger, Leipzig. **38**—Wiener Entomologische Zeitung. **40**—Societas Entomologica, Zurich. **51** — Novitates Zoologicae, Tring, England. **55**—Le Naturaliste, Paris. **56**—Mittheilungen, Schweizerischen entomologischen Gesellschaft. Schaffhausen. **81**—Biologisches Centralblatt, Erlangen. **84**—Entomologische Rundschau. **92**—Zeitschrift fur wissenschaftliche Insektenbiologie, Berlin. **96**—Bulletin Trimestriel, Societe d'Histoire Naturelles de Macon, France. **143**—Ohio Naturalist, Columbus. **184**—Journal of Experimental Zoology, Philadelphia. **189**—Pomona Journal of Entomology, Claremont, Cala. **193**—Entomologische Blatter, Nurnberg. **196**—Arkiv for Zoologie, Stockholm. **206**—Annals, Scottish Natural History, Edinburgh. **207**—Anales, Academia de Ciencias Medicas, Fisicas y Naturales de la Habana, Rivista Cientifica. **216**—Entomologische Zeitschrift. Stuttgart. **217**—Bulletin, Societe Entomologique d' Egypte. **249**—Journal, Biological Chemistry Baltimore. **251**—Annales, Sciences Naturelles, Zoologie. Paris. **252**—Annuario, Museo zoologico della R. Universita di Napoli (Nuova Serie). **253**—Archivum Zoologicum. Budapest. **254**—Archives de Parasitologie. Paris. **255**—West Virginia Agricultural Experiment Station. Morgantown. **256**—Science Bulletin, Museum of the Brooklyn Institute of Arts and Sciences.

GENERAL SUBJECT. **Houlbert, C.**—Les insects. Anatomie et physiologie generales. Introduction a l'etude de l'entomologie biologique. Paris. 1910. **Muhling, A.**—Streifzuge durch Kleine Sammlungen. **216**, xxiv, 32. **Oshanin, B.**—Tables generales des pub-

lications de la Societe Entomologique de Russie, 1859-1908. **19,** xxxviii, Supplement. 1909. **Pierce, W. M.**—Fumigation Studies-II. Does ordinary contract fumigation pay? **189,** ii, 176. **Redi, F.**—Experiments on the generation of insects (Translated from the Italian edition of 1688 by Mab Bigelow). Chicago. The Open Court Publishing Co. 1909.

APTERA. Neumann, L. G.—Notes sur les Pediculides. **254,** xm, 497.

NEUROPTERA. Collections zoologiques du Baron Edm. de Selys Longchamps. Libellulinen 2. facs. x Catalogue systematique et descriptif, 1909. **Back, E. A.**—The woolly white-fly; a new enemy of the Florida orange (Aleyrodes howardi), **7,** Bull. No. 64, pt. 8. **Banks, N.**—Notes on our eastern species of the may-fly genus Heptagenia. **4,** xlii, 197 (*). **Crawford, D. L.**—American Psyllidae I. (Triozinae) **189,** ii, 228, (*). **Wasmann, E.**—Nils Holmgren's neue Termitenstudien und seine Exsudattheorie. (175. Beitrag zur Kenntnis der Myrmekophilen und Termitophilen). **81,** xxx, 303. **Williamson, E. B.**—A new species of Celithemis. **143,** x, 153 (*).

ORTHOPTERA. Hammerschmidt, J.—Beitrage zur Entwicklung der Phasmatiden. **97,** xcv, 221. **Rehn, J. A. G.**—On the Orthoptera of Bermuda. **1,** lxii, 3. Some notes on Idaho Orthoptera, with the description of a new species of Trimerotropis. **1,** lxii, 12 (*). **Schulthess Rechberg, A.**—Neue Orthoptera aus Transvaal. **56,** xii, 8, (°). **Stevens, N. M.**—An unequal pair of heterochromosomes in Forficula. **184,** viii, 227.

HEMIPTERA. Baker, C. F.—Californian Emesidae. **189,** ii, 225, (*). **Distant, W. L.**—Insecta Transvaaliensia: a contribution to a knowledge of the Entomology of South Africa. Part X. (°). **Essig, E. O.**—Notes on California Coccidae V. **189,** ii, 209. (*). Aphididae of So. California IV. 189, ii, 223. **Montandon, A. L.**—Quelques types d'Hemipteres de Guerin Meneville des Collections du Musee Zoologique de l'Universite de Naples. (Notes synonymiques et observations diverses). **252,** iii, No. 10. **Poppius, B.**—Ueber einige Anthocoriden aus Ceylon. **38,** xxix, 139 (°). **Quaintance & Sasscer**—The oyster-shell scale and the scurfy scale. **7,** Circular No. 121. **Ragues, P. V.**—Clasification Gundlach de Hemipteros Cubanos, conforme a los ejemplares que existen en el museo del instituto de 2a ensenanza de la Habana. **207,** xlvi, 425.

LEPIDOPTERA Barnes & McDonough—New species and varieties of No. American Lepidoptera. **4,** xlii, 208 (*). **Bordas, M. L.**—Les glandes cephaliques (Glandes sericigenes et glandes mandibulaires) des chenilles de Lepidopteres. **251,** x, 125, 1909. **Burgeff, H.**—Beitrage zur Biologie der Gattung Zygaena, II. **92,** vi, 144. **Cockle, J. W.**—Notes on a few butterflies found at Kaslo

and in northern Br. Columbia. **4,** xlii, 203. **Dognin, P.**—Heteroceres nouveaux de l'Amerique du sud. Fasc. I. Oberthur, Rennes. **Fassl, A. H.**—Neue Dismorphien aus West-Columbien. **40,** xxv, 9. **Gramann, A.**—Ueber den Simplon an den Lago Maggiore. **216,** xxiv, 30. **Hampson, G. F.**—Descriptions of new African moths. **11,** V, 430 (°). **Jordan, K.**—Some new moths (Morionia n. g. of Zygaenidae), **51,** xvii, 255 (°). **Paravicini, L.**—Beitrag zur kenntnis der sudamerikanischen Pieriden-Gattung Tatochila. **56,** xii, 21. **Pearsall, R. F.**—A new Stamnodes. **4,** xlii, 213, (*). **Smith, J, B.**—The Noctuidae of California I. **189,** ii, 179. **Thierry-Mieg, P.**—Descriptions de Lepidopteres nouveaux. **55,** xxxii, 119. **Wolley Dod, F. H.**—Noctuid notes. 4, xlii, 189.

DIPTERA. Bruce, D.—The development of Trepanosomes in Tsetse flies. **197,** lxxxii, 368. **Dean, W. H.**—The Sorghum midge (Contarinia sorghicola). Papers on cereal and forage insects. **7.** Bull. No. 85. pt. 4. **Gedoelst, L.**—Cordylobia rondhaini, n. sp., Diptere congolais a larve cuticole. **254,** xiii, 539. **Ludlou, C. S.**—Mosquito observations.—Continued. **4,** xlii, 193 (*). **Portchinsky, J.**—Sur les larves de Gastrophilus. **22,** xxxv, 669. **Rubsaamen, E. H.**—Ueber deutsche Gallmucken und Gallen. **92,** vi, 125, (°). **Stevens, N. M.**—The chromosomes in the germ-cells of Culex, **184,** viii, 207.

COLEOPTERA. Boode, E.—Ein Raubritten in Hinterhalt, **193,** vi, 141. **Brooks, F. E.**—Three snout beetles that attack apples, **255** Bull. No. 126. Snout beetles that injure nuts. **255,** Bull. No. 128. **Gantes, E.**—Les mesures de defense contre les vers du cotonnier, **217,** ii, 33. **Gebien, H.**—Coleopterorum catalogus. Pars 15: Tenebrionidae I. **Gortner, R. A.**—The origin of the brown pigment in the integuments of the larva of Tenebrio molitor, **249,** vii, 365. **Heinemann, R.**—Kafer in Maulwurfsnesten, **193,** vi, 121. **Jordan, H.**—Verdauung ausserhalb des Korpers (aussenverdauung) bei Carabus auratus, **40,** xxv, 13. **Kleine, R.**—Die Lariiden und Rhynchophoren und ihre Nahrungspflanzen, **193,** vi, 137. **Krausse, A. H.**—Die Phylogenie und geographische Verbreitung der Formen des Carabus auratus, **40,** xxv, 13. **Kleine, R.**—Die Lariiden und Rhyntine sheet: a medium for mounting the smaller Coleoptera, **9,** xliii, 141. **Parker, W. B.**—The life history and control of the hop flea-beetle (Psylliodes punctulata). **7,** Bull, No. 82 pt. 4. **Pic, M.**—Coleopteres exotiques nouveaux originaires d'Amerique, **55,** xxxii, 105, 115. **Reitter, E.**—Das Insektensieb, dessen Bedeutung beim Fange von Insekten, insbesondere Coleopteren, und dessen Anwendung, **193,** vi, 133. **Schaeffer, C.**—Additions to the Carabidae of N. A., with notes on species already known. **256,** i, 391, (*). **Strohmeyer, O.**—Neue Borkenkafer aus Abessynien, Madagaskar, Indien und Tasmania, **193,** vi, 126, (°). **Szombathy, C.**—Especes et varietes

nouvelles du genre Semiotus, **253,** i, 23, 1909. **Xambeu, C.**—Moeurs & metamorphoses des Coleopteres de la tribe des Chrysomeliens, **55,** xxxii, 105, 120.

HYMENOPTERA. Bugnion, E.—La structure anatomique du Trigonalys halmi, **56,** xii, 14. **Crawford, J. C.**—Descriptions of certain Chalcidoid parasites, **7,** Tech. Ser. No. 19, pt. 2, (*). **Gahan, A. B.**—Four new species of Hymenoptera. Chalcidoidea. Encyrtidae. **4,** xlii, 205 (*). **Hoppner, H.**—Zur Biologie der Rubusbewohner, **92,** vi, 133. **Kieffer, J. J.**—Beschreibung neuer sudamerikanischer im Zoologischen Museum zu Berlin aufbewahrtet Diapriiden, **84,** xxvii, 39 (°). **Metz, C. W.**—Bees of the genus Colletes from Mexico. **189,** ii, 191 (*). **Mocsary, A.**—Chrysididae in Territoris Syr-Dariae a Leone Wollmann collectae, **253,** i, 1, 1909, (°). **Parker, J. B.**—Notes on the nesting habits of Bembex nubilipennis, **143,** x, 163. **Rohrwer, S. A.**—Notes on Tenthredinoidea, with descriptions of n. s. **4,** xlii, 215 (*). **Schrottky, C.**—Neue sudamerikanische arten der bienengattung Prosopis, **38,** xxix, 133. **Trani, E.**—Di un nuovo proctotrupide parassita delle larve degli Anthrenus musaeorum, **252,** iii, No. 4, 1909. **Zavattari, E.**—Catalogo delle Mutille del museo Zoologico di Napoli. Con osservazioni critiche e sinonimiche e descrizione di nuove species, **252,** iii, No. 9.

Doings of Societies.

At a regular meeting of the Feldman Collecting Social held March 16th, 1910, at 1523 S. 13th Street, Philadelphia, eleven members were present; Mr. A. B. Champlain, of Harrisburg, Pa., visitor.

Mr. Wenzel made a communication on relaxing and remounting Coleoptera, using *cold* water (instead of hot) with a dash of ammonia in it. This not only relaxes the specimen and loosens the glue, if it is on a slip, but also removes the grease.

Mr. Champlain remarked on collecting Carabidae in the vicinity of Harrisburg, Pa., describing how many were taken at night by the aid of an acetylene lamp.

Mr. Daecke exhibited a species of Tachinidae, *Alophora diversa,* Coq., from Conenago in the fall when he collected about a dozen specimens. The wings of the males are infuscate and of the female hyaline, but unlike most Diptera the

eyes of both sexes are holoptic. He also exhibited his collection of Pipunculidae and Oestridae.

Adjourned to the annex.

GEO. M. GREENE, *Secretary.*

At a regular meeting of the Feldman Collecting Social, held April 20, 1910, at 1523 South Thirteenth Street, Philadelphia, twelve members were present. Mr. C. W. Fenninger, visitor. President Harbeck in the chair.

Mr. Daecke stated that he was not aware that the upper side of the abdomen of beetles has been used to differentiate closely allied species and he exhibited two specimens of *Cyllene pictus* and two of *C. robiniae* with wings spread. The upper side of abdomen of *pictus* is reddish, anal segment black, that of *robiniae* is all black. Both species have two rows of six golden yellow lunules each, along the abdomen, caused by yellow pile, except the anal segment which shows one median dorsal spot of golden which is narrow and oblong in *pictus*, and obtusely triangular in *robiniae*. Also exhibited and recorded *Xylota tuberans* Will., from Browns Mills Junction, June 5, 1908, and *X. metallifera* Bigot, from Clementon, April 25, 1909, as new to New Jersey. These Syrphids were determined by Mr. Coquillet and are rather unusual for that State, as the former was recorded from Texas and the latter from Colorado. Also exhibited a specimen of *Bruchus mimus* Say. from Hummelstown, Pa., July 17, 1909, a species of which Mr. Wenzel has representatives from Kentucky and Louisiana.

Mr. C. T. Greene exhibited the following Diptera: *Metacosmus mancipennis* Coq., from Pemberton, N. J., July 11, 1909. (The type of this genus was described from the Pacific Coast). *Parallelomma flavovaria* Coq., Castle Rock, Pa., May 12, 1907. *Sphegina campanulata* Rob., from Roxborough, Pa., June 12, 1909; and a Lepidipteron, *Cirrhophanus triangulifer* Grote, Castle Rock, Pa., August 1, 1909, all collected by himself.

Mr. George M. Greene exhibited specimens of *Limonius stigma* Hbst. one from Glenside, Pa., April 28, 1901, collected

by himself, and one from Castle Rock, Pa., April 10, 1910, collected by C. T. Greene. (Two were taken on the latter date). Smith's 1900, N. J. List for this species gives "New Jersey," and the Amer. Ent. Soc. collection contains one without data.

Mr. Kaeber exhibited specimens of *Sphenophorus melanocephalus* Fabr., many of which were collected in the Philadelphia neck, April 16, 1910, under reeds along the shore, and one of *S. zeae* Walsh, also larvae of *Cryptorhynchus lapathi* Linn and workings of same in willow. Adjourned to the annex. G. M. Greene, *Secretary.*

A meeting of the American Entomological Society was held December 23rd, 1909. In the absence of the President and Vice-President, Mr. Philip Laurent occupied the chair. Eleven persons were present. The reports of the Treasurer, Curator and Librarian were read.

The following persons were elected to serve as officers for the year: *President,* P. P. Calvert; *Vice-President,* H. W. Wenzel; *Treasurer,* E. T. Cresson; *Recording Secretary,* Henry Skinner; *Corresponding Secretary,* E. T. Cresson, Jr.; *Curator,* Henry Skinner; *Librarian,* E. T. Jresson, Jr.; *Publication Committee,* E. T. Cresson, C. F. Seiss and B. H. Smith; *Executive Committee,* Philip Laurent, H. W. Wenzel and D. M. Castle; *Finance Committee,* J. W. McAllister, C. S. Welles and D. M. Castle.

Henry Skinner, *Recording Secretary.*

A meeting of the American Entomological Society was held April 28th, 1910. Mr. H. W. Wenzel, Vice-President, in the chair. Thirteen persons were present. The report of the Finance Committee was read and approved. A letter from Mr. R. P. Dow was read and inviting the Society to take part in the entomological outings of the New York and Brooklyn Societies on Memorial Day and July Fourth.

Mr. Rehn exhibited specimens of five species of Orthoptera from Alberta, Saskatchewan and Idaho. A new species of *Trimerotropis* and two females of a Decticid, *Idiostatus variegatus,* described from Pocatello and here recorded for the second time were the most desirable things in a good sized series from Idaho. A specimen of the curious Stenopelmatid, *Cyphoderris monstrosus* taken on the Saskatchewan River was commented upon and specimens of *Melanoplus kennicot-*

tii and *alaskanus,* both of which are rare in collections, were in the exhibition. All the specimens were secured by Dr. Skinner except the *Cyphoderris,* which was taken by Prof. Stewardson Brown.

Mr. Laurent exhibited the egg, larva and imago of *Gastropacha americana* and said the larva wonderfully mimics its surroundings.

Mr. Matthews showed specimens of some rare Australian species of Lepidoptera such as *Papilio laglaizei, Liphyra brassolis* and *Zeuzera boisduvalii.*

Mr. C. T. Greene reported the following Diptera as having been taken this year: *Neoascia distincta* Will. Malaga, New Jersey, April 3rd, and *Syrphus diversipes* Macq., Castle Rock, Pa., April 10th. Both species were taken by Mr. C. T. Greene.

HENRY SKINNER, *Recording Secretary.*

A meeting of the Entomological Section of the Academy of Natural Sciences of Philadelphia, was held December 23, 1909. Mr. Philip P. Laurent, Director, presiding. Eleven persons were present. The following persons were elected officers to serve for the year 1910: *Director,* Philip Laurent; *Vice-Director,* Henry W. Wenzel; *Treasurer,* E. T. Cresson; *Conservator,* Henry Skinner; *Secretary,* E. T. Cresson, Jr.; *Recorder,* Henry Skinner; *Publ. Committee,* E. T. Cresson and E. T. Cresson, Jr.

HENRY SKINNER, *Recorder.*

A meeting of the Entomological Section of the Academy of Natural Sciences of Philadelphia was held May 26th. Mr. Philip Laurent, Director, presiding. Twenty-two persons were present.

Dr. Philip P. Calvert gave an informal account of his recent entomological researches in Costa Rica. Mrs. Calvert and he arrived in that country May 1, 1909, and left it May 9, 1910. In a brief sketch of the physical features of Costa Rica, mention was made of the considerable difference in elevation between the coasts and the central region, the abundance of rivers, the sharply-marked division of the year into wet (May to November) and dry (December to April) seasons on the Pacific slope while on the Atlantic side the dry season is not so pronounced, one effect of this contrast being conspicuously shown in the much greater abundance of epiphytes

on tree-trunks and branches on the Atlantic slope than on the Pacific.

The principal objects of the speaker's researches were to collect data on (1) the seasonal distribution of the Odonata, (2) their larval forms, and (3) their habits. Emphasis was laid on the fact that he at no time planned the gathering of a large collection of specimens or the making of a complete exploration of Costa Rica. Headquarters were established at Cartago, on the line of the railroad, at an altitude of 4750 feet on the Atlantic slope, three miles from the divide. Very comfortable accommodations were found in Weldon's Hotel in that town, managed by Mr. Joseph Weldon, formerly of Pittsburgh and McKeesport, Pennsylvania. The town was clean, healthy, lighted with electricity, was supplied with good water piped to the houses, and was drained by an underground sewer system.

In furtherance of the first object of investigation mentioned above, collections and observations were made at intervals in the same places and as nearly as possible in the same spots, and record was made each day of all species seen. The principal points at which this work was done were as follows:

On the Atlantic slope,

Banana River region, 50 feet, Nov.
Guapiles, 984 feet, June, Nov.
Peralta, 1088 feet, Aug., Mar.
Turrialba, 2000 feet, July.
Juan Viñas, 2500-4000 feet, June, Aug., Oct., Dec., Feb., Mar., April.
Cachi, 3600 feet, Mar.
Cartago, 4750 feet, every month.
Volcano Irazu, 4750-11,300 feet, July, Sept., Mar.

On the Pacific slope,

Tres Rios, 4260 feet, and La Carpintera to 5700 feet, Dec., Mar.
Alajuela, 3100 feet, Sept., Dec.
Turrucares, 1800-2200 feet, Aug., Dec., April.
Surubres, 800 feet, Oct.
Puntarenas, 10 feet, Feb.
Province of Guanacaste (chiefly near Liberia and Santa Cruz), 0-2200 feet, Jan.

At all of these places search was made for larvae and their exuviae as well as for the imagos. Living larvae were car-

ried to Cartago and placed, usually singly, in tumblers or bottles of water, and the attempt made to rear them to transformation. An acceptable food for them was found in bloodworms (Chironomid larvae) which could be obtained in abundance near the town. Larvae of a number of species of Odonata were successfully reared,* including some from the eggs. The care of this living material involved the return of one or both of the investigators to Cartago at short intervals.

Collections of terrestrial Molluscs and Annelids, of Araneids, Orthoptera, Microdiptera, certain groups of Coleoptera and of Lepidoptera, and of bromeliadicolous animals were also made to a slight extent.

Gratifying progress in study of the Odonata was being made when, on April 13, 1910, severe earthquakes damaged houses, and even threw down some, in San Jose, Cartago, and other towns of the central plateau. The tremors continued during the remainder of the month, but were generally of decreasing intensity. On May 4, however, at 6.50 P. M., while Mrs. Calvert and the speaker were sitting in their room at Cartago, a most violent earthquake occurred, throwing them to the floor when they attempted to escape. The roof over them and three walls remained upright, but the fourth, of brick, crashed, partly into their room. When the shaking ceased for the time, they made their way over the debris to the window and escaped unhurt to the street, where they spent that night, the next, and the intervening day. The fallen wall destroyed and buried the larvae in rearing, but in the daylight all the other collections, notes, photographic negatives, etc., were recovered from the ruins.

Cartago and nearby villages were completely destroyed and offered no shelter. San Jose was badly damaged and the fear of renewed shocks drove people everywhere to tents and improvised huts in streets, parks and open places. With these unfavorable conditions and the approach of the rainy season, the investigators judged it best to return home to save themselves and their material from further loss.† They left Cartago May 6, on the first train to Limon, and sailed thence on May 9, three months earlier than planned and very much to their regret.

*Cf. Ent. News for June, 1910, page 264.

†Prof. J. F. Tristan, writing from San Jose, C. R., May 26, 1910, states that earthquakes had continued up to that date.

They were not ill during their whole stay in Costa Rica and attribute their entire freedom from fever to the healthfulness of a great part of the region visited, to their always sleeping under mosquito nets and, when abroad, to covering the exposed parts of their bodies, wherever mosquitos were noticed, with a mixture of citronella oil and cocoa butter (suggested by Dr. Henry Skinner), an ample supply of which was taken with them. Neither of them took a single grain of quinine during the year. Drinking water was boiled, except when it was rain water directly gathered and filtered through charcoal, otherwise Apollinaris, procurable throughout the country, was substituted.

Grateful acknowledgment was made of the kind aid received from many friends, both Costa Rican and foreign, to whom much of the success attained is due.

Dr. D. M. Castle, who had just returned from Florida, said the weather conditions there were very unfavorable for collecting. It was very cold and the winds were high. In spite of the unfavorable weather he managed to get some desirable species. Savannah and Tybee Island were visited. At Enterprise the weather was cold with no rain. Coronado Beach was visited and also Miami and at these places the conditions were very much the same. Sweep netting was not possible so the umbrella was largely used.

Mr. Rehn made a few remarks on the Acridean genus *Eotettix*, illustrating the same by specimens of four of the five known species. The fifth species is represented by the unique type in the Hebard collection. The distribution of the genus is now known to cover the coastal section of the southeastern United States from north-central Florida to southeastern North Carolina.

Mr. J. A. G. Rehn was elected a member and Mr. John H. West an associate.

HENRY SKINNER, *Recorder.*

In a former circular your attention was drawn to the First Congress of Entomology which will be held at Brussels from August 1st-6th of this year. We have now the pleasure of presenting the Preliminary Programme and inviting you to become a member of the Congress. Many governments, public institutions and societies have already signified their intention of sending delegates, and it is to be hoped that the gathering will be thoroughly representative of our science.

As we consider that friendly intercourse between Entomologists of various countries is of great importance for the furtherance of their studies, in which they often depend upon each other, the social side of the Congress has received our due attention and we are singularly fortunate in being assisted therein by an influential Honorary Reception Committee representing Belgium.

HONORARY COMMITTEE.

President, MM. F. Schoollaert, Minister President, Minister of Agriculture.

Members, le baron Ed. Descamps, Minister of Sciences and Arts; J. Renkin, Minister of Colonies; Em. Beco, Governor of the Province of Brabant; Adolph Max, Bourgmestre of the City of Brussels; le baron Léon Janssen, President of the Executive Committee of the International Exhibition.

The numerous attractions which Brussels offers, especially in Architecture and Art, are this year enhanced by the International Exhibition which takes place in this city and which should prove a further inducement for participating in the Congress. Thanks to the generosity of the committee, the members of the Congress will have free access to the Exhibition.

For the Preliminary International Committee:

G. Severin, General Secretary of the Congress; A. Lameere, President of the Congress.

(1) Anybody who takes an interest in any branch of Entomology, scientific or applied, may become a member of the Congress.

(2) The Congress will consist of:

(a) Honorary members.

(b) Life-members, who pay a life composition of at least £10. The life compositions will be invested as a permanent fund, of which only the interest will be at the disposal of the International Committee.

(c) Ordinary members, who pay a fee of £1.

(d) Ladies and children accompanying members may become Associates on payment of 10*s*. and have all the privileges of members, except the right of receiving the publications.

RULES.

(3) All payments should be made as early as possible, by check or money order, to A. H. Jones, Esq, Entomological Society, London, 11 Chandos Street, Cavendish Square, London W.

(4) The addresses and lectures will be distributed over five General Meetings and the following ten Sections:

1. Systematics; 2. Nomenclature and Bibliography; 3. Museology and History of Entomology; 4. Zoogeography; 5. Bionomy, Oecology, Cecidiology and Mimicry; 6. Physiology and Psychology; 7. Economic Entomology; 8. Medical Entomology; 9. Anatomy and Ontogeny; 10. Phylogeny, Palæontology and Evolution. The papers of wider interest will, as far as possible, be read at the General Meetings.

(5) Members who intend reading a paper, or, if prevented from attending the Congress, sending a paper in MS. to be read by some other member, are asked to fill in the accompanying form B and return it before the middle of July to G. Severin, rue Vautier, 31, Brussels.

(6) All manuscripts and illustrations must be in the hands of the committee by November 1st. No colored plates will be issued unless paid for by the author. Manuscripts only in Dutch, English, French, German, Italian, Latin, Portugese or Spanish can be accepted. Authors will receive 30 separate copies of their papers free of charge.

(7) Members who take part in the discussions and are desirous of having their remarks recorded in the Proceedings of the Congress, are requested to hand an abstract of their remarks to the Secretary, during the meeting.

(8) Inquiries about prices of rooms, etc., should be directed to M. G. Severin, who is assisted by a Housing Committee.

PRELIMINARY PROGRAMME.

The meeting will take place in the "Palais des Fetes," provided for such purposes by the committee of the Exposition Universelle. In the evenings there will be informal gatherings and official receptions.

Sunday, July 31st, 8 P. M.—Reception by the Entomological Society of Belgium.

Monday, August 1st, 9 A. M.—Visit to the Office in the

"Palais des Fetes" for the receipt of the definite programme, badges, etc. 10.30 A. M.—First General Meeting. Opening address by the President. Address of welcome by the represenative of the Government. Election of Officers and formation of Sections. 2 to 4 P. M.—Sections. 4.30 P. M.—Walk through the town, guides being provided by the Entomological Society of Belgium.

Tuesday, August 2nd, 9 A. M.—Second General Meeting. 2 P. M.—Sections. 4.30 P. M.—Visit to the Exhibition.

Wednesday, August 3rd, 9 A. M.—Third General Meeting. In the afternoon visit to the Museum of the Congo. Excursions to Tervueren, Foret de Soignes, Waterloo, etc.

Thursday, August 4th, 9 A. M.—Fourth General Meeting. 2 to 4 P. M.—Sections. 4.30 P. M.—Visit to the Musée Royal d'Histoire naturelle de Belgique.

Friday, August 5th, 9 A. M.—Fifth General Meeting. Constitution of a Permanent International Committee. Selection of the place of meeting of the Second Congress of Entomology. Section for Nomenclature and Bibliography. 2 to 4 P. M.—Sections. 7 P. M.—Banquet.

Saturday, August 6th—Excursions into the Ardennes, to Bruges, Malines, Antwerp or Spa.

N. B.—The final programme of Receptions and Excursions will be sent to members later.

Of the lectures and addresses of more general interest which have so far been announced, we mention the following:

W. Bateson. On Mendelism.

R. Blanchard. On Medical Entomology.

O. Cruz. On Prophylaxis of Yellow Fever at Rio de Janeiro.

F. A. Dixey. On Mimicry.

A. Forel. On the Distribution and Phylogeny of Ants.

G. B. Grassi. On the Transmission of Disease by Insects.

A. Handlirsch. On Fossil Insects.

R. Heymons. On the Ontogeny of Insects.

W. J. Holland. On the Preservation of Types.

J. Kunkel d'Herculais. On Locust-Plagues.

E. Wasman. On Ants.

Any additional information may be obtained from M. G. Severin, Secretary-General of the Congress, 31, rue Vautier, Brussels, Belgium, or Dr. Henry Skinner, Logan Square, Philadelphia, Pennsylvania.

Stockhausen, Printer, 53-55 N. 7th Street, Philadelphia.

OCTOBER, 1910.

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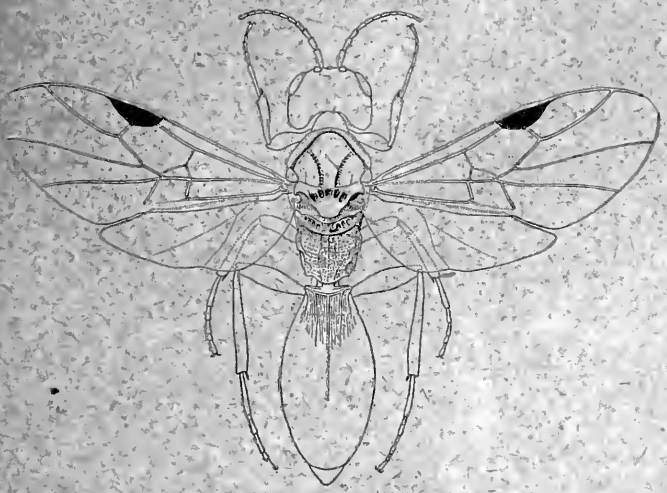

Vanhornia eucnemidarum Crawford.

PHILADELPHIA:
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DAECKE ON TRYPETID GALLS.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXI. OCTOBER, 1910. No. 8.

CONTENTS:

Trypetid Galls and Eurosta elsa n. sp.

(With Plate X.)

BY E. DAECKE.

In an interesting paper in Psyche, Vol. XIV, No. 4, page 71, the late Millett T. Thompson described the galls of *Eurosta reticulata* Snow and *Eutreta sparsa* Wied., both on the root of golden-rod, while *Oedaspis polita* Loew, *Oedaspis atra* Loew and *Eurosta solidaginis* Fitch have been previously recorded as gall-makers on golden-rod.

During the summer of 1906 I had the good fortune of locating the galls of a golden-rod-loving Trypetid not hitherto recorded.

It was in September and golden-rods were in full bloom when I took a stroll with my little niece through a sparsely wooded section near Richmond Hill, L. I. As natural as it is for a collector to take insects it is for a little girl to pick flowers. Elsa picked golden-rods, but alas! out came a plant with its roots which the loose, sandy soil could not hold—and a new story was told.

There were one to three galls on the root of every plant examined, of fleshy, potato-like consistency, with a chamber

scarcely wider than the puparium and leading out toward the upper end; the aperture of exit softly drawn together. Length, 20-25 mm.; width, 10-12 mm.

Unfortunately, all galls collected showed that the insects had but recently emerged. Obviously they were unknown Trypetid galls of a large species which emerged in early September, and looking up the list of known life histories of the local species, everything pointed toward *Eurosta comma* Wied.

To verify this I had to wait one year, and was not disappointed in finding them at the same place in August, 1907, and ready to emerge. In the meantime I betook myself to Lucaston, N. J., where I always collected *E. comma* in September. After a little search I located the galls and was surprised to find them on *Solidago rugosa* Mill., while those from Richmond Hill, L. I., were taken on *Solidago juncea* Ait.

A difference in the host-plant might mean a difference in the species, hence the emerging of these flies was awaited with considerable interest. Flies from both cages began to emerge September 7 and continued until October 8. The flies reared from *Solidago juncea* proved to be the true form of *Eurosta comma* Wied. (see plate), but those from *Solidago rugosa* taken at Richmond Hill, L. I., differed uniformly from this species and proved to be a form new to science.

Eurosta elsa n sp.

Front sparingly beset with minute yellowish hair, the bristles are brownish. The upper surface of thorax clay-yellowish pollinose with short pile of same color. Scutellum brownish with two bristles. Abdomen reddish-brown with short blackish pile. Ovipositor conical, attenuated near apex, dark brown with black pile, transversely with fine ridges. Femora, middle and hind tibiæ reddish-brown; front tibiæ and all tarsi pale brownish yellow. Wings broad and rounded, dark brown with a number of small semi-transparent dots scattered over the surface. The extreme tip of wing with a narrow hyaline border and some hyaline indication at the end of sixth vein. A small triangular hyaline spot on the anterior margin beyond the stigma rarely exceeding the second longitudinal vein.

This species resembles *E. comma* Wied. very closely. It can be readily distinguished, however, in both sexes by the trian-

gular hyaline spot on the anterior margin of the wing. The comma mark by which Wiedemann named his species is missing on *E. elsa,* that is, the hyaline portion of triangle beyond the comma is infuscated on *E. elsa.* The ovipositor shows considerable variation in both species, but in two respects the differences are permanent. The ovipositor of *E. comma* is smooth and uniformly conical, that of *Eurosta elsa* is more or less attenuated near apex and finely ridged transversely.

Described from two males and five females. One male was taken near Baltimore, Md., October 1, 1899, all the others were reared from galls collected at Richmond Hill, N. Y., in October, 1907, by Miss Elsa Schwensen and myself.

The figure of upper left-hand corner of Plate X shows the galls of *Eurosta comma* on the root of *Solidago rugosa* Mill. The rest of the plate pictures *Solidago juncea* with the galls of *Eurosta elsa.* Figures on plate all about half size.

Notes on some Heliothid Moths.

By T. D. A. Cockerell.

1. **Rhododipsa masoni** Smith.

Some years ago my wife collected specimens of this species at Boulder, Colorado, always on flowers of *Gaillardia aristata.* The moth rests on the flowers so that the red wings are on the red disc, and the yellow thorax is over the yellow rays, with the result that although the insect is brightly colored, it becomes practically invisible. I afterwards found that this habit was known to Mr. J. Mason, of Denver, and Professor Gillette. The type was, I believe, discovered through the picking of a *Gaillardia* flower.

2. **Lygranthoecia brevis** Grote.

At Boulder, on August 3, I noticed that this species rests upon the disc of *Helianthus lenticularis,* and is admirably protected in this position by its color. It seems to me very close to *R. masoni,* and I had taken it for a new form of *Rhododipsa,* but Dr. Dyar assures me that it is Grote's *brevis.* Hol-

land's figure (Pl. xxvii, f. 40) is not much like my insect; Hampson's is better, but hardly characteristic, and as I was unable to identify my species from the works of these authors, I give a brief new description.

Expanse about 26 mm.; eyes large, rounded; prothorax with mainly yellow hair, almost entirely replaced on disc of thorax above with broad gray scales, having a more or less greenish lustre; behind this are large tufts of hairs which are broadly tipped with red; abdomen dark plumbeous with a metallic greenish and pinkish lustre, the apex broadly pinkish shading into orange at tip; anterior tibiae very short, three spurs on outer side, one near middle of apex, and mesad of that two large ones, also a small one on inner side higher up; pattern of anterior wings essentially as in *R. masoni,* but bright deep ferruginous taking the place of pink; antemedial line creamy white, with a short angular process, directed basad, in its lower part; median field with largely ochreous scales, but dark in region of stigmata; postmedian line broadly S-shaped; pattern of apical field, including checkered fringe, about as in *Pyrocleptria californica.* Posterior wings black with a white fringe; basal three-fifths of costa broadly pallid, the pale area squarely truncate at end. The moth carries pollen on its head, and undoubtedly assists in the pollination of the sunflower.

3. **Lygranthoecia mortua** Grote.

This extremely variable species abounds at Boulder during the first half of August, and is always found resting on the flower-discs of *Grindelia* where it is usually inconspicuous. The *packardii* (Grote) form appears to be the more normal one, but *mortua* proper also occurs, and there are other varieties. Possibly the series includes more than one species.

4. **Rhodophora gaurae** Sm. and Abb.

This beautiful species occurs in Boulder at light in July and August.

5. **Schinia hulstia** Tepper.

Taken at Boulder by Mr. S. A. Rohwer, and determined by Dr. Dyar.

Mr. John A. Grossbeck, well known for his papers on Geometridae, announces his removal from the New Jersey Agricultural Experiment Station, New Brunswick, N. J., to the American Museum of Natural History, 77th Street and Central Park West, New York City.

Turner's Genera of Thynnidae with notes on Ashmeadian Genera.

By S. A. Rohwer, Bureau of Entomology, Washington, D. C.

The *Thynnidae* have, until recent years, been one of the neglected families of Hymenoptera. This has been due largely to the fact that they are confined almost entirely to the Southern Hemisphere, and seem to be more numerous in Australia. The appearance of the one hundred and fifth fascicule of the Wytsman's Genera Insectorum, which contains the genera of *Thynnidae* as defined by their champion, Mr. Rowland E. Turner, is a great boom for this neglected family. Hymenopterists in general, and more especially students of *Thynnidae*, are very grateful to Mr. Turner for this contribution to our knowledge of this interesting, though difficult, family.

The character of the various parts of Genera Insectorum varies greatly, but Mr. Turner's may be classed among the best. This fascicule contains sixty-two pages and four plates, two of which are colored. Of the fifty-three genera of *Thynnidae* thirty-two are figured, and no less than fifty species are figured in part or in entirety.

