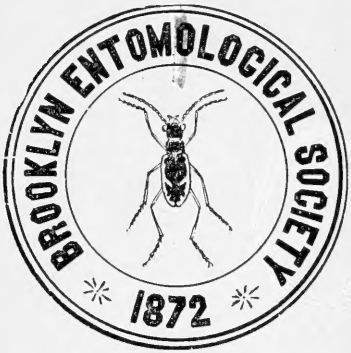
ENTOMOLOGICA AMERICANA

PUBLISHED BY THE



AT BROOKLYN, N. Y.

VOL. III. — APRIL 1887 to MARCH 1888.

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ENTOMOLOGICA AMERICANA

VOL. III. BROOKLYN, APRIL, 1887. NO. 1.

By the Retiring Editor.

When, two years ago, I took Editorial charge of *Entomologica Americana*, it was without any knowledge or expectation that before the end of the year I should leave Brooklyn, the city of its publication. In the summer of 1885 I was appointed to the position of Assistant Curator of Entomology in the U. S. National Museum, and it was considered that it would still be possible to continue to control the publication, notwithstanding the necessary change of residence. It was at that time and for some time afterward, possible for me to get to Brooklyn for a few days every month or two, and the disadvantages resulting from a residence of the Editor outside the city of publication, were reduced to a minimum. Nevertheless some difficulties arose which induced the Editor to ask for an assistant, and Mr. Geo. D. Hulst was elected to that position by the Society. Since the summer of 1886 it has been impossible for me to get to Brooklyn, except at rare intervals, and despite the best efforts of all concerned it was found impossible to get the numbers out as promptly as theretofore. The loss of time in sending proofs twice to Washington for correction, and the consequent tendency on the part of the printer to run in notes on short pages on his own proof reading, resulted in some annoying errors,—all of which, and some other reasons not necessary to enumerate, induced me to resign my position with the end of Vol. II, and to decline a re-election. It is not without regret that I resign the privilege of editorial communication with the Entomological World; but the good of the Journal in my opinion required it. Nevertheless, as a contributor I shall hope to keep up my interest in the Journal and its success shall be, as before, one of my most earnest efforts. It would be in poor taste for me to praise my own work, but I cannot refrain from a

feeling of satisfaction at the results of my efforts during the past years, and I take this opportunity of most sincerely thanking those who have by their aid, their contributions and their advice, aided me in making the Journal a success.

As to my successor and whilom assistant, he is not unknown to the readers of "ENT. AM." and he will, no doubt, succeed even better than I did in raising the character and value of the Journal. I bespeak for him the same aid from the friends of the Journal that was so liberally accorded me.

JOHN B. SMITH.

By the Incoming Editor.

In assuming the duties and responsibilities of my office, I have no policy to unfold or promises to make. It is a serious undertaking to try to fill the place of my predecessor, one of our ablest Entomologists and as well one of our best Systematists, but circumstances have induced him to retire, and the Brooklyn Ent. Society has chosen me to take his place. I shall try to do my duty to it, and to the Science, in which its members are interested; I shall be abundantly satisfied if the Journal during the year just begun maintains the character and standing which it has always had under the leadership which has just ended. I beg the assistance of those who are interested in Entomology and ask them to make it to a proper extent their medium of communicating facts and discoveries in the Science to the Entomological World at large.

Antennal Structure of the genus Cressonia.

BY JOHN B. SMITH.

In several communications to the Brooklyn Ent. Society and to the Ent. Society of Washington I called attention to the distinctive character of the antennæ of the *Saturniidae* and *Ceratocampidae*, and in a Revision of the former family in the Proc. U. S. N. Mus. for 1886, I pointed out more fully of what this peculiarity consists and its systematic value. Herrich-Schäffer was the first so far as I can find, who noticed the character of the pectinations in this group in his "Europäische Schmetterlinge", but he there considers it valueless for systematic purposes. Recently, in examining a specimen of *Cressonia Juglandis*, I found to my surprise, that the antennæ here are in the ♂ exactly as in the *Saturniidae*. I had carefully examined the great majority of Bombycid genera and found the pectinations single, and the re-currence of the doubly bi-pectinate antennæ

in this *Sphingid* genus was therefore unexpected. No other American species is so distinguished, and I cannot find a note of any other species so distinguished, from other countries.

In describing the genus, Messrs. Grote and Robinson (Proc. Ent. Soc. Phil. V, 186) stated that the antennæ were "doubly bi-pectinated" in the ♂, simple in the ♀, failing however to remark on the anomalous nature of this structure. In venation this species is typically *sphingid*, and its larva of the true *sphinx* type. The tongue in the imago is entirely obsolete, the feet are subequal in length, the frenulum wanting in the ♀, very minute in the ♂, the loop wanting on the primaries: these structures being essentially *Bombycid*.

This structure can hardly be explained in any way, unless we consider it an example of reversion—considering the *Saturniids* as the more ancient type, and the typical *Sphinges* as more recent than the *Smerinthids*.

Catocala marmorata, *Edw.*

This insect, one of the most beautiful, as well as one of the largest of its genus, for many years was known only in isolated examples. The type came from Yreka, Cal. Then it was taken here and there, in from one to four or five specimens. In West Farms, by Mr. Angus; in New Jersey, by Mr. Doll; in Covington, Ky., by Mr. Dury; in Ills., by Prof. French; in Evansville, Ind., by Mr. Evans, as well as other places, but everywhere very rarely. A year or two since however its true home was found; Mr. Franck of Brooklyn, while travelling through Kentucky, heard of a local collector, and after the manner of the "brethren of the net" visited him to see who he was, and what he had. Imagine his surprise to find that this collector, unknown to fame, had *C. marmorata* by the scores. Our wide awake Brooklynite came to us showing box after box of these regal insects! By a misfortune many were broken, but we saw enough to excite our wonder. The collector reported, that it was very common in his vicinity.

Geo. D. Hulst.

Notice to Subscribers.

It has been our custom in the past to send the first two numbers of Entomologica Americana to all subscribers to the preceding volume. We will follow this custom this year also, but No. 3 of the current volume will be sent only to those who have renewed their subscriptions. We call the attention of all to this and ask them to remit as soon as convenient to the Treasurer. If the address of any subscriber be incorrect, he will confer a favor by sending his corrected address to the Editor.

SYNOPSES OF CERAMBYCIDÆ.

By Chas. W. Leng, B. S.

(Continued from p. 200, vol. II.)

Our most variable and widely distributed species. Black or brown with white or yellow pubescence on thorax and elytra. The thoracic pubescence may be either in the form of anterior and posterior marginal bands more or less interrupted, or lateral blotches more or less extended. The elytra always have bands as shown in our figure, but they may be broken into dots or the lines waved throughout their entire length or again they may be nearly concealed by a generous sprinkling of hair over and between them. These variations in color have caused an extensive synonymy and although no varieties actually seem to exist in nature I would suggest that for convenience in cabinet arrangement two names be retained: *fuscus* Kirby, for the form with the sides of thorax entirely covered with pubescent blotches and the elytral bands wavy, and *interruptus* Lap & Gory, for the form with the bands greatly obscured by the sprinkling of white hair. Such specimens will always be noted by the collector as distinct and less confusion will be caused by retaining the names than by omitting them

X. annosus Say. J. A. P., V, 2, 1827, p. 277.

Length 9—15 mm. = .36—.60 ins. Hab. Mo., Cal., Mont., Tex., Me., N. H.

Black with white pubescence. The apical and intermediate bands are fairly distinct, the others entirely obscured by the sprinkled white hair. This species is more slender than *undulatus* and *nauticus*, and that will serve to distinguish old or poorly marked specimens. Fresh specimens are easily known by the uniform white pubescence on the black ground. It appears to be rather rare.

X. nauticus Mann. Bull. Mosc., 1843, II, p. 305; *gramineus* Hald, Trans. Am. Phil., X, 1847, p. 40; Lec. J. A. P., ser. 2, II, p. 27.

Length 11—14 mm. = .44—.56 ins. Hab. W. T., Cal., Mont., Or.

Brown, with yellowish-brown bands and interspersed pubescence, the bands always more or less confused. The bands are always more angulate than in *undulatus*, certain forms of which this species strongly resembles. Beneath the segments are never distinctly banded with yellow, as is usual in *undulatus*. *X. gramineus* does not differ in any way from *nauticus*. I have indicated in the synoptic table the most interesting feature in this species, the tendency to form transverse rugæ on the pronotum like *Neoclytus* or a tubercle at the side.