Mr. Turner divides the Thynnidæ into three sub-families, Diamminæ, Rhagigasterinæ and Thynninæ. His classification differs from that proposed by Ashmead in a number of ways, and it seems that the arrangement proposed by Turner is a more natural one, although it is hard to tell until the entire group has been thus tabulated.

It is pleasing to see that Mr. Turner has chosen to divide the species into small well defined genera. With the number of described species increasing by the thousands it is almost necessary that the limits of the genera be more closely drawn than in days when only comparatively few species were known.

One of the star features of this fascicule of the Genera Insectorum is that the types of the genera are indicated. The fixing of genotypes is absolutely necessary in taxonomic work, and it is hoped that in the future the editor of the Genera Insectorum will insist on this being done for all fascicules.

It is a great deal easier to criticize work done by others than to do the work oneself. It is, however, not with the idea of criticizing that the following notes, on this admirable paper of Mr. Rowland E. Turner, and remarks on Ashmeadian genera are given. W. H. Ashmead was the first to attempt a detailed classification of the genera of Thynnidæ and two of his genera were founded on species only characterized in his generic tables. These genera have been treated differently by Mr. Turner, but in neither case have they been characterized correctly. For this, one cannot blame Mr. Turner. It is hoped that the following notes will put the Ashmeadian genera on a firmer basis.

In some few cases the ruling of the International Committee on Zoological Nomenclature has not been followed by Mr. Turner. To these cases attention will be called and what is believed to be a correct interpretation given.

It will be noted that in certain cases the synonyms have been omitted from the list of species so the synonymy is not complete. The following omissions are to be noted:

Agriomyia (*Tachynomyia*) *spinolae* Guérin, (a species named as the genotype of *Tachynomyia,* by Ashmead), and *Thynnus ferridus* Erichs. should be placed as synonyms of *Tachynomyia abdominalis* Guérin, p. 27. *Thynnus plagiatus* Sm. should be included in the synonymy of *Eucyrtothynnus maculipennis* (Guérin), p. 25.

Thynnus (*Elaphroptera*) *holomelas* André should be included as a synonym of *Elaphroptera intaminata* (Smith), p. 23.

The naming of a described species as a type of a new genus without telling the genus in which it was originally described, causes trouble for other workers.

Some of the characters given in the generic keys are not as definite as one would like, and it is hoped that in a later paper Mr. Turner will tell us what is "very near" and what is "not very near" (p. 15, category 30). A comparison between the length of the second transverse cubitus and the distance of the second recurrent from it would be very serviceable here. "Ventral aspect" instead of "beneath" (first part of category 37, p. 16), would avoid ambiguity. Yet these are minor points, and

when it becomes necessary to use such minor points to find fault with a work, it must be of a high character.

Thynnidea Ashmead = **Thynnoides** Guérin.

Thynnoides Guérin, Voy. Coquille Zool. II, 2, p. 214, 1830.

Type—Thynnoides fulvipes Guérin.

Thynnidea Ashmead, Can. Ent., p. 98, 1903.

Type—Thynnus fumipennis Westw.

According to Mr. Turner *Thynnus fumipennis* Westw. and *Thynnoides fulvipes* Guérin are congeneric so *Thynnidea* Ashmead is a synonym of *Thynnoides* Guérin.

Neozeleboria n. n.

Zeleboria Turner, Gen. Insect. Fas. 105, p. 32, 1910. Not *Zeleboria* Saussure or Ashmead.

Ashmead in CAN. ENT., p. 102, 1903, fixed the type of *Zeleboria* Saussure as *Thynnus carinatus* Smith, a species originally included; Turner preferred to use *Thynnus sexmaculatus* Smith which is not congeneric with *Thynnus carinatus* as the genotype, therefore, a new name is necessary for *Zeleboria* Turner. For this group the name *Neozeleboria* may be used. A species once designated as the type of a genus must always remain the type.

The type of *Neozeleboria* is *Thynnus sexmaculatus* Smith.

Zeleboria Saussure = **(Glaphyrothynnus** Turner).

Thynnus carinatus Smith and *Thynnus xanthorrhoei* Smith, the genotypes of *Zeleboria* and *Glaphyrothynnus* respectively, are congeneric so *Glaphyrothynnus* Turner is a synonym of *Zeleboria* Saussure.

Aelothynnus Ashmead (non Turner).

Type of the genus: *Aelothynnus multiguttatus* Ashmead (original designation), CAN. ENT., p. 101, 1903.

Female.—Unknown.

Male.—Clypeus convex basally, broadly produced in the middle, truncate at the apex; labrum rather broadly triangular, subequal in length to the apical width, broader apically, with a median V-shaped notch; maxillary palpi 6-jointed, the basal joint small, the remaining joints long, the second but little shorter than the third, the third and fourth

subequal and slightly longer than the subequal fifth and sixth; labial palpi 5-jointed, the basal joint small, the second joint slightly longer than the remaining subequal ones; no process between the bases of the antennae; antennae slender, nearly of equal width throughout, the apical joints slightly arcuate, the third joint much shorter than the fourth, antennae when stretched posteriorly reach nearly to the apex of propodeum; pronotum about two-thirds the length of the scutellum, sharply truncate anteriorly; propodeum rounded laterally, not sharply oblique from the metanotum; anterior coxae with the ventral aspect not concave; second recurrent vein about half the length of the second transverse cubitus from the base of the third cubital cell; tarsal claws with a tooth near apex; gaster elongate, smooth, no constriction between the segments; ventral segments without spines; hypopygidium nearly twice as long as the width at the apex, gently widening apically, bounded laterally by strong ridges which join with the lateral teeth, median tooth longer and more slender than the lateral ones, a prominence in the basal middle; seventh dorsal segment not flattened or produced.

In Turner's table this runs to *Elidothynnus* Turn., but differs from his description by the 5-jointed labial palpi, and differently shaped hypopygidium.

Aelothynnus multiguttatus Ashmead.

Can. Ent., p. 101, 1903.

The characters given by Ashmead in his table of the genera of Thynnidæ (CAN. ENT., June, 1903), are sufficient to satisfy the technical requirements so this species should date from that time and be accredited to Ashmead. The following characters may aid in its determination.

Male.—Length 7.5 mm. Clypeus shining, impunctate; front confluently punctured, the upper part more sparsely so; posterior orbits and vertex shining, almost impunctate; fourth antennal joint slightly shorter than the fifth; anterior face of the prothorax shining impunctate; pronotum, mesonotum, scutellum, mesopleurae shining, with distinct well separated punctures; propodeum rather closely punctured, punctures in some places confluent so as to appear striate; apical dorsal segment irregularly punctured; lateral lobe of the hypopygidium, triangular, obtusely rounded. Black; base of mandibles, clypeus except a median spot, a spot at the inner base of each antenna, narrow inner orbits to near top of eye, line on posterior and anterior margin of pronotum, tegulae, a line below spot on scutellum, metanotum (postscutellum of authors), a spot above the middle and posterior coxae, spots on lateral apical dorsal angle of first segment, a band on apical dorsal

margins of segments 2-5 interrupted in the middle and broadly dentate laterally, and spots on ventral, apical, lateral angles of segments 2-5, *yellow;* legs below the femora testaceous. Wings clear, iridescent hyaline; venation testaceous.

Type locality—Australia. Two males collected by Mr. Koebele.

Type—Cat. No. 13,204, U. S. N. M.

Turnerella n. n.

Aelothynnus Turner, Gen. Insect. Fas. 105, p. 39, 1910; and other references; not Ashmead, Can. Ent., p. 101, 1903.

Turner considering that *Aelothynnus multiguttatus* Ashm. was undescribed named *Thynnus cerceroides* Sm. as the type of *Aelothynnus. Aelothynnus multiguttatus* Ashm. and *Thynnus cerceroides* Sm. are not congeneric, which leaves *Aelothynnus* Turn. without a name. For this genus the name *Turnerella* may be used.

Type of *Turnerella* is *Thynnus cerceroides* Sm.

Guerinius Ashmead = **(Tachynothynnus** Turner).

Guerinius Ashm., Can. Ent., p. 100, 1903.

Type—Thynnus flavilabris Guérin (original designation.)

Tachynothynnus Turn., Gen. Insect. Fas 105, p. 50, 1910.

Type—Thynnus shuckardi Guérin (original designation.)

The characters given by Ashmead for the genus *Guerinius* do not agree with genotype.* This caused Turner to place *Thynnus flavilabris* Guer. in his genus *Tachynothynnus* and consider *Guerinius* Ashm. as unknown. In this, however, he was wrong for the type of a genus once being named remains the type regardless of what the author had before him. The species Ashmead had before him called *Thynnus flavilabris* is *flavilabris* as understood by Turner and agrees with the original description.

Iswaroides Ashmead.

Jn. N. Y. Ent. Soc., VII, Mar., pp. 50-51, 1899.

Can. Ent., p. 98, 1903.

* The galaea are exserted and close together in such a manner that Ashmead in his haste mistook them for the labrum which he called "Bilobed," whereas it is broadly rounded. Ashmead was wrong in saying the lateral margins of the spine of the hypopygidium is "almost straight."

Type—Iswaroides koebelei Ashmead (original designation.)

This genus was founded for a male and female collected by Mr. A. Koebele in Australia. The specimens are on the same pin and were supposed to be in copulation. The differences between the male and female are so great—the two sexes falling in entirely different places in Turner's table—that it may be that this female may have used this male as mode of transport and does not even belong to the same genus.* If at some later time this should be proven to be true the female would have to be placed in a new genus, the male being the true type of *Iswaroides*, occurring on the page previous to the one on which the female was described.

Male Characters.—Posterior margin of head rather deeply arcuate; clypeus much produced, narrowed to the truncate apex; labrum narrow posteriorly, truncate, with the lateral angles sharp; mandibles with a distinct inner tooth; maxillary palpi 5-jointed, the first joint shorter than the second, which is the longest, apical three subequal; labial palpi 4-jointed, no marked difference in the length of the joints; antennae fully as long as the head and thorax (including propodeum), the third joint shorter than the fourth, joints beyond the fifth distinctly arcuate, the apical joints not narrower than the basal ones; inner orbits distinctly diverging toward the clypeus; no tubercule between the bases of the antennae; pronotum not much shorter than the scutellum, sharply truncate anteriorly and slightly arcuate; propodeum gradually rounded; anterior coxae distinctly concave on the ventral aspect; tarsal claws cleft; second recurrent vein about one-fifth the length of the second transverse cubitus from the base of the third cubital cell; the spurious vein present in the first cubital cell; gaster elongate, the segments strongly constricted, not flattened; sixth ventral segment with distinct spines at its lateral, apical angles; the fifth segment with rudimentary spines; hypopygidium broader apically, tridentate, the spines slender and long, the middle one the longest, extending beyond the seventh dorsal segment, apical dorsal segment rounded apically, the lateral apical angles tuberculate.

In Turner's table the male runs to *Aclothynnus* (*Turnerella* n. n.), but the labrum is truncate with the lateral angles sharp; the maxillary palpi are 5-jointed; the antennæ are fully as long as the head, thorax and propodeum; and the anterior coxæ are distinctly concave on the ventral aspect.

* That this is often the case has been suggested by Mr. Turner in a letter.

Female Characters.—Head flattened, seen from above about twice as wide anteriorly as at the base, but little longer than the width in the widest part; clypeus short, at the apex truncate; mandibles without a tooth; malar space not as long as half the width of the eye; eyes in outline oval; trophi wanting but according to Ashmead (1899) the maxillary palpi are 4-jointed and the labial palpi 3-jointed; pronotum seen from above quadrate, at the anterior lateral angles tuberculate, without a median sulcus; propodeum broader than rest of the thorax, a little longer than the meso- and metanotum, the posterior face truncate; claws with an erect inner tooth, not cleft as Ashmead (1899) says; gaster a little longer than the other two parts of the insect; the second dorsal segment does not differ from the others, the apical two-thirds of the segment is depressed, more broadly so in middle, and shining, the basal part with distinct punctures; the sixth ventral segment is shining centrally, the lateral part irregularly rugose; hypopygidium a little more than twice as long as the basal width, narrowing apically where it is truncate, shining impunctate, a tuft of long hair on each side near the apex; apical dorsal segment with a convex, shining, somewhat boat-shaped area, rather wider apically and nearly three times as long as the greatest width; a long tuft of hairs from a little below the middle at the side of this convex area.

In Turner's table this runs out at category 11.

Iswaroides kobelei Ashmead.

Male.—Length 11.5 mm. Head and clypeus closely distinctly punctured except on the front where the punctures are confluent; thorax similarly punctured, the punctures on the propodeum rather finer; the basal part of the segments of the gaster with distinct poorly defined punctures; when seen from behind the ventral segments appear to have small tubercules at the lateral margins; the space between the spines broadly arcuate, the middle spine curved upward apically. Black tibiae and tarsi slightly brownish; the scattered hairs silvery; wings dusky hyaline, venation black.

Female.—Length 5.5 mm. Head shining and, except for a few widely scattered punctures, impunctate; a median furrow between the antennae; pronotum finely striatopunctate; propodeum shining, slightly impressed in the middle; legs rather strongly spinose; basal part of the segments of the gaster with distinct punctures. Head ferruginous, the legs, thorax and abdomen pale piceous; hair white or gray except that at the apex of the gaster, which is rufous.

Type locality: Australia. A male and female, supposed to be in coitu, taken by Mr. A. Koebele.

Type—Cat. No. 13,205, U. S. N. M.

Some New England Orthoptera Observed in Late October.

By H. A. Allard, U. S. Dept. of Agriculture, Washington, D. C.

During a late October trip to central New England in 1909, I spent a few days observing and collecting the Orthoptera occurring at this season on and near Fort Hill, Oxford, Massachusetts.

At this time the nights were cold and frosty, with more or less thin ice forming on quiet water. The leaves, for the most part, were brown and withered, and many trees and shrubs had become entirely bare. In the low grounds and marshes bordering the ponds and streams the luxuriant grasses and sedges of summer were entirely dried and shrunken. The pastures and grass fields, however, were still fresh and green.

During the warm, sunny days, the following Orthoptera were observed or collected, almost entirely in the green, upland fields and pastures:

1. *Ceuthophilus maculatus* Harris. Beneath rocks in stone piles.
2. *Orphulella speciosa* Scudder. In open, sunny grass fields.
3. *Encoptolophus sordidus* Burmeister. In open grass fields and pastures.
4. *Stenobothrus curtipennis* Harris. Extremely common in grass fields.
5. *Melanoplus femur-rubrum* DeGeer. In open fields and pastures.
6. *Orchelimum agile* DeGeer. A single specimen in a pasture swale.
7. *Gryllus pennsylvanicus* Burmeister. Thousands everywhere in dry fields.
8. *Nemobius fasciatus* var. *vittatus* DeGeer. Extremely common in fields.
9. *Nemobius palustris* Blatchley. In cold, damp situations beneath leaves, etc.
10. *Oecanthus niveus* DeGeer. Rarely heard at this season.

Only two specimens of *Ceuthophilus maculatus* were found.

* The writer is indebted to Mr. A. N. Caudell of the U. S. National Museum for the identification of the Orthoptera listed in this paper.

Both were taken from beneath rocks in stone piles; one in damp woods, the other in a dry, open field.

Encoptolophus sordidus Burm. at this season occurs almost entirely in the sunny pastures and grass fields of dry, upland localities. This locust appears to be the hardiest and most active species at this season, and is rather difficult to capture owing to its strong powers of flight. Like many other locusts, this species stridulates only during flight, producing an unusually sharp, vigorous rattle, as it dashes across the fields. I captured many males of this species as I walked over the fields. If one is disturbed, it darts in a swift, straight flight some rods away with a noisy rattle. This locust is very common in all dry upland situations.

One of the smallest and noisiest locusts occurring at this season is *Stenobothrus curtipennis* Harris. Its notes are heard only during the sunny hours of the day, in pastures, fields, and in open, sunny places in the woods. These notes are frequent, short, lisping phrases, of several seconds' duration, produced by the sawing of both legs simultaneously upon the outer edge of the tegmina. This small locust is one of the commonest species at this season.

At this late season of the year it is very unusual to find an Orchelimum. I was successful in finding but one individual of *Orchelimum agile* DeGeer. I took this, one sunny afternoon late in October, among some low-land grasses in a sheltered pasture swale. I had been searching for specimens of *Nemobius palustris* when I heard the faint note of an *Orchelimum* near at hand. The insect was so chilled and enfeebled that it merely fell into the grass unable to leap when I reached down to grasp it. Its song was so brief and feeble that it was audible but a few feet away.

Among the late autumn insects, *Gryllus pennsylvanicus* Burmeister is one of the commonest and most musical crickets in New England. As soon as the morning sun has warmed the fields, great numbers of the males and females of this species may be seen traveling about in all upland fields and pastures. The gravid females are concerned with the sole function of ovi-

positing, while the more or less attentive males spend their time stridulating until silenced by the chilly hours of nightfall. The characteristic note of this field-cricket in New England is a short, brisk chirp, repeated at more or less regular intervals. In the piedmont region of Northern Georgia, where *Gryllus pennsylvanicus* is also very common, the characteristic stridulation is a rather weak, prolonged trill. The chirping stridulation in North Georgia is far less common, and seems to be the distinctive note of a form of this species appearing later in the season. In New England the chirping form seems to occur exclusively, as in this region I have never heard the more prolonged trill of the southern form.

Throughout October and early November the little ground cricket *Nemobius fasciatus* var. *vittatus* DeGeer fairly swarms in the grass fields and pastures of much of New England. Although I have observed and collected the short-winged forms of this cricket many years at Oxford, Massachusetts, I have never yet taken the long-winged form in this region. Around Washington, D. C., however, I have found the long-winged form intermingling with the short-winged form in some localities, and in others entirely wanting. Those factors which determine the presence or absence of the long-winged or short-winged forms of this Nemobius in any locality throughout its range are not yet obvious.

Nemobius fasciatus, as well as *Gryllus pennsylvanicus* includes two singing forms in portions of its range. I have noted these two forms definitely only for the short-winged *vittatus* at Oxford, Mass. Here both singing forms of *vittatus* are very common. The stridulation of one of these forms is a very high-pitched, prolonged trill, ti-ti-ti-ti-ti-ti-ti-ti-ti-ti; that of the other form is a very brief, shrill, intermittent tiiii-tiiii-tiiii. A considerably lower pitch quite sharply distinguishes the brief intermittent notes, tiiii-tiiii, from the prolonged trill. These two trilling forms of *Nemobius fascatus* var. *vittatus* are quite definitely confined in separate colonies, and in different localities. The prolonged trilling form occupies almost exclusively the dry, grassy upland fields and pastures. In the damp and

marshy low grounds in fields and pastures this form is replaced almost entirely by pure colonies of the intermittent trilling form. Only where the wet and dry conditions overlap is there a noticeable intermingling of the two forms. At Oxford, Mass., *Nemobius fasciatus* var. *vittatus* is the most abundant insect of late autumn, and continues to trill in the fields until overcome by the keen, freezing nights of November.

I find the tiny *Nemobius palustris* Blatchley fairly common at Oxford, Mass., though far less so than the preceding. *Nemobius palustris* is much more local in its distribution, preferring to conceal itself beneath the grass and leaves in cool, damp spots by roadsides, and amidst the moss and leaves covering damp banks near brooks in thinly wooded situations. I have never heard this cricket in open fields frequented by *Nemobius fasciatus* var. *vittatus*, nor in any locality which is not damp or wet, and provided with an abundance of leaves or dead grass beneath which it can remain concealed. Its usual habitat is beneath the matted grasses and leaves in cool, damp situations, whether by roadsides, in fields or in woods. I not infrequently find this cricket beneath flat, deep-sunken stones in damp soils. Wherever found, its close association with damp or wet soils is at once evident. At Oxford, Mass., this cricket dwells almost entirely beneath the matted grass in damp soils by roadsides. In this region I have never observed it in true swamps or boggy sphagnum marshes which seem to be its favorite habitat in many other portions of its range, as stated by Blatchley in Indiana. This cricket is not readily collected until first located by its stridulations.

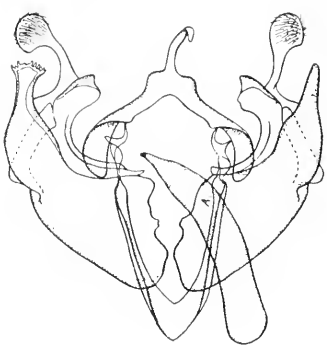
At this season of the year the true arboreal katydids may hardly be expected, since the woods are mostly leafless. However, on one or two occasions I heard the sharp, rasping tzeep of some species in an apple tree, which had not entirely lost its green leaves.

With the coming of autumn, the number of musical Orthoptera rapidly decreases, and in particular situations, many forms soon entirely disappear. These changes are largely brought about by more or less profound changes in the accustomed en-

vironment of certain species. After the luxuriant vegetation of the lowlands and marshes has become brown and withered, the species of *Conocephalus* and the noisy Orchelimums are no longer heard. When the forests have become bare, the trees have lost not only their leaves, but also all the arboreal katydids whose dwelling places were among the leaves.

Unlike the warm summer nights which are enlivened with the music and harmony of countless singing musicians concealed everywhere amidst the grasses, shrubs and trees, the long, freezing, late autumn nights in New England, except for the occasional wintry rustle of dry leaves, are painfully silent. Not until the morning sun has become high, and the open fields have lost their frosty chill, is there any sign of surviving insect life. By midday, if the weather is mild, the hardier locusts make their usual flights across the fields, and countless numbers of big and little crickets move restlessly about, trilling ceaselessly in the grass until sundown. If the evening is very warm, the slowly uttered trills of an occasional *Oecanthus niveus* may sometimes be heard, yet how impressive and pathetic these few short trills with their autumn environment of almost leafless trees and shrubs!

The notes of Orthoptera at different times during the day and at different seasons, show considerable variation in pitch, intensity, sound-quality, and delivery. These differences are mainly dependent upon varying conditions of moisture, temperature, etc. Late in the night, after the air has become damp and chilled, the deep-toned trill of *Oecanthus latipennis* is considerably lower in pitch and intensity than the same trill heard during warm afternoon hours. In the cool night air the wing vibrations have slowed down, so that each successive note is separated by longer intervals, imparting to the trill a marked quaver or tone rhythm. Higher temperatures from day to day throughout the summer very quickly increase the tone intensity and rate of delivery of the intermittent trills of *Oecanthus niveus*. In the same manner the colder temperatures of late autumn markedly modify the intensity and delivery of the notes of musical insects, until they become barely audible at certain low temperatures.



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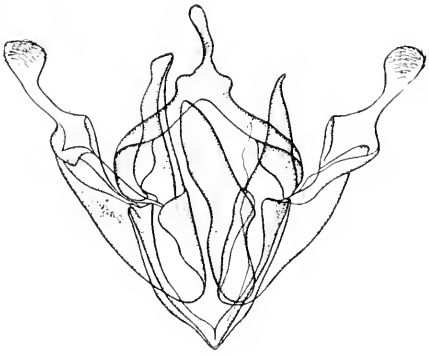

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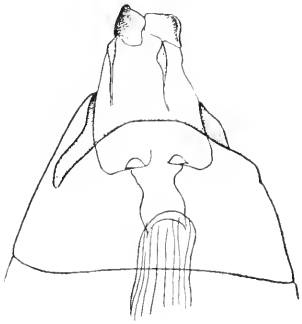

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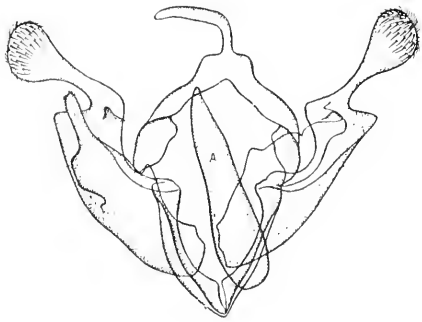

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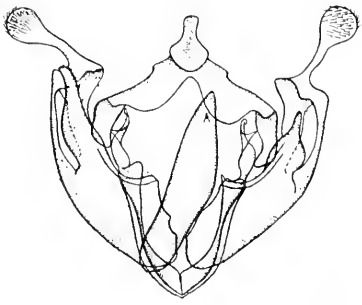

2

MAMESTRA TRIFOLII—SMITH.

New England Orthoptera collected in late October and November include almost entirely the true ground-inhabiting forms, as the crickets and acridian locusts. These are confined almost entirely to the open, upland fields and pastures which retain their greenness longest and are most exposed to the warmth of the sun's rays throughout the day.

Orthoptera are everywhere less abundant in species as cold weather approaches, yet careful observations at this season are of no less importance, since much information can be gained concerning the habits and relative numbers of those hardier species which become the dominant forms late in autumn.

Notes on Mamestra trifolii Rott. and its Allies.

By J. B. Smith, Sc.D.

(With Plate XI.)

Mamestra trifolii is one of our common Noctuids and usually represented by a fair series in collections and a very few duplicates, because, occurring throughout the country, there is little or no chance for exchange. It is recognized as a somewhat variable species and as a rule two types are brought out in collections: one in which there is little or no contrasting maculation, the s. t. line not conspicuous, but moderately dentate and without preceding sagittate black dashes; the other in which there are strongly contrasting shades, s. t. line conspicuous, strongly dentate to form a W on veins 3 and 4, preceded by well-defined, sagittate black marks. In almost every reasonably good series the difference between these two extremes is easily bridged by apparently intermediate forms.

In my catalogue the species stands as *trifolii* Rott., with *chenopodii* Fab., *albifusa* Wlk., *glaucovaria* Wlk., and *major* Speyer as synonyms and *oregonica* Grt. as a variety.

Hampson refers the species to *Scotogramma* Smith, gives the same synonymy except that he omits *major* Speyer altogether, and adds additionally *verna* Esp., *saucia* Esp., *treitschkei* Bdv., *pugnax* Hbn., *farkasii* Tr., *intermissa* Wlk, *inquieta* Wlk, and *canescens* Moore.

Of these names, however, he deems the following worthy of special mention:

"Ab. 1 *farcasi.* Fore wing darker and more varigated."

"Ab. 2 *oregonica.* Greyer; fore wing more thickly irrorated with pale brown."

"Ab. 3 *treitschkei.* Fore wing with medial part of subterminal line defined by prominent dentate black marks on inner side."

"Ab. 4 *albifusa.* Fore wing tinged with rufous and with white suffusion on costal area and beyond post medial line, the subterminal line with prominent dentate black marks on inner side at middle."

The form figured on p. 29 as *trifolii* ♂, agrees very nearly with the uniformly marked type usually found in our collections, except that it seems to be rather darker than our ordinary forms. There is, however, a still darker form occurring in the Northwest, which has been quite generally called *oregonica* in collections—largely on my authority.

In rearranging my series of *Mamestra* I set aside all the examples of *trifolii* for closer study, and Dr. Barnes was good enough to send me his material—the whole small enough for so common a species. During his visit to me, Mr. F. H. Wolley Dod marked in my box two examples, one as representing *albifusa* Wlk., the other as representing *oregonica* Grt., both in agreement with Hampson's memoranda, and, as to the *albifusa,* the most extremely contrasting specimen in my collection.

In separating out this material I find I have almost no Pacific Coast specimens, and, on close examination, the single example of *oregonica* as named by Dod is obviously not *trifolii*, although the name may be correct. In other words, I am not sure of my *oregonica,* although it agrees generally with the description. I am certain, however, that the specimen represents a good species, and one that I propose to fix by figuring the male sexual structures, so that if at any time later typical *oregonica* become available for dissection, they can be compared structurally, if not autoptically, with the material now before me.

After separating the material under examination as nearly as possible into two series, I examined the ♂ abdomen of extreme forms and found two strikingly distinct structures. The contrasting form, *albifusa,* has at the base of the abdomen a

pair of hair pencils fitting into grooves at the sides; the harpes are only slightly asymmetrical, but the claspers are altogether unlike, that of the left side, seen from below, being practically lost, while that of the right side is fully developed. The uncus in this form is only slightly dilated toward tip. In the uniform, or *trifolii* series, the abdomen has neither hair pencil nor lateral grooves; the harpes are decidedly dissimilar, both claspers are well developed though entirely unlike, and the uncus is spatulate at tip.

Oregonica in genital structure resembles *trifolii* in that the abdomen has no hair pencils, but the claspers are hugely and irregularly developed, altogether unlike anything else examined.

Having determined the existence of two structurally distinct forms, I attempted to divide them upon superficial characters, choosing contrast and development of the W-mark in the s. t. line as a base. On this I succeeded in getting two very nice series, coincident in distribution; but on testing by genitalic structure I found it all wrong; some very nicely contrasting forms that should be *albifusa* by all superficial signs, proved structurally like uniformly marked examples that should be and were *trifolii*. Abandoning this base, I noted a slight difference in wing form; one type with primaries a little more drawn out and pointed than the other. This served better, and then, on close study of individual features, I noted that in some examples the reniform was symmetrical above and below, making a rather broad, kidney-shaped mark. In other examples the inner defining line slopes toward the middle, drawing the mark out into a somewhat conical form that breaks the reniform outline. I found also that this was accompanied by a somewhat more ovate orbicular, tending to draw to a point inwardly, and on this basis all my examples separated nicely, the genitalic and ornamental characters coming into agreement.

Unfortunately, I have no European examples for comparison at this time, so that I am unable to say whether our forms are identical with those from that country, or whether there is not more than a single species involved in that country. All that I

can do now is to call attention to the fact that very similarly marked species exist; that further critical study of the European forms is needed, and in this connection to fix the American forms designated by the names now in use in our collections.

Mamestra trifolii.

Tends to uniformity in color, and ranges from an even ash-gray to luteous gray, variable in the amount of powdering. There is little contrast in the ground color, but the relative distinctness of claviform and reniform is variable, and so is the distinctness of the W in the s. t. line. This may be only slightly marked, or extend distinctly to the outer margin, and may or may not be preceded by dark marks or shades; rarely, however, are the preceding marks black. The orbicular varies in size and somewhat in shape, but is never drawn inwardly into a point. The reniform is broadly and symmetrically kidney-shaped.

Forty-seven examples of this type are under examination, and they come from Massachusetts, New York, New Jersey, Connecticut, Illinois, Iowa, South Dakota, Colorado, Washington, New Mexico and Arizona, covering thus approximately the entire country.

The structure of genitalia has been sufficiently mentioned to be left to the figure for further details. Examples from the entire range of localities have been examined in the preparation of this figure.

Mamestra albifusa Wlk.

The primaries, especially in the male, have a distinctly mottled appearance and tend to lighter shadings in the median and s. t. spaces. The maculation is on the whole much more distinctly relieved, and the W-mark of the s. t. line is always prominent and extends to the outer margin. Sagittate marks always precede the s. t. line; but they vary much in distinctness, and range anywhere from brown to black. The peculiarities of the orbicular and reniform have been already described, the latter as a rule somewhat less contrasting than in the preceding.

Thirty-six examples of this type are at hand from Maine, Alberta, Manitoba, Colorado, New Mexico, Arizona, Texas, Middle California.

The single example from Maine is doubtful. It is a female, very contrastingly marked, labeled by Mr. Dod as typical *albifusa,* but with the wing form and almost the reniform of *trifolii.* It is the only specimen in the entire series that is at all doubtful, and I have left it here chiefly because it fills in every respect the requirements of Walker's *albifusa.* The most easily recognizable portion of the sexual parts without dissection is the uncus, which is readily seen in mounted specimens where the anal parts are somewhat expanded.

Mamestra oregonica.

I have one male from my own collection, Colorado Springs, VI, which I refer to this species, and with this I am inclined to associate three females from Denver and Durango, Colorado, out of the Barnes collection. The male, which agrees with Mr. Grote's description, is very uniform in ground, slightly reddish in tint, the maculation clear but not at all relieved. S. t. line pale, not at all shaded, with a small W on veins 3 and 4, not extending more than half-way through the terminal space. Orbicular large, incompletely defined. Reniform broadly kidney-shaped, like that of *trifolii.* The three females agree in essentials, but are darker throughout.

On the under side this species has a continuous extra-median line and a discal mark on all wings.

The male genitalia are remarkable by the abnormal development of the claspers, which are separable from the harpes to the base, and cannot be described better than by a reference to Figure 5 on plate.

A species which at first sight looks like an intensification of *oregonica,* and which I have at times named as such, I have now separated out under the term *morana.*

Mamestra morana n. sp.

Ground color a dull luteous fuscous, without contrasting colors or markings. Front protuberant, with an obscure transverse darker shading. Collar with a median and terminal transverse dusky line which is never conspicuous and often barely traceable. Thoracic disc a little powdered with whitish, patagia with an obscure submarginal line. Primaries with the maculation of *chenopodii,* but obscure, broken, without decided contrasts. The basal and median lines are geminate,

scarcely relieved against the dark ground. S. t. line slender, pale, usually broken, the outward dents on veins 3 and 4 usually small and never conspicuous, although in some examples they extend to the outer margin. There are no conspicuous preceding marks, sometimes not even a dusky shading although, as a rule, the latter is present. Claviform short, broad, with a smoky outline, not dark-filled. Orbicular varying in size, nearly round, outlined in smoky, sometimes with a dark center, usually concolorous. Reniform large, broad, a little constricted, not well defined, dusky. Secondaries yellowish, smoky at base, with a broad outer blackish border; fringes yellowish. Beneath, whitish or yellowish, powdery; with a continuous exterior dusky line crossing both wings and a tendency to a dark area in the s. t. space; primaries with a blackish lunule, secondaries with a black discal spot.

Habitat—Colorado: Denver, Glenwood Springs, Fort Collins in June and July; Wyoming; Yellowstone Park in July; Washington: no date nor definite locality; British Columbia: Rossland in July.

A series of ten males and eighteen females is at hand, and the specimens differ little except in depth of ground color. In some the maculation is scarcely at all relieved; in others it is as well defined as in the average *chenopodii*. The dull, smoky-luteous ground will serve to distinguish this form from its allies.

A characteristic feature is the dusky shade of the s. t. space beneath. This, in most cases, is a real band, while in all cases the shading is obvious.

In sexual structure the species is bizarre. The harpes are of the *trifolii* type, but the claspers are asymmetrical, compound and, on the right side, the outer process is bluntly and raggedly terminated. The figure must be referred to for a real understanding of this structure, which is almost exactly duplicated in an altogether different species, *M. ortruda,* which by its other features is referable to quite a different series of species.

Explanation of Plate XI.

Figure 1.—*Mamestra albifusa,* male.
Figure 2.—*Mamestra trifolii,* male.
Figure 3.—*Mamestra albifusa,* female.
Figure 4.—*Mamestra trifolii,* female.
Figure 5.—*Mamestra oregonica,* male.
Figure 6.—*Mamestra morana,* male.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—EDS.

PHILADELPHIA, PA., OCTOBER, 1910.

THE GROWING APPRECIATION OF ENTOMOLOGY.

The London *Times* for Wednesday, August 10, 1910, devotes rather more than two columns, exactly forty-six inches, to a sober and sensible account of the first International Congress of Entomology, held at Brussels August 1-6. We quote a few sentences: "Entomology is at last recognized officially as an important science. The study of insects so long looked upon with disdain as a pastime for children and old men has at last vindicated its claim as a valuable branch of human mental activity. That is to say, from being a purely intellectual exercise, entomology has developed a most important practical aspect that will, in the near future, have a profound and far-reaching effect upon the lives and fortunes of millions. The discovery of the astonishing phenomenon that one species of mosquito, and one only, is the vehicle for the transmission of yellow fever, another of malaria, while a single kind of biting fly communicates sleeping sickness to the teeming millions of the African Continent, has a direct and vital influence upon tropical medicine; and the Americans have long since realized that an accurate knowledge of the habits of one kind of beetle may save agriculturists from damage that may result in the loss of hundreds of thousands of pounds. Thus entomology has won the serious attention of practical men who, acting together with the purely academical devotees of the pure science,

have demonstrated their attachment to and appreciation of their study by organizing an International Congress that has received the hearty support of institutes, departments and governments."

On another page of this issue we give an account of the proceedings of the Congress.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

Mr. C. B. Hardenberg, formerly a resident of Philadelphia and later connected with cranberry insect investigations for the State of Wisconsin and the U. S. Department of Agriculture, has been appointed Entomologist to the Transvaal. His address is Box 434, Pretoria, Transvaal.

Prof. John B. Smith sailed for Europe August 20th and expects to return about the middle of October on the steamer Ryndam.

Mr. William Schaus is now located at 97 Elm Park Gardens, London, S. W., England. The first fruits of his three years of collecting in Costa Rica have appeared in a paper, in the Annals and Magazine of Natural History, containing descriptions of new species of Syntomidae and Arctiidae.

The Sixth Annual Report of the State Forester of Massachusetts. By F. W. Rone, State Forester. This is a very interesting and valuable document. The gypsy and brown-tail moth suppression is now under the supervision of the State Forester, and he gives a very complete account of what has been done in this line. The postal cards showing the life history of these two species in color should be a valuable method of educating the people. The predaceous *Calosoma sycophanta* and *scrutator* are also shown in the same way.

Dr. Henry Skinner, editor of the News, left for England on July 9th, and after spending some days in that country, took part in the International Congress of Entomology at Brussels, August 1 to 7. Going by way of Cologne, the Rhine, Mayence, Nuremberg and Vienna, he reached Graz to participate in the International Congress of Zoology there, ending August 19th. Writing on this last-named date, he expected to go to Trieste, take the Dalmatian trip of the Congress and return to England via Venice, the Italian lakes, Switzerland and Paris. He is expected in Philadelphia about September 26th.

Recent Gifts and Accessions to the Entomological Department at Oxford University.—From the report of the Hope Professor of Zoology, E. B. Poulton, for 1909, we learn that Dr. G. B. Longstaff has given an endowment of £2400 for an assistantship or other aid to the department. The remaining collections other than the Coleoptera, with over 3,000 types, acquired by the British Museum of Natural History in 1893, and zoological library of the late F. P. Pascoe, the distinguished authority on certain groups of Coleoptera have been presented by his daughter, Miss Pascoe. Mr. W. Walmesley White, of Teneriffe, gave a very fine collection of Lepidoptera of that island, a welcome addition, for the study of island faunas, to the Wollaston collections of Coleoptera of Madeira and the Canary Islands. Another gift consists of between 5000 and 6000 specimens of *Acidalia virgularia*, bred in a Mendelian experiment by Messrs. L. B. Prout and A. Bacot, in ten generations from a cross between two geographical races of the moths.

Plant-dwelling Odonate Larvae.—In the News for June last, page 264, is recorded the breeding of *Mecistogaster modestus* Selys from a larva found in the water among the leaf bases of a bromeliad in Costa Rica. That I was not the first to breed this species is shown by the following. While in Cartago, Costa Rica, I received a letter from Mr. Frederick Knab, of the United States National Museum, dated Washington, August 5, 1909, in which he stated: "In the course of my mosquito work in the tropics I investigated the water between the leaves of the epiphyte Bromeliaceae and found that, besides mosquito larvae, there was a rich insect fauna. The winter of 1907-08 was spent at Cordoba, Mexico, and there I found that nearly every bromeliid investigated contained dragonfly larvae. I was not prepared to rear Odonata, but I finally did succeed in breeding out a couple of rather large, unfortunately crippled, Agrionids. I intended sending these to you when your announcement appeared that you would receive no more material. Since then these specimens have been destroyed by Dermestidae." Since my return to the United States, Mr. Knab has written me under date of August 18, 1910: "Herewith I am sending you, by Mr. Viereck, the fragments of the two dragonflies which I bred from arboreal bromeliids. I am afraid you can do but little with them, there is so little left, but if you can make them out I would be glad to hear from you." There is no doubt that the fragments of the imagos sent by Mr. Knab belong to the same species which I reared in Costa Rica, *Mecistogaster modestus* Selys, and they transformed in the same month, April (but of 1908), as mine did. Mr. Knab's letter of August 5, 1909, reached me in Costa Rica before I had found any bromeliadicolous Odonata, although I had

looked for them, and was a distinct encouragement to persevere in my search. I went to Costa Rica having this suggestion of Mr. O. W. Barrett's in mind, published in the NEWS for November, 1900, page 601: "I understand the early stages of *Mecistogaster* and *Megaloprepus* are still unknown. . . Now, is it possible that the early stages are passed in the large water-retaining leaf bases of Bromeliads?" I am glad to acknowledge my indebtedness to Messrs. Barrett and Knab in this search, and I hope to publish later descriptions and figures of this and other larvae of Costa Rican Odonata. I am not forgetful of the fact that the above-mentioned suggestion and discoveries of plant-dwelling Odonate larvae are antedated by the finds of Mr. Perkins in the Hawaiian Islands, first announced, I believe, by Dr. David Sharp in Volume V of the Cambridge Natural History (1895), page 426, in these words: "Mr. R. C. L. Perkins has recently discovered that the nymphs of some of these are capable of maintaining their existence and completing their development in the small collections of water that accumulate in the leaves of some lilies growing on dry land." A figure of one of these Hawaiian larva is given on the same page. In his own work on the Neuroptera (1899) in the "Fauna Hawaiiensis," Mr. Perkins several times alludes to these larvae (of several species of *Agrion*) inhabiting the plant *Astelia veratroides*, but gives no figure of them. There is still much opportunity for further research along this line, as the larvae of *Megaloprepus*, *Pseudostigma* and of *Mecistogaster* other than *M. modestus* have not yet been found.—PHILIP P. CALVERT.

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), excluding Arachnida and Myriapoda. Articles irrelevant to American entomology, unless treating of new genera, 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, and are all dated the current year unless otherwise noted. This (°) following a record, denotes that the paper in question contains description of a new genus; while this (*), that of a new North American form.

For complete record of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

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HYMENOPTERA. Banks, N.—New species of Psammocharidae (Pompilidae), **6**, xviii, 114-126 (*). **Beutenmiller, W.**—The No. Am. species of Aulacidea and their galls, **153**, xxii, 253-258. **Bischoff, H.**—Die Chrysididen des koniglichen zoologischen museums zu Berlin, **258**, iv, 427-493 (*). **Brues, C. T.**—A new Pteromalid parasitic on Tortrix fumiferana, **4**, xlii, 259-260 (*). A new species of Telenomus parasitic on the eggs of Tussock moths, **5**, xvii, 106-107 (*). **Cameron, P.**—On some Asiatic species of the subfamilies Braconinae and Exothecinae in the Royal Berlin Museum, **40**, xxv, 22-23, 25-26 (°). On some Asiatic species of the subfamilies Exothecinae, Spathiinae, Hormioinae, Cheloniae and Macrocentrinae in the Royal Berlin Zoological Museum, **46**, liii, 41-55 (°). On a new genus and species of parasitic Cynipidae (Eucoilinae) from Cape Colony, **9**, xliii, 180 (°). Descriptions of four new species of Hymenoptera from Auckland Island. The Subantarctic Islands of New Zealand, by C. Chilton, Wellington. Vol. 1, 75-77, 1909 (°). **Cockerell, T. D. A.**—The No. Am. bees of the genus Nomia, **50**, xxxviii, 289-298 (*). Some bees of the genus Nomada from Washington State, **5**, xvii, 91-98 (*). **Ducke, A.**—Zur Synonimie der neotropischen Apidae, **45**, 1910, 362-369. **Emery, C.**—Genera Insectorum, Formicidae, subfam. Dorylinae, **194**, fasc. 102, 34 pp. **Girault & Sanders**—The Chalcidoid parasites of the common house or typhoid fly (Musca domestica), and its allies, **5**, xvii, 108-117, 145-160 (*). **Howard, L. O.**—On the habits with certain Chalcidoidea of feeding at puncture holes made by the ovipositor, **179**, iii, 257-260 **Kieffer, J J.**—Beschreibung neuer sudamerikanischer im zoologischen museum zu Berlin aufbewahrter Diapriiden, **84**, xxvii, 46-48, 54-56 (°). Description de nouveaux Bethylides, **86**, xxix, 31-

56 (*). Description de nouveaux Evaniides d'Amerique, **86,** xxix, 57-81 (*). Genera Insectorum, Belytidae, **194,** fasc. 107, 47 pp. Serphiden und Cynipiden von Madagaskar, **156,** ii, 529-534 (°). **Luderwaldt, H.**—Sphex striatus bei seinem Brutgeschaft, **92,** vi, 177-179. **Malden, W.**—Diseases of bees, **186,** v, 41-48. **Meade-Waldo, G.**—New species of Diploptera in the collection of the British Museum, **11,** vi, 100-110 (°). **Pfankuch, K.**—Ueber einige Typen der Holmgrenscher Gattung Bassus, **45,** 1910, 280-284. Die Typen der Gravenhortschen Gattung Bassus, **45,** 1910, 271-280. **Phillips, E. F.**—Bees, **7,** Farm. Bull. No. 397. **Rohwer, S. A.**—Notes on Tenthredinoidea, with descriptions of new species, **4,** xlii, 242-244 (*). Descriptions of new Psenid wasps from the U. S., **102,** xii, 99-104 (*). On a collection of Tenthredinoidea from eastern Canada, **50,** xxxviii, 197-209 (*). **Roubaud, E.**—Recherches sur la biologie des Synagris. Evolution de l'instinct ches les Guepes solitaires, **86,** lxxix, 1-21. **Sanders, G. E.**—Conflicts between ants, **75,** 1909, 51-54. **Schmiedeknecht, O.**—Opuscula Ichneumonologica, fasc. 25, pp. 1921-2000. **Schrottky, C.**—Neue Arten der Hymenopterengattung Ammophila aus Argentinien, **40,** xxv, 30-32. Neue und wenig bekannte sudamerikanische Bienen, **84,** xxvii, 56-57, 63, 72, 78, 88-89. **Snodgrass, R. E.**—The anatomy of the honey bee, **7,** Tech. Ser. No. 18. **Stenton, R.**—On the oviposition and incubation of the ichneumonid Paniscus (Parabatus) virgatus, **9,** xliii, 210-212. **Strand, E.**—Neue Hymenopterengattung, **40,** xxv, 26 (°). **Szepligeti, G.**—E. Jacobson'sche Hymenopteren aus Java und Krakatau. Teil II. Braconiden und Ichneumoniden, **83,** xxxii, 85-104 (°). **Turner, R. E.**—Genera Insectorum, Thynnidae, **194,** fasc. 105, 62 pp. (°). **Wasmann, E.**—Zur kenntniss der Ameisen und Ameisengaste von Luxemburg (continned), **270,** iv, fasc. 3 et 4, 103 pp. 1909. **Wheeler, W. M.**—Colonies of ants (Lasius neoniger) infested with Laboulbenia formicarum, **5,** xvii, 83-86. **Zander, E.**—Studien ueber die Honigbiene (Apis mellifica),**97,** xcv, 507-550.

The papers, in Russian, of Prof. Dr. N. V. Nassonov on Strepsiptera have been made accessible to German-reading students by a translation, by A. v. Sipiagin, published by Karl Hofeneder. (Untersuchungen zur Naturgeschichte des Strepsipteren. Von Prof. Dr. Nikolai Viktorovich Nassonov....Aus dem Russischen übersetzt von Alexander v. Sipiagin....Mit Anmerkungen und einem kritischen Anhang über einige Ansichten Meinerts betreffs der Anatomie des Weibchens herausgegeben von Karl Hofeneder, S. J. XXXIII. Bericht d. Naturwiss.-med. Vereins Innsbruck, 1910.) The 206 pages comprise a preface and an appendix by the publisher and translations of Nassonov's

articles on *Xenos Rossi* and the position of the Strepsiptera in the system (1892), the Metamorphosis of the Strepsiptera (1892), the Morphology of *Stylops melittae* (1893), Remarks on *Halictophagus Curtisii* (1893) and a supplement of six pages (1893). A table of contents, pp. 203-206, lists the anatomical, physiological, developmental and ecological topics treated which have made these papers of the Russian author among the most important ever published on this group of insects. Six lithographic plates reproduce those of the original memoirs.

A Preliminary List of the Arachnida of Indiana, with Keys to Families and Genera of Spiders, by Nathan Banks.—Mr. Banks has recently sent me a copy of this interesting reprint from the Thirty-first Annual Report of the Department of Geology and Natural Resources of Indiana, 1906. One hundred and sixty-nine species are listed, 145 in the *Aranеida*, 10 in the *Phalangida*, 4 in the *Pseudoscorpionida*, and 11 in the *Acarina*. Two new forms, *Clubiona triloba* and *Singa hentzi*, are described. There is also an interesting sketch on spider structure. It would be very helpful to entomologists if the News would publish short reviews of various papers, especially those published, as in this case, in publications quite inaccessible to those in the more remote parts of the United States.—K. R. C.

Doings of Societies.

THE FIRST INTERNATIONAL CONGRESS OF ENTOMOLOGY.

[The following account is derived from letters from Dr. Henry Skinner, editor of the News, who attended the Congress as a delegate from several societies, the official program and other documents which he has sent, an extended notice of the meeting in the London *Times* for August 10 "from a correspondent," and an article by Herr Sigm. Schenkling in the *Deutsche Entomologische National Bibliothek* for August 15. The Preliminary Program, Rules, etc., were printed in the News for July last, pages 337-340.]

The Congress began with a reception to the members tendered by the Entomological Society of Belgium, at the Taverne Royale, Galerie du Roi 23, Brussels, on Sunday, July 31, at 8 P. M. Members were given their badges, free tickets to the Universal Exposition then in progress, admitting the holders for all the days the Congress was in session, and other official

documents; this distribution was continued the following day in the office of the General Secretary (M. Guillaume Severin) in the Palais des Fetes of the Exposition, in which building all the sessions were held. At the evening reception between seventy and eighty ladies and gentlemen were present.

A translation of the detailed program of the Congress follows:

Monday August 1.

10.30 A. M.—General session. Opening address by M. Auguste Lameere, Rector of the Free University of Brussels, President of the Congress. (E. Simon, Paris, Vice-president.) Report of the General Secretary, M. G. Severin. Organization of the sections. Conference by M. J. Künckel d'Herculais (Paris): "The invasions of grasshoppers, their destruction by natural causes and by man." Meeting of the Presidents of the sections.

2 P. M.—Section of Economic and Pathologic Entomology. President, R. Blanchard (Paris). Vice-president, F. Theobald (Wye). F. V. Theobald: Artificial distribution of insect pests. A. Andres (Alexandria): Notes on Lepidoptera attacking cotton and methods for their destruction. R. MacDougall (Edinburgh): *Galeruella lincola,* Coleopter, its life history and habits with notes on preventive and remedial researches (great damage done to *Salix*). D. Morris (Boscombe): The disinfection of imported seeds of plants and the use of insecticides (summary of laws in force in the British West Indies to control the introduction of insect pests with a general account of the several insecticides in use and the supplementary precautions of quarantine and inspection after admission of seeds and plants).

Section of Systematics. President, H. Kolbe (Berlin). Vice-president, J. Villeneuve (Rambouillet). H. Kolbe: Comparative morphology and classification of the Coleoptera. H. Kertesz (Budapest): The generic relations of the hitherto described species of *Pachygaster* (Diptera). L. Navas (Zaragosa): Some organs of the wings of insects. P. Speiser (Sierakowitz): The idea of genera in classification (creation of the

idea of genera one of the greatest deeds of Linnaeus; earlier genera often arbitrarily erected; necessity of testing them in respect to their phylogenetic relations; even to-day many genera are artificial, not natural).

Section of Nomenclature and Bibliography. President, S. Schenkling (Berlin). Vice-president, K. Kertész. A. Janet (Paris): A plea on the mode of entering species in indexes (alphabetic order by species not by genera). H. H. Lyman (Montreal): The importance of the uniform use of technical names referring to types, cotype, etc., and on the right of authors to change the names given by other authors (*Blakei* to *Blacei*, *Walkeri* to *Valkeri* etc.). W. Horn (Berlin): Communication of the paper sent by A. de Semenow-Tjan Shansky to the Congress: The taxonomic limits of the species and its subdivisions (Mem. Acad., St. Petersb., VIII Sér., v. 25, N. 1.)

Tuesday, August 2.

9 A. M.—General Session. President, E. L. Bouvier (Paris). Vice-president, W. Rothschild (Tring). R. Blanchard: Conference on Medical Entomology. E. Wasmann (Luxemburg): Ants and their guests. The paper announced for the meeting by A. Forel, on the geography and phylogeny of the ants, was not given owing to the author's absence due to a death in his family.

2 P. M.—Section of Bionomy, Physiology and Psychology. President, H. von Buttel-Reepen (Oldenburg). Vice-president, H. Osborn (Columbus). H. von Buttel-Reepen: Atavistic phenomena in the bee state; are there two or three germ fundaments in the bee egg? (various hitherto unconsidered morphological and biological phenomena in the bee state, *Apis mellifica-mellifica* L., *A. mellifica-fasciata* Latr., *A. mellifica-remipes* Pall., etc., show very old agreement with earlier developmental stages). K. Hasebroek (Hamburg): *Cymatophora or* aber. *albingensis* Warn. and its significance for melanism around Hamburg. E. W. Carlier and C. L. Evans: Note on the chemical constitution of the red colored secretion of *Timarcha tenebricosa*. H. Osborn: Remarks on the Jassid fauna

of North America (a general consideration of the occurrence and distribution of North American species, suggestions as to derivation and factors in the separation of species). J. Dewitz (Metz), announced for this session, was absent.

Section of Economic and Medical Entomology. President, Sir D. Morris (London). Vice-president, J. Kunckel d'Herculais. F. V. Theobald: The distribution of the Yellow Fever Mosquito (*Stegomyia fasciata*). V. Vermorel (Villefranche): The destruction of insects injurious to cultivated plants. J. M. Howlett (Pusa, Bengal): Economical questions in Bengal. A. Renard (Liege): Insects which transmit diseases. G. H. Carpenter (Dublin): Notes on the Oestridae (account of experiments to elucidate the life history of *Hypoderma bovis* and the economic value of preventive treatment; observations on the warble fly of the Reindeer, *Oedemagena tarandi*). L. Gedoelst (Brussels): Cuticolous Diptera of the Bovidae in the Congo. F. S. Perez: Preliminary notes and information on *Sphenoptera lineata* (Coleoptera) and the larva of a Lepidopter which attack *Hedysarum coronarium* of Tunis and Sicily.

Section of Nomenclature. President, H. Skinner (Philadelphia), Vice-president, P. Magretti (Milan). S. Schenkling and K. Jordan (Tring): Communication of various propositions sent to the Section by Messrs. Elliot, Lindinger, Alphéraky, Horn, Prout, Dampf and others.

Wednesday, August 3.

9 A. M.—General Session. President, R. Trimen (Oxford), Vice-president, A. Handlirsch (Vienna). F. A. Dixey (Oxford): Mimicry. R. C. Punnett (Cambridge): Mendelism and Lepidoptera.

10 A. M.—Section of Evolution and Mimicry. President, F. Merrifield (Brighton), Vice-president, S. Sjöstedt (Stockholm). F. Merrifield: Experimental Entomology. W. Schaus (London): What end is served by mimicry? (laws of nature and of evolution, observations made during long years in the forests of the neotropical region; birds only rarely attack diurnal Lepidoptera which have no need of protective colors).

K. Jordan: The systematics of certain Lepidoptera which resemble each other and their bearing on general questions of evolution. E. B. Poulton (Oxford): C. A. Wiggin's researches on mimicry in the forest butterflies of Uganda, 1909-1910 (the Danaine and Acraeine models fly in the same forest with their Nymphaline, Papilionine and other mimics and their proportions vary greatly at different times of the year).

Thursday, August 4.

9 A. M.—General Session. President, E. B. Poulton, Vice-president, E. Everts (The Hague). A. Handlirsch: Reconstructions of fossil insects. H. Donisthorpe (London): Ants and their guests. Y. Sjöstedt (Stockholm): The Swedish Kilimandjaro Expedition and its results.

2 P. M.—Section of Bionomy, Physiology and Psychology. President, E. Wasmann, Vice-president, P. Marchal (Paris). W. Horn: Analogous phenomena of twig-inhabiting Cicindelid larvae in the oriental and neotropical regions. E. L. Bouvier: Harvesting ants of the vicinity of Royan. R. Garcia y Mercet (Madrid): Nidification, biology and parasites of some Sphegidae (*Pelopoeus destillatorius, Chalybion bengalensis, Stigmus solskyi, Diodontus minutus*, etc.) K. Hasebroek: *Vanessa urticae* and *Plusia moneta* altered by Röntgen rays (demonstration). E. Olivier (Moulins): Abnormal pairings among insects. G. Horvath (Budapest): The Polyctenidae and their adaption to parasitic life. M. Bachmetjew (Sofia): Anabiosis in insects (lifeless condition which is produced by exposure to a certain temperature).

Section of Systematics. President, A. von Schulthess (Zurich), Vice-president, C. Gahan (London). E. L. Bouvier: Decapod Pycnogonids. A. Schulz (Villefranche): Systematic review of the Monomachidae (Hymenoptera). S. Schenkling: The new Jung-Schenkling Catalogus Coleopterorum. M. Bachmetjew: Spatial arrangement of Systematics (Spatial arrangement of systematics is presented in space by three coordinates whereby the existence of + or — forms is determined; its terminology is simpler).

Friday, August 5.

9 A. M.—General Session. President, A. Lameere, Vice-president, G. Horvath. Designation of a permanent international committee. Election of a central bureau of nomenclature. Choice of the place for holding the second Congress. Election of a President. [Oxford, in the summer of 1912, *not* 1913, under Professor E. B. Poulton.]

2 P. M.—Section of Museology and of the History of Entomology. President, W. J. Holland (Pittsburgh), Vice-president, J. C. H. de Meyere (Amsterdam). W. J. Holland: On the conservation of types in museums. J. M. Howlett: Preservation of collections in tropical climates. R. Garcia y Mercet: History of Entomology in Spain. H. Skinner: One hundred years of Entomology in the United States of America (an account of the few papers published on entomology prior to 1800: work of the pioneers; condition of affairs during the activity of Thomas Say, the father of American Entomology).

Section of Zoogeography. President, K. Holdhaus (Vienna), Vice-president, E. Olivier. K. Holdhaus: On the dependence of the fauna on the soil (influence of the soil constitution on biocenetics and geographic distribution of insects). E. Olivier: Geographic and physiologic distribution of the Lampyrid Coleoptera. W. Horn: On the Wedda Bridge (Tertiary land connection between Ceylon and the southeast of the Asiatic continent). S. Sainte Claire-Deville (Epinal): Limits of the hypogaeous and cavernicolous faunae in France.

The secretaries for the Congress were F. Ball, J. Desneaux, Baron M. de Selys-Longchamps, M. Philippson and H. Schouteden, all of Brussels, and F. Steinmetz, of Malines.

At its session of August 1 the Congress named the following Honorary members: C. Brunner von Wattenwyl (Vienna), C. Emery (Bologna), J. H. Fabre (Serignan), L. von Heyden (Frankfort), F. V. A. Meinert (Copenhagen), F. Plateau (Ghent), O. M. Reuter (Abo), S. H. Scudder (Cambridge, Mass.), P. C. T. Snellen (Rotterdam) and A. R. Wallace (Dorset).

The printed alphabetical list of members present at the Con-

gress gives the number of "adherents" including Universities, Museums, Institutes and Societies) as 270 of which 24 are life members. The actual attendance was about 180. In addition to those named in the program, some of those present were Arrow, Bagnall, R. Brown, Burr, Champion, Gillander, Jones, Longstaff, G. A. K. Marshall, and C. Rothschild, from England; Gounelle, Lesne and R. Martin from France; Assmuth, Becker, Bourgeois, Dadd, Dampf, Kuntze, Reh, von Rosen, Schubert, Seitz and Stringe from Germany; Klapalek, Bohemia; Ris, Switzerland; Dodero and F. Solari, Italy; Veth, Holland; nearly all the members of the Belgian Entomological Society; Tullgren, Sweden; Kosminski, Schnabl and Zaitzev, Russia; Sasaki and Inouye, Japan; Lahille, Argentina. Ladies present were Mesdames Burr, Donisthorpe, Dodero, Horn, Janet, Junk, Kolbe, Poulton, Schouteden, Severin, Speiser and Veth and Misses Engels, Kertész, Poulton, Severin and Solari.

Members of the Congress were also invited to the following excursions and reunions:

Aug. 1, 4.30 P. M.—Members of the Belgian Entomological Society placed themselves at the disposition of the congressists for sight-seeing in Brussels. At 6 P. M. an excursion to Malines under the guidance of MM. Steinmetz and Schouteden. At 8 P. M. a concert by the chimes in the tower of the Cathedral.

Aug. 2, 4.30 P. M.—Visit to the Exposition.

Aug. 3, P. M.—Excursions to Tervueren (Musée du Congo), Waterloo or the forest of Soignes. Dr. Skinner writes, "On Wednesday, the 3rd, I spent the afternoon tramping over the field of Waterloo with some of the Belgian entomologists and enjoyed the country perhaps more than the historical associations. M. Kerremans, the eminent Buprestidist, is an authority on Waterloo and he gave the history and acted as chief guide," and of the Musée du Congo, which he visited on another day, "It is a very fine display of everything relating to the trade, industries and natural history of the Congo. They have twenty-five gorillas and six okapis and two mounted skeletons of the latter."

Aug. 4, 4.30 P. M.—Visit to the Musée d'Histoire Naturelle, Brussels, where a group picture of the Congress was taken.

Aug. 5, 7 P. M.—Banquet at the Taverne Royale. "It was a swell affair and a great success. Of course there were many speeches and much good fellowship and the wine flowed and made things merry. Some of the men wore splendid decorations. It was really a fine thing to see so many distinguished entomologists under such auspices."

Aug. 6—Excursions to the Ardennes, Bruges and Ostend, or Antwerp.

Aug. 7, 9 P. M.—Reception by the Mayor of Brussels at the Hotel de Ville.

Of the Congress as a whole Dr. Skinner writes, "The meetings were well attended and the papers interesting and valuable." The writer in the *Times* declares it "was an unqualified success from start to finish."

The propositions laid before the Section on Nomenclature were: (translated from the French)

1. It is desirable that the international rules of zoological nomenclature should also be followed by entomology in so far as they respond to the needs of this science.

2. It is desirable that descriptions be accompanied by figures as far as possible.

3. The names of authors ought to be written in full as far as possible. The Committee on Entomological Nomenclature is charged to prepare a list of abbreviations of the names of authors for the next Congress.

4. Descriptions which are published only in merchants' catalogs or in political journals are to be rejected (without retroactive effect).

5. The Committee on Entomological Nomenclature is charged to prepare for the next Congress, a list of names of genera, species and varieties whose orthography it is desirable to correct.

6. It is highly desirable that entomological publications bear the precise date of their publication. The permanent international committee is charged to make known this resolution of

the Congress to all the editors and publishers of entomological publications.

7. Entomology adopts the law of priority without exception for the names of genera, species and varieties. The point of departure for nomenclature is the tenth edition of the *Systema Naturae* of Linnaeus (1758).

8. The Section on Nomenclature of the first international Congress of Entomology considers it as of the greatest importance that a new rule ("disposition") be added to the international rules of zoological nomenclature to the effect that in the description of a new species or variety, one specimen ("exemplaire") only be marked as "type," the other specimens examined at the same time by the author as "cotypes."

[At this writing we are not informed as to the action taken by the Congress on these propositions.]

NEWARK ENTOMOLOGICAL SOCIETY.

Meeting held January 9, 1910, in Turn Hall, with eleven members present. No program having been arranged for the meeting, adjourned after some informal discussion.

Meeting held February 13, 1910, in Turn Hall, with thirteen members present. Mr. Broadwell reported the following captures of Lepidoptera: *Acronycta caesarea,* Woodside, N. J., June 6; *Dercetis vitrea,* Woodside, N. J., June 17. Mr. Brehme exhibited a live *Anthocharis ausonides* with chrysalis from which it emerged.

HERMAN H. BREHME, *Secretary, pro tem.*

Meeting held March 13, 1910, in Turn Hall, with fifteen members present. Mr. Frederick Grubb, of Paterson, was elected a member. Mr. Buchholz reported the capture of *Autographa simplisima* Ottl., *A. rogationis* Gn. and *Erastria caduca* Grt., at Elizabeth, N. J., the first mentioned on May 15, the others on September 15, and *Acronycta caesarea* Sm., at Newark, N. J., on June 21.

Prof. Smith exhibited specimens of the various stages of *Rhynchites bicolor* and of the injury caused by them to roses

The beetle after emerging from the pupa, in which stage the winter is passed, attacks the unopened buds of the roses, boring holes through the calyx and petals, and feeds on the unripe pollen. Thus when the flowers expand the petals are badly mutilated and the blooms unsightly. The beetles continue to feed on the pollen after the flowers are open, and when the seed pods begin to form the eggs are laid within them. The larvæ develop within the capsules and when full grown leave the pod and enter the earth for pupation. Incidentally the Professor called attention to the method used in the Entomological Laboratory of the New Jersey Experiment Station for mounting insects in alcohol for exhibition purposes. The specimens are arranged on a white porcelain slip and held in place by a transparent glue. This slip is placed in a vial and corked with a rubber stopper, the air within the glass tube being removed by the insertion of a fine pin down the side of the stopper, and which is withdrawn when the stopper is in place.

Mr. Buchholz said that from a piece of yucca which he secured in California he bred a Tineid (pronounced new by Mr. W. D. Kearfott), after the wood had become thoroughly dry. The year thereafter still other specimens issued, having apparently lived over for two years in the pupa stage.

Mr. Frank remarked that from a wooden souvenir which he had purchased in the mountains numerous small beetles emerged three years after.

Meeting held April 10, 1910, in Turn Hall, with seventeen members present.

Mr. Buchholz reported the capture of *Catocala jair* Streck., at Lakehurst, N. J., on July 17.

Mr. Grossbeck made a few remarks on the Barnes and Strecker collections of Lepidoptera. Over the Geometrid section of the former he had the pleasure of working for two months and in this group he believes the collection to be the largest in the country. Most of the other sections of the Macro-Lepidoptera are represented even better than the Geometridæ which has suffered some neglect since the death of the

last authority in the family, Dr. Hulst, and some of the sections, as, the Diurnals, Sphingids and Catocalæ are well-nigh complete. Best of all is the immense series of one species that Dr. Barnes keeps—practically no limit being set on insects that display variation—and the excellent condition and mounting of the specimens themselves. At present the entire collection is being reset and mounted on the best Kirby pins. The collection is kept in cabinet drawers of the most modern make, is abundantly labelled in all respects and well arranged.

The Strecker collection now located in the Field Museum of Natural History, under the charge of Mr. William J. Gerhard, approaches in number of specimens that of Dr. Barnes, but includes the species of the world and is hence far from complete in North American species. It is much richer in Diurnals than in nocturnals and contains many monstrosities. In respect of mounting and general condition of the specimens it vies with that of Dr. Barnes.

JOHN A. GROSSBECK, *Secretary*.

FELDMAN COLLECTING SOCIAL.

At a regular meeting of the Feldman Collecting Social held at 1523 South Thirteenth Street, Philadelphia, May 18th, 1910, twelve members were present. President Harbeck in the chair.

Prof. Smith said that in the January minutes of the Social published in the May number of ENT. NEWS, p. 239, he was made to say just opposite to what was intended and it should read: The "wood leopard moths" on the Harvard University grounds at Cambridge, Mass. are doing great injury. This insect, which remains in the larval stage two full years, is injurious within the range of sparrow domination only and usually wherever other birds can live the "leopard" is not injurious. But in the Harvard campus the gray squirrels which are very numerous and tame absolutely prevent the breeding of any bird so there is nothing at all to check the caterpillars.

Mr. Wenzel read a postal and letter from Dr. Castle, at present collecting in Florida. In the latter he mentioned the method of collecting *Acalles hubbardi* LeC. in Opuntia.

Prof. Smith read a communication from A. F. Burgess on *Calosoma* and *Carabus*. Mr. Wenzel said that *Calosoma* seemed practically wiped out in this locality, mentioning the scarcity of the various species and said that the only species he had seen common were *willcoxi* and *scrutator* at Burleigh, Cape May Co., N. J. Prof. Smith said that in Europe where *Carabus* is very common, many species live in the open and cultivated ground, while here we have not a single species with this habit.

Mr. C. T. Greene exhibited and recorded the following Diptera: *Sphecomyia vittata* Wied., Malaga, N. J., V-1-'10 and *Teuchocnemus bacuntius* Walker, a ♀ from Clementon, N. J., V-7-'10, both collected by himself. He had taken two ♂ specimens of the latter at Darby, Pa., V-7-1899; the New Jersey record in the 1900 list is Palisades."

Mr. Kaeber, in continuation of his communication of last meeting, said he collected more *Sphenophorus* in the "Philadelphia Neck" adding *minimus* and *pertinax*. Many were taken under stones and some in copulation in roots of grasses. He said that the larvae of *Cryptorhynchus lapathi* were still active in the willows and many Diptera were around the workings. Prof. Smith said the poplars in New Jersey were more infested than the willows and that the weevil was in maturity about the latter part of August.

Mr. Wenzel exhibited his collection of *Platynus*, which is nearly complete, explaining that where about 75 per cent. were previously mounted on slips now that we have the firm fine pins it is only necessary to mount a couple of species in this manner. Adjourned to the annex.

GEO. M. GREENE, *Secretary*.

OBITUARY.

CYRUS THOMAS, PH.D.

Among the names of those men whose earnest work in the seventies and eighties laid the foundations of economic, and to a great measure systematic, entomology in America, that of

Cyrus Thomas occupies a prominent place. Although the last twenty-five years of his life were spent in archaeological and ethnological work, his early work made his name very familiar to the present day entomologist, particularly students of the Orthoptera. Born at Kingsport, Tennessee, July 27, 1825, he died at Washington, D. C., June 27, 1910, at the age of eighty-five.

Dr. Thomas practiced law until 1865, was county clerk of Jackson County, Illinois, 1850-53, and a minister of the Evangelical Lutheran Church, 1865-1869. In 1869 he was appointed assistant on the United States Geological and Geographical Survey of the Territories (Hayden Survey), serving until 1873 and reporting on a number of Orthoptera collections made by the field parties of the survey. From 1873 to 1875 he was Professor of Natural Science in the Southern Illinois Normal University, while from 1874-1875 he served as state entomologist of Illinois. As a member of the famous U. S. Entomological Commission he served from 1877-1879, in 1882 becoming Archaeologist of the U. S. Bureau of Ethnology, which post he held at the time of his death.

His papers on Orthoptera number twenty-eight, in addition to his work in connection with the Entomological Commission. The first Orthoptera paper was published in 1862, the last being in the Commission reports. The latter reports, drawn up by Riley, Packard and Thomas, are probably his best known work, collaborating as he was with the other commissioners on several very important economic problems, but the more strictly taxonomic paper of greatest value from his pen was the "Synopsis of the Acrididæ of North America," published in 1873 as a report of the U. S. Geological Survey of the Territories. His other papers making known the new material secured by the Survey field parties are of the greatest value to the working Orthopterist.

As an archaeologist Dr. Thomas was well known for his works in Maya inscriptions and codices, on the Cherokee and Shawnee Indians and numerous other studies.—[J. A. G. R.]

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NOVEMBER, 1910.

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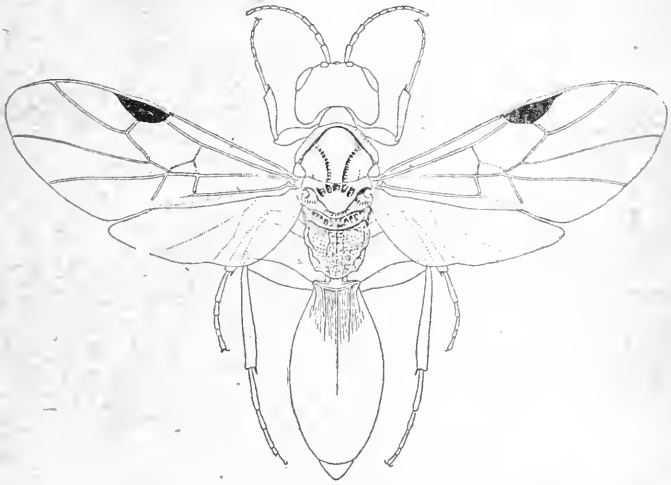

Vanhornia eucnemidarum Crawford.

PHILADELPHIA:
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FIRST INTERNATIONAL ENTOMOLOGICAL CONGRESS.

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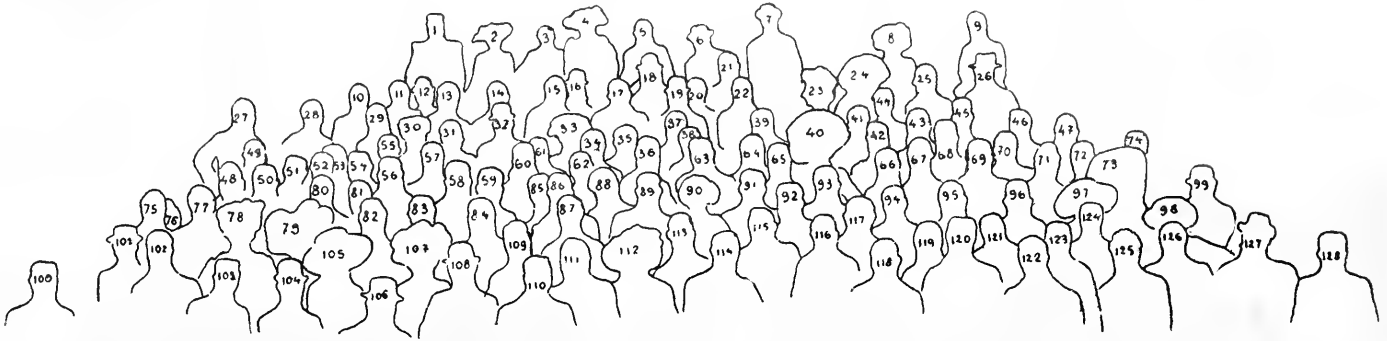

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ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXI. NOVEMBER, 1910. No. 9.

CONTENTS:

Synonymical Notes on Neuroptera.

BY NATHAN BANKS.

In the Records of the Indian Museum, Vol.III., for October, 1909, Dr. Needham has published some new genera and species of Neuroptera. One *Annandalia*, p. 208, is a genus of Hemerobridæ near *Sympherobius*. I have now seen a specimen of it and find it is the same as my *Notiobiella* from Australia; Navas has recently described species of *Notiobiella* from India. *Notiobiella* was described in the Proc. Ent. Soc. Wash., XI, p. 80, issued 31 August, 1909.