NEOCLYTUS, *Thom.*

This genus is again sharply defined by the transverse ridges of the pronotum, which are not elsewhere found, except as above stated in an

occasional specimen of *X. nauticus*. The usual number is five, the anterior being the most elevated. There are frequently other ridges at the sides as well as the row down the middle, and there is a tendency to coalesce, which in two species is carried to the extreme, and the row of transverse ridges becomes one broad longitudinal ridge, rugose at top. The form of the ridges and the femoral species, and the form of elytral tip, which seems very constant in this genus, serve to divide the species as follows:

Middle and posterior femora spinose at apex.
Thorax with a longitudinal elevated ridge, rugose at apex. antennæ filiform.
Elytra truncate, spinose; thorax with apical basal and middle pubescent bands, ... **scutellaris.**
Elytra truncate, spinose; thorax with apical and basal bands only..... **luscus.**
Thorax with a middle and two lateral rows of transverse rugæ, almost coalesced; antennæ thickened externally; elytra shortly acuminate..... **irroratus.**
Thorax with a few distinct transverse rugæ; antennæ filiform or thickened on middle joints; elytra obliquely truncate, spinose.
Thoracic ridges distributed over entire dorsal surface, thorax spinose at sides; pubescence white, in arcuate bands..... **devastator.**
Thoracic ridges arranged in median row; pubescence yellow in straight bands only..... **erythrocephalus.**

Femora not spinose; antennæ filiform.
Thorax with a few feebly elevated but distinct transverse rugæ in median row; sides of thorax simply punctured.
Elytra transversely truncate ..... **approximatus.**
Elytra shortly acuminate..... **balteatus.**
Elytra separately rounded ..... **interruptus.**
Thorax with many transverse rugæ at middle and sides, strongly elevated but more or less confused.
Elytra rounded at tip.
Elytral bands forming two oval marks..... **conjunctus.**
Elytral bands irregular (see figure) ..... **ascendens.**
Elytral bands forming one oval and two oblique bands..... **capraea.**
Elytra truncate at tip.
Bands angulate or arcuate.
Thorax wider than long..... **muricatulus.**
Thorax longer than wide ..... **longipes.**
Bands straight, transverse ..... **torquatus.**

Of these species it may be noted that *ascendens*, *approximatus*, *balteatus* and *interruptus* are known only by specimens in the cabinets of Dr. Horn or the late Dr. Leconte. The species do not vary in marking to the extent noted in *Xylotrechus.*

N. angulatus Fab. Ent. Syst., I, 2, p. 335: Chev., Mon., 1862, p. 531; *rhombifer* Oliv., Ent., IV, 70, p. 46, t. 4, f. 51; Lap & Gory, Mon., p. 17, t. 4, f. 19; Lec., J. A. P., ser. 2, II, p. 26; *Hopei* Lap & Gory, Mon., p. 18, t. 5, f. 20; Lec., l. c., p. 28.

Length 11—15 mm. = .44—.60 ins. Hab. Jamaica, Cuba, Georgia, N. Y.

I have not been able to see this insect and am therefore unable to include it in the synopsis. It is described as under :

"Reddish brown, thorax longer than wide with fine short transverse rugæ at "middle and two at sides somewhat longer, the sides subspinose; elytra truncate and "externally spinose, with the suture, basal margin, an oblique line from humerus to "suture and a small spot at middle, whitish or luteous pubescent, or with the lines "reduced to dots."

The posterior thighs are described as spinose by Dr. Leconte in *rhombifer*, not in *Hopei*. It is a West Indian species and apparently rare in collections here.

N. scutellaris Oliv. Encycl. Meth., V, 1790, p. 266; Ent. IV, 70, p. 51, t. 5, f. 52; Lap & Gory, Mon., p. 53, t. 11, f. 62; *elegans* Melsh., i. litt.; Hald., Trans. Am. Phil., X, p. 40.

Length 7—16 mm. = .28—.64 ins. Hab. La., Ga., N. C., Va., Tex., Pa., Ohio, N. Y., Kans., Neb.

Differs from the next but slightly ; the band of thorax is however always distinct, the thorax more narrowed in front, and the elytra more strongly armed at tip, generally bispinose.

N. luscus Fab. Ent. Syst. Suppl., p. 152; Syst. El., II, p. 347; Lap & Gory, Mon., p. 27, t. 6, f. 32; Lec., J. A. P., ser. 2, II, p. 26; *aculeatus* Dej., Cat., 3d ed., p. 356; *humeralis* Newn., Ent. Mag., V, p. 394; *maculosus* Gmel., ed. Linn., I, 4, p. 1854; *mucronatus* Fab., Syst. Ent., p. 193; Oliv., l. c., IV, 70, p. 38, t. 3, f. 34; *tricolor* Megerle, i. litt.

Length 7—19 mm. = .28—.76 ins. Hab. Pa., Ga., La., Ohio, Tex., Va., Mo., Can., Or.

Reddish brown, posterior two-thirds of elytra and parts of thorax often darker. This and the above have the markings fairly constant but sometimes partly obliterated.

N. irroratus Lec. J. A. P., IV, 1, 1858, p. 26; *morosus* Chev., Mon., 1860, p. 501; Dej., Cat., 3d ed., p. 356.

Length 10—18 mm. = .40—.72 ins. Hab. Texas.

Very distinct by the characters named in the table. Dark brown with sparse whitish pubescence. Chevrolat has based a new genus upon its characters which, as it stands alone in our fauna, it seems unnecessary to use. The clubbed antennæ are partly approached by other species.

N. devastator Lap & Gory, Mon., p. 17, t. 4, f. 18, bis.; Chev., Mon., 1862, p. 531; *araneiformis* Sturm, Cat., 1826, p. 121; *cordifer* Dej., Cat., 3d ed., p. 357; *campullipes* Schüpp, Dej. Cat., l. c.; *corthurnatus* Klug, Dej. Cat., l. c.; *rufescens* Lap & Gory, Mon., p. 16, t. 4, f. 18.

Length 5—16 mm. = .20—.64 ins. Hab. Florida.

This species has been taken in great number at Key West and Indian River, Fla., also in Cuba. Color reddish brown with white pubescence. Thorax sometimes black and white markings sometimes partly obliterated.

N. erythrocephalus Fab. Ent. Syst., I, 2, p. 335; Lap & Gory, Mon., p. 20, 5, f. 23; Hald., Trans. Am. Phil., X, p. 39; *acuminatus* Fab., Spec. Ins., I, p. 234;

ambulator Sturm, Cat., 1826, p. 121; *americanus* Gmel., ed. Linn., I, 4, p. 1854; *aspericollis* Germ. Ins. Spec. Nov., p. 517.

Length 5—18 mm. = .20—.72 ins. Hab. N. H., Mass., Can., N. Y., La., Pa., Va., Del., N. C., N. J., Tex., Iowa, Ga., Kans., Neb.

I have included this species with those having spinose femora and elytra, although in small specimens the spines are very small. The anterior ridge of pronotum very prominent in large specimens is also scarcely visible in small ones. Color reddish brown, except beneath and elytra behind first band more or less black. Elytra bands yellow.

N. approximatus Lec. Proc. Ac. Phil., 1862, p. 42.

Length 10 mm. = .56 ins. Hab. Kansas.

I have seen only one specimen in Dr. Horn's collection; reddish brown with yellow bands.

N. balteatus Lec. S. M. C., 1873, p. 201.

Length 14 mm. = .56 ins. Hab. Oregon.

This I have not seen. The color is described by Dr. Leconte as fusco piceus with yellow markings. The sketch we owe to Dr. Horn's kindness.

N. interruptus Lec. S. M. C , 1873, p. 201.

Length 10 mm. = .40 ins. Hab. California.

I have seen one specimen in Dr. Horn's collection, reddish brown with yellow markings.

The three species above named though closely resembling each other and *erythrocephalus*, appear to be very distinct. They appear also to be equally rare.

N. conjunctus Lec. Ent. Rept., 1857, p. 61.

Length 8—16 mm. = .32—.64 ins. Hab. Cal., Or.

Black with yellow or white bands. In a large series I find no variation except in size.

N. capraea Say. J. A. P., III, 1823, p. 424; Am. Ent., III, t. 53; Lec., J.A. P., ser. 2, II, p. 26; *elevatus* Lap & Gory, Mon., p. 32, t. 7, f. 40; *gibbicollis* Lap and Gory, Mon., p. 24, t. 6, f. 28.