In this same article Dr. Needham says he has identified the *Hemerobius setulosus* of Walker as a *Micromus*. Walker says that his species is near the *H. hirtus* of Europe; this latter species is a *Megalomus*, and I have a species of *Megalomus* from India which in other points also agrees with Walker's description. This species also fits very well with a species of *Megalomus M. nowhalieri*, recently described by Navas from India. So I consider *M. nowhalieri* as a synonym of *M. setulosus* Walk. In this same article Navas (Broteria,

IX, 1910, describes two new genera of Hemerobiidæ, *Zygophlebius* and *Balmes* which differ from all other forms in having very broad wings and the subcosta, radius and radial sector all united at tip near the stigmal region of wing. Now this is the exact character that distinguishes the old genus *Psychopsis* of Newman from all other Hemerobiidæ, and the figures of Navas only make more plain the fact that *Zygophlebius* and *Balmes* are synonyms of *Psychopsis*. Navas in his synoptic table places *Psychopsis* in the Hemerobininæ near my genus *Oliarces*. This is sufficient evidence that he has not recognized *Psychopsis*. In the Ann. Soc. Sci; Bruxelles for April, 1909, p. 4 (sep.) Navas has described a species of the Hemerobiid genus *Psectra* (*P. bucnoi*) as new from New York State. He distinguishes it from the old species *P. diptera*, because the hind wings are fully developed, and some slights points in venation. The general view of Neuropterists is that these two and four-winged forms are all one species, and a recent Swedish article treats of them under the one name showing that both forms occur in both sexes and in the same localities. However this may be, the American four-winged form was described in 1856 by Asa Fitch as *Hemerobius delicatulus*, and is so recorded in papers of Hagen and by myself, so that *P. bucnoi* Navas is a synonym of *P. delicatulus*. In a monograph of the family Nemopteridæ (Mem. Real. Acad. Cien. Artes, Barcelona, VIII, No. 18, p. 21, 1910), Navas has erected a new genus, *Eretmoptera*, for some species and seemingly on good characters, the name, however is preoccupied by Kellogg in 1900, for a curious little California fly, so that I propose *Nemopterella* for the *Eretmoptera* of Navas.

Captain Charles Kerremans, of Brussels, the great authority on The Buprestidae of the world devotes all his spare time to getting out his superb monograph of those insects. He has a remarkable collection and many of the Tropical species are very brilliant insects. During the International Entomological Congress he gave a very enjoyable evening reception to some of the delegates and exhibited his collection.

Notes on the Arachnida of Placer Co., California.

By Karl R. Coolidge.

The following species of *Arachnida* were taken by myself at Alta in April and the earlier part of May, 1907. A brief sketch of the region in which I collected has already been given (Entom. News, Feb., '08).

When I first arrived at Alta, on April 6, there was a good covering of snow on the ground and hence little collecting was done until towards the latter part of the month. The next day after my arrival I took a short trip into the American River Cañon, which is about a thousand feet below the elevation of Alta, and there several species were taken which were not met with at Alta. *Epeira gemma,* in particular, was very abundant in the entrances to the old deserted mines of the Forty-niners.

An *Ottonia* (*Trombidium*) *locustarum* was found under some leaves, and, considering the threatening weather, I concluded to take him in.

As is well known, the Arachnid fauna of Northern California has many species common to Europe and America, and in California northern spiders extend much farther southward than in the Eastern States, although the Pacific latitudes are considerably warmer than the Atlantic ones. A complete *Arachnid* survey of Placer county should produce interesting results, and I hope, from time to time, to be able to add to the present list.

With most of the species, I have given the other California localities from which they are known, recorded by Banks ("Some Arachnida from California," Proc. Cal. Acad. Sci., Vol. III, 1904) or in my list of the *Araneida* of Santa Clara county, Cal. Besides those here enumerated, I have a few other species unidentified as yet, and which may prove new. I am glad to be able to here thank Mr. Nathan Banks, of East Falls, Va., for his kindness in identifying various species.

ARANEIDA.

CLUBIONIDAE.

Cayenna californica Banks.

Cayenna californica Banks.

A few examples of this species were found in my room, late at night, April 6. Described from Marin and Santa Clara Counties, California.

AGALENIDAE.

Agalena pacifica Banks.

Syn.: *A. curta* McCook, Amer. Spid. II. [No description.]

Quite common in April.

Agalena californica Banks.

Also common. Described from Black Mt. (Santa Clara County, Cal.), and recorded from Claremont.

THERIDIDAE.

Steatoda borealis Hentz.

Common in cracks and window frames. My specimens are much darker than those from Palo Alto. *Borealis* is a widespread species, occurring all over the United States. I have found it abundant at Palo Alto and Pacific Grove (Monterey County), and have received specimens from Calgary, Alberta (Wolley-Dod) and Fort Wingate, New Mexico (Woodgate).

a

Steatoda borealis Hentz; *a*, position of eyes.

Linyphia phygiana Koch.

This species is common in Europe and in the Northern United States down to California. In Placer County I found it extremely abundant especially on the tips of spruce and pine branches. The nest is a large flat sheet supported by threads from above and below.

Linyphia litigosa Keys.

A few immature specimens on pine. It is very much rarer than the preceding. Banks does not record it.

EPEIRIDAE.

Epeira curcurbitina Clerck.

Syn.—*scnoculata,* Fab.
viridis-punctata, De Geer.
Var.—*displicata* Hentz.
Syn.—*americana* Walck.

Displicata may be considered the American variety of the European *curcurbitina.* It is abundant all over the United States.

Epeira gemma McCook.

Several taken in May. The web is a large circular affair, and the owner rests in a nest of leaves and rubbish placed on the upper side. *Gemma* is one of the largest orb weavers of the Pacific Coast and is well distributed from San Diego to British Columbia, and also occurs in Louisiana, Montana, Utah, South Dakota and other States. I have received a number of specimens of *gemma* from Mr. F. H. Wolley-Dod, collected at Calgary, Alberta.

Zilla californica Banks.

A single immature specimen taken. It is not rare in the vicinity of San Francisco Bay.

Cyclose turbinata Walckenaer.

Syn.—*caudata* McCook.

The webs of this species were very noticeable on spruce and pine branches. The spider itself, however, is rather difficult to detect as it usually remains near the center of its web, at the junction of the line provided for dead insects, etc., and looks like part of the rubbish.

Cystophora californiensis Keys.

Syn.—*Epeira bucardia* McCook.

Five specimens in the shaft of an old mine in the American River Canon, April 7. *C. californiensis* is common at Palo Alto and is also reported from Marin County and Mt. Shasta.

TETRAGNATHIDAE.

Tetragnatha extensa Linn.

Occurs in Europe and the Northern United States down to the West Coast. The synonymy of this species would cover several pages.

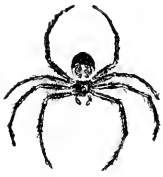
THOMISIDAE.

Xysticus californicus Keys.

A number of young taken on the blossoms of *Arctostaphylos manzanita* Parry. Appears to be well distributed throughout California.

Misumessus asperata Hentz.

Also common on *Arctostaphylos*. *Asperata* belongs to the genus *Misumessus* Banks, comprising the following species: *M. asperata, M. oblonga* Keys (type), *viridans* Bks., *M. bellula* Bks., and *M. pictilis* Bks.



Misumessus asperata Hentz.

Asperata is common throughout the United States. I have taken it rarely at Palo Alto. Banks does not record it.

LYCOSIDAE.

Pardosa glacialis Thorell.

Sny.—*Lycosa concinna* Thorell.

Pardosa brunnea Emerton.

But a single specimen captured. In California, known from Marin and Shasta Counties. Reported from Colorado under the name of *concinna*. (Banks, Lycos. Col. J. N. Ent. Soc. 51, 94.) Originally described from Greenland and has been found on Mt. Washington, New Hampshire.

PHALANGIDA.

PHALANGIDAE.

Liobunum exilipes Wood.

Several specimens belonging to the species taken in early April. It has a wide distribution and has been collected in California, at Claremont, Mt. Shasta, Palo Alto and several other localities.

ACARINA.

TROMBIDIDAE.

Ottonia (Trombidium) locustarum Riley.

A single specimen under leaves. Known from the East and also Texas and California. It is known to destroy grasshoppers' eggs. Very characteristic in having the anal opening on the dorsum, like the Eupodid genus *Notophallus*.*

*For figure see Banks, Proc. U. S. Nat. Mus. XXVIII, No. 1382, p. 32, and also Trans. Amer. Ent. Soc. XXI, p. 213, 1894.

Noctuid Notes.

By F. H. Wolley Dod, Millarville, Alta, Canada.

During a trip in the East, made last winter, devoted principally to the study of Noctuidæ in various collections, the author was enabled, through the courtesy of Prof. J. B. Smith, to spend about twenty-two full working days over that at Rutgers College, nominally Prof. Smith's own. It was the first time I had had the pleasure of meeting the Professor, with whom I have been in correspondence for over sixteen years, and I found him goodness personified. He gave me undisturbed possession of the collection room during nearly the whole of the time, affording me opportunity of discussing various points with him as they turned up, and urging me to help myself to any species for which I took a fancy. The extent to which I availed myself of the latter offer may be judged from the fact that I filled a number of cigar boxes (I find it convenient to forget the exact number!) and further imposed upon his generosity and good nature, not to mention his valuable time, by leaving them with him to be packed and sent after me! The time I spent in careful study, comparison and note-taking at the collection was of incalculable pleasure and benefit to me, and I had, as is my custom, over five hundred specimens of my own with me to compare with types, etc.

For similar opportunities of study of which I gladly availed myself I am indebted to Mr. Beutenmüller, of the American Museum of Natural History at New York; Mr. Doll, of the Brooklyn Institute of Arts and Sciences; Dr. H. G. Dyar, of the United States National Museum at Washington; Dr. Wm. Barnes, of Decatur, Ill., and Mr. Gerhard, of the Field Museum, Woodlawn Park, Chicago.

As Prof. Smith has published by far the greater part of the literature dealing with North American Noctuidæ for some years past, it must necessarily be at him that most of my criticism will have to be leveled in periodical publications of notes. I trust that such criticisms of the writings of him or others will give no offense, as they will be made in friendly spirit,

believing that such is the best way towards understanding past publications, as well as stimulating interest in a much neglected family of Lepidoptera. We cannot all think and see alike, nor is it easy to find two men with exactly the same views about species. Free criticism also leads to the detection of errors, and where the critic errs he may justly claim that expressing a wrong opinion is often more useful than expressing none.

Paroragrotis catenuloides Smith.

In Journ. N. Y. Ent. Soc. xviii, p. 88, June, 1910, Prof. Smith designates, under this name, the species universally labeled *catenula Grt.* in American collections, and always named as such by himself. In so doing he has, in the author's opinion, merely created a synonym of *vetusta* Walker. When I was at the British Museum during February and March, 1909, I recognized in Grote's type of *catenula* from Colorado, which is excellently figured by Hampson, the *contagionis* of Smith. The latter was described in 1900 from Glenwood Springs and Garfield county, Col., and Verdi, Nevada. Prof. Smith sent me specimens five years ago from Stockton, Utah, and I have since received upwards of a hundred from the same locality, from which I now have a picked series of thirty in my collection. One of these I have labeled as being exactly like Grote's type of *catenula,* as I fortunately had a dozen or more specimens of my own with me to choose from. I have one specimen from Glenwood Springs. The type of Walker's *vetusta,* from Nova Scotia, is a very badly rubbed specimen, but undoubtedly the species passing under that name in the East. My series at present consists of over forty set specimens, from Sherborn, Mass.; Chicago; Vineyard, Utah; Denver and Glenwood Springs, Col.; Kalso, B. C.; Calgary, Alta, and Aweme, Man. The variation consists of differences in tint, from a whitish or luteous to a violaceous gray, and in differences in distinctness of the lines. In some the t. p. line is continuous, deeply crenate; in others it is punctiform only, with whitish points on the veins exterior to the black ones. The reniform is broad but ill defined and irregularly outlined.

It is perhaps best described as a dark cloud, partially or wholly filling the space between its indistinct defining lines. I have studied the species closely for years, and entirely failed to recognize two species out of specimens standing variously as *catenula* and *vetusta*. As a whole, Western specimens have better defined maculation than those from the East, but I have specimens from Chicago, Calgary and Glenwood Springs which match well. It is the usually better marked Western forms which have been called *catenula* in error, and which Smith now designates as *catenuloides*. I have seen a good deal of material in other collections, including Prof. Smith's own, but have no reason for supposing that the new name applies to anything but *vetusta*. Holland's figure of *vetusta* is correct, and the *catenula* of my published Alberta list is the same species.

Catenula is much the same color, but smaller, narrower of wing and much lighter in build. Besides this, the most obvious difference in maculation is in the reniform. This is a blackish constricted crescent, with the cross vein in its center usually showing up of the pale ground color. Contrast this with the broad cloud of *vetusta*. In *catenula* there are three distinct black points on the costa, defining the extremities of basal, t. a. and t. p. lines. In *vetusta* these points are geminate, inclosing whitish. Though I have never confused the two myself, the resemblance of occasional specimens is undeniable, especially in the case of a small *vetusta* in which the dark cloud in the reniform is much reduced. The two species stood mixed in the British Museum when first I saw them, but have since been separated. Fortunately the type of *catenula* is correctly figured in Vol. IV, of Hampson's Catalogue, and the figure of *contagionis* is the same species, as is also, I regret to say, the woodcut under *vetusta*, the type being too poor to figure. Both have occasionally a pinkish or violaceous variety, as has also, by the way, the similarly endowed *scandens*. *Muracnula* Y. & R. I believe to be *vetusta*.

As Prof. Smith makes no generic reference for *catenula* in the paper above referred to, we can only assume that his

reference of *contagionis* to Euxoa must stand. *Porosagrotis* is recognized by Hampson, and distinguished from *Euxoa,* (1) by the stoutness of the fore tibial armature and (2) by the male clasper being falcate instead of bifurcate. The former character is not a well-marked one, and can hardly be distinctive. The form of male clasper, on which Prof. Smith based the genus, he states to be striking and quite constant. Sir George Hampson appears to take this for granted, as he gives no figure. Pro- and metathoracic crests in *Euxoa,* absent in *Porosagrotis,* is the only other distinctive character mentioned by Hampson, but this is not well marked either, as I find such crests in both *vetusta* and *satiens,* placed by him in *Porosagrotis.*

Mamestra tenisca Sm.

Described in the same journal from Stockton, Utah, and Bozeman, Montana. I saw the type in Prof. Smith's collection, beside specimens of *stricta* from Stockton which he does not mention having. *Tenisca* seemed to me a very close ally of *stricta,* but distinct. I have no compared specimen, and though I have one of the species from Stockton, my notes do not enable me to feel sure which.

Mamestra meodana Sm.

Described as a close ally of *liquida* yet, and said probably to occur over a similar range. Of its validity as a species I am very doubtful. Typical *liquida* Prof. Smith states to be narrow winged and brighter colored. I saw the type from Washington in the British Museum, but did not note that it was brighter or narrower winged than Calgary specimens which were there also. Hampson figures the type, and I passed the figure without other comment, so assume it to be good. It appears a little narrower winged and more contrasting than Calgary specimens, which are typical *meodana.* But as those figures are sometimes a trifle inaccurate in detail, it is unsafe to judge from one with respect to such a closely allied form as the present. But assuming Prof. Smith to be correct in stating that *liquida* is the bright form, I studied his two series together and

cannot feel sure that the differences are specific, the maculation being admittedly similar. I have seen no Calgary specimens quite as bright as Prof. Smith's *liquida* nor have I any such from other localities. *Lilacina,* an allied species, has an even greater range of variation, and at Calgary I take the even dull gray form called *illabefacta* by Morrison, and every intergrade up to a form as bright and contrasting as supposed typical *liquida.*

Luperina extensa Sm.

Smith now refers his *Perigea flavistriga* to this species. The latter was described from Lethbridge, Alta, and *extensa,* prior by half a page only, from Regina, Sask. *Flavistriga* was procured through me, *extensa* through Dr. Fletcher, and both, oddly enough, were taken by Mr. T. N. Willing. When at the British Museum I made the reference in my notes, with a query, from figures of each type sent there by Prof. Smith. The venture was risky, but proved correct. The type of *extensa,* which is now greasy and probably much discolored, is poorly marked and almost the color of a dark *passer. Flavistriga* is well marked, and blacker brown. I have a splendid specimen from the Red Deer River compared with both types.

Hyppa spaldingi Sm.. (Jour. N. Y. Ent. Soc. xvii, p. 59, June, 1909).

Described from Stockton, Utah. This is prior to *Trachea umbrifacta* Hamps. (Cat. IX, 501, 1910), described from the same locality. The type of *umbrifacta* is a female, one of several specimens received by me from Mr. Thomas Spalding, dated May 30 to June 27, 1907. I took a couple to the British Museum, but not finding it in the collection, left one for Sir George Hampson to describe. *Spaldingi* was a unique, also a female, and did not pass through my hands. Smith, while describing it as a *Hyppa,* remarked that it was quite unlike our other *Hyppas,* and recalled the yellow-winged *Xylophasia semilunata* and *inordinata.* It is more like *cinefacta,* and has the thoracic vestiture and the tuftings of that species. Hampson places both, with others of our Hadenas, in *Trachea* Ochs. *Hyppa,* which Hampson makes a synonym of *Lithomoea*

(=*Lithomoia*, Hübner), has a more quadrately scaled and loose, hairy thorax, hairier palpi and larger abdominal tufts. My only male has the ciliate antennæ of *cinefacta*, which is its closest ally.

Perigea alfkenii Grt.

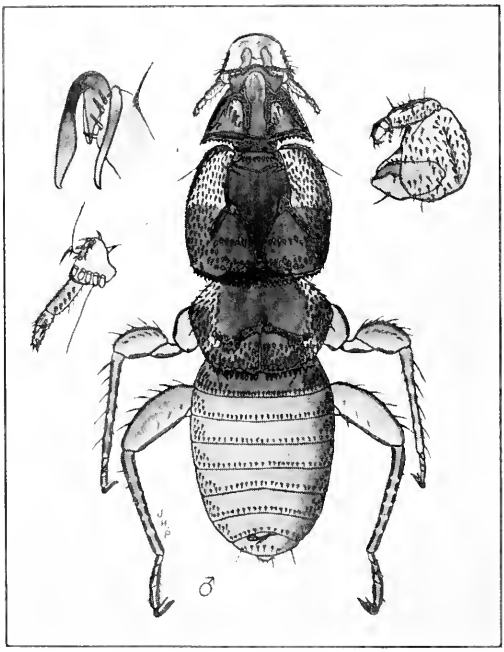
Grote applied this name to the type of his *perplexa* without locality, in the Neumœgen collection at Brooklyn. I have the species from Arizona and California, and it stands correctly named, under *Namangana* Staud, in the British Museum. But the species has hairy eyes, which has been overlooked by Hampson, as he treats the genus as smooth-eyed. The hairs are very fine, short and sometimes, even in apparently unrubbed specimens, very scarce and difficult to see with a powerful lens even in strong sunlight. *Perigea latens* Sm., described from San Diego, Cal., and Yuma Co., Ariz. (Journ. N. Y. Ent. Soc., xvi, p. 92, June, 1908), has also hairy eyes and is, in my opinion, the same species. I have a good series from the first-named type locality. The type labels, by the way, read *patens*.

Taeniocampa occluna Smith.

Described in the same journal, xvii, p. 64, June, 1909, from a single male from Mesilla Park, New Mexico. Its author states under the description that the antennæ are very shortly pectinate, almost serrate only. I had overlooked that statement, but failed to notice any external difference from *alfkenii*, to which I have referred the species in my notes. *Alfkenii* has male antennæ bipectinate, with rather short branches above the shaft and shorter ones beneath it. The upper row of branches cannot be called "almost serrate" in any of my specimens. A confirmation of antennal differences is necessary to convince me that *occluna* is not *alfkenii*.

Eupolia licentiosa Smith.

Described in 1894 from a pair from Utah in the Neumœgen collection, the genus being created to receive it. But the species has hairy eyes, though the hairs, being very short and



A NEW POLYCTENID—KELLOGG AND PAINE.

scarce, they were overlooked in describing the genus. Hampson makes *Eupolia* a synonym of *Namangana;* and *licentiosa,* which was known to him only by a figure of the male type, is in the catalogue next to an Indian species, but in a different section of the genus from *alfkenii,* the sections being separated on antennal structure.

A New Polyctenid.

By V. L. Kellogg and J. H. Paine, Stanford University, California.

(Plate XII)

The curious bat-infesting, wingless, insect parasites of the genus *Polyctenes* as originally described by Giglioli in 1864 were assigned by their discoverer to the Dipterous family Nycteribiidæ, but their sucking beak and incomplete metamorphosis align them with the Hemiptera, as indicated in 1874 by Westwood. In 1879 Waterhouse added, quite wrongly, a new winged genus to the group and decided, mainly on the strength of his addition, that the family was nearly allied to the Hippoboscidæ. In 1906 Kirkaldy, in a paper in the Canadian Entomologist (Vol. 38, p. 375) includes the following reference. (This paper is a list of emendations to the authors previous "List of the Genera of the Pagiopodous Hemiptera Heteroptera," Trans. Amer. Ent. Soc., vol. 32, pp. 117-156, 1906).

'..Family ..Polyctenidae.

"Genus 1. *Polyctenes*, Giglioli, 1864. Q. Journ. Micr. Sci., IV. 25, type *mobossus*. Gigl., Pl. 1b., Figs. 13-14.

"Genus 2. *Euroctenes*, gen. nov., type *lyrae* (C. O. Waterh., 1879. T. E. S. London, Pl. IX, Figs. 1-2).

"Genus 3. *Eoctenes*, gen. nov., type *spasmae* (C. O. W., op. c., Figs. 3-4).

"Genus 4. *Hesperoctenes*, gen. nov., type *fumarius* (Westw. 1874, Thesaurus Ent. Oxon., Pl. 38)."

"The characters of these four genera have been indicated by various authors, but only one, *Polyctenes,* has been named:

"1. Palaeogaeic forms; posterior legs comparatively short and stout, about half the length of the bug; the claws unequal, and nearly simple, the other large and bent, its basal tubercle nearly as long as the simple claw.....2.

"1a. Neogaeic forms; posterior legs as long as the bug; claws nearly equal, with a small tooth at the base,
1, **Hesperoctenes**, mihi

"2. Antennae long, the third segment almost (or more than) as long as the fourth.....3.

"2a. Antennae shorter, third and fourth segments about equally long .....4, **Eoctenes**, mihi.

"3. Head medianly wider than long. Pronotum transverse,
3, **Polyctenes**, Gigl.

"3a. Head medianly longer than wide. Pronotum elongate,
2, **Euroctenes**, mihi."

The new species which we describe here is based on three specimens, two males and one female, received from the Entomological Research Committee of the British Museum in Tropical Africa. These specimens were taken from an unidentified bat from Khartoum in the Egyptian Sudan.

Eoctenes eknomius sp. nov.

Differs from the type species of the genus, *E. spasmae*, in having the the metathorax cleft for half its length and a row of cultriform spines on the posterior margin of both the pro and mesothoracic segments, as well as a similar row on the head. It shows also various less conspicuous differences.

Length of body, 2.3 mm.; width at widest part, .8 mm.

Head: Length, .46 mm.; width, .44 mm.; widest at posterior angles, which are acute, and narrowing to the base of the antennae, then widening suddenly to form the rounded clypeus. Suture separating clypeus from the posterior portion of the head very distinct. The lateral margins of the clypeus are flattened and here occur four rounded chitinous thickenings on each side, from each of which arises a fine hair, the anterior one short, second long, third short, and fourth long. The posterior margin is incised angularly leaving a central clear space, bordered laterally by two fan-shaped chitinous thickenings which extend forward into the clypeus. A row of sharp spines extends inward from the posterior lateral angles to the inner angles of the posterior margin. On the ventral side of the head a chitinous band extends from each posterior angle of the head forward along the margin, curving

inward before it reaches the antennae and bearing a row of fifteen long, flattened, blunt spines. On the dorsal surface of the hind head are two rows of five sharp spines each, extending obliquely inward and backward. Just forward of the first spines of this series are two more. Occipital margin sinuous and bordered by thirty-four of the characteristic flat spines. On the posterior lateral angles are three or four sharp spines. Antennae, length, .26 mm., four jointed; basal segment broad, flat, triangular shaped with the apex pointing forward with a row of the broad, flat spines across the base on the ventral surface; second segment long, cylindrical; third and fourth short, the distal segment a trifle the longer; numerous spines on all the segments.

Thorax over twice as long as the head, 1.08 mm. Prothorax, length .56 mm., width, .6 mm. The general shape is quadrilateral, the widest part a little posterior of the middle; sides flatly rounded, meeting the slightly convex anterior margin in an obtuse angle; a row of short spines occurs paralleling the median portion of the anterior margin; behind these are three long spines on each side which point toward the meson; entire surface of prothorax covered with short, sharp spines, with the exception of a bare central area. The posterior margin is convex and meets the sides in an angle; along this margin is a row or thirty-seven broad, flat spines. Mesothorax broader than long; length .46 mm., width .58 mm.; anterior margin convex, extending under the prothorax; anterior angles broadly rounded, the segment here presenting the greatest width; lateral margins flattened and narrowing to meet the posterior margin in an angle; posterior margin convex, bearing a row of thirty-four broad, flat spines. This segment is divided along the meson from the posterior margin nearly to the middle; entire surface covered with short spines, with the exception of a bare central area. The metathorax has the appearance of being the first abdominal segment and extends under the mesothorax to the anterior end of the median division of that segment. At the anterior lateral angles is a chitinous process and a dark blotch, seen through the mesothorax.

Prothoracic legs short and carried folded under the prothorax; tibiae almost as broad as long; tarsi three segmented. Meso- and metathoracic legs long, tibiae slender; posterior pair extending beyond the end of the abdomen; tarsi four segmented with two claws, one of which is heavy, compound and recurved; simple claw smaller. All the legs bear numerous spines.

Abdomen elliptical; eight segmented; a row of short spines extends across each of the first seven segments and numerous spines are near the lateral margin of each segment.

Eupithecias that appear to be Undescribed.

By Richard F. Pearsall, Brooklyn, N. Y.

E. valariata n. sp.

Expanse, 20 mm.—palpi short, stout, dark brown. Antennae slender, flattened, shortly ciliate in ♂. Front and vertex, pale ashen gray, the former with dark brown line above clypeus. Thorax with narrow band of dark brown, crossing above scutellar region. All the rest of the body and wings above with ground color of light gray, heavily sprinkled with ruddy brown scales. On primaries, which are narrow, somewhat produced apically, these are massed broadly along costa, and inner margin, less so subterminally, leaving cell a somewhat clearer gray; vein below cell, brokenly barred with black. Abdomen without black ring, the dorsal tufts on central segments, small, clear white. A series of fine indistinct lines, crossing primaries are formed by the ruddy scales, the basal with strong outward angle below costa, almost touches wing base at inner margin, and the discal and intradiscal run parallel with it, the latter passing through the small, but distinct black discal spot. The extra discal, broader and slightly darker, rounding out about cell runs straight, with a slight basal trend to inner margin. Parallel with this are three or four hair lines, traceable in submarginal space. The pale geminate line, usually following extra discal, and the white subterminal line are wanting in this species. Marginal black line faint, broken. Secondaries clear, except several broad, short lines at inner margin. No discal dots. Fringes on all wings long grayish. Beneath, pale ashen, the primaries flecked with darker scales. No lines as above, but the geminate pale line beyond extra discal is quite apparent, and extends sometimes across secondaries, in which case it is bordered by a broken line of dots at crossing of veins, externally. Discal dots dusky somewhat diffuse. Legs and body sprinkled with dark brown scales. Abdomen beneath clear white centrally with lateral borders of dark brown, dusky at tip.

Types—Two ♂ ♂ and two ♀ ♀ from San Diego California, through Mr. L. E. Ricksecker, the former labeled III.-9 and 10th, the latter III 10 and 12th, 1910, all in authors collection.

When fresh, these examples were veiled with a roseate hiush, which quick fades into the ruddy brown as described.

E. cognizata n. sp.

Expanse, 22 mm. Palpi short, stout, dark brown. Front, dark brown centrally, with margins and vertex paler, almost white. An-

tennae stout, bi-fasciculate ciliate, dark brown above, ringed with white. Thorax broadly banded across front with dark brown, behind which there is a central patch of clear white scales, more distinct in front, extending over the scutellar region. Primaries ample, a little extended apically, above a golden brown, with cross lines and veinings of dark brown and black. Discal dots round moderately large, distinct, black. The dark basal area, is succeeded by a paler space centrally, crossed by a suffused dark line. A geminate pale line precedes the discal line, which is broad at costa crosses it with a gentle curve, then at median vein, makes a sharp angle toward discal dot, receding and becoming a straight hair line below to middle of inner margin. Three or four fine lines sub-parallel to this cross discal space, darkening it somewhat, the outer one forming the extra discal, hardly darker than the others, and less sharply angled below costa. The pale geminate line is broad, rather clearly defined. Subterminal space veined with dark brown and black and having a sprinkling of white scales apically, is divided centrally by a clear white much broken line, with a large spot between veins 3 and 4 and at vein 1, terminating in a sharply defined V. Marginal line on all wings heavy black, broadly broken at veins inwardly crescentic between them. Fringes on all ♀ wings long silken yellowish brown, cut with dark spots at end of veins. Secondaries pale yellowish ashen. The inner margin broadly overlaid with color of primaries, less distinctly so along outer border. A few dark brown cross lines and the geminate pale line, show at inner margin but all disappear before reaching center, except the two at base which faintly reach the costal margin in direct lines. Discal dots large, dusky, blurred. Abdomen clothed with rough dark and yellow brown scales. Segments at terminal margin narrowly edged with white. Tufts not apparent. A narrow black lateral line on second and third segments. Beneath dusky yellowish ashen, darker on primaries. Two pale geminate lines start from costa on either side of the jet black linear discal dot, and merge below it into a single line, running straight to inner margin. Outside the dark brown extra discal which outwardly margins the pale lines mentioned, and is quite well marked—the usual geminate pale line, as above, is clearly defined and runs across wing with a gentle outward curve below costa. The inception of the dark lines is heavy, almost black at costa. The subterminal space has a series of pale lateral dashes through it. On secondaries three dusky brown lines cross wing within the black linear discal spot. The fourth is more waved and darker, and just passes the lower point of the discal spot. At costa it has a dusky diffuse brown spot, and is quite well marked at inner margin. Outside this is the broad geminate pale band, its outer margin curved outward to parrallel border of wing, and indi-

cated by a row of dots on veins subterminal space as on primaries, but less distinct. Body and legs silvery ashen, the latter heavily covered in part with dark brown scales. Abdomen dusky at tip.

Type.—A perfect ♂ from Witch Creek, California, taken II, 15, '09, by Mr. H. W. Marsden. Another ♂ in only fair condition from the same locality has been in my possession for several years, but too much rubbed to constitute a type. This I have made a cotype. Both are in my collection.

(To be continued)

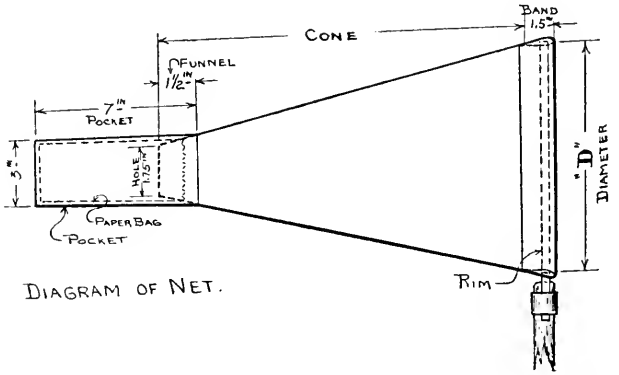
Collecting and Mounting Micro-Diptera.

By E. T. Cresson, Jr.

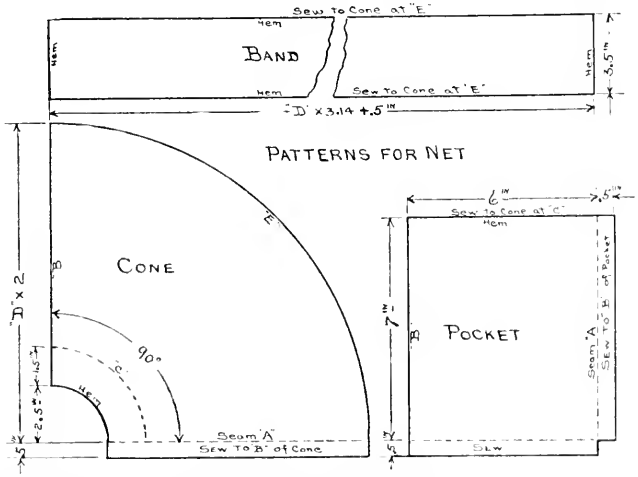
In the little experience I have had in the collecting and mounting of Micro-Diptera, methods have been developed which I find very satisfactory and greatly enhance the value of a collection of these small insects. Altho the methods may not be new to many collectors, still there are some to whom these notes will be of aid. The common absence of good series of Micro-Diptera in most collections I have examined, is due no doubt to their small size, but especially to the fact that entirely different methods must be employed, than are usual with the larger insects, in collecting and mounting, to insure perfect specimens. This subject, I will divide into two instalments, of which the first will be upon collecting. My experience in this line has been done mostly in quest of the members of the Acalyptrate family Ephydridae, to which my remarks will pertain more especially, and to those insects having similar habits and habitat; but the same methods may be used with the small insects of other orders.

It is at once seen that the net proper (cone) is simply a large funnel with its small end projecting about one and a half inches into the bag (pocket); out on the base or large end of the cone is sewn a separate piece (band) which in case of detachable rims, can be turned over and sewed permanently as shown, or, for solid rims, if one wishes to have a detachable

net, can be left so as to lap over the rim and buttoned or similarly fastened: in which case the upper edge of the band is not sewn to the cone at "E," as given in detail of patterns.



This band is used because the goods is cut bias along this edge and cannot be satisfactorily lapped over the rim. The dimensions of the pocket is given for the accommodation of a standard one-quarter pound paper bag. I have given sketches



of the patterns by which the material for the net can be cut, based upon the diameter "D" of the cone at the rim. Care must be exercised in sewing edge of pocket to cone at "C," and must

be done before either the cone or pocket is sewn up along edges "B;" but your mother, wife, sister, or lady friend who has any idea of dressmaking can easily make such a net after a little study of the drawings.

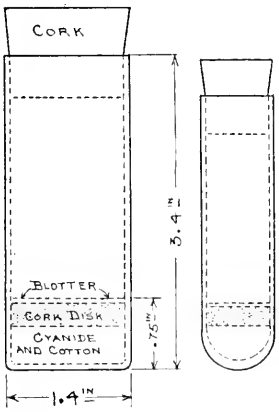
First in use, and of most importance in the collecting paraphernalia, is the net. The form I use was first suggested to me by Prof. C. W. Woodworth, of the California Agricultural Experiment Station at Berkeley, California, and is designed only for sweeping in which it excels all others in the collecting of Micros. It should be made of closely woven goods, such as bolting cloth, muslin, or any similar good material that will withstand the rough usage which a sweeping net is likely to encounter; never use bobbinet, or too heavy a material. Muslin, unbleached, is as good as any, is cheap, and one net will stand quite a number of ordinary collecting seasons. The design I use is shown in the outline drawing accompanying, and can be readily understood upon a little study. I use the Simplex net, ten inch steel rim, which I find very satisfactory, especially after eliminating the possibility of the ferrule working up the handle, by the use of a snap spring which keeps the ferrule in place when the net is in use, or, on the handle when the net is detached.

For use, a standard one-quarter pound paper bag, which is about six and a half inches long by two and a half wide, is inserted into the pocket, through the small hole at end of cone, arranging that the end of the same protrudes into the paper bag, funnel-like, as shown in the sketch. A few rapid sweeps through the air to inflate the paper bag and a glance to see that the end of the cone is properly placed and the net is ready for use. A net of this design, especially for collecting Ephydridae, or other hypdrophilous insects, has one great advantage over the usual or standard. In collecting over water or wet flats with the usual form of net the end will often hang down enough to strike the water, and thereby ruining the catch and also requiring some time for drying the net before continuing the collecting. With this form, even if the pocket

should get wet, the paper bag inside will generally remain dry enough to get out the catch safely, and may be renewed as often as necessary, thus eliminating any danger along this line. Another advantage, is that the most minute insects are retained, being unable to work their way out as they would through the bobbinet. It is also much easier to kill the catch than the usual method of putting the end of the net into a large bottle and waiting. To extract the paper bag after sweeping, grasp the pocket about one inch below its junction with the cone, firmly with one hand, and with the aid of the other reach in and pull the paper bag out through the small hole, all the while keeping the top of the bag pinched tight.

With the idea of keeping the catches from the various places or habitats separate, but more especially to keep them clean and dry, I use a number of small killing-bottles in preference to a few larger ones; although a medium size bottle is preferable for killing, while the smaller ones are used for keeping the catch in after killing. I use tubular vials without neck, as shown in an accompanying sketch, the larger about 1½ inches and the smaller ⅞ inches in diameter. In the bottom of each is placed a little cotton and a few lumps of potassium cyanide, then a little more cotton; upon this press down a snugly fitting cork disk in which has been punched three to five ⅛ inch holes. A disk of white blotting paper pressed down on top of this completes the operation and the bottle is ready. All this should take up about ½ to ¾ inches of the bottle. The blotting paper disks should be renewed as soon as they become moist or discolored, as they serve the purpose of keeping the insects from contact with the cork disk which soon becomes moist from the cyanide. Binding a

KILLING BOTTLES.



½ inch of adhesive plaster around the top of the bottles, and covering the bottom and lower side with the same, will lessen the danger of breaking when several are carried in the pocket or knapsack, and it also keeps the broken parts together if breakage occurs. A small label on the smaller bottles can be used for recording the habitats of each catch.

To transfer our catch, from the bag to the killing bottle, take the bag in the right hand and insert the mouth of the bottle into it, all the while keeping the bag snugly around the same. Now invert the bag, and with a few taps on its side and bottom as well as jarring the bottom of the bottle down upon the palm of the hand, all the catch will be transferred, leaving a surprisingly few in the bag. The bag can be used again if still in good condition. After killing, the catch should be transferred to one of the smaller bottles and the habitat noted. This method will always insure dry, clean specimens, especially if the worms, grasshoppers and all such of the larger insects or matter that may cause moisture or otherwise damage the specimens, are removed. This should always be done. When the bottle becomes nearly filled, or the insects lay closely together, an occasional gentle shake, or invertion, and ventilation by the removing of the cork for a few seconds, will keep the catch from sweating. With these Micros, one must always guard against the accumulation of moisture, which is sure to discolor the fine pollinose coating, and which I have never found means of restoring when once discolored. This is all that need be said about the collecting method. Our next concern will be the mounting, which will be discussed in another section. Of course there are many little details and tricks that will be worked out by each collector to suit himself, but in the main, the foregoing remarks will be sufficient to give an idea of the methods I have found most satisfactory and which have been the means of bringing to light many new species of the formerly obscure family Ephydridae and which are now represented in my collection by a series of perfect specimens.

The Development of a Green-Bottle Fly.

By Mary O. Allen, Milwaukee, Wisconsin.

The following life history is the result of investigation extending over a period of four summers under quite varying conditions. Knowing that several species of Diptera live on decaying matter, meat, both raw and cooked, was left exposed in several different places and at different times in order to obtain eggs, and these were usually forthcoming after a night's exposure if the conditions were right. Pieces left on the ground were often eaten by cats or dogs, and one small piece was drawn into the earth by a very large earth worm as was known by the fact that it had been put on a small piece of cloth, and the corner of this cloth was drawn into his hole and the worm was in this hole. Those portions of meat placed three or four feet above the ground were not touched, probably because the pupal state is passed under the surface of the earth if possible, and the larvæ could not drop down safely as can many caterpillars; also meat left in very sunny places was not visited, so it would seem as if the fly must know that sun and drought are fatal to her offspring. She herself disports in the sun most of the day. Whether the meat is raw or cooked seems to make no difference, but the green-bottle will not lay its eggs upon vegetable matter, although they may be seen extracting food from vegetable refuse. They must determine where the host is by the sense of smell.

The earliest that eggs have been obtained is June 13th, and it seems probable that they are usually laid in the early morning, as only once has a fly been seen depositing eggs. In this case she began by walking over and over the meat, fully forty or fifty times, feeling all the time with her ovipositor until she found just such a crevice as she wished. Into this she deposited about thirty eggs in irregular rows, then walked on continually feeling her way. She kept this up for two hours, depositing all the way from four to fifty or more eggs in each place. She probably laid no less than four hundred eggs, but they were not actually counted.

These eggs are pearly white, elongated oval in shape and when placed under a microscope are quite transparent and show a groove down one side. The eggs begin to hatch the day after they are laid, unless it is cold weather, when the development is retarded somewhat.

However, one does not always notice the larvæ, as immediately after emergence they begin to burrow into their host, unless they are in dense shade or it is cool weather. A casual observer might never realize that there were any maggots in the meat and yet, if it is pressed open or raised up, it will be seen to be nothing but a squirming mass of them protected from heat and light by an outer shell of their host. In one case forty maggots ate the whole inside out of a piece of meat an inch square in four days. Linnæus says the larvæ of three blow-flies will devour the carcass of a horse as quickly as a lion.

A newly-hatched maggot, apparently headless, tailless, footless, and semi-transparent, is nearly cylindrical in shape, but tapers somewhat towards one end; and its two long tracheæ running the whole length of its body as well as its black, powerful jaws, which enable one to determine the position of its head, may be plainly seen by the naked eye. Although all the motions of his internal organs may be distinctly seen with a microscope, yet in the very young larva the alimentary tract could not be traced, while the course of the tracheæ could be followed showing a branch and its two smaller branches in each segment and under high power, magnifying 450 times, one could see the fine projections at the thickest part of each segment on the ventral side, which part of the body is slightly flattened. The projections aid in locomotion, as do the jaws in some degree, for they grasp their food very firmly, yet these larvæ move in much the same manner as do worms and can travel in either direction with great rapidity. It is due to their general appearance and manner of locomotion that they are often termed worms and the resemblance

*Charlotte Taylor, Flies, Harper's Vol. xviii.

is certainly very complete. The posterior end of the body is nearly circular and here the tracheæ terminate in two spiracles, and at the second segment on the ventral side they end in two fan-like projections, which in the blow-fly Lowne says are functionless, which may be the case in this maggot also.

The larvæ grow rapidly; the warmer the weather the faster they grow, and when full-grown are nearly opaque and very strong. Their integument is very tough and thick and nothing seems to kill them but sunshine, drought, chloroform, and boiling water poured over them. They will not live more than two or three hours if left unprotected from the direct rays of the summer sunshine and will raise a heavy weight for such a small being in order to get into the shade; and in all stages of their development, lack of moisture will cause death. Several larvæ and all of the pupæ brought into the house died, and the second summer, when there was no rain for three weeks, but three flies appeared, in spite of the fact that they had been wet with water from the hose. It is even difficult to produce death by means of drugs; one larva placed in a cyanide bottle that had killed several insects was found the next morning burrowing in the plaster of Paris in the bottom of the bottle; it was then put into alcohol and after ten minutes was found standing upright on its anterior end or head; on another, benzine was poured and ammonia tried without result. But boiling water poured over them or the fumes of chloroform will cause death in a few minutes. It is to be inferred that their skins must be kept moist or they would not suffer so from lack of rain and from direct heat, and also that they do not take in a great deal of air, or fumes would have a deadlier effect on them; thus the toughness of their integument keeps them from being easily killed. Their jaws are so powerful that a full-grown larva moving across your hand will feel like a series of slight pin pricks, and they can make a scratch on a piece of cardboard.

A full-grown larva consists of three parts: a basal portion like a rounded plate, to which the strong muscles attach-

ing these jaws to the body wall are joined; to this is hinged a much smaller and more cylindrical portion to the knobs of which the jaws proper are fastened; these are made up of three joints, each capable of being moved in the other and the terminal one with a very sharp point: these points if brought together rapidly and forcibly, can tear away any substance capable of mastication by such small animals. These jaws are so strongly attached to the larva that they cannot be pulled out, but must be cut away from the body-wall, and yet may be retracted by the maggot.

From this mouth extends quite a simple alimentary tract consisting of a long tube with three enlargments: a crop, a stomach and the proventriculus, at the base of which enter five tubes; these are the malpigian tubes and they probably perform an excretory function. This whole tract is transparent, except the stomach, which has very muscular walls, is absolutely opaque, and of a yellowish-orange color; the outer part of the tube is perfectly clear throughout its whole length, while the inner portion is mottled, seems to have particles of food in it, and to be a tube within a tube. The only reason that can be given for this is that this contraction took place after death, and was due to the chloroform, but as insects do not breathe but through the tracheæ this does not seem a plausible explanation.

These larvæ are full-grown at the end of five days, and are then about one-half of an inch long. As soon as they have attained their growth, they stop eating and begin to burrow into the ground. They do not all reach this stage at exactly the same time, it being not less than three days before all the maggots had disappeared from view. If they are not allowed to go into the earth, they will try to burrow into anything that is soft enough, or if there is nothing to hide in, they simply become quiet and grow shorter and more rotund. However, larvæ in this state will move on stimulation for at least two days after the quiescent period has commenced. On removing them after one day under ground, it will be noticed

that they have become shorter and are somewhat barrel-shaped, and but little more than one-half their former size, or about one-quarter of an inch long; they are now turning a light brown and the outer covering is growing hard. In two days they are of a dark brown chestnut color, perfectly quiet, and the outer skin is perfectly hard but brittle; they are now pupæ. On trying to open these cases you will notice that the first three segments form a sort of cap and will separate from the rest if pulled quite hard, and, on cutting it open, the contents appear to be only a watery fluid with a few green and yellow tubes floating in it, the whole mass being attached but slightly to the case at the end. On looking closer, one hard, yellowish, opaque body may be seen which is the compound eye of the future fly. This appears first, then the rest of the head, the thorax, the abdomen, the legs, and lastly the wings of the fly can be distinguished. As each part develops the traces of larval life disappear, the substance of the old maggot being rapidly absorbed.

It is very wonderful when we consider that in but two or three days a squirming maggot, capable of moving, breathing, and eating with such strength and rapidity, can be so changed that no one part can be traced, not even his strong jaws, and that in ten days all this can be entirely absorbed and worked over into a new being. How carefully all the parts are folded over one another and how little remains of our maggot! No wonder the larva must pass through this stage while buried an inch under the ground if possible, an absolutely helpless thing must be protected from its enemies.

But these pupæ do not always mature; if placed on the surface of the earth or brought into the house and kept dry, death will ensue; also after the drought of three weeks mentioned above, but three perfect flies appeared, although the earth in the box was full of pupa cases, showing again the disastrous effect of drought. If raised in tin boxes only a small proportion come to maturity, possibly because air does not circulate through the earth as readily as when in wooden

boxes, and it is more apt to become sour or moldy. Then, too, the larvæ have hardly begun to pupate before very tiny flies begin to appear in large numbers. These are Phoridæ, and it seems as if they must be parasites, as only a very small number of green bottle pupae come to maturity; in one case only four out of twenty-five, in another three out of forty and again none where there were at least one hundred larvæ.

Eleven days after beginning to pupate perfect flies appeared and continued to struggle out of the ground for five days. How are these small insects able to make their way out of such hard cases and through all that solid earth? The head of the fly is formed at the end of the case, and when ready to emerge forces open this cap which splits into two parts, one or both parts of which often fall off; it does this by means of a sort of bladder-like organ—the ptilinum, which projects through the frontal suture. This assists him in his journey to the light, but it is afterwards withdrawn into the head and connot be seen. He comes out quite slowly, and at this time and even for five minutes after emergence he may be picked up with ease and will even rest on your hand for a short time, yet those flies which hatched in the night would nearly always escape were the glass covering raised but slightly, so rapid are they in their movements. When they first come out their wings are moist and uninflated, and they seem fatigued by the great exertion they have made. It takes flies but a very short time to fill their wings with air; they are not like dragon-flies, which may be seen during May and June on the grasses along the banks of the marshes and ponds pumping air into their wings by means of violent movements of the abdomen for nearly ten minutes before they can fly away. All the broods of green-bottles raised were composed of both males and females, the latter being more in number. The males may be told by their smaller size and nearly contiguous eyes. In both, the thorax and abdomen are of a bright green color, their compound eyes are wine-colored and are outlined with a narrow line of white; they are more oval in the male than in the female, and the white line is less con-

spicuous. Between these eyes there are three simple eyes, or ocelli, arranged in the form of a triangle. Between these large eyes as well as along the sides of the thorax and on the end of the abdomen there are several hairs or bristles which serve as a protection. The antennæ are also found between the eyes and consist of three joints, the third one provided with a feathered bristle. They may be bent down into a groove in the front of the head, and on that account are not so apt to be observed as those of most insects.

The mouth-parts consist of a pair of palpi, one on each side of a proboscis or sheath, which encloses three pointed portions. The proboscis of the green-bottle, as that of the house-fly when not in use, may be drawn into a groove on the under side of the head, and it has at its extremity two flexible lobes. This is quite large as compared with that of many Diptera, and consists of two lobes; it has no large veins and its only use seems to be to act as a protection to the halteres. These latter are very small, as the larger the alulet, the smaller the halteres. Their use is doubtful, but they are probably of value in flight, as it is said if one be cut off the insect will fly sideways, and if both be removed it cannot fly. They vibrate constantly, and as air passages extend from them through the whole body, they fill the nervures of the wings by means of these movements; a nerve runs their whole length from the papillæ at their base and they may be organs of smell or of hearing. The legs consist of the five parts: coxa, trochanter, femur, tibia and tarsus, common to all insects, the last joint of the tarsus having two pads with a pointed portion, the empodium between them. At intervals along the legs and at every joint are two or more bristles, these are not only useful as a protection, but also as cleansers.

Everyone must have noticed flies rubbing their heads, wings and abdomen with their legs, this is to clean them, as these hairs then act as a brush.

In some places Diptera of the species *Lucilia* are a menace to cattle and even to man; in The Netherlands *Lucilia sericata* deposits its eggs in the wool of sheep, and in South

America, and even as far north as Kansas, the larvæ of the screw-worm fly and of some other of this species infest man, the former living in the nasal fossae and causing great suffering. But *Lucilia caesar* is not as obnoxious to man as many flies, as it rarely comes into their houses. It is frequently seen resting on the upper side of the leaves of low bushes in the sunshine, and on the under side of the leaves or on the stems on damp or cold days. But although it lives on decaying animal and vegetable matter and its habits are similar to those of the house-fly, it is probably not as harmful to man.

A FATAL DISEASE SUPPOSED TO BE TRANSMITTED BY INSECTS.—An announcement of the discovery of what is thought to be the specific germ that causes infantile paralysis was made last night at a special meeting of the College of Physicians, called to discuss this important subject. Coupled with this announcement was the statement that the discovery may evolve a treatment that will successfully combat the disease.

Dr. Allen J. Smith, dean of the medical school and director of the school of tropical medicine, of the University of Pennsylvania, stated that in the blood of some of the cases of infantile paralysis examined in the laboratories of the state department of health small protozoa, a low form of animal life were found scattered among the red corpuscles.

They were only found in the blood of patients suffering from this disease, he said, and resemble the germ that causes sleeping sickness. He further said that his investigations led him to believe that the germ causing the disease is probably transmitted by insects, and that the disease might be eliminated in the same manner as typhoid fever and malaria have been checked.

Doctor Smith told of examinations of the various organs of those who died from this disease. While many authorities have stated that infantile paralysis had certain characteristics of rabies, Doctor Smith said that, on examination of the brain, he was unable to find any of the negri bodies usually found in sufferers from rabies.

He then went on to say that scattered through the blood of some of these cases small germs belonging to the animal, rather than the vegetable, kingdom were found. He made a chart on the blackboard, drawing in the corpuscles and the newly discovered protozoa. Because no one else has found them in the blood, Doctor Smith said that he was not absolutely certain yet that they were the germ that caused the disease, but pointed out their similarity to the germ of sleeping sickness.—"The North American," Philadelphia, October 13th.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—EDS.

PHILADELPHIA, PA., NOVEMBER, 1910.

Dr. Joseph S. Neff, Director of the Department of Public Health and Charities of the City of Philadelphia, gives the following directions in regard to house flies, which we quote from a Newspaper article:

"The advice of the Department, to select most carefully the dealers in food supplies from whom you buy, was followed out in part, for those dealers who kept their bread in paper bags, their poultry and meats free from flies by screen or paper, their berries, fruit and vegetables off the pavement where dogs and other animals could not molest them and where they were free from the germ-laden dust of the streets, noticed this year a marked increase in their business. By next Spring it is planned to have at least one hygienic store in each locality, where the public appreciate the importance of cleanliness of their food suply. In this way the careless, slovenly dealers will be forced to eliminate dirt and infection or go out of business."

This is one method of attacking the house-fly problem and much can doubtless be accomplished in this way.

Now that people are gradually being educated along these lines, there are a number of them who will not resort to restaurants where the flies in their bare feet, are walking all over the food and suiciding in the soup and cream jug. Neither is it a pleasant idea to think of eating food, exposed on the street, and covered with dessicated horse-manure, dried sputum and other interesting street products. Of course the prevention of flies would be a more logical way to accomplish the object, but that desired end can only be brought about gradually, as the people awaken to the necessities of the case.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

Folsom's "Entomology" has just appeared in a Japanese translation made by Professors Miyake and Uchida of Tokyo. We are glad to note the great appreciation of the entomological work done by Americans.

Prof. E. Dwight Sanderson has been appointed Dean of the College of Agriculture of West Virginia, at Morgantown. He is the Business Manager of The Journal of Economic Entomology and all subscriptions and advertisements should be sent to his new address.

Ponera opaciceps in Colorado.—Last March my wife and I were rather surprised to find a Ponerine ant on Flagstaff mountain, Boulder, Colorado, this being the first member of the group observed in this region. Dr. Wheeler kindly determined it as *P. opacipes* Forel, new to Colorado, but common to Texas. The only *Ponera* Dr. Wheeler ever took in Colorado was a single example of *P. incrorata* Wheeler, near Colorado Springs.—T. D. A. Cockerell.

A New Human Trypanosomiasis Conveyed by Insects.—Dr. C. Chagas has an article, in German, on this topic, in the first volume of the *Memorias do Instituto Oswaldo Cruz*, Rio Janeiro, 1909, according to a note by Nathan Banks, in *Science* for July 1, 1910. "This disease is similar to the African sleeping sickness, and is considered to be transmitted by certain blood-sucking reduvids bugs, especially *Conorhinus megistus* Burm. A small species of monkey, *Callithrix penicillata*, is thought to be the reservoir of the disease."

Phalangium longipalpis, Weed, in New York:—This species was described by Weed from specimens collected in Arkansas. Since that time no further captures of this large and striking Phalangid have been recorded, except a single male taken at Carlton Station, N. Y., in July, 1906, and reported in the News, XVIII, p. 161.

In September, 1909, I spent a week at a farm near Hamburg, N. Y. and was surprised to find this species abundant there on the trunks of fruit trees on the lawn. Males, females and young of various sizes were found. Again in September, 1910, I collected them in numbers at Plattsburg, N. Y., on the shore of Lake Champlain, where they were found under boards in a lumber yard and on the trunks of shade trees at the barracks. On September 16th, I collected an adult male on a tree trunk at Syracuse, N. Y., and on the 19th I found both sexes on fence posts at Stanley, Ontario Co., N. Y. In fact it has been the most abundant species collected during September.—C. R. Crosby.

Boston Society of Natural History.—Museum Expeditions, 1910. —An intensive study of New England natural history brings to view the fact that comparatively little is known of the habits and local distribution of many of our plants and animals. The more thorough investigation of the New England area undertaken by the Society has already resulted in a great increase in our knowledge of the local flora and fauna, while the preservation and exhibition of the New England species in the Society's Museum becomes in itself a unique undertaking. The exploration of the more inaccessible portions of this area is a task requiring much effort and expense, but with the co-operation of friends and members of the Society it must eventually be accomplished. Thanks to a special appropriation by the Council, the Society was able the past summer to undertake several short collecting trips, a brief summary of which will be of interest.

Vermont is still in many ways the least known of the New England states from the naturalist's point of view. The first of the season's expeditions was therefore made to the region on the east side of Mt. Equinox (3,816 feet) in the southwestern part of the state. The Curator, C. W. Johnson, accompanied by Messrs. J. A. Cushman and G. M. Allen, spent a week in early June at Manchester on the eastern slope of the mountain. The native limestone, which is characteristic of the formation of this region, is here somewhat harder than it is farther south, so that many of the lime-loving plants found in the limestone area of western Massachusetts and Connecticut are here absent. The flora of the upland area above 2,500 feet on the mountain is strikingly different from the association of plants found in the valley and on the lower slopes, for Mt. Equinox is one of a number of isolated peaks in Vermont whose summits are sufficiently elevated to form boreal islands. In addition to a large collection of plants, a very interesting lot of insects, molluscs, and small mammals was obtained. The fact that the streams of this region are part of the Hudson Valley drainage area should make their further investigation of importance in view of the likelihood of finding species here that have come in from the western waters. Frequent rains hindered the work of collecting and made it impossible to continue the investigation to the other slopes of Mt. Equinox and the adjoining hills, of which little is as yet known.

During the last week in June, the Curator spent several days on Martha's Vineyard, collecting principally in the vicinity of Edgartown. Among the insects obtained here were a number representing typical austral species. It will be of importance to make further collections of plants and insects on this and other islands off our coast at various periods of the growing season.

In extension of his previous season's work in Maine, the Cura-

tor, C. W. Johnson, spent several days during the middle of August collecting insects at Fort Kent and vicinity, in the extreme north of the state, as well as a part of one day at Ashland Junction. The various collections made this season have added largely to the known distribution of many species of insects, besides adding many that were previously unrecorded for New England. A few of the species taken will doubtless prove to be new.

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), excluding Arachnida and Myriapoda. Articles irrelevant to American entomology, unless treating of new genera, 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, and are all dated the current year unless otherwise noted. This (°) following a record, denotes that the paper in question contains description of a new genus; while this (*), that of a new North American form.

For complete record of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

1—Proceedings, Academy of Natural Sciences of Philadelphia. **2**—Transactions, American Entomological Society, Philadelphia. **4**—The Canadian Entomologist. **5**—Psyche, Cambridge, Mass. **7**—U. S. Department of Agriculture, Bureau of Entomology. **9**—The Entomologist, London. **11**—Annals and Magazines of Natural History, London. **12**—Comptes Rendus, L'Academie des Sciences, Paris. **14**—Proceedings, Zoological Society of London. **16**—Bulletin, Societe Nationale d'Acclimation de France, Paris. **18**—Ottawa Naturalist. **22**—Zoologischer Anzeiger, Leipzig. **24**—Berliner Entomologische Zeitschrift. **45**—Deutsche Entomologische Zeitschrift. **47**—The Zoologist, London. **49**—Annales historico-naturales Musei Nationalis Hungarici, Budapest. **50**—Proceedings, U. S. National Museum. **55**—Le Naturaliste, Paris. **74**—Naturwissenschaftliche Wochenschrift, Berlin. **81**—Biologisches Centralblatt, Erlangen. **84**—Entomologische Rundschau. **89**—Zoologische Jahrbucher, Jena. **92**—Zeitschrift fur wissenschaftliche Insektenbiologie, Berlin. **102**—Proceedings, Entomological Society of Washington. **119**—Archiv fur Naturgeschichte, Berlin. **153**—Bulletin, American Museum of Natural History, New York. **160**—Internationale Revue der Gesamten Hydrobiologie und Hydrographie, Leipzig. **175**—Aus der Natur, Berlin. **179**—Journal of Economic Entomology. **184**—Journal of Experimental Zoology, Philadelphia. **189**—Pomona Journal of Entomology, Claremont, Cala. **191**—Natur. Munchen.

193—Entomologische Blatter, Nurnberg. **196**—Arkiv for Zoologie, Stockholm. **197**—Proceedings, Royal Society, Biological Sciences, Series B, London. **198**—Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass. **200**—Bulletin Scientifique de la France et de la Belgique, Paris. **216**—Entomologische Zeitschrift, Stuttgart. **236**—Boletin, Sociedad Aragonesa de Ciencias Naturales, Zaragoza. **237**—University of Colorado Studies, Boulder. **240**—Maine Agricultural Experiment Station, Orono. **244**—Zeitschrift, Induktive Abstammungs und Vererbungslehre, Berlin. **253**—Archivum Zoologicum, Budapest. **258**—Mitteilungen, Zoologischen Museum in Berlin. **262**—Public Health and Marine-Hospital Service of the United States, Washington. **272**—Memorias, Real Academia de Ciencias y Artes de Barcelona. **273**—Proceedings, Royal Physical Society . . ., Edinburgh. **274**—Archiv fur Zellforschung, herausbegen von Dr. R. Goldschmidt, Leipzig. **275**—Philippine Journal of Science, General Biology, Manila. **276**—Bulletin, Societe lepidopterologijue de Geneve. **277**—Victorian Naturalist, Melbourne. **278**—Annales, Society Zoologique Suisse et du Museum d'Histoire de Geneve, Revue Suisse de Zoologie. **279**—Jenaische Zeitschrift fur Naturwissenschaft, Jena. **280**—Annals Transvaal Museum, Pretoria. **281**—Annals of Tropical Medicine and Parasitology, University of Liverpool, Series T. M. **282**—Abhandlungen der Naturhistorishen Gessellschaft zu Nurnberg. **283**—Bulletin, Societe Zoologique de France, Paris **284**—Bulletin, Museum National d'Histoire Naturelle, Reunion Mensuelle des Naturalistes du Museum, Paris. **285**—Natur-Study Review, Urbana, Illinois. **286**—Archiv fur Mikroskopische Anatomie und Entwicklungsgeschichte, Bonn. **287**—Proceedings, Royal Society of Victoria (new Series), Melbourne. **288**—Bulletin, Geological Society of America, Washington. **289**—Kansas University Science Bulletin, Lawrence. **290**—Biological Series, Michigan Geological and Biological Survey, Lansing.

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Doings of Societies.

A meeting of the American Entomological Society was held June 13, 1910. Dr. Calvert, President, in the chair. Ten persons were present.

Miss Hannah Thomas presented a large amount of North Carolina Lepidoptera in papers, collected by her brother, the late Lancaster Thomas.

Mr. E. T. Cresson, Jr., made a communication on a method of collecting Micro-Diptera.

Mr. G. M. Greene exhibited and presented to the collection, a pair of *Alaus oculatus* in coitu and explained his method of mounting them.

Dr. Castle exhibited a tick, *Dermacentor americanus,* taken from a woman's breast at Collingswood, New Jersey.

Dr. Calvert exhibited a box of Odonata, material studied for the Biologia Centrali-Americana and to be returned: The special method of labelling the specimens was shown. He also exhibited a nest of *Vespa vulgaris* and some of the wasps.

The President appointed the Secretary of the Society to represent it at the First International Entomological Congress and the Eighth International Zoological Congress.

Mr. J. A. G. Rehn and Prof. E. M. Ledyard were elected members.

HENRY SKINNER, *Secretary.*

A meeting of the Entomological Section of the Academy of Natural Sciences of Philadelphia was held September 22nd, 1910. In the absence of the Director and Vice-Director, Dr. Castle presided. Eleven persons were present.

Mr. Haimbach gave a talk on some of his observations while in Massachusetts this summer. He first exhibited a few specimens of *Perichymenobuis frustellus* he captured and made some remarks on its habits. He also exhibited a small nest of the white face hornet (*Vespa maculata*) in which he found a species of mud-dauber wasp, which Mr. Daecke thought was there merely by accident. Mr. Haimbach then gave an interesting account of his observation of the ravages of the Gypsy and Brown-tail moths, remarking upon the desolate appearance of the woods caused by these pests; there seemed to be no life of any kind except the caterpillar and moths. One afternoon he noticed a hollow maple trunk which was thickly lined inside with the moths, but next morning they had all gone. He said he was fortunate to be there during a great flight of the Brown-tail moth and gave an account of the flight, also of the "brown tail itch" caused by the irritation from the fine hair from these moths. A noticeable peculiarity of the Brown-tail is that it hibernates in the larval state, while the Gypsy moth hibernates in the egg state. He said he saw the ravages of the four principal pests, Leopard, Gypsy, Brown-tail-moths and Elm leaf beetle.

Mr. Ilg exhibited a mount showing the life history of *Ateva aurea* Mr. Daecke said that the species is more common west than here but he has collected it in New Jersey. This was followed by discussions by some of the members relative to the species.

Dr. Calvert showed a male of *Neurocordulia yamaskanensis* Provancher, taken by Mr. Daecke at Perdix, near Harrisburg, Pa., June 8, 1910, which is a new species for Pennsylvania, it having been originally described from Quebec.

Mr. Cresson exhibited some *Dermestes* larvae and imagos taken from a leather works in Camden, N. J., where it was doing much damage to the hides. There were three species

in the lot *Dermestes lardarius, cadaverinus* and *frischi*. He also exhibited a branch of a pine tree from the Academy's herbarium which was infested with some of the larvae. Mr. Cresson also spoke of the idea of having a local collection and asked for the help of the members in regard to donations. The subject was discussed by Mr. Daecke and others.

E. T. Cresson, Jr., *Recorder Pro Tempore.*

At a regular meeting of the Feldman Collecting Social held this evening, at 1523 S. 13th Street, thirteen members were present. President Harbeck in the chair.

Mr. Daecke exhibited five varieties of *Straussia*: v. *perfecta,* v. *longitudinalis,* v. *typica,* v. *vittigera* and v. *arculata.* Said he had found two varieties in copulation, so apparently each male takes a female of the same variety. A male *longitudinalis* was pointed out as very striking. A southern form of dragon-fly was also shown, *Heterina tricolor* Burm., a female from Camp Hill, Harrisburg, Pa., 9-5-09.

Dr. Castle detailed his trip to Georgia and Florida, telling of his disappointments due to wind and dry weather and exhibited the cone or seed cluster of the "coontie" (arrowhead plant) *Zania integrifola* Michx. from Miami, Fla., on which *Allocorynus slossoni* Schaeffer breeds, but could find no specimens of the weevil.

Mr. C. T. Greene exhibited and recorded the following Diptera: *Caenomyia ferruginea* Scopoli, Castle Rock, Pa., 5-29-10; *Ceria signifera* Loew, Germantown, Pa., 6-4-10; and *Criorhina notata* Wied., a male from Castle Rock, Pa., 5-29-10, all collected by himself.

Mr. Harbeck exhibited and recorded *Dasyllus champlaini* Walton, Browns Mills Junc., N. J., 7-10-06, and *Eclimus niger* Macquart, Manahaukin, N. J., 5-30-10.

Mr. Wenzel mentioned a trip to Rehoboth Beach, Del., saying how fine the vegetation was—it extends to the beach and is not gnarled and twisted like that of Jersey. He said the maritime flora is entirely absent.

Mr. Geo. M. Greene read extracts from back numbers of Entomological News in which is described the feeding of *Eudamus* and a *Pamphila* in the same manner that Mr. Daecke mentioned in last October meeting. Also an article on *Cryptorhynchus lapathi* Linn., corroborating Mr. Kaeber's statements of last two meetings. He exhibited the following Coleoptera collected by C. T. Greene: *Elater sayi* LeC., Roxborough, Pa., 4-23-10; *Scricosomus silaceus* Say., Wenonah, N. J., 5-15-10, Castle Rock, Pa., 5-29-10; and *Hormorus undulatus* Uhler, Castle Rock, Pa., 5-29-10 and 6-5-10.

GEO. M. GREENE, Secretary.

THE PACIFIC COAST ENTOMOLOGICAL SOCIETY.

The 33rd regular meeting was held on the evening of August 28th, 1909, at Thompson's Grill, San Francisco. President Van Dyke in the chair. Twelve members and five guests were present.

Mr. J. C. Huguenin reported the results of a collecting trip to the Santa Cruz Mountains.

Mr. F. X. Williams gave the results of last summer's work at Lake Tahoe.

Mr. Edw. Ehrhorn reported his summer's collecting and observations at Lake Tahoe; his description of collecting insects on the snow at Mt. Tallac was very interesting.

Mr. Leon Munier gave the results of his work at Glen Allen, Sonoma Co., California, in June. There was very little to be taken as a result of two bad seasons—the first cold and the second very hot and dry. He further made remarks upon a spider found on the street in San Francisco.

Mr. Fuchs talked on the meat gathering habits of certain wasps, as *Vespa occidentalis* or yellow jacket; also, of the insect gathering habits of others, with special reference to a large wasp that he observed attacking a *Mygale*, and which afterwards bit off the tarantulas legs.

Mr. G. R. Pilate discussed Mr. Fuchs' observations.

Mr. Fuchs then referred to studies on the maculation of *Hippodamia convergens,* the spots ranging from none to 12 and 22, with other variations.

Mr. F. W. Nunenmacher stated that at Cactus Springs, Nevada, there was a cliff 300 feet long, and that it was at the time of his visit there literally covered with *Hippodamia lecontei*: the whole country was red from the congregated Hippodamiae.

Mr. Wm. Mann, of Leland Stanford, Jr. University, made some very interesting remarks upon Myrmecophilus Coleoptera and other small insects.

Mr. E. J. Newcomer reported some data obtained at Lake Tahoe, California, these referred to Lepidoptera observed at the summit of mountains, while none were noticeable on the sides of the mountains.

Mr. Huguenin exhibited two boxes of Coleoptera.

Mr. Williams, Lepidoptera from vicinity of Lake Tahoe, California.

The 34th regular quarterly meeting was held at Thompson's Grill, O'Farrell St., San Francisco, on November 20th, 1909, President Van Dyke in the chair. Twelve members were present, also seven guests.

A communication from Mr. L. E. Ricksecker and a note on the Larva of Gloveria *medusa* Strecker were read.

Mr. Ralph Hopping made remarks on the habits of *Pleocoma frimbriata* and *behrensii.*

Mr. Chas. Fuchs gave a report of his work in the Entomological Department of the University of California, with an exhibition of the arrangement of the representatives of different orders of the Insecta.

Mr. Dudley Moulton gave an interesting talk on the work being done to suppress the pear Thrips.

The Society had the pleasure of Dr. Creighton Wellman's presence, who gave an account of his studies on the Meloidæ and his method of classification. The Doctor also

made remarks on collecting in Africa. Dr. Wellman also reported the death of Prof. Kraatz, a great authority on Coleoptera. At the request of the Doctor all the members arose to their feet as a token of esteem to Prof. Kraatz. The Secretary of the Society was instructed to write to Dr. Walter Horn, expressing the Society's sympathy to the Deutsches Entomologische Gesellschaft.

Mr. J. E. Cottle made remarks upon the depth of cabinet boxes.

Mr. Percy Baumberger exhibited a box of Hymenoptera.

Mr. Fuchs, a box of insects, it being No. 1 of a series that he was preparing for teaching purposes.

Mr. Cottle exhibited a specimen of *Pyrameis,* a sport of *carayae*, resembling *atlanta.*

The 35th regular quarterly meeting was held on the evening of February 19th, 1910, at Thompson's Grill, San Francisco, President Van Dyke in the chair. Thirteen members and four guests were present.

Dr. Creighton Wellman and Mr. Wm. Mann, were elected to membership.

Mr. J. E. Cottle and Mr. F. X. Williams reported collecting on Mt. Tamalpais at night; 120 moths came to the acetylene light.

Dr. Van Dyke gave an interesting talk on the results of his studies of the Coleoptera collected on the Galapagos Expedition.

Mr. F. W. Nunenmacher exhibited and made remarks on a *Zarhipis* larva.

Dr. Wellman stated that there was great danger in putting too much stress on characters specialized by atrophy.

Mr. F. X. Williams reported finding a Meloid larva in a Carpenter Bee's nest while on the Galapagos Expedition. Dr. Wellman said if it was so, it will be a *Horia*, and points to a more recent relation to the mainland.

Mr. Chas. Fuchs exhibited some Coleoptera from Mexico.

Dr. Van Dyke said that South America will prove to be one of the most interesting of all countries. It has many very primitive genera and species, and intermediate forms. *Parandra* was cited as an example.

Dr. Van Dyke spoke of the death of Mr. Kirkaldy, and the Society requested the Secretary to write and express its regrets and sympathy to Mrs. Kirkaldy.

F. E. Blaisdell, Secretary.

Ier Congrès International D'Entomologie.

Bruxelles—1er-6 août 1910.

Membres assistant au Congrès.

Andres, A., Alexandrie.
Arrow, G.-J., Londres.
Bachmetjew, P., Sophia.
Bagnall, R.-S., Penshaw.
Ball, F., Bruxelles.
Becker, Th., Liegnitz.
Bivort, A., Fleurus.
Blanchard, R., Paris.
Bondroit, Bruxelles.
Boone, A., Turnhout.
Bourgeois, J., St.-Marie aux-Mines.
Bouvier, E.-L., Paris.
Braem, R., Bruxelles.
*Burr, Malcom, Eastry.
Von Buttle-Reepen, H., Oldenbourg.
*Candèze, L., Liége.
Carpenter, G.-H., Dublin.
Champion, G.-C., Londres.
Clavareau, H., Bruxelles.
De Crombrugghe de Piquendaele (baron G.) Bruxelles.
Crahay, N.-I., Bruxelles.
Dampf, A., Koenigsberg.
Desguin, E., Anvers.
Desneux, J., Bruxelles.
Dewitz, J., Metz.
Dixey, F.-A., Oxford.
de Dobbeleer, F., Frasnes.
Dodero, A., Genes.
Donisthorpe, H., Londres.
Dupuis F., Bruxelles.
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Everts, Jonkheer, Ed., La Haye
Ferrant, V., Luxembourg.
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Garcia y Mercet, R., Madrid.
Gedoelst, L., Bruxelles.
Gillanders, A.-J., Alnwick.
Goetgebuhr, Gand.
Goffart, L., Bruxelles.
Gounelle, E., Paris.
Guilliaume, A., Bruxelles.
Guilleaume, F., Bruxelles.
Handlirsch, A., Vienne.
Hasebroek, K., Hambourg.
de Hennin Boussu-Walcourt (Dom) Maredsous.

L'asterisque (*) designe les membres a vie.

Hastert, P., Luxembourg.
de Hennin-Boussu-Walcourt Em. Bruxelles.
Hepburn (Sir. A. Buchan), Londres.
Holdhaus, K., Vienne.
Holland, W.-J., Pittsburgh.
Horn, W., Berlin.
Horvath, G., Budapest.
Howlett, J.-M., Pusa.
Imhof, O.-E., Windisch.
Jacqué, L., Bruxelles.
Janet, A., Paris.
Jones, A.-H., Londres.
*Jordan, K., Tring.
Joseph, Edw.-G., Oxford.
Junk, W., Berlin.
Kerremans, Ch., Bruxelles.
Kertész, K., Budapest.
Klapalek, F., Prague.
Kolbe, H., Berlin.
Kosminski, P., Moscou.
Künckel d'Herculais, J., Paris.
Kuntze, A., Dresde.
Lahille, F., Buenos Aires.
Lameere, A., Bruxelles.
Lesne, P., Paris.
Longstaff, G.-B., Putney Heath.
Lyman, H.-H., Montreal
Mac Dougall, R. S., Edinbourg.
Magretti, P., Milan.
Marchal, P., Paris.
Marshall, Guy A.-K., Londres.
Martin, H., Bruxelles.
Martin, R., Paris.
Mayné, R., Bruxelles.
Merrifield, F., Brighton.
de Meijere, J.-C.-H., Amsterdam.
de Moffarts (baron P.), Botassart.
Morris (Sir Daniel), Boscombe.
Navas, Longinos, Saragosse.
d'Orchymont, Menin.
Olivier, Ern., Moulins.
Osborn, H., Columbus.
Philippson, M., Bruxelles.
Pirsoul, F., Namur.
Poulton, E.-B., Oxford.
Punnett, R.-C., Cambridge.
Reh, L., Hambourg.
Renard, A., Liége.
Riotte, C., Steyl.
Ris, F., Rheinau.
Roelofs, P.-J., Anvers.
Rosen (Baron von), Munich.
*Rothschild (Hon. N.-C.), Tring.
*Rothschild (Hon. W.), Tring.
Rowland Brown, H., Londres.
Sainte Claire Deville, J., Epinal.
Sasaki, Chujiro, Tokio.
Schaus, W., Londres.
Schenkling, S., Berlin.
Schmiedeknecht, O., Blankenburg.
Schnabl, J., Varsovie.
Schouteden, H., Bruxelles.
Schubert, K., Berlin.
von Schulthess, A., Zurich.
Schulz, A., Villefranche.
Seeldrayers, E., Bruxelles.
deSélys-Longchamps (baron M.) Bruxelles.
Seitz, A., Darmstadt
Severin, G., Bruxelles.
Simon, E., Paris.
Sjöstedt, Y., Stockholm.
Skinner, H., Philadelphie.
Smits van Burgst, La Haye.
Solari, F., Genes.
Speiser, P., Sierakowitz.
Steinmetz, F., Mannes.
Stringe, R., Königsberg.
Sturgess, W.-B., Gerrards Cross.
Szilady, Z., Nagy Enyed.
Theobald, F., Wye.
Trimen, R., Oxford.
Tullgren, A., Experimentalfältet.
Van Bierviiet, J., Bruxelles.

van Dissel, E.-D., Utrecht.
Vaughan-Williams, R., Londres.
Vermobel, V., Villefranche.
Veth, H.-J., La Haye.
Villeneuve, J., Rambouillet.
Wainwright, C.-J., Handsforth.
Meade-Waldo, G., Londres.
Wasmann, E., Luxembourg.
Willem, V., Gand.
Wytsman, P., Bruxelles.