Length 12—20 mm. = .48—.80 ins. Hab. Ark., Pa., Mass., La., Va., Kans., Mo., N. Y., Miss., Neb., Texas.

Black with bands of yellow or occasionally white. The thorax is usually entirely black, but in two specimens before me, from Texas, the quadrate spaces between the thoracic ridges are entirely clothed with silvery white hair.

N. ascendens Lec. Bull. Geol. and Geog. Surv., IV, 1878, p. 462.

Length 8½ mm. = .34 ins. Hab. Colorado.

This species I have not seen and our figure is copied from a sketch, made by Dr. Horn, of the only specimen known in Dr. Leconte's collection. It is described as elongate and similar to *muricatulus* in form and sculpture, but thorax less muricate and more coarsely punctured toward

sides. Elytra marked as in figure, and the posterior femora extending to tip of elytra.

N. muricatulus Kirby. Fn. Bor. Am., IV, p. 177; *leucozonus* Lap & Gory, Mon., p. 90, t. 17, f. 105.

Length 7—10 mm. = .28—.40 ins. Hab. N. H., Cal., Utah, Wyo., H. B. T., Mass., Can., Va., Cal., Me., La.

Black or brown with white markings, very constant in arrangement. This species varies somewhat in the form of the thorax which is usually nearly quadrate, a little wider than long, but sometimes very much wider.

N. longipes Kirby. Fn. Bor. Am., IV, 1837, p. 176.

Length 9—11 mm. = .36—.44 ins. Hab. Texas, Va., Can.

Black with white markings as in our figure, but sometimes partly obliterated. This species runs very close to the preceding, is however more slender, especially in the form of the thorax, the legs are longer, and the tip of the elytra tends more to the acuminate form. The base of the elytra bears very much more white hair.

N. torquatus Lec. S. M. C., No. 264, 1873, p. 200.

Length 7½—12 mm. = .30—.48 ins. Hab. Texas.

Black with yellow bands. Might be confused with *erythrocephalus*, but is easily known by the transverse yellow band at middle of prothorax. The anterior femora are finely dentate beneath, not very obviously in small specimens.

EURYSCELIS, *Chev.*

This genus was erected by Chevrolat for a few species with twelve jointed antennæ, one of which has occured in the United States.

E. suturalis Oliv. Ent., IV, 1795, 70, p. 62, t. 7, f. 91; Lap & Gory, Mon., p. 15, t. 4, f. 16; Chev., Mon., 1862, p. 530; *longipes* Dej. Cat., 3d ed., p. 357.

Length 6½—11 mm. = .26—.44 ins. Hab. St. Domingo., N. Y., Tex.

I have two specimens before me, one from New York and one from Texas. Light brown with white pubescence. The thorax is carinate, like *Neoclytus* and the femora spinose.

CLYTANTHUS, *Thom.*

This genus, which has neither the frontal carina nor thoracic ridges is separated from *Clytus* by the narrow episterna of the metathorax. The two species differ greatly in the elytral marking which are described below.

C. ruricola Oliv. Ent., IV, 70, p. 65, t. 8, f. 96; Lap & Gory, Mon., p. 56, t. 11, f. 65; Lec., J. A. P., ser. 2, II, p. 27; *capreolus* Dej. Cat., 3d ed., p. 356; *hamatus* Say, J. A. P., III, 1823, p. 423; Am. Ent., III, t. 53.

Length 7—12 mm. = .28—.48 ins. Hab. Canada to Virginia, Maine to Illinois.

(TO BE CONTINUED.)

Notes on some species of Geometridæ. No. 3.

By Rev. Geo. D. Hulst.

(Continued from p. 224, vol. II.)

Marmopteryx gibbicostata Walk. (C. B. M. Geom., p. 1388, 1862.)

This species published as *Cidaria gibbicostata* is declared by Dr. Packard, 5th Rept. Peab. Acad. Sci., p. 89, to be the same as *Tephrina strigularia*, Minot, which was described Proc. Bost. Soc. N. H., XII, 170, 1869 as *Anisopteryx strigularia*. On p. 88, 5th Rept. Peab. Acad. Sci., Dr. Packard states *Larentia costinotata*, Walk., C. B. M. Geom., p