DAMES.

Mme. Ball.
Melle. Brown.
Mme. Bouvier.
Mme. Burr Malcom.
Mme. Donisthorpe.
Mme. Dodero.
Melle. Engels.
Melle. Forel.
Mme. Horn.
Mme. Janet.
Mme. Junk.
Mme. Kertesz.
Mme. Kunckel d'Herculais.
Mme. Kolbe.
Melle. Kerremans.
Mme. Lameere.
Melle. Le Lorrain.
Mme. Longstaff.
Mme. Morris.
Melle. Merrifield.
Mme. et Melle. Poulton.
Melle. Rowland-Brown.
Mme. Rousseau.
Mme. Sainte Claire Deville.
Mme. Schouteden.
Mme. de Sélys.
Mme. et Melle. Severin.
Melles. E. et M. Solari.
Mme. Speiser.
Mme. Smits van Burgst.
Mme. Trimen.
Mme. Veth.

Le nombre d'adhérents (Universités, Musées, Instituts, Sociétiés) est de 270, dont 24 membres à vie.—La liste complète paraîtra dans les comptes rendus du Congrèss.

OBITUARY.

ADOLPH CONRADI.

Adolph Conradi, a well known entomologist, died at his home in Bethlehem, Pennsylvania, on Aug. 4th, after a lingering illness of a complication of diseases. During his lifetime he gathered two collections of butterflies and other insects, one containing 35,000 specimens, and the other composed entirely of species of day-flying butterflies native to America and numbering many thousands.

Mr. Conradi was known to many collectors of the Lepidoptera and for many years carried on an extensive exchange correspondence. He was 72 years of age.

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DECEMBER, 1910.

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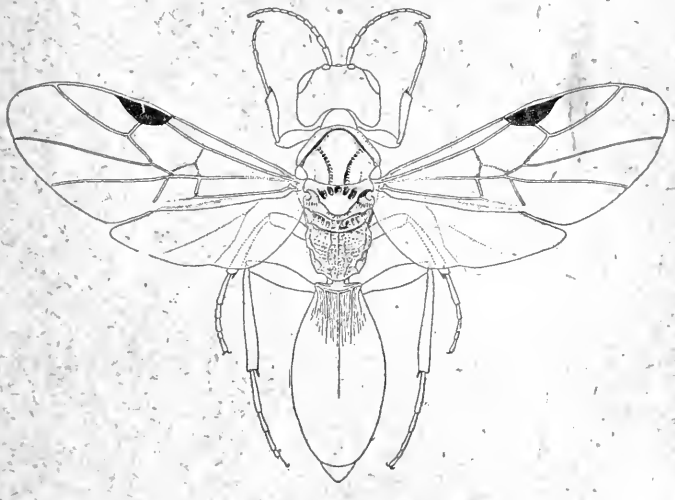

Vanhornia eucnemidarum Crawford.

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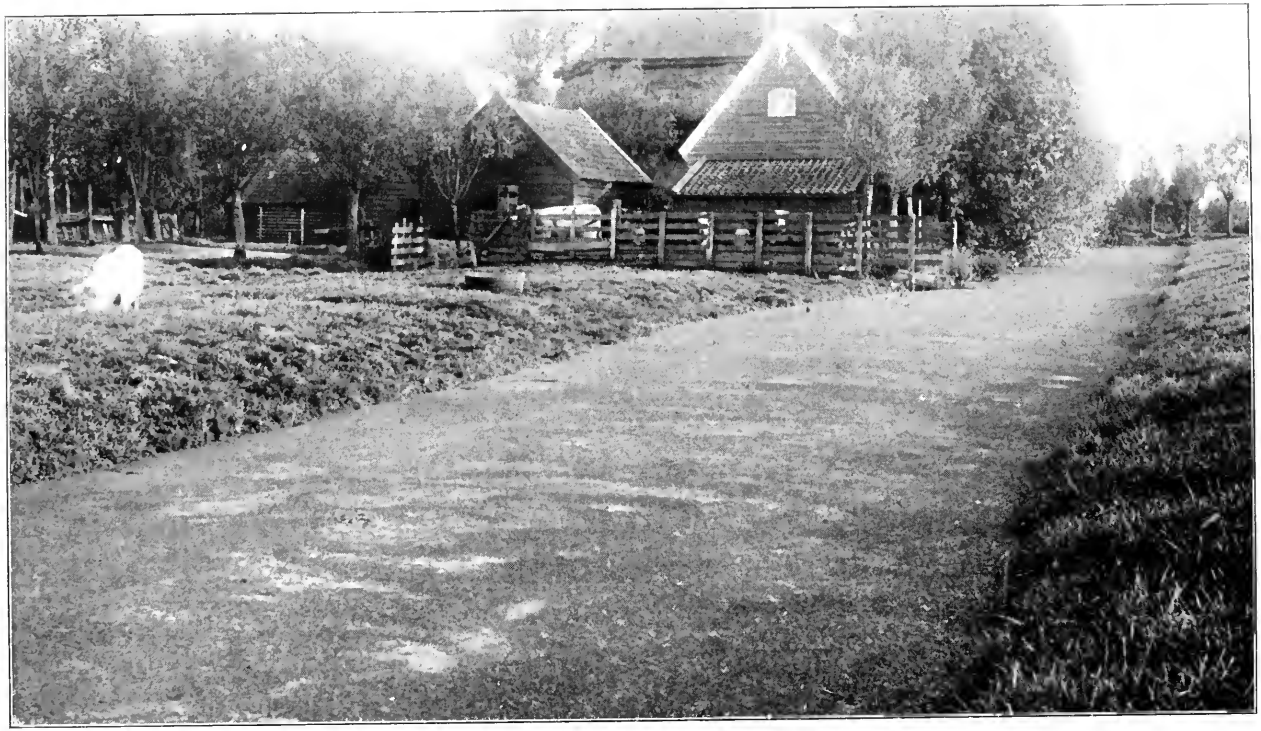

A BROAD DITCH AT BOSKOOP, HOLLAND, COMPLETELY COVERED BY A CARPET OF AZOLLA—SMITH.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXI. DECEMBER, 1910. NO. 10.

CONTENTS:

Azolla vs. Mosquitoes.

BY JOHN B. SMITH, SC.D.

(Plate XIV)

During the summer of 1908 there appeared in the newspapers throughout the country an extract from a consular report, stating, in effect, that experiments made in Germany had demonstrated that a water plant, a specimen of *Azolla,* had been made practically useful in dealing with the mosquito pest by preventing their breeding.

Naturally this interested me and I tried to ascertain just what basis there was for the report. I could learn little about *Azolla* from such botanists as I consulted. Every one of them knew it, but not one of them knew very much about it: it was simply one of those locally common things that is taken for granted.

Meanwhile Dr. Bartmann, the exploiter of the *Azolla* proposition had written to the Governor of New Jersey, offering, for an adequate pecuniary reward to come to the relief of the State and to make experiments. The letter was referred to me in due course and I put myself into communication with

the good Doctor hoping to get further light on the subject. But the Doctor refused to shed any light whatever without a supply of the right kind of illuminant, and Dr. E. B. Voorhees who was at that time in Europe, failed to find him at his home in Wiesbaden. Meanwhile I had enlisted the aid of Dr. David Fairchild of the U. S. Department of Agriculture, and of Dr. N. L. Britton, Director of the Botanical Garden at Bronx Park, New York City, in getting a supply of the *Azolla* from Europe. Through the former I secured a sending from the Botanical Gardens at Hamburg, which arrived in bad condition; through the latter I received a supply from the Botanical Gardens at Kew, England, which arrived in excellent condition and which was propagated in the Bronx Park houses during the winter of 1909-10. It appeared also that a native species of *Azolla* did actually occur in New Jersey, but only in two places where it had been planted years ago and where it had just maintained itself, without spreading, for several years.

The matter was considered worth investigating first, because it seemed to have German official endorsement: second, because I remembered very clearly during my visit to the Dutch low countries in 1900 most of the ditches were covered by a complete coating of plants that parted readily for a boat but closed in again, immediately behind. This vegetation, I now learnt was a species of *Azolla* and it did not seem improbable to me that this covering of a vegetable carpet might really account for the very general freedom from mosquitoes, enjoyed in these regions. An attempt to secure a supply of the Dutch *Azolla* in a nursery importation in the late winter of 1909 also failed because the plants were dead when received; but from the sources already mentioned I found myself in the possession, at the Bronx Park, of a small supply of plants at the opening of the season of 1910. These plants were put out at several points in May and at first they did well, began to multiply, and apparently found something not to their liking. No one could explain the difficulties so but one thing remained

to be done: visit the home of the plant and find out all about it myself. In late August therefore I started and found myself at Hamburg during the early days of September. I found a very cordial reception at the Botanical Institution and Garden, at the Station fur Pflanzenschutz, and at the Institut für Schiffs-and Tropen-krankheiten, and soon had all the information it was theirs to give.

It was the Botanical Garden that had supplied the plants, and the Institute for Tropical diseases that had watched and, in a measure, checked the experiments made by Dr. Bartmann near Wilhelmshafen and elsewhere. The records and reports showed clearly enough that under favorable conditions the *Azolla* would form a surface covering on water areas that would absolutely prevent mosquito breeding and would not adversely affect fish and other aquatic animals. They showed also, however, and quite as conclusively that the *Azolla* required the most favorable conditions to accomplish this and that even a small percentage of salt and even a moderately low temperature was either fatal to the plant or checked its growth. One of the New Jersey failures was thus explained by the entrance of some brackish water into the pond and seemed to demonstrate that on salt marsh areas or wherever tides of brackish water ever entered, the plant would be useless. It was also found that a cold storm in August killed so large a percentage of the plants that it required 3 weeks to become re-established and, meanwhile *Anopheles* bred merrily and even maintained itself along the edges where grasses and rushes prevented the complete surface covering of the plants. Furthermore the plants would not stand the North German winters which are not as severe as our own. The practical conclusion was that in North Germany *Azolla* could not be relied upon to control mosquitoes to any practical extent and the experiments were abandoned. It was however indicated that in warmer countries better results might be obtained and experiments in the German Colonies in Africa are to be continued. Curiously enough none of the officials or

experimenters had made any attempt to discover under what conditions Azolla flourished naturally and, ecologically, the plant was no better known at Hamburg than it was in New Jersey.

My next headquarters were at Amsterdam and my first real acquaintance with *Azolla* was made at Boskoop, accompanied by Dr. Quanije of the Phytopathological Service, Mr. Moerlands of the Horticultural School and Mr. Ouwerkerk of the Nurserymen's Association. Here, undoubtedly *Azolla* formed a complete vegetable carpet over every ditch and canal, and mosquito breeding was practically impossible. So luxuriant was the plant that it could be twice removed from the surface during the season always leaving enough to restore the covering promptly.

During the next two weeks I covered the bulk of the "polder" area in Holland, and found just where and how *Azolla* flourishes.

First of all, it occurs nowhere, so far as I could learn, outside of the "polders" or reclaimed areas, where the water was all stagnant. Second, its point of greatest abundance coincides with the most completely developed peat or turf area. Haarlem, Leiden, Boskoop and vicinity have every ditch and almost every canal covered by an almost perfect carpet and these are the richest peat areas in the country. South of Rotterdam where there is a sand or clay addition, *Azolla* works out, and the same is true east of Amsterdam, not a trace of it being seen at Naarden.

Nor does the plant maintain itself in shallow water, where ice forms to the bottom. It comes in year after year only in ditches three feet deep which never freeze to the bottom, and where ground ice never forms. A severe winter is always followed by scanty crop of *Azolla* next summer.

In Belgium I did not see the plant at all; but I had neither the time nor the funds to continue my investigations in that country as I had done in Holland.

As the practical outcome of my work I feel no hesitation

in saying that *Azolla* is useless in dealing with the local city and the salt marsh problems. But there is a chance that in some of our South Jersey peat bottom swamps the plant may do good service and there I hope to be able to establish it. It is also quite possible that in some of the more southern states its range of usefulness may be greater. For New Jersey I do not see any great or immediate advantage from the plant; its habits are such, however, that in localities better adapted to it, great benefit may result from its introduction.

Notes on the Life Stages of Catocalae; a Summer's Record and Incidental Mention of Other Lepidoptera.

By R. R. Rowley and L. Berry.

As has been the case for the past two or three years there was a warm spell in late March and early April and, as usual, a promise of an early summer but everybody knows how deceptive these promissory signs were. The middle of April found us in the grip of a second winter and venturesome insect life either perished or crawled back into its hole and awaited a second invitation to come forth. Butterflies had been on the wing and the early April warmth had nursed to life the eggs of various moths that make our springtime and early summer fauna.

The record shows a fine imago of *Papilio zolicaon* from a pupa sent to the senior author by Mr. E. A. Dodge of Santa Cruz, California, March 18th; an imago of *P. asterias,* ex pupa, March 20th; a *P. philenor* on the 29th of the same month and a fine male *luna* on the 30th.

The eggs of *Catocala ilia* began hatching on the 31st of March and finished up on the 1st of April. The buds of bur oak were just bursting and the young "crawlers," unlike the lively brood of April, 1909, settled down to their diet of foliage and seemed contented and happy. What a delight to watch the little fellows grow and the colder the weather out of doors,

the sturdier grew the caterpillars, in doors! The two weeks before the destructive sleet, snow and frost, had, however, given them strength to meet the cold that wilted the foliage of every tree and shrub.

It is hardly possible that the eggs of *ilia* in the woods did not hatch until the wintry winds had ceased to blow, about the 26th of April, but *illecta* larvae were past the second moult by the 5th of April out on the honey locust sprouts, and on the 20th were found the first *innubens* larva, half grown.

April 1st a chrysalid of *Smerinthus cerisyi* (*ophthalmicus*) from E. A. Dodge gave a fine male imago, later two other males, and unfortunately, a deformed female.

The first find of *illecta* larvae was on the 6th of April, 17 of them and one was half grown (past 3d moult). The last, nine in number, were found on the 30th. The first *illecta* caterpillar began spinning on the 15th of April.

The record for April 17th reads, "Ice last night. Cold west wind with gusts of driving snow. Found 26 larvae of *C. illecta,* chilled and half frozen, the snow beating me in the face as I searched for the little "Cato-worms."

The snow continued through the 18th and 19th and the young foliage of the forest was frozen stiff by the morning of the 23d. Still the *illecta* larvae lived out of doors. The morning of the 24th with two inches of snow settled the fate of the fruit and must have played havoc with larvae for I found exposed caterpillars of *illecta* and *innubens* frozen stiff and dead but I found others alive later on. It is surprising how much cold these tender, unprotected creatures can stand!

The young larvae of *Catocala ilia* have small black heads, are gray and with lateral round black spots. At ten days of age, the larva is over half an inch long, lighter gray with four large lateral black spots to each side. The little tubercles are black.

Remembering his experience with *ilia* larvae the year before, the senior author placed small bur oak twigs or branches in the breeding jars and the larvae appeared tame, as they

lay along the dark colored twigs or ate the bur oak catkins. It is a little strange that these branches would convert untamed, restless "crawlers" into docile, lazy "worms," but so it seemed for in 1909 the whole brood died of over exertion and failure to take proffered nourishment.

The eggs of *Catocala unijuga,* secured by the junior author, hatched on the 8th and 9th of April. These larvae did well from the beginning, feeding on willow and differed in no wise from the brood fed by the senior author in 1907 and described in a paper that year.

From the *ilia* larvae, seventeen reached maturity and spun pupal cases but only fourteen imagoes emerged, eleven males and three crippled females, all of uniform color, rather dark, and of the normal form. The female that laid the thirty eggs producing this brood, was a plain *ilia.* That there was no variation in these bred moths was a source of some disappointment but, after all, it strengthened the belief that when individuals of a variety are common they are the offspring of varietal parents.

The first moths, three in number, from the brood in doors, emerged on the 13th of June and the last one on the 17th, while the first seen in the woods was on the 16th of the same month. From this fact, it would seem that the *ilia* larvae in the woods passed through the freezing weather of the first two weeks of April.

Of the fourteen bred imagoes, three were so badly crippled as to be worthless, a lone female with a very small hind wing having been kept as an oddity.

About fifty per cent. of the eggs yielded chrysalids, thirty three and a third per cent. of the eggs gave fine cabinet specimens. On June 23d the senior author took in the woods a specimen each of *Catocala ilia* and *innubens,* the latter ragged.

A number of *ilia* were seen at that time.

On the next day in company with Harold Davenport, a young *Catocala* enthusiast, he took six *ilias* and one *polygama,* one of the former being *uxor* or the white spotted variety, while

on the 30th, of twenty captured *ilia,* two had pure white spots. Five *innubens* taken at this time were all of the variety *hinda.* It was nearly a month after this before the normal *innubens* appeared in any number. Furthermore, the *hinda* were all much smaller than the later normal *innubens.*

On July 3d in company with Geo. H. Hosenfelt and Walter Brown of St. Louis, sixteen *ilia,* several of them *uxor,* seven *hinda* and three worn *polygama* were taken. After this date other *ilia* were captured but in poor condition. In fact specimens were seen up to the 1st of September. Here at Louisiana, it has been the best *ilia* year since 1900. Two of the specimens taken on the 30th of June had pale hind wings, one of them being quite as yellow as *neogama.*

The first *illecta* larva began spinning April 15th, a whole month in advance of *parta* larvae which began hatching on the 16th and yet the first and only *parta* I ever saw taken here (the night of June 29th, 1906, at sugar and by Mr. E. A. Dodge) was in company at the bait with a somewhat weathered *illecta.* It might be proper to state here that on the same evening the first and only *Catocala consors* ever seen alive by the senior author was taken in the little clump of small trees where we were trapping. How it did rain that night and what a drenching we all got!

The eggs of *parta* and *scintillans* began hatching on April 16th. Larva of the former, one day old, is light brown with dark chestnut head. On the 24th the caterpillars were one third of an inch long, light (almost flesh color) with a very light dorsum. Head, light chestnut. This was after the first moult. Just before the moult the color is light rusty-brown. April 26th the larva reddish brown along the side and light middorsally. The red-brown along the sides is much darker above the prolegs. Head light brown or chestnut. Prolegs very dark at base, lighter outward. Head chestnut.

Eggs of *vidua* and *palaeogama* hatched on April 30th. When full grown, larvae of *ilia* hide beneath paper in the bottom of the jar in day time, feeding at night, exactly the re-

verse of *illecta* which never seems to try to conceal itself nor does it cease eating, day or night. *Innubens* at maturity makes some attempt to conceal itself but in captivity, feeds all the time. *Parta* and *unijuga,* like *ilia,* seem to feed only at night and more or less conceal themselves by day.

May 5th larva *C. parta* one inch long, dead-twig brown with a slightly lighter middorsal row of "sausage links." Head, true and prolegs, body color. Black dashes on the side of the head.

The first egg of *Catocala relicta* var *bianca* hatched May 5th.

It might be well to give a condensed description of the *ilia* larva. When full grown this caterpillar is from 2½ to 3 inches long, when at rest, and robust. Rather a light grayish in color with a tinge of green. Tubercles ashen. Over the 3d pair of prolegs is a darker cross band. True and prolegs gray. The lateral setae are short. Head rounded with narrow, dark brown dashes from the center above, half way to the mouth, outlining two large eyelike gray spots above with a small central lighter tubercle. The whole larva is quite light.

Eggs of *cara* and *relicta* began hatching on May 8th. On May 10th eggs of *amica* hatched and *concumbens* on the eleventh.

Eggs of *C. ultronia* collected by the junior author hatched on the 21st of April and the young larvae were rather elongate, brownish with a darker head. On the 30th, the larvae were one-half inch long and very slender, rather dark lead color with a lighter middorsal longitudinal streak and with a sharp distinct hump over the third pair of prolegs. On May 5th the caterpillars were three-fourths of an inch long, dark brown with a light middorsal narrow band or line. A red spine-like tubercle over the 3d pair of prolegs as in the larva of *C. paranympha* (European). Head lobed or tubercled above. True legs light in color. On May 11th, the larva one inch long lead-brown with a strong middorsal red tubercle over the third abdominal prolegs with a red cross band just behind

it. Head, true and prolegs, body color. Head somewhat *cara*-like with black lateral dash. Underside, pale lead color with distinct round black spots. A middorsal longitudinal lighter stripe. On May 15th all of the largest *ultronia* larvae died apparently in the last moult. The smaller ones stiffened in death and appeared life-like. They fed on wild plum and seemed to be like the larvae of *C. paranympha* in almost every respect, even habits.

On May 15th the larvae of *C. parta* were two and one fourth inches long, light grayish grown, striped longitudinally with a middorsal row of elliptical gray spots, disconnected. Head of the *cara* type with a broad black, lateral dash from the mouth around to the mouth. The upper lobes of the head yellow brown. The cross elliptical hump over the third pair of abdominal prolegs, light yellow brown inside a narrow, black encircling line. True and prolegs light gray-brown. Lateral row of very short setae.

The larvae of *unijuga* began spinning May 11th, those of *innubens* on the 19th and *parta* on the 21st.

The *innubens* larvae of this year were from eggs laid by a female *scintillans* and like the brood of last year were perfectly healthy and grew fast but when crowded, they do not reach the size of larvae in the woods.

As the eggs of *C. amica* are small, so are the larvae, light yellow brown in color with a big round, light chestnut head. The few specimens that the senior author had, refused both white and bur oak leaves and died without eating.

On the 23d of May, the larvae of *C. parta* were two and three fourths inches long, wood brown, striped longitudinally by lighter and darker bands, the striping more or less distinct. The hump over the third pair of prolegs hardly lighter than the dirty middorsal longitudinal band and not very conspicuous. The cross ridge over the eighth abdominal segment distinct but not abnormal. The spiracular and the two (one on either side) bands, flanking the middorsal band, darker than the other bands. Head small, flat, obcordate, with lobes

not otherwise colored than the light brown head. Lateral black dashes on the head very distinct. True and prolegs light. Lateral row of short setae. These larvae hide under paper in the bottom of the jar in day time, except on rainy or cloudy days when they remain on the twigs of their food plant. It is thus probable that one would have more success larvae hunting on rainy or cloudy days.

The first larva of *C. neogama* taken in 1910 was trapped between shingles leaning against a small walnut tree and, since the larva was past the second moult, it must have been seven or eight days old. Later, many other larvae of *neogama* were taken and proved quite healthy, contrary to last year's experience. The first imagoes of *C. illecta* emerged from bred pupae on the 26th of May. The larvae of these chrysalids began spinning on the 15th of April. Allowing five days from this date for the change to the pupa state, the length of the life of the chrysalis is over a month. Many of the later species of *Catocala* require less time to complete the pupal period.

Illecta is thus one of our earliest Catocalans, plentiful here but rarely seen. In fact the senior author has never seen one in day light, though Mr. Dodge reported starting them out of thistles as he walked through a clearing near the woods. It is probable that the much rarer *clintoni* is quite as early as *illecta.*

When sugaring on the night of the 29th of June, 1906, we took fresh specimens of *grynea, polygama, ultronia,* the one *parta* and one *consors.* The Illectas and *clintoni* taken were ragged and faded. *Ilia* is hardly later than *illecta* and *clintoni* and then comes *innubens.*

Insolabilis is another of the early moths, probably occurring in June though a St. Louis collector reports taking one specimen late in May.

June 6, 1910 a full grown larva of *C. ultronia* taken between shingles leaning against a "wild-goose plum tree," was two and one fourth Inches long, dark brown, exact color of plum bark. Tubercles distinct with brown tips. Middorsal band hardly

distinguishable. Head small, flat, cara-like with a black encircling line. Upper lobes of head yellow-brown. Between the 5th and 6th abdominal segments a cross band of light reddish-brown is back of a middorsal spine-like tubercle over the 5th segment in place of the wart of other *Catocala* larvae. There is a lateral row of short setae. True and prolegs, body color. This larva is much like that of *C. paranympha* of Europe. The general body color is a peculiar dead-wood brown and recalls the prunescence on *Catocala* pupae. The underside of the body is a beautiful purple with the mid-ventral row of black spots.

A second *ultronia* larva, taken between shingles on the 8th of June was one and three eighths inches long, mouse color with a somewhat lighter face bounded by an intensely black encircling line of dashes united above. The upper lobes of the head were colored as the body. The fifth abdominal segment was lighter, subdorsally. Tubercles dark, almost black with brown tips. The cross band over the 5th and 6th abdominal segments hardly distinguishable from the rest of the body but with a slight orange or red shade. The middorsal tubercle over the 5th abdominal segment, brown with a reddish tinge, long and spine-like. A strong black line behind the pair of tubercles on the 8th abdominal segment.

On the 13th of June another larva of *ultronia* was taken between shingles.

The first of these three caterpillars began spinning on the 7th of June, and the imago emerged on the 3d of July, the second imago on the 8th of July and the third on the 10th of the same month. It appears that the length of the pupal stage is about twenty two days. Among the three imagoes, there was considerable diversity of color.

A larva of *Catocala amica,* found on bur oak by the junior author on June 8th was five eighths of an inch long, light-lead, almost silver color. True and prolegs white. Head slightly darker than the body color. Tubercles like small black dots. June 9th, this larva moulted. Was about five eighths of an

inch long, light lead color with a lighter middorsal longitudinal band. Over the 5th abdominal segment a slight black cross ridge. True and prolegs light. Underside of body whitish green with inky black spots located midventrally. Head, body color, rather large and white at the lobes above with a black spot in front of each white lunule. Tubercles black.

The larva moulted again on the 14th of June, one inch long, ashen gray with somewhat lighter tubercles. From the second abdominal segment on to the end of the body, except the 5th segment the color is lighter. The middorsal band is narrow and of the same color as the body from the 2d abdominal segment on. The cross band over the 5th abdominal segment narrow but dark brown. Tubercles dark brown set in black. The dorsal pair of 7th abdominal tubercles dark red-brown, prominent. Head gray with cream colored lunules at the lobes above. Head somewhat *cara*-like. On June 19th the larva was one and a half inches long, reddish gray with lateral row of short setae. The middorsal band narrow and hardly differing from the general body. Tubercles red. True and prolegs body color. Head large but flattened in front and with pale yellow lunules at the lobes above, inside of which is a red tubercle. Tubercular bristles noticeable. Over the 5th abdominal segment is a blackish cross ridge and over the 8th abdominal segment a strong pair of red tubercles.

June 25th the *amica* larva one and three fourths inches long, slender, light gray in color. Tubercles like flesh-colored points. Head flattened in front and lobed above with pale yellow lunules at the lobes. No facial dashes. Head as body in color. No hump over the 5th abdominal segment which is dark and quite pronounced. The pair of tubercles over the 8th abdominal segment red and much stronger than the others, reminding one of the tubercles similarly situated on the much larger larva of *C. cerogama*. There is a lateral fringe but the setae are short. The under side of the body, pale with a greenish tinge. The midventral black spots present. The true and prolegs body color. The larva began spinning June

18th, and the chrysalis gave the imago July 17th with a pupal period of about 16 days.

Of fifty one pupae of *Catocala illecta*, seventeen gave female imagoes, four moths with deformed wings, and thirty-four male moths or two males to every female.

The first larva of *Catocala grynea* was trapped between shingles leaning against an apple tree on the 11th of June. It was one and a half inches long, dark leaden brown, striped longitudinally with dark and light leaden brown. The middorsal longitudinal band narrow and much lighter than the other stripes. A row of short lateral fringe.

Head gray with an encircling lateral black stripe or dash. True and prolegs dark. The place of the *Catocala* hump over the 5th abdominal segment is a horn-like tubercle, directed sharply backward and colored like the middorsal band but a little darker. The under side of the body flesh color with the midventral row of black spots.

A second larva of *grynea* was found June 15th between shingles and was one and five eighths inches long, light grey all over with a tinge of flesh color. Row of dense short lateral setae. Longitudinal bands but moderately distinct. Head brownish red about the lobes above with orange lunules at the lobes. True legs body color. Prolegs darker. Middorsal band narrow and of elongate links somewhat lighter than the body color. The horn like tubercle over the 5th abdominal segment, short, stout and directed backward and a little darker than the rest of the body.

The third larva, full grown, was found on the 19th of June and in coloration like the first. A black line on the 3d thoracic and the 3d, 4th, and 5th abdominal segments bounds the middorsal band on either side. A lower (stigmatal) lateral black line is noticeable on the 1st, 2d, 3d, 6th, and 8th abdominal segments. Head *cara*-like with lateral black dash and flesh-colored lunules at the lobes above.

The first of these larvae began spinning June 17th, making its cocoon of silk and bits of chewed leaves. The second on

the 16th of June and the third on June 21st. The second of these died without pupating. The imago from the larva that began spinning June 17th appeared July 7th. The pupal period is apparently about three weeks.

On the 9th of June a pupa of *grynea* was found buried in the rotten wood of the top railing of a fence near an apple tree and later a chrysalis was dug from a crack in the same railing and a number of empty pupal skins found in cocoons attached to the underside of the railing. As the cocoon making in both *ultronia* and *grynea* is the same, bits of chewed leaves and silk, it is probable that neither of these spin under leaves on the ground.

The remarkable likeness of the larvae of these two species and of the European plum feeder, *paranympha* certainly places these moths close together and shows how absurd is the grouping of the species of *Catocala* upon color alone. There is no question that the safest and sanest classification is upon the larva. In a large series of specimens of any one of the species will be found a considerable variation in the color band of the hind wing as well as in the depth of color of the forewing. What would our systematists do with a black hindwinged *palaeogama* or a bright yellow-banded hindwinged *cara* or *ilia*?

The senior author's experience with the larvae of *concumbens* in 1910 was not quite so disastrous as that in 1909 with the same species. The eggs hatched early and the larvae did fine till at or past the last moult and probably would have pupated with little loss had the fine, mild weather continued, but the torrid heat that set in just before their last moult destroyed a number of them. The first larva began spinning June 17th and seven in all pupated but only four of the chrysalids gave imagoes and two of these were indifferent specimens. The other two were large and fine. Hardly better results attended the rearing of *relicta*, few of the larvae reaching the chrysalis stage. Still the imagoes were larger than those reared in 1909.

The larva of *concumbens* were rather sluggish and at no stage of their growth did any of them ever rest on the underside of the breeding jar lid but remained mostly on the twigs even when well grown.

The larvae of *neogama* always hide under paper in the bottom of the jar.

The caterpillars of *amatrix, cara,* and *relicta* often rest on the underside of the jar lid.

For two or more years, the senior author's experience with larvae of *Catocala neogama, piatrix* and *cara* was anything but satisfactory, however, in 1909, all did well and good series of the moths were secured. The first *piatrix* larvae were perfectly healthy but toward the last of the season there was a considerable loss. Contrary to the experience of 1909, the senior author was able to rear a fine lot of *amatrix* larvae and secure a magnificent series of beautiful moths, setting nineteen perfect specimens.

The dainty coloration of the front wings of some of the female *nuri* is marvelous. There is no one of the series entirely without all vestige of the oblique black band across the front wing and it does seem strange that the commoner form should be designated the variety in this species.

Imagoes from larvae bred in doors, appear from one to two weeks earlier than moths from forest feeding caterpillars and it was an easy task the past year to foretell what would likely be in abundance in the woods a week or more later and the senior author was not disappointed in his conjecture that *ilia* and *piatrix* would be abundant, for 1910 was preeminently the year of these two moths. Hardly less numerous was *cara,* and *innubens* is always plentiful.

Epione, relicta, vidua, robinsoni and *angusi* were rather scarce. *Neogama, palaeogama* and *habilis* were hardly more abundant.

Numbers of *amatrix* picked up about town would seem to show this species common but the senior author did not see a specimen of it in the woods. It is an abundant moth at Vinton, Iowa.

In late August Harold Davenport took two specimens of *C. nebulosa* but both were ragged. However, he secured sixteen eggs from the female.

On August 12th, a female *Catocala abbreviatella* was taken in the grass under an apple tree and, although crippled, laid fourteen eggs. This was the first moth of this species taken at Louisiana by the senior author although Mr. E. A. Dodge reports taking it at *Asclepias* blooms in 1900, 1901 and 1902 after sundown.

On July 30th, Harold Davenport took a fine male *C. junctura* on a shade tree in the city limits. On the 15th of August he captured a splendid *C. angusi* var *lucetta*, having taken on July 31st, a gigantic male *C. viduata*.

The senior author took a fine perfect female *viduata* on September 6th and a ragged female *C. ilia* with light yellow hing wings, on the 8th, that laid a few eggs, somewhat larger than the usual *ilia* egg and almost black against a lighter brown. Rubbed, as it was, this moth was somewhat puzzling and not till she laid the eggs was the collector positively able to determine her specific relations.

From eggs laid by a *C. innubens*, plain form, a brood of larvae was reared in 1909 that gave not a single *scintillans* moth while from eggs laid by a *scintillans*, a fine lot of imagoes of which 46 per cent. were *scintillans* were bred in 1910. As in 1909 there was practically no loss in these larvae and it is this hardy character of the *innubens* caterpillar that assures an abundance of the moths, every summer. From the latter part of June till the first of September, it is fairly common in the woods and during much of these two months passable cabinet specimens may be secured. The majority of the first specimens of the season are of the variety *hinda* and this is smaller than the normal form that hardly appears in numbers much before August. A splendid variation of *hinda* has a white or cream colored spot on the front wing and a purple reflection from the top of the primaries. *Scintillans* appears along with *hinda* and lingers until *innubens* proper disappears.

It is likely that the larvae of *innubens* like those of *piatrix* develop irregularly during much of the summer and new moths are constantly appearing.

Of the *Catocala* larvae of the common species, that of *neogama* is perhaps the largest, measuring over three and a half inches and stocky in proportion. The larva of *amatrix* often reaches three and three fourths inches but is rather slender. *Cara* three to three and a half. *Concumbens* two and three fourths to three inches. *Unijuga*, three to three and a half inches. *Ilia* about three inches but stout. The pupal period of *amatrix* is from twenty three to twenty eight days; of *piatrix*, from twenty two to twenty five days; of *neogama* about twenty-four days.

The last *Catocala* imago from a bred pupa was a *piatrix* that emerged September 9th, but moths of this species were seen at Louisiana as late as September 22d. A female *C. robinsoni* was taken Oct. 1st and lived in captivity till the 15th. It seems more than likely that the food of most *Catocala* moths is the juices of fruits. One of the authors has seen evening after evening, Piatrices feeding at grapes. Wherever there was a bruised berry or wormy fruit, the moth settled down for a repast. He even recognized the same individual moth for much of two weeks at a repast of grape juice. Homoptera came to the same food. The scarcity of fruit this year may have rendered the moth bolder than usual for the author could have taken several of them in his fingers. The moth lights on the leaves or bunches of grapes with its wings half spread and thrusts its proboscis into the bruised place on the fruit.

Quite as interesting as capturing the moths is the search for larvae. It is little trouble to collect larvae of *illecta* and *innubens* since they are so plentiful and the former makes little effort to hide itself at any time, lying out boldly on the twigs. Where shag-bark hickory is plentiful larvae of *residua*, *angusi*, *habilis* and *palaeogama* may be secured in numbers beneath the bark, more rarely *judith*, *vidua* and *epione*. *Piatrix*, *ultronia* and *grynea* may be taken between shingles, leaned in pairs

against small walnut trees, plum trees and apple trees. *Neogama* has been taken under loose paper beneath walnut bushes and between shingles. *Cara, amatrix* and others may be found on dead twigs, along vines that climb their food plants or under leaves lying against the trees on which they feed. Hunts for larvae should begin by the first of April, as the eggs of several of the earlier species hatch in March.

The shingle trap should be early set and many good things can be taken on fruit trees, especially plum and apple. It is probable that half a dozen species can be taken on these trees alone. *clintoni, abbreviatella, grynea, polygama, crataegi* and possibly *titania.*

The junior author has found the south east corner of a wood the best collecting ground for imagoes this summer, but it has been the experience of the senior author that the moths are a little eccentric sometimes and just when he has searched all the known haunts and is about disgusted with the search, they turn up in numbers in unexpected places. After much rain, they are low and often, on hot dry days, are high in the trees. On cool days, of course, they are less active and can be more easily taken as they lie sheltered beneath a great limb base or among the foliage of *Ampelopsis.*

The peculiar habits of some of the Catocalae make it difficult to take perfect specimens. *Epione* and *piatrix* fly low, even alighting on the ground. So also do *cara,* and *amatrix* but less often. The whereabouts of *illecta* and *abbreviatella* in the day time are more or less mysterious.

For intelligent assistance in the the preparation of this paper and careful scrutiny of the manuscript in the typing, the authors are indebted to Miss Margaret Haley of Louisiana, Missouri.

Drs. W. Barnes and J. McDunnough, of Decatur, Ill., who are at present engaged on a revision of the two Lepidopterous families Megathymidae and Cossidae, would be very pleased to receive material for identification and comparison. Specimens of *M. cofaqui* Stckr. are particularly desired, also *Hypopta* species from the Western States. The authors contemplate giving accurate figures of all North American species, and guarantee the utmost care in handling of specimens.

A new Anthidium from New Jersey.

By J. C. CRAWFORD.

Anthidium harbecki n. sp.

Female.—Length, about 13 mm. Black, with sparse white pubescence; head and thorax closely, coarsely punctured, the punctures of the mesonotum separated only by thin walls, those on the supraclypeal area, above insertion of antennae and on the clypeus, except on upper margin, about as close; those back of the ocelli separated from each other by about a puncture width; first joint of labial palpi about as long as second; maxillary palpi three jointed; the following body markings lemon yellow—clypeus; a small triangular supraclypeal mark; sides of face as high as insertion of antennae, and above that a narrow line on inner orbits; dilated above and attaining the height of anterior ocellus; a small spot behind the eyes below summit; a small spot on tegulae anteriorly and one on the tubercles; two small spots on anterior margin of mesoscutum, from which run caudad, lines reaching backward about as far as a line connecting the anterior margins of the tegulae; lateral margings of the mesoscutum; edges of axillae; margin of scutellum, interrupted medially, a short vertical line on the mesopleurae, narrow subapical bands on segments 1-5 and two elongate spots on segment 6; the band on segment one and two narrowly interrupted medially; all the bands with the posterior margin almost straight, the front margin at extreme sides dilated anteriorly and on segments 1-4 the bands attenuated medially; propodeum and pleuræ closely punctured; wings dusky with broad apical margins more deeply infuscated; legs strongly swollen, the basal joint of all tarsi broad and flat; the hind tibiae broadening towards apices; anterior apices of all tarsi broad and flat; the hind tibiae broadening towards apices; spur on hind and middle tibiae very thick; femora black, with a broad reddish-testaceous stripe above and the apices of the same color; lower margins of front and middle femora with a lemon-yellow stripe; tibiae yellow, the under sides reddish; basal joint of all tarsi yellow, the apical joints reddish; claws with a small but distinct pulvillus; pubescence on inner side of hind tarsi fulvous; apical margins of segments 2-5 narrowly depressed; basal margins of segments 2-6 somewhat constricted; punctures of abdomen not so coarse as on thorax, becoming finer towards bases of segments, those on the disks separated from each other by about a puncture width; anal opening on segment 6 in the shape of a cupid's bow; ventral scapa almost white.

Four female specimens collected by Mr. H. S. Harbeck at Wenonah, New Jersey, Aug. 21, 1910.

Type Cat. No. 13,454 U. S. N. M.

One of the paratypes deposited in the collection of the American Entomological Society.

Two of the paratypes differ in having the band on segment 2 entire.

Observations on Cicada pruinosa and a description of a new species.

By Wm. T. Davis.

In Entomological News for April, 1907, Prof. Smith and Mr. Grossbeck mention eight examples of *Cicada pruinosa* Say from southern New Jersey. Say says of the species that it is "found on the Missouri; it is also very common in Pennsylvania. . . ." In July 1909 Mr. Geo. P. Engelhardt collected a male *pruinosa* near Wilmington, N. C..

So far as I am aware nothing has been written of the song and habits of this species, and so during the last week in August, 1910, I visited Cape May Co., N. J., with the object of finding out something about the insect. I had not long to wait, for on the 26th, on the road leading westward from Cold Spring, I heard in a hedge of large cedars and other tangle a cicada's song quite new to me. Upon climbing up one of the cedars I was pleased to capture the first *pruinosa* that I had seen alive. There were several others in the hedge, but I could not catch them. Later I found that the species was quite general in the cedar woods, though occasional in the deciduous forest as well. I collected one and heard many in the cedar and pine woods near Fishing Creek, but they were more numerous in a grove of red cedars, hollies, persimmon, etc., standing near the shore between Higbee's Landing and the Town Bank. I saw those females at their place, all on the cedars, but I didn't catch any of them, though I collected many males. At times there would be four or five singing together, and then there would be a period of quiet, and one might pass that way and never suspect the presence of *Cicada pruinosa*. The song when heard at a considerable distance might be taken for that of a bird; there is only a loud *zape, zape, zape,* but upon a nearer approach the constant *zing* is heard, so that the song may be rendered as *z-zape, z-zape, z-zape,* that is to say there is continuous *zing* with the *zape* at pulsating intervals. The song commences with a low *zing* or *zzz,* and gradually breaks into an impetuous *z-zape*. Some-

times the male sways his abdomen up and down with each *zape*. Occasionally an individual will only *zzz*, and not get up enough energy to *zape*. I listened to several such. Altogether the song is quite unlike any other cicada song that I have heard and cannot be confused with that of any of the other New Jersey species.

I collected several specimens of *Cicada lyricen* and two of *Cicada linnei* in the vicinity of Cold Spring, Bennett and Fishing Creek, but strange to say I heard or saw nothing of *Cicada sayi*.

In August, 1909, Mr. George P. Engelhardt collected a cicada at Blowing Rock, N. C. which was new to me. In July, 1910, Mr. Leng and I secured a much broken specimen at Clayton, Ga., and still later I received from Mr. Brimley a male and female of the same species collected at Raleigh, N. C. I have also a single specimen from Staten Island, N. Y., collected some years ago, that may belong to this species. While the insect resembles *Cicada lyricen* De Geer there are some striking differences in color by which it may be readily identified, and Mr. John A. Grossbeck to whom I have shown my material thinks with me that it should be named. I take pleasure therefore in naming this species for Mr. George P. Engelhardt of the Brooklyn Museum, who gave me my type specimen, and who has been my companion on many pleasant rambles afield.

Cicada **engelhardti** n. sp.

Length: ♂ 32 mm., to tip of wings, 50 mm.; ♀ 30 mm., to tip of wings 50 mm.

Head black, sometimes with narrow, tawny stripe on front. Prothorax black, with small greenish fulvous central arrow-shaped spot, broadest behind. In *lyricen* this spot is broadest in front. Posterior and lateral borders of the pronotum black. Mesothorax nearly all black, with two faint parenthesis-like lines of fulvous partly enclosing the central portion. Sometimes these lines are heavier and there is a shade of fulvous on the posterior portion of the mesothorax. The inner surface of the front marginal vein is usually back and darker than the same parts in *lyricen*. Abdomen black above, with two narrow pruinose lines or spots at base. Beneath, with broad central black stripe and at each side is a broad lateral pruinose border.

This insect is blacker than *Cicada lyricen*, lacking the considerable amount of fulvous markings of that species, particularly on the prothorax.

Mallophaga from Birds and Mammals.

By V. L. Kellogg and J. H. Paine, Stanford University, California.

The following determinations, with description of one highly interesting new species, of *Mallophaga* are based on a small collection of these parasitic insects taken from various birds and one mammal, by Mr. Allen H. Jennings in the Panama Canal Zone. The specimens were sent us by Dr. S. T. Darling, Chief of Laboratory in Ancon Hospital, Ancon, Canal Zone, Isthmus of Panama.

Lipeurus baculus Nitzsch.

Specimen from the domestic pigeon (Canal Zone, Panama).

Lipeurus assessor Giebel.

Specimens from the turkey buzzard, *Cathartes aura*, (Canal Zone, Panama). Kellogg has recently recorded (Science, N. S. V. 31, pp. 783-784, 1910) this well-marked *Lipeurus* from the Californian condor, *Gymnogyps californianus*, and Carriker has taken it from the king vulture *Gypagus papa* in Costa Rica, while Giebel described it originally from the South American condor, *Sarcorhamphus gryphus*. It is thus a characteristic parasite of the greater American vultures. Osborn found a *Lipeurus* on turkey buzzards, *Cathartes aura*, at Ames, Iowa, but described it as a new species, *marginalis* (Ohio Naturalist, v. 2, p. 176, 1902). Specimens from the Canal Zone buzzards cannot, however, possibly be assigned to Osborn's species despite their agreement with it, and disagreement with typical *assessor*, in the matter of size. The characteristic strong medium and transverse abdominal markings of *assessor* (absent in *marginalis*) are plainly in evidence. If Osborn were a less careful systematist or less acquainted with the *Mallophaga*, we might suspect the two female specimens on which he established *marginalis* of being immature *assessors*. But as a matter of fact Osborn is both careful and well acquainted with the *Mallophaga* while, in addition, his description of the markings, confined to the lateral margins, indicates maturity of the specimens.

The small size of our specimens of *assessor* from the turkey buzzard, only two-thirds the ordinary *assessor* dimensions, should be noted perhaps by a varietal name, as *minor*.

Lipeurus heterographus Nitzsch.

Specimens from the domestic chicken (Canal Zone, Panama).

Lipeurus variabilis Nitzsch.

Specimens from the domestic chicken (Canal Zone, Panama). They seem to be Piaget's variety *gamma* recorded by him from certain pheasants, but if we should undertake in seriousness to subdivide this very variable species, *variabilis,* into its varieties, it would lead to senseless pages of variation describing.

Goniocotes gigas Taschenberg.

Specimens from domestic chicken (Canal Zone, Panama).

Laemobothrium delogramma Carriker.

One male and two females from the turkey buzzard, *Cathartes aura* (Canal Zone, Panama). The three specimens are larger than Carriker's measurements for the species. The male is 9 mm. long and the females 10 mm. each. The male is also considerably darker and more nearly wholly covered by markings than Carriker's description calls for. But on the whole if *delogramma* is a good species, and it seems to be our specimens should be assigned to it. It is a species certainly not far removed from Kellogg's *L. gypsis* from a griffon vulture, *Gyps kolbi,* from the Eastern Transvaal.

Colpocephalum kelloggi Osborn.

Specimens from the turkey buzzard, *Cathartes aura* (Canal Zone, Panama). The species was described from specimens taken on the same host in Iowa and Nebraska.

Colpocephalum longicaudum Nitzsch.

Specimen from a "fly catcher" (Canal Zone, Panama).

Menopon alternatum Osborn.

Specimens from the turkey buzzard, *Cathartes aura,* (Canal Zone, Panama). The species was described from specimens from the same host from Iowa and Nebraska.

Menopon pallidum Nitzsch.

Specimen from the domestic chicken (Canal Zone, Panama).

Menopon incertum Kellogg.

Specimen from a "fly catcher" (Canal Zone, Panama). Kellogg has recorded the species from several passerine birds from California and from twenty different bird species, mostly passerine, from the Galapagos Islands.

Menopon jenningsi n. sp. (Fig. I.)

Specimens, male and females, from a guinea pig, *Cavia cobaya,* (Canal Zone, Panama). This is the third *Menopon* species to be recorded from a mammal. *Menopon* is a two-clawed genus and ought to be found only on birds. As a matter of fact all but three of its more than two hundred species are limited to birds. The other two besides this present new one recorded from mammals are Piaget's *extraneum* and *longitarsus.* Of these two the first was described by its discoverer from the guinea pig and the second from *Halmaturus giganteus,* a large kangaroo. Curiously our new species, also from the guinea pig, does not at all resemble Piaget's *extraneum* from the same host, which is indeed quite of the usual bird-infesting Menopon type. But our species does show points of resemblance with the odd, aberrant species *longitarsus* from the kangaroo. Both *longitarsus* and our species have a curious superficial likeness to species of the typical guinea pig-infesting, one-clawed *Mallophaga* of the genus *Gyropus.* There seems to be an actual modification of these *Menopon* species of aberrant host habits toward the *Gyropus* species typical of the same hosts. Yet one of the mammal-infesting *Menopon* species is not at all modified in this way. Is its adoption of a mammal host a more recent matter, perhaps?

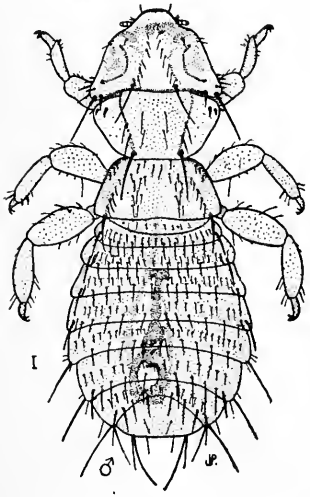

Fig. 1.—*Menopon jenningsi* n. sp.

Description of male.—Length, 1.6 mm.; width, .64 mm. across abdomen; general color pale, with light yellow on thorax and abdomen. Head: Length, .3 mm.; width, .48 mm.; front rounded; sides concave opposite the mandibles, then expanding before the antennae; remainder of margin slightly concave; posterior angles narrowly rounded. There are several minute hairs on the front; five short spines around the posterior angles, one of which, on the posterior margin, is very heavy; also one long spine on the posterior angle; a row of short spines on the dorsal surface extending from the mandibles along the faint occipital bands to the posterior margin with the marginal spine of this series long and heavy; occiput slightly sinuous.

Thorax.—Length, .44 mm.; width, .24 mm.; pro- and metathorax similar, the metathorax resembling the prothorax inverted; prothorax slightly longer and slightly narrower than the metathorax. Four short, stout spines at the anterior angle of the prothorax; two narrow longitudinal chitinous bands parallel to the margin on the prothorax with a long heavy spine arising at the posterior termination of each band. Two long heavy spines occur in the same relative position on the metathorax. Other spines as shown in the figure. There are numerous heavy spines on the ventral surface of both head and thorax. Legs pale in color.

Abdomen.—Length, .8 mm.; width, .6 mm., oval. An indistinct yellowish band and two rows of spines on each segment except the last; a heavy, long spine on each posterior lateral angle, except the last three, where two occur; length and strength of spines increasing posteriorly, those of the last segments being very heavy and long. Genitalia dark and conspicuous, extending almost to the thorax, and of unusual type.

Female.—Length, 1.72 mm.; width across abdomen, .68 mm. A fringe of fine hairs occurs on each side of the ventral surface of the last segment of the abdomen; this segment is rounded.

Gyropus ovalis Giebel.

Specimen from a guinea pig, *Cavia cobaya,* (Canal Zone, Panama).

Trichodectes sp.

A single poor specimen from a rat, *Mus rattus* (Canal Zone, Panama). Also two specimens of a wingless Psocid (Atropidae) were sent with the lot labelled "parasites from *Mus rattus.*" It would be very interesting if we could know that these Atropids were really living on the rats feeding on the hair or dermal scales. Kellogg has found Atropids in rats'

nests and bird nests living undoubtedly on the loose hairs, feathers and dermal exuviae. It is his belief, based primarily on certain striking facts of morphology, that the *Mallophaga* are degenerate descendants of the Psocidae (see Psyche, v. 9, pp. 339 ff., 1902).

New North American Cossidae.

By Wm. Barnes, S.B., M.D., and J. McDunnough, Ph.D.

In anticipation of a revision of North American Cossidae, on which we are at present engaged, and in which we propose to figure all the species, we append descriptions of several new species which have recently been received by us. The types of all these are contained in Dr. Barnes' Collection.

Givira minuta, n. sp.

♂.—Front, white; antennae, slightly bipectinate, shaft white. pectinations brown; thorax gray, sprinkled with black, patagia and metathoracic tuft reddish-brown; abdomen smoky gray, with small black lateral tufts on third segment and prominent reddish-brown anal tuft; primaries light ochreous-brown, shaded with fuscous beyond cell, and with a broad creamy costal margin; on costa at base of wing is an indistinct smoky brown spot, followed outwardly by a large semi-triangular spot of same color, extending from costa to second anal vein, the apex situated at a point just below median vein, costal angle sharp, lower angle rather blunt and preceded by slight reddish scaling; a row of brown spots along costa of which those situated near apex are largest; a smoky brown patch in cell and a somewhat larger one situated between the base of second cubital and the second anal vein; on inner margin directly below this patch a minute circular patch of similar color, portion between this and base of wings containing several fine transverse striations; beyond these two patches a distinct whitish shade extending nearly to anal angle; an oblong reddish bar at end of cell, defined slightly by lighter; subterminal space from costa to vein Cu. with a series of large irregular smoky brown blotches, that between veins M1 and M2 being the smallest and followed by a white patch extending to margin of wing; some indistinct terminal black scaling, followed by a fine terminal line of a light ochre color; fringes checkered brown and white with dark basal line; secondaries dark smoky brown, lighter on costa, with very faint traces of scattered striations and a light ochre terminal line; fringes checkered, with dark basal line. Beneath dark smoky brown with an ochreous terminal line to both wings and the markings of upper side

faintly reproduced; costa of primaries lighter, with a series of dark dots; fringes as above. Expanse, 17 mm.

Habitat: Cochise Co., Ariz. (June 8-15) 1 ♂.

This species presents a great superficial resemblance to *Eugiva carisca* Schaus, from Jalapa, Mex. Through the kindness of Dr. Dyar we have received a water color drawing of this latter species, and a careful comparison has proved it distinct. It may be most easily separated by the white teminal patch, the larger size of the patch below cubitus, and the much darker color of the secondaries.

Givira marga, n. sp.

♂.—Antennae pectinate, brownish, with white scales on shaft; front grayish white; thorax and patagia brownish gray, thickly sprinkled with white, abdomen darker. Primaries gray, with an indistinct darker shade beyond the cell, extending to inner margin; covered with fine black strigae, especially noticeable in outer third, where they form several irregular bands across the wing; basal portion of wing free from markings except along costa which is dotted with black; a prominent white bar at end of cell; extremity of veins spotted with black. Secondaries smoky brown, lighter along costa with faint traces of reticulation and a dotted marginal line. Beneath primaries as above, lighter along inner margin, markings more indistinct; secondaries lighter, reticulation in outer half prominent; basal half of costa marked with black dashes. Expanse, 30 mm.

Habitat:—Santa Catalina Islands, Calif. Described from 2 ♂ ♂.

This species resembles *G. anna* Dyar, from which it may be distinguished by its darker ground color and the lack of white on basal half of inner margin of primaries.

Givira lotta, n. sp.

♂.—Antennae pectinate, brownish, with white shaft; front and palpi grayish; thorax and patagia smoky brown, strongly sprinkled with gray; abdomen with traces of tufts on basal segments, dark brown; primaries, ground color gray, obscured with dark brown at base, the dark shading extending obliquely to a point on costa beyond cell; costa gray, spotted with black; a faint white dot at apex of cell, and a white marginal line on basal half of inner margin; outer third of wing pure gray; faint traces of reticulation over whole wing; the extremity of veins bordered by a double row of black dots, which extend outward across the fringes; these latter gray, bordered outwardly slightly with white. Secondaries dark smoky brown with

traces of reticulation and darker checkering on fringes, which show traces of white at anal angle. Beneath, primaries, smoky, silvery gray along inner margin; costa, gray with black spots; traces of strigae over whole wing; fringes as above; secondary, pale gray, lighter along costa, which is striped with black; some traces of reticulation give a powdery appearance to wing; fringes dark brown. Expanse, 29 mm.

The faint dot at end of cell, combined with the dark brown markings is sufficient to distinguish this species from *anna* Dyar, and it differs from *marga* B. & McD. in possessing the white line on basal half of inner margin.

Habitat:—Yavapai Co., Ariz. (Buchholz), Aug. 16-23. 2 ♂ ♂.

Hypopta palmata n. sp.

♂—Palpi porrect, extending beyond front, antennae strongly bipectinate, shaft white; collar and thorax largely white, sprinkled with black and gray scaling; abdomen light brown, rather thickly haired at base and with slight blackish anal tuft; primaries white, shaded strongly with dark smoky brown along inner margin, below the cell from base of Cu2 to anal angle, and beyond the cell along veins M1 and M2, the dark scales extending slightly upward towards apex; veins, especially the branches of median and cubitus, outlined in dark, the dark scaling broadening out at extremity of veins to form small triangular patches along outer margin, the intervening white patches presenting a fan-like appearance; costal margin and cell remain entirely white, as well as a long oval patch below the cell between the cubitus and first anal, and a sharply pointed shaft extending between the two anal veins to their point of junction; fringes dusky, composed of black and white hairs; secondaries light smoky brown; veins slightly darker; fringes whitish. Beneath gray, lighter at base with veins sharply outlined in darker. Expanse, 22-26 mm.

Habitat:—Gila Co., Ariz. 2 ♂ ♂.

Genus **HAMILCARA** n. gen. (Type *atra* n. spec.)

Palpi minute, upturned; thoracic vestiture scaly; antennæ of ♂ bipectinate in basal half only; frenulum well developed; primaries narrow with large areole, vein R1 from cell, R2 from areole, R4 and R5 stalked from a point with R3, M1 from just below areole, M2 and M3 from a point, Cu from angle of cell, 1st and 2nd anal not connected; secondaries with S. C. free, R and M1 almost parallel from base of wing to margin, with perpendicular discocellular bar, M2 and M3 from

angle of cell, Cu 1 from behind "cellula intrusa," which is present on both wings.

This genus is closest to the European genus *Phragmataecia* Newm., but an examination of the type (*arundinis*) showed several points of difference in the venation of primaries; in *arundinis* vein R1 is from areole, which is much broader than in *atra* and connected basally with the "cellula intrusa;" the abdomen is also produced for a far greater length beyond hind wings, and the thoracic vestiture is entirely hairy.

It also differs considerably in venation from *Zeuzera* (type *pyrina* L.), the most readily distinguished feature being the lack of the cross-bar on secondaries between subcostal and radius.

H. atra n. spec.

♂.—General color dark smoky gray; thorax sprinkled with lighter scales and with blackish markings on hinder portion; abdomen gray; primaries thickly covered with fine black striations, forming a series of irregular transverse lines across wings; in basal portion these are closer together, causing a darker appearance; a narrow black bar at end of cell; secondaries smoky, lighter at anal angle and inner margin; remainder of wing very finely reticulated with black. Beneath as above; all black markings obscure except along costa of primaries for two-thirds its length. Expanse, 35 mm.

Santa Catalina Mts., Ariz. 1 ♂, Coll. Barnes.

Hamilcara gilensis n. spec.

♂.—Thorax gray, mixed with black, especially on metathoracic segment; base of legs thickly covered with long gray hairs; abdomen with short silky gray squammation; primaries gray, shaded with light brown in basal portion of submedian fold and with numerous fine black transverse striae, which in the outer portion of wing tend to form irregular bands; from costal margin, at one-third from base, a black bar of variable width, inwardly oblique, extends across cell to cubital vein; a narrow black bar at end of cell extends upward to costa, both bars being parallel; fringes dusky, checkered with black; secondaries pure white, bordered by dusky fringes, along the margin of which a few faint reticulations are discernable. Beneath, primaries, smoky gray, lighter along costa and inner margin; a series of dark spots on costal margin; striations of upper side faintly reproduced in outer portion of wing; secondaries as above. Expanse, 34-40 mm.

Habitat:—Gila. Co., Ariz. 3 ♂ ♂.

Some Australian Sawflies.

By S. A. Rohwer, Washington, D. C.

Through the kindness of Mr. R. E. Turner, while in London last year, I had the pleasure of studying many specimens of Australian Tenthredinoidea belonging to him. The following species proved to be new. The Australian Tenthredinoid fauna is very different from any other region—the genus *Arge* being the only genus which is not restricted to the island and its immediate environs, excepting the introduced *Eriocampoides lamacina* (Retz.) Two species are described from the collections of the British Museum of Natural History, and all the types of all the species are in this Museum. Paratypes of some of the species collected by Mr. Turner are in the United States National Museum.

Perga rubripes, new species.

Female.—Length, 16 mm. Head, excepting the shining clypeus and posterior orbits, and thorax opaque, with fine, close punctures; antennal club nearly as long as the three preceding joints, rounded at the apex; lobes of the scutellum broad, obtuse, projecting posteriorly so as to form a nearly straight line with the sides of the scutellum; venation very like *bella* Newman. Black; head behind the supraorbital line, most of the posterior orbits, sides of the anterior lobe of mesonotum, and the scutellum dull rufous; middle of the clypeus, mandibles (apices piceous), legs below the coxae, and the two apical abdominal segments shining rufo-testaceous; antennae, a spot at the base of each antenna, margin of the clypeus, narrow posterior orbits, line on pronotum, tegulæ, lateral line on the side lobes of the mesonotum, line on the pleura, spot above the posterior coxa, and seven lateral spots on the abdomen white. Wings hyaline, iridescent; venation testaceous.

Type locality:—Tasmania. Two females.

Type:—In the British Museum of Natural History.

Related to *P. foeresteri* Westwood, but that species has the lobes of the scutellum extending laterally so as to form an angle with the sides of the scutellum.

Perga leucomelas, new species.

Female.—Length, 12.5 mm. Clypeus impunctate, slightly emarginate; head quadrate, dulled by small punctures; in front of the an-

terior ocellus is a shining, slightly depressed area; postocellar area defined laterally, with a longitudinal impressed line in the middle; eyes very prominent, almost circular in outline; malar space large; antennal club longer than any other joint, broadest in the middle; dorsulum and scutellum opaque, with fine punctures; lobes of the scutellum obtuse; sheath obliquely truncate. Head and thorax above brownish-ferruginous, with the pronotum a little paler; tergum except the sides and apex bright reddish-yellow; sides and apex of the tergum, pleuræ just beneath wings and the sheath dark brownish-black; venter, pectus, most of pleurae, legs except the infuscate middle tibiæ and tarsi the blackish posterior tibiæ and tarsi cream color; antennæ blackish, the apical two-thirds of the club pallid. Wings yellowish hyaline, iridescent; venation dark brown, stigma reddish.

Type locality:—Kuranda, Queensland, Australia; paratype from Cairns, Queensland. Collected by Mr. R. E. Turner.

Type:—British Museum of Natural History.

Paratype:—Cat. No. 13,357 U. S. N. M.

In color related to *P. cameroni* Westwood, but the second cubital cell is not longer than the first, and the pleuræ and venter are paler than the body.

Perga froggatti, new species.

Female.—Length, 14 mm. Clypeus and posterior orbits shining, with large, widely separated punctures; head and thorax opaque, with close, small punctures; club of the antennæ longer than the three preceding joints, the apex rounded; scutellum with two lateral lobes; second cubital cell quadrate; the third cubital cell as long as one and two combined; legs normal. Dark reddish brown; the tibiæ and abdomen a little paler. Wings yellowish hyaline, iridescent; venation the color of the body.

Type locality:—New South Wales, No. 222.

Paratype locality:—Cumberland, New South Wales.

Type:—In the British Museum of Natural History.

Paratype:—Cat. No. 13,358 U. S. N. M.

Perga lucida, new species.

Female.—Length, 14 mm. Head and thorax shining with large, sparse punctures, the punctures closer on the middle lobe of the mesonotum; scutellum flat, with very small apical lobes; mesonotum with the anterior lobe well defined; antennæ longer than the three preceding joints, rounded at the apex; second cubital cell not quadrate; third cubital cell much wider on the cubitus; legs normal. Shining

reddish-brown. Wings yellowish hyaline, iridescent; venation the color of the body.

Type locality:—New South Wales, No. 217.

Type:—In the British Museum of Natural History

This species and *P. froggatti* are related to *P. belinda* Kirby —the three being similarly colored and having six-jointed antennæ with the club longer than the preceding joints. They may be separated as follows:

Scutellum closely, densely punctured, opaque .... **froggatti Roh.**
Scutellum with scattered punctures, shining 1
1. Occiput and vertex shining, with a few scattered punctures; middle lobe of the mesonotum well separated from the lateral ones ..... **lucida** Roh.
Occiput and vertex with close punctures, opaque; anterior lobe of mesonotum poorly defined ..... **belinda** Kby.

Genus **PTERYGOPHORUS** Klug.

Pterygophorinus Ashmead.

Lophyrotoma Ashmead.

Pterygophorus civetus Klug.

Pterygophorus insignis Kirby.

Pterygophorus uniformis Kirby.

Pterygophorus analis Konow [1907, Zeit. Hym. Dipt., p. 218].

Pterygophorus analis A. Costa.

Pterygophorus guadialis Konow [1907, Zeit. Hym. Dipt., pp. 218, 219].

Pterygophorus distinctus, new species.

Easily recognized by the truncate clypeus, opaque appearance and pale spot on the pleuræ.

Female.—Length, 12 mm.; expanse, 25 mm. Clypeus very rough, the apex truncate; head, except a small area in front of the anterior outline, very opaque with close punctures; antennal furrows complete; postocellar area well defined; antennæ, 23-jointed (the apical joint wanting), the joints beneath with the normal triangular-shaped rami; dorsulum and scutellum opaque like the head, pleuræ more shining; abdomen opaque above; venation normal. Black; antennal joints 3-9, a spot on the pronotum, a large spot on the scutellum, metanotum, abdominal segments one and two, part of the sixth and the api-

cal segment yellow or slightly reddish; legs black; bases of the four anterior tibiae, their tarsi and the hind tibiae and tarsi the color of the body. Wings subhyaline, costa and basal vein at the apex very dark; venation dark brown, stigma and costa reddish.

Type locality:—Woodford, New South Wales. One female collected by Mr. G. A. Waterhouse, May 24, 1909.

Type:—British Museum of Natural History.

Pterygophorus turneri, new species.

Related to *P. distinctus* in the truncate clypeus, but may be distinguished from that species by the shining appearance, entirely black pleuræ, and the absence of antennal furrows below the ocelli.

Female.—Length, 12 mm.; expanse, 25.5 mm. Head very transverse, shining, impunctate; clypeus truncate; antennæ 20-jointed, the two apical joints almost consolidated; antennal furrows almost wanting below the ocelli; postocellar furrow gently curved; postocellar area well defined; thorax shining like the head; abdomen slightly dulled; venation normal. Shining blue-black; antennal joints 3-9, large spot on the pronotum, scutellum, metanotum, a faint indication of a narrow band on segments one and five, and the apical segment *straw-yellow,* legs black, base of the four anterior tibiæ, the hind tibiæ and tarsi straw-yellow. Wings yellowish hyaline, iridescent, costal area darker; venation pale brown, stigma and costa reddish.

Type locality:—Cairns, Queensland, Australia. Two females collected by Mr. R. E. Turner, for whom the species is named.

Type:—In the British Museum of Natural History.

Paratype:—Cat. No. 13,360 U. S. N. M.

Pterygophorus zonalis, new species.

Related to *P. interruptus* Klug, but that species has the transverse median vein but little basad of the middle of the first discordal cell, and the antennæ are entirely black.

Female.—Length, 10.5 mm.; expanse, 25.5 mm. Head quite transverse, shining; clypeus emarginate; antennal furrows wanting below the ocelli; postocellar area well defined; postocellar furrow rather sharply angled; thorax sculptured like the head, shining; venation normal; sheath rounded on the lower margin. Blue-black marked with reddish-yellow; antennal joints 3-9, large spot on the pronotum,

a spot on the pleuræ, scutellum, metanotum, abdominal segments one to four and the terminal segment reddish-yellow; apical abdominal segments velvety-black; the remainder of the body blue-black; legs black; all the tibiæ and tarsi reddish-yellow. Wings yellowish hyaline, iridescent, costal area from the basal vein to the apex of the wing much darker; venation black, costa and stigma reddish.

Type locality:—Mackay, Queensland, Australia. Two females collected by Mr. R. E. Turner, labeled "169 Hg."

Type:—In the British Museum of Natural History.

Paratype:—Cat. No. 13,359 U. S. N. M.

EURYS Newman.

The species of this genus may be separated by means of the following table:

Abdomen, pronotum and legs rufous; small species ..... **inconspicua** Kby.

Abdomen and thorax metallic 1

1. Color, bright green 2
   Color, dark olive green, or with a bronzy appearance 3
2. Clypeus deeply notched; malar space shorter than the pedicellum; base of the femora black ..... **nitidus** Kby.
   Clypeus nearly truncate; malar space about the same length as the pedicellum; femora entirely pale ..... **laetus** (Westw.)
3. With a strong reddish tint to the body; no ocellar basin, but a line-like furrow from the anterior ocellus to the middle fovea; (antennæ rather strongly clavate; scutellum rough, the edges sharp, slightly reflexed) ..... **aeratus** Newm.
   Without reddish tint; ocellar basin present and a broad shallow depression from the anterior ocellus to the middle fovea ..... **decepta** Roh.

Eurys decepta, new species.

Female.—Length, 5 mm. Clypeus deeply notched; malar space shorter than the length of the pedicellum; antennal and supraclypeal foveæ confluent; middle fovea very large and only slightly separated from the ocellar basin; ocellar basin broad; a fovea behind each lateral ocellus; antennæ rather clavate, the third joint longer than the fourth; head dullish, closely, finely punctured; dorsulum and scutellum shining; venation normal except the first cubital cell is narrow and as long as the second; claws simple. Head and thorax olive green, with a bronzy tint, metallic; the bronze color of the abdomen is more marked than that of the thorax; ventral part of tergal seg-

ments with pale spots; labrum, mandibles and legs below the trochanters rufous; wings slightly yellowish hyaline, iridescent; venation dark brown.

Male.—In general the male is like the female, but the base of the femora, or the femora entirely are black, and the pale spots on the abdomen are wanting.

Type locality:—Melbourne, Victoria, Australia. One female collected by French; and one female and four males labeled "C. F. 2' 01" No. 1,165 (supposedly from Victoria).

Type:—In the British Museum of Natural History.

Paratype:—Cat. No. 13,355 U. S. N. M.

Euryopsis bella, new species.

Male.—Length, 4.5 mm. Clypeus truncate; malar space shorter than the pedicellum; antennae 11-jointed, the third joint longer than the fourth; antennal furrows not very strong; ocellar basin wanting; middle fovea large, circular; head and thorax shining with separate punctures; venation as in *Eurys*. Bright metallic green; knees and legs below reddish. Wings yellowish hyaline, iridescent; venation brown.

Female.—What may be the female has the clypeus notched, and the legs reddish.

Type locality:—Near Sydney, Australia. Collected by Mr. R. E. Turner.

Type:—In the British Museum of Natural History.

Female in the U. S. National Museum.

The males of the two species of *Europsis* Kby. may be separated as follows:

Femora entire reddish; color blue with some greenish tints; apical antennal joint obtuse, shorter than the preceding **nitens** Kby.

Femora mostly black; color, green; apical antennal joint more acute and longer than the preceding ..... **bella** Roh.

NEOEURYS, new genus.

Short, robust, metallic species; clypeus truncate; malar space distinct; posterior orbits narrow; antennæ slender 14-jointed, the third joint longer than the fourth; scutellum rounded at the apex; body much like *Eurys*; claws simple; abdomen normal; the third cubital cell as long as the first and second combined; first recurrent vein received near the base

of the second cubital cell; the second recurrent vein received in the basal third of the third cubital cell; radial cell of the hind wings truncate and appendiculate. Venation in the main like *Eurys*.

Type of the genus:—*Neocurys metallica* Rohwer.

Readily separated from its allies by the 14-jointed antennæ.

Neoeurys metallica, new species.

Female.—Length, 4.75 mm. Head opaque, finely and closely punctured; antennal furrows present near the ocelli only; postocellar furrow wanting; area between the lateral ocelli and the middle fovea raised; no ocellar depression; middle fovea oval more sharply defined above; antennal joints slightly ridged beneath; dorsulum and the scutellum more shining than the head; stigma broad, the lower margin rounded; sheath straight above, rounded below, the apex obliquely truncate. Metallic bronze; labrum, mandibles, four anterior knees, all the tibiæ and tarsi reddish-yellow. Wings yellowish hyaline, iridescent; venation pale brown, basal half of the stigma pallid.

Type locality:—Heborne, Victoria, Australia. Two females labeled "C. F. ♂ 00" No. 1,167.

Type:—In the British Museum of Natural History.

Paratype:—Cat. No. 13,356 U. S. N. M.

DIPHAMORPHOS, new genus.

Short, robust species. Head seen from the front broader than high, posterior orbits rather narrow, similar to some Nematines; clypeus short; labrum large; eyes slightly converging to clypeus; malar space present but narrow; antennæ inserted close to the clypeus, 15-jointed, third joint much longer than the fourth; ocelli in a triangle, the lateral ones on the supraorbital line; thorax much like *Blennocampa*; legs normal, postbasitarsis much shorter than the following joints, claws simple; venation differs from *Perreyia* as figured by MacGillivray [Proc. U. S. N. M. XXIX (1438) fig. 80] in the second recurrent being received by the third cubital cell.

Type of the genus:—*Diphamorphos nigrescens* Rohwer.

Diphamorphos, Clarrisa Kirby, *Eurys* Newman, *Europsis* Kirby and *Neocurys* Rohwer will form a subfamily in the Tenthredinidæ. *Diphamorphos* may easily be separated from

the other members of the subfamily by the antennæ inserted close to the clypeus not near the middle of the face.

Diphamorphos nigrescens, new species.

Female.—Length, 6mm; robust; clypeus truncate; antennal furrows present and nearly complete; middle fovea deep, circular, with a transverse arm on each side; third antennal joint as long as four plus five; head and thorax shining, with some scattered punctures. Black; labrum, mandibles, legs below the knees and trochanters pallid; femora brown. Wings hyaline, iridescent; venation brown.

Type locality:—Victoria, Australia. Two females labeled "C. F. 2, 01" No. 1,187.

Type:—In the British Museum.

Paratype:—Cat. No. 13,353 U. S. N. M.

Diphamorphos minor, new species.

Female.—Length, 3.5 mm. Clypeus truncate; malar space very narrow; postocellar area well defined; antennal furrows wanting; ocellar basin wanting; posterior orbits very narrow; middle fovea deep, circular; third antennal joint as long as four plus five; head and thorax shining, without puncture; appendiculation of the radial cell not as distinct as in *nigrescens,* Black; legs below the coxæ and the four basal abdominal segments rufous. Wings hyaline, slightly dusky, iridescent; venation black.

Male.—Length, 3 mm. Postocellar area parted by a furrow; abdomen entirely black; otherwise as in female.

Type locality:—Cairns, Queensland, Australia. Many specimens collected by Mr. R. E. Turner. Specimens labeled "Kur. 2 '02."

Type:—In the British Museum.

Paratype:—Cat. No. 13,354 U. S. N. M.

A Preoccupied Generic Name.

THYNNOTURNERIA n. n.

Turnereila Roh., Ent. News, Vol. 21, Oct., 1910, p. 349; not *Turnerella* Ckll., Ent., Oct., 1910, p. 262.

Type:—*Thynnus cerceroides* Sm.

ERRATA.

Page 397.—Line 4 from bottom, for *endowed* read *colored.*

" 398.—Line 25, for *liquida* yet read *liquida* Grt.

" 400.—Line 25, for *external* read *antennal.*

—F. H. Wolley Dod.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., DECEMBER, 1910.

We have lately received a letter from a distinguished entomologist who asks our help in getting his specimens determined. This is only one of a number of such letters we have received from various workers and collectors. He says, "I have been trying to find some kind person who will undertake to determine some Hymenoptera and another who would do the same in Diptera, but so far without success." He had applied to some museums and individuals without result and says, "So I am turning to you almost as my last hope." These conditions seem rather strange in view of the fact that the number of persons engaged in systematic work has greatly increased. The men at the various museums and experiment stations are all more or less systematists in part. We know naming things is not the easy task some persons think, but in the good old days it was not so difficult to get specimens named as there was always some hard working specialist and enthusiast who gladly did the work. There certainly seems to be something wrong in this respect at the present time. The plea of overwork seems like an excuse as the men in former times that did such work were not professional entomologists that worked from 9 to 4.30, but men engaged in other pursuits that worked at entomology after a hard day in earning their daily bread.

SAY WASP NESTS SET BARNS ON FIRE.—Hollidaysburg, Pa., Oct. 31.—Last week two of the largest barns in Blair County, owned by William McKillup and A. E. Helsel, worth $10,000, were burned to the ground. Investigators, after a thorough inquiry, put forth the theory that the barns were set on fire by wasps' nests, ignited by spontaneous combustion, produced by the chemical action caused by the wax coming in contact with the paper-like susbstance of which the nests are composed. —*Newspaper.*

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

THE ENTOMOLOGICAL SOCIETY OF AMERICA.—The fifth annual meeting of the Entomological Society of America, will be held in Minneapolis, Minn., Tuesday and Wednesday, December 27 and 28, 1910, in connection with the annual meeting of the American Association for the Advancement of Science. The annual address will be given on the evening of December 28th, by Prof. F. L. Washburn.

It is proposed to hold a joint session with the American Association of Economic Entomologists on the afternoon of December 28.—JOHN B. SMITH, *President;* C. R. CROSBY, *Secretary-Treasurer.*

UNIVERSITY OF PENNSYLVANIA ESTABLISHES NEW COURSE IN MEDICAL DEPARTMENT.—The study of beri-beri, sleeping sickness, leprosy, cholera, yellow fever and other distinctly tropical diseases will be one of the most important branches of scientific investigation to be undertaken in the new course of training for medical missionaries to be established this week at the medical department of the University of Pennsylvania.

The course, which has been made necessary by the opening of missions in tropical countries in all parts of the world, will facilitate the dealing with disease in those regions. It is intended not only to help the American who goes to the hot zones to carry a gospel of health and hygiene, but to prepare the student from Central and South America, who comes here to college, to meet home conditions. Heretofore no medical equipment to fit the physician for this peculiar phase of work has been given, and he reached his field of endeavor unable to cope with its diseases.

The lectures and clinics, which will last for fifteen weeks, although open to students of the medical department, will be in the nature of post-graduate work. Practicing physicians and graduates of other colleges will be admitted, and upon completion of the course they will be given a certificate.

The course will include the methods of preventing the spread of diseases and disinfection; the hygiene of houses, plantations, jails and immigrant stations. The various diseases of the eye, including the parasites of the eye and the stings of insects, will be discussed. In addition, there will be courses in surgery, bacteriology, pathology, helminthology, arthropodology, protozoology, tropical medicine and climatology, together with the study of the skin diseases of the tropics.

The lectures and clinics will be conducted by Drs. A. C. Abbott, W. Pepper, M. B. Hartzell, George E. de Schweinitz, G. P. Muller, Allen J. Smith and Philip P. Calvert and M. H. Jacobs.

THE EIGHTH INTERNATIONAL ZOOLOGICAL CONGRESS was held in Gratz, Austria, from the 15th to the 20th of August. Gratz is an important town, situated in the mountains and has an excellent university. There were nearly six hundred persons in attendance and over fifty delegates from the United States. Many important papers were read and the excursions and social functions were greatly enjoyed. The excursion to Dalmatia under the auspices of the Congress was a success in every way and the president Hofrat Prof. Dr. L. von Graff did everything in his power for the comfort and enjoyment of the excursionists.

The Austrian-Lloyd steamer Africa left Trieste on the morning of August the 20th and returned to the same place August 26th. Most of the towns in Dalmatia were visited. A numbers of congressionists also visited Bosnia and Herzegovina. Owing to the coronation of H. R. H. Prince Nicholas it was not possible to visit Cettinje, the capitol of Montenegro. Prof. Herbert Osborn of Columbus, Ohio, attended the Congress as representative of the Entomological Society of America and the Ohio State University. He read a paper on an entomological subject. Dr. Henry Skinner was also in attendance as representative of the American Entomological Society and the Entomological Society of America. The next Congress will be held in Monte Carlo, in 1913.

An Appeal To Reason.—A while ago the German Entomological National Museum in Berlin sent to me by mail a number of Hemiptera for determination. Upon the arrival of the package I was informed that I had to pay a duty of $7.13 as insects can be sent duty-free only to museums. The sum is not very large, but repeated several times a year it is not quite immaterial and this time I refused to pay it and ordered the package to be sent back to Berlin. Is there no entomologist in Washington of such social standing that he could make it clear to the very wise legislators who trot in the footsteps of Messrs. Payne and Aldrich that it is an outrage to have to pay a regular monetary penalty to the Government for the right to devote one's leisure hours to scientific studies? Is this one of those sacred points in the law which it would be "unconstitutional", or " un-American" to repeal? Or is there in this country a museum-trust trying to monopolize the study of foreign insects? Every time even small boxes with one or two types, sent by sample-post from abroad for comparison, are addressed to me, they must first go to the Customs in Boston where they sometimes are tampered with, apparently suspected to be something else than insects. Recently one of my correspondents had the happy idea to send some insects via Japan and San Francisco, and then for the first time I got them without trouble, though rather belated.

Yet difficult as it is to receive insects, it is hardly easier to send them abroad. When I sent my first box from Minnesota the postmaster, contrary to the regulations of the Universal Postal Union, refused to despatch it. As he had got his job from political reasons without knowing anything about postal matters (something unthinkable on the other side of the ocean), I realized that it was useless to argue with him and wrote to the Postmaster-General in Washingon whereupon I promptly got justice. Upon presentation of my first insect box at the postoffice in this city the postal official refused to forward it because the insects looked to him "poisonous" and "dangerous to handle." He did not yield until after a lengthy quibbling which has been more or less vigorously repeated every time I have had something to send.

Anywhere in Europe and its colonies, even in the remotest corner of darkest Russia, entomologists can send and receive insects without the slightest trouble, not to speak of duties. How long shall this remain a *pium desiderium* here?—E. Bergroth, Fitchburg, Mass.

The twenty-third annual meeting of the American Association of Economic Entomologists will be held in Minneapolis, Minnesota, December 28 and 29, 1910, in connection with the annual meeting of the American Association for the Advancement of Science. The exact time and place of holding the sessions, information concerning hotel headquarters, railroad rates, etc., will be forwarded to members as soon as the program is made up.

The Association is assured a cordial welcome in Minneapolis and the members are urged to be present and assist in making the meeting a pronounced success.—E. D. Sanderson, *President,* Morgantown, W. Va.; A. F. Burgess, *Secretary,* Melrose Highlands, Mass.

Research Work in Africa.—The Entomological Research Committee (Tropical Africa), appointed by the Colonial Office, has lately issued Part 2 of the first volume of the *Bulletin of Entomological Research.* It contains articles by recognized experts on the subject, including Dr. J. B. Davey, Mr. Frank Hughes, Mr. Harold H. King, Mr. R. Newstead, Mr. F. C. Willcocks, Dr. A. C. Oudemans, and Mr. Charles Rothschild.

The *Bulletin* states that Mr. S. A. Neave, the committee's entomologist in East Africa, has recently visited the shores of the southern end of Lake Nyasa. He could find no signs of *Glossina palpalis,* and he considers that the nature of the vegetation and the general character of the insect fauna render it highly improbable that the species will be found there. *G. morsitans* was found abundantly on the Upper Shire river and on the western shores of Lake Nyasa, though in the latter case it was more plentiful half a mile or so inland than on the actual shore. This species appeared to be absent from the eastern side of the lake. Mr. Neave has also traversed the southern portion of the Protectorate, and is now proceeding by land along the whole western side of the lake, leaving Karonga about the middle of July and striking across German East Africa to Mombasa. On the west coast Mr. J. J. Simpson has already visited all the medical posts in the Western Province of Southern Nigeria, and most of those in the Central Province. He is now traversing the Eastern Province, and will then proceed to Northern Nigeria. Encouraging reports have been received from both entomologists with regard to the cooperation of medical and other officers in furthering the work of the committee.

It is also announced that arrangements have been made by the Colonial Office for short courses in entomology to be given at the two Schools of Tropical Medicine at Oxford, Cambridge, Edinburgh, and Dublin, for the benefit of officers in the African Colonies and Protectorates when home on leave. Advantage has already been taken of this in a number of cases, for during the present summer the following numbers have taken, or are taking, courses in entomology:—Officers from the Gold Coast, 7; from Sierra Leone, 2; from Northern Nigeria, 1; from Southern Nigeria, 8; from the East Africa Protectorate, 3; from Uganda, 1; from Nyasaland, 2; making a total of 24. Twenty-two other officers have intimated their desire to take the course in the near future.—*London Times.*

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), excluding Arachnida and Myriapoda. Articles irrelevant to American entomology, unless treating of new genera, 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, and are all dated the current year unless otherwise noted. This (°) following a record, denotes that the paper in question contains description of a new genus; while this (*), that of a new North American form.

For complete record of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

4—The Canadian Entomologist. **5**—Psyche, Cambridge, Mass. **6**—Journal, New York Entomological Society. **7**—U. S. Department of Agriculture, Bureau of Entomology. **9**—The Entomologist, London. **11**—Annals and Magazine of Natural History, London. **12**—Comptes Rendus, L'Academie des Sciences, Paris. **16**—Bulletin, Societe Nationale d'Acclimation de France, Paris. **22**—Zoologischer Anzeiger, Leipzig. **35**—Annalen, Societe Entomologique de Belgique. **40**—Societas Entomologica, Zurich. **44**—Verhandlungen, K. k. zoologisch-botanischen Gesellschaft in Wien. **50**—Proceedings, U. S. National Museum. **53**—Transactions and Proceedings, New Zealand Institute, Wellington. **55**—Le Naturaliste, Paris. **76**—Journal, Cincinnati Society of Natural History. **83**—Notes from the Leyden Museum. **84**—Entomologische Rundschau. **89**—Zoologische Jahrbucher, Jena. **92**—Zeitschrift fur wissenschaftliche Insektenbiologie, Berlin. **94**—"Das Thierreich" herausgegeben von d. Deutschen zoologischen Gesellschaft, Berlin. **123**—Bulletin, Wisconsin Natural History Society, Milwaukee. **136**—Stettiner Entomologische Zeitung. **152**—California Agricultural Experiment Station, Berkeley. **153**—Bulletin, American Museum of Natural History, New York. **173**—Die Grossschmetterlinge der Erde, von A. Seitz, Stuttgart. **176**—Archiv fur entwicklungsmechanik der Organismen, Leipzig. **179**—Journal of Economic Entomology. **180**—Annals, Entomological Society of America. **188**—Bulletin, International Academie des Sciences de l'Empereur Francois Joseph I., Prague. **189**—Pomona Journal of Entomology, Claremont, Cala. **232**—Bulletin, Societe Portugaise des Sciences Naturelles, Lisbon. **262**—Public Health and Marine Hospital Service of the United States, Washington. **268**—Acta Societatis Scientiarum Fennicae, Helsingfors. **285**—Nature Study Review, Urbana, Illinois. **291**—Proceedings, Staten Island Associa-

tion of Arts and Sciences, Lancaster, Pa. **292**—Acta Universitatis Lundensis (nova series). **293**—Spolia Zeylanica, Colombo, Ceylon. **294**—Fauna Sudwest-Australiens. Ergebnisse der Hamburger sudwest-australischen Forschungsreise 1905. Jena. **295**—Handbuch der Vergleichenden Physiologie. Herausgegeben von Hans Winterstein. Jena. **296**—Forest and Stream, New York.

GENERAL SUBJECT. Biedermann, W.—Die Aufnahme, Verarbeitung und Assimilation der Nahrung. Neunter Teil. Die Ernahrung der Insekten (Hexapoda). **295,** ii, 1st Halfte, 726-902. **Braun & Luhe.**—A handbook of practical parasitology. (Insecta, pp. 183-192), 208 pp. New York, Wm. Wood Co., 1910. **Cockerell, T. D. A.**—Fossil insects and a crustacean from Florissant, Colorado, **153,** xxviii, 275-288 (*). **Dury, C.**—Ecological notes on insects, **76,** xxi, 61-63. **Hawkins, L. S.**—Insects in the course of study, **285,** vi, 193-195. **Mangold, E.**—Die Produktion von Licht, Insekten, **295,** iii, 2d Halfte, 290-304. **Meissner, O.**—Kurz Bemerkungen ueber einige neuere naturwissenschaftliche Theorien. III. Die Mimikrytheorie, **40,** xxv, 49-50. **Meyer, Dr.**—Zur Mimicrytheorie, **40,** xxv, 60. **Przibram, H.**—Die Homoeosis bei Arthropoden, **176,** xxix, 587-615.

APTERA & NEUROPTERA. Bengtsson, S.—Beitrage zur kenntnis der palaarktischen Ephemeriden, **292,** v, Nr. 4, 19 pp., 1909 (°). **Enderlein, G.**—Panisopelma quadrigibbiceps, eine neue Psyllidengattung aus Argentinien, **22,** xxxvi, 280-281 (°). **Handlirsch, A.**—Der erste fossile Insekt aus dem Oberkarbon Westfalens, **44,** lx, 249-251 (°). **Hare, E. J.**—Some additions to the Perlidae, Neuroptera-Planipennia, and Trichoptera of New Zealand, **53,** xlii, 29-33, 1909 (°). **Klapalek, F.**—Revision der Gattung Acroneuria, **188,** xiv, 1909, 234-247 (*). **Muttkowski, R. A.**—Additional notes on Trichocnemis aliena, **123,** viii, 106-109. The applicability of certain generic names of Odonata, **123,** viii, 158-160. Gomphus cornutus in Milwaukee County, **123,** viii, 110-111. **Ris, F.**—The identity of two Odonata fossils, **123,** viii, 102-105. Odonata, **294,** ii, 417-450. Libellulinen, Collections Zoologiques du Baron Edm. de Selys Longchamps. Catalogue systematique et descriptif. Fasc. xi, 245-384.

ORTHOPTERA. Davis, W. T.—Additions to the list of Staten Island Orthoptera, **291,** ii, 193-194. Staten Island Grouse Locust, **291,** ii, 148, 149. **Megusar, F.**—Regeneration der Fang-, Schreit- und Sprungbeine bei der Aufzucht von Orthopteren, **176,** xxix, 499-586.

HEMIPTERA. Barber, T. C.—The Coccidae of Audubon Park, New Orleans. (First Paper.) **179,** iii, 420-425. **Bergroth, E.**—

Remarks on Colobathristidae with descriptions of two new genera, **35,** liv. 297-303 (°). **Bierman, C. J. H.**—Homopteren aus Niederlandisch Ost-Indien, **83,** xxxiii, 1-68 (°). **Cockerell, T. D. A.**—The Coccidae of Boulder County, Colorado, **179,** iii, 425-430 (*). **Davis, J. J.**—A list of the Aphididae of Illinois, with notes on some of the species, **179,** iii, 407-420. **Distance, W. L.**—Rhynchotal notes LII. Australian Pentatatomidae, **11,** vi, 369-388 (°). **Gillette, C. P.**—Plant louse notes, family Aphididae, **179,** iii, 367-371, 403-407. **Hagemann, J.**—Beitrage zur kenntnis von Corixa, **89,** xxx, 373-426. **Matausch, J.**—Observations on Membracidae in the vicinity of Elizabeth and Newark, N. J., **6,** xviii, 164-171. Smilia camelus, and some of its variations, **6,** xviii, 171-172 (*). Contributions a l'etude biologiques des Chermes, **12,** cli. **652-654. Oshanin, B.**—Verzeichnis der palaearktischen Hemipteren. Band III, 217 pp.—**Reuter, O. M.**—Neue beitrage zur phylogenie und systematik der Miriden, **268,** xxxvii, No. 3, 177 pp. **Schmidt, E.**—Neue und bekannte Gattungen und Arten der subfamilie Cercopinae des indoaustralischen Faunengebietes, ein Beitrag zur Kenntnis der Cercopiden, III, **136,** lxxii, 52-129 (°). **Schumacher, F.**—Beitrage zur Kenntnis der Biologie der Asopiden, **92,** vi, 263-266. **Severin & Severin.**—Notonecta undulata preying on the eggs of Belostoma glumineum (note), **4,** xlii, 340. **Van Duzee, E. P.**—A revision of the American species of Platymetopius, **180,** iii, 214-231 (*).

LEPIDOPTERA. Andre, E.—Elevage de deux especes de Cricula des Indes, **16,** lvii, 407-419. **Barnes & McDunnough.**—List of Sphingidae of America, north of Mexico, **5,** xvii, 190-206. New species and varieties of N. A. Lepidoptera, **6,** xviii, 149-162 (*). **Busk, A.**—New moths of the genus Trichostibas, **50,** xxxviii, 527-530 (*). **Davis, W. T.**—A visitation of geometrid moths, **291,** ii, 130-131. **De Seabra, A. F.**—Quelques observations sur les metamorphoses du Trichosoma boeticum, **232,** iii, 155. **Forbes, W. T. M.**—New England Caterpillars, No. 2. Eubaphe nigricans, **6,** xviii, 163-164. **Franck, G.**—The influence of climate in producing aberrations in Lepidoptera, **291,** ii, 151-154. **Fyles, T. W.**—Basilona imperialis (note), **4,** xlii, 332. **Marsh, H. O.**—Biologic and economic notes on the yellow-bear caterpillar (Diacrisia virginica), **7.** Bull. No. 82, 59-66. **Meyrick, E.**—Lepidoptera from Kermadec Islands, **53,** xlii, 1909, 67-73 (°). **Pearsall, R. F.**—A new geometrid genus and new species from the extreme South-West, **4,** xlii, 330-332 (*). **Punnett, R. C.**—"Mimicry" in Ceylon butterflies, with suggestions as to the nature of Polymorphism, **293,** vii, pt. 25, 1-24. **Quayle, H. J.**—The orange tortrix (Tortrix citrana), **179,** iii, 401-403. **Rippon, H. F.**—Icones Ornithopterorum: A mono-

graph of the Rhopalocerous genus Ornithoptera, Vol. II. Pub. by the author, Upper Norwood, S. E., England. **Schaus, W.**—New species of Heterocera from Costa Rica, II, **11,** vi, 402-422 (*). **Schmidt, H.**—Biologische Bemerkungen zu einigen gallenerzeugenden Schmetterlingen, **40,** xxv, 57-58. **Smith, J. B.**—Notes on certain Taeniocampa species, **4,** xlii, 317-323. Notes on the N. A. species of Agroperina, **6,** xviii, 137-148 (*). Notes on the species of Anytus, **5,** xvii, 206-209 (*). **Warren, W.**—Euchoristea gen. nov. Fauna palaearctica, **173,** Lief. 65, 93 (°).

DIPTERA. Austen, E. E.—New African Phlebotomic Diptera in the Br. Mus., Part VII. Tabanidae, **11,** vi, 337-356 (°). **Currie, D. H.**—Mosquitoes and flies in relation to the transmission of leprosy, **262,** P. H. Bul. No. 39, 42 pp. **Enderlein, G.**—Neue Gattungen und Arten ausser-europaischer Fliegen, **136,** lxxii, 135-209 (°). **Graenicher, S.**—The bee-flies (Bombyliidae) in their relations to flowers, **123,** viii, 91-101. **Hodge, C. F.**—A practical point in the study of the typhoid or filth fly, **285,** vi, 195-199. **Hyslop, J. A.**—The smoky crane-fly (Tipula infuscata), **7,** Bull. No. 85, 119-132. **Kertesz, C.**—Catalogus Dipterorum hucusque descriptorum, Vol. VII. Syrphidae, Dorylaidae, Phoridae, Chythiidae. 470 pp. **Miller, D.**—Bionomic observations on certain New Zealand Diptera, **53,** xlii, 226-235, 1909. **Thompson, W. R.**—Synonymical and other notes on Diptera, **5,** xvii, 210-213.

COLEOPTERA. Ahlwarth, K.—Coleopterorum Catalogus, Pars 21; Gyrinidae. 42 pp. **Brown, T.**—On the Coleoptera of the Kermadec Islands, **53,** xlii, 1909, 291-306 (°). **Dury, C.**—New species and additions to the list of Cincinnati Coleoptera, **76,** xxi, 64-67 (*). **Herman, W. C.**—A new bird enemy (Calosoma scrutator), **76,** xvi, 80. **Horn, W.**—Une forme nouvelle d'Omus, **35,** liv, 293-295 (*). **Johnson & Hammar.**—The grape root-worm, with especial reference to investigations in the Erie grape belt from 1907-09, **7,** Bull. No. 89, 100 pp. **Kerremans, C.**—Monographie des Buprestides, Lampetis (continued). Tome V. Livr. 3-4, pp. 65-128. **Klimsch, H. F.**—Eine interessante Monstrositat (Anchomenus assimilis), **40,** xxv, 56. **Krausse, A. H.**—Clytus rhamni temesiensis und Clytanthus sarton.—Mimikry? **92,** vi, 301-305. **Lameere, A.**—Revision des Prionides. Seizieme Memoire. Prionines (III), **35,** liv, 272-292. **Leng, C. W.**—The species of Diplotaxis liable to occur on Staten Island, **291,** ii, 198-200. **Marsh, H. O.**—Notes on a Colorado ant (Formica cinereorufibarbis), **7,** Bull. No. 64, 73-78. **Muttkowski, R. A.**—A new species of Chalcophora from Wisconsin, **123,** viii, 135-136 (*). **Nichols, M. L.**—The spermatogenesis of Euchroma gigantea, **198,** xix, 167-178. **Schmidt, A.**—Eine Serie

neuer Aphodiinen, **136,** lxxii, 1-51. Coleopterorum Catalogus, Pars. 20: Aphodiinae. 111 pp. **Schmidt, H.**—Notizen zur Biologie unserer gallenbildenden Russelkafer, **84,** xxvii, 137-140. **Sherman, J. D.**—A list of Labrador Coleoptera, **6,** xviii, 173-197. **Xambeu, C.**—Moeurs & metamorphoses des especes du genre Rhizotrogus, **55,** xxxii, 226-228.

HYMENOPTERA. Blandenier, A.—Fecondation des meres-abeilles en captivite, **16,** lvii, 420-421. **Brues, C. T.**—Notes and descriptions of N. A. parasitic Hymenoptera,—IX, **123,** viii, 67-85 (*). **Burrill, A. C.**—How sanguinary ants change at will the direction of column in their forays (F. sanguinea var.), **123,** viii, 123-132. **Cockerell, T. D. A.**—Some very small Australian bees, **9,** xliii, 262-264 (°). Descriptions and records of bees, **11,** vi, 356-366 (°). **Dalla Torre & Kieffer.**—Cynipidae, 94, Lief. 24, 891 pp. **Janet, C.**—Organes senesitifs de la mandibule de l'Abeille, **12,** cli, 618-621. **Kearney, J. L.**—Some solitary hunting wasps (popular), **296,** lxxv, 690-91. **Langhoffer, A.**—Blutenbiologische Beobachtungen an Apiden, **92,** vi, 275-277. **Lovell, J. H.**—The Prosopididae of Southern Maine, **5,** xvii, 177-185 (*). **Luderwaldt, H.**—Zur Biologie zweier brasilianischer Bienen, **92,** vi, 297-300. **Quayle, H. J.**—Aphelinus diaspidis, **179,** iii, 398-401. **Robertson, C.**—Hosts of Strepsiptera, **4,** xlii, 323-330. **Rohwer, S. A.**—Japanese sawflies in the collection of the U. S. National Museum, **50,** xxxix, 99-120 (°). **Schmiedeknecht, O.**—Opuscula Ichneumologica, Fasc. xxvi, pp. 2001-2080. **Snodgrass, R. E.**—The thorax of the Hymenoptera, **50,** xxxix, 37-91. **Solowiow, P.**—Bau der Stigmen bei den Larven Cimbex, **92,** vi, 271-275. **Tucker, E. S.**—New parasites of the genus Meraporus, **4,** xlii, 341-346 (*). **Wheeler, W. M.**—A gynandromorphous mutillid, **5,** xvii, 186-190. **Whitmarsh, R. D.**—North American Paniscini, **180,** iii, 186-208. **Woodworth, C. W.**—The control of the Argentine ant. (Synoptic tables, and figures of allied forms), **152,** Bull. No. 207, 53-82.

Doings of Societies.

At a regular meeting of the Feldman Collecting Social held Sept. 21st, 1910, at 1523 S. 13th St., Philadelphia, thirteen members were present. Pres. Harbeck in the chair.

Dr. Castle read an itemized list of the families represented in the Coleoptera recently collected by him in Florida—in all about 300 species.

Mr. C. T. Greene exhibited a pair of *Sphecius speciosus* Dru. (Hym.) collected at Wenonah, N. J., IX-5-10.

Mr. Harbeck reported the finding of a colony of *Stelis australis Cress* (Hym.) at Wenonah, N. J., on VIII-28-10, taking about twenty specimens. Three specimens were also taken of a species of *Dianthidium* (Hym.) which he could not identify.

Mr. Laurent stated that *Polyphylla variolosa* Hentz (Col.) was very common around the electric lights at Anglesea, N. J., on the night of June 30th. Of thirty or more specimens collected all proved to be males; said that he had been with Dr. Skinner about twenty-six years ago when two were caught at Asbury Park, N. J. Dr. Castle remarked that Dr. Stevens had found this species plentiful at Plymouth, Mass. The females apparently never come out, but could be found by watching the males dig in the sand and then following them. Mr. Wenzel said this was questionable, as in *occidentalis* the female is the commoner. He mentioned a case where many females of *variolosa* were found on and near a rail fence.

Mr. Harbeck said in Trenton, while people were away from home from Saturday morning until Monday morning, the Catalpa sphinx larvae had completely denuded a Catalpa tree and that a bucket and a half of larvae had been collected from the remaining trees.

Mr. Haimbach exhibited five specimens of a moth collected at Hyde Park, Mass. VII-10-10 and stated that he had taken fifty-one in two days. It belongs to the genus *Periclymenobius* containing three species all described from the Pacific coast. The species shown is *P. frustellus* Wals. (on determination of Mr. Kearfott). Mentioned having seen the flight of the Brown-Tail Moth while there and said that if one looked at the electric lights it resembled a blizzard.

Adjourned to the annex.

GEORGE M. GREENE,
Secretary.

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Exotic butterflies given in exchange for stamp collection or unused current issue your locality.—Geo. Rossiter, 618 Queen E, Toronto, Can.

Eggs—Would like to buy eggs of Sphingid and Saturnid moths or of any other large moth. Please mention food plants and price. Will not pay more than 5c. per doz.—S. L. Wright, Jr., Bay Head, N. J.

Indian and Venezuelan butterflies to exchange for others. Desire large and showy North American and Mexico.—George Rossiter, 618 Queen E, Toronto, Canada.

Living pupae and cocoon wanted of the following for cash or exchange from one to one hundred of each species: *A. luna*, *C. imperialis*, *regalis*, *dictynna*, *jorulla*, *orizaba*, *splendida*, *gloveri*, *calleta*, *columbia*, *californica*, *angulifera*, *C. pandora*, any *Sphinx*, any *Papilio* and eggs of any Catocalae.—A. F. Porter, Decorah, Iowa.

Wanted—All kinds of pupae and cocoons from North America and Mexico, either for cash or good exchange.—Herman H. Brehme, 74 13th Avenue, Newark, N. J.

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IN EXCHANGE

The Following Insects of East Africa and South America:

Ceroglosus gloriosus, bouqueti v. andestus, suturalis, peladosus, Caliderus macropus.

Oryetes boas, Eudicella, Eudalia, Neptomoides polychloros, Inesida leprosa, Dyplognata montana, Chirocselis mulleri, Pachytiscus hector, Ranzania bertolini, Eulyctus nodipennis, Microcerus annuliger, Callichroma aurovittata, Hemiptris, Kraatzi, Cerolepsis virigularis, Lixus orbitalis, Rabdotis aulica, Phryneta conradti spinata, Microcerus spiniger, Steromus sansibaricus, Volumnia westermani, Dicastes gerstackeri, Popillia hibernis, Cionerus perlatus, Psiloptera guttulata, Sternocera interrupta, castanea.

For the Following North American Specimen:

Tetracha, Cincidela, Calosoma, Cychrus, Carabus, Dynastes, Strategus, Cerambicidae.

In Exchange or Cash, Pupae and Cocoons:

Epiphora bauchiniae, 80c.; Attacus atlas, $1.20; edwardsii, $1.50; Actias leto, $1.50; selene, 80c.; Anth. mylitta, 80c.; andamana, $1; Leopa katinka, 70c.; Calig. cachara, 60c. Cocoons Attacus jacobae, aurota and Morpho hercules can be had cheap.

For the following pupae or cocoons of Papilios, all silk bearer, Sphinx and Smerinthus, especially T. Modesta as well as any other common specimens. Communicate with

JOSEPH SEVER, 335 East 49th Street, New York Cith

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Will exchange eggs of *Hemileuca californica*. Cicindellidae wanted. *C. senilis* for exchange. Send list of duplicates and number of specimens of each.—G. R. Pilate, Box 94, Colton California.

For exchange—ENT. NEWS, Vols. XV, XVIII and XIX, all unbound and complete, except Vol. XV, No. 1, has first plate missing; wish tropical Lepidoptera in exchange.—Miss Kate W. Strong, Setauket, Long Island, New York.

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Lepidoptera in papers from this locality for exchange. Lists sent on application. Edwin P. Meiners, Troy, Illinois.

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Imported Indian Cocoons of *atlas, mylitta, roylei, ricini, trifenestrata, selene, telo* and others, and hybrid *selene-luna* in papers for *regalis, versicolora* and other live native pupæ.—James L. Mitchell, 212 Indiana Trust Building, Indianapolis, Indiana.

North American and exotic Lepidoptera wanted. Will offer North American Coleoptera in exchange.—G. Chagnon, Post Office Box No. 186, Montreal, Canada.

I collect in all orders for cash. Locals only. Unique field. Hand-written price lists for intending buyers, two cents. Specialists served.—A. H. Manee, Southern Pines, N. C.

Diptera—Will give duplicates in exchange for identification.—A. J. Weidt, 439 Washington Street, Newark, N. J.

Duplicates—Fine *Parnassius* ex. Thian-Shan, Turkestan, including *romanovi, appolonius* and ab. *flavomaculata, Staudingeri nubilosus, intermedius*, etc.; rare Saturnids in paper as: *Philosamia, ricini, athacus, Edwardsi, atlas;* var. ex. *java: Arpema mimosæ; Actias selene; Antherea mylitta* and var. *sivalica; Nudaurelia menippe, ringleri, caffraria*, etc., and plenty of common species in papers and cocoons. Will take in exchange cocoons or moths of rare Saturnids or Parnassius; particularly want *Calleta, Colombia* cocoons.—J. Henry Watson, 70 Ashford Road, Withington, Manchester, England.

I have for exchange living pupae of *P. asterias, Sp. achemon, quinquemaculata, sexta, chersis, A. luna, A. myron, A. aurora, E. tityrus* and *octomaculata.* Want pupae of others not in my collection.—Joseph N. Lang, 619 Bunker St., Chicago, Ill.

Lepidoptera—I have for exchange living pupae of *Adelocephala bicolor, Sphinx jamaicensis;* also in papers, *Meganostoma coesonia, Apantesis virgunculta* and *catocalae.*—James Tykal, 2807 Ridgeway Avenue, Chicago, Ill.

EXCHANGES.

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.

Records of Hemiptera collected on Long Island desired (especially Homoptera, and will be received with much appreciation by C. E. Olsen, Jefferson Ave., Maspeth, L. I.

Wanted connections with reliable entomologists in California, Arizona and Florida for the intercourse of mutual assistance in experimental work with Heterocera and Rhopalocera.—Carlo Zeimet, 170 William Street, New York, P. O. Box 1613.

Cicindelidae for exchange. All are first class, fresh, in papers. Also have others in my collection.—Adolph Maresh, 2517 S. Homan Avenue, Chicago, Ill.

Wanted—Proc. Ent. Soc. Phila., Vol. ii; Trans Am. Ent. Soc., Vol. iii; Experiment Station Record, Vol. iii, No. 4, and Vol. iv, No. 5; Bull. of Brooklyn Ent. Soc., Vol. iii. Will pay cash or exchange.—R. W. Harned, Agricultural College, Mississippi.

Wanted—Riley's 9th Mo. Report. Have Riley's 4th and the Supplement to 9th and index to the 9th Mo. Reports for sale.—E. O. G. Kelly, Wellington, Kansas.

Polyphylla variolosa offered in exchange—Have you fine specimens of this rare North American beetle in your collection? If not, send me a list of not over twenty rare species that you have to offer in exchange. My supply of specimens is limited.—Philip Laurent, 31 East Mt. Airy Ave., Philadelphia, Penna.

Coleoptera exchanged for native or exotic specimens new to my collection. List on application.—Emil Liljeblad, 1018 Roscoe St., Chicago, Ill.

Wanted—All kinds of pupae and cocoons either for cash or good exchange.—Herman H. Brehme, 74 13th Ave., Newark, N. J.

Have for Exchange—Eggs of *Catocala innubens, cara, ilia, neogama, vidua, piatrix, scintillans* and pupae of *modesta* and other hawks and pupae of *ajax, cresphontes, luna* and others. Wish eggs or imagoes of *marmorata*, etc.—R. R. Rowley, Louisiana, Mo.

Imported Indian Cocoons of *atlas, mylitta, roylei, ricini, trifenestrata, selene, leto* and others, and hybrid *selene-luna* in papers for *regalis, versicolora* and other live native pupæ.—James L. Mitchell, 212 Indiana Trust Building, Indianapolis, Indiana.

North American and exotic Lepidoptera wanted. Will offer North American Coleoptera in exchange.—G. Chagnon, Post Office Box No. 186, Montreal, Canada.

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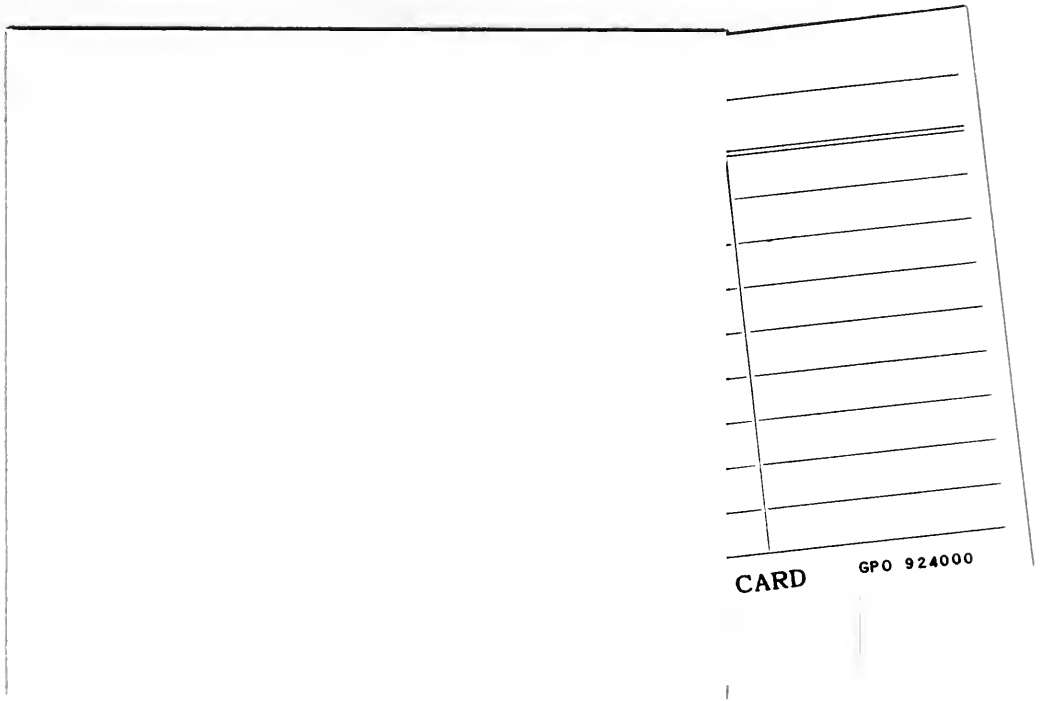
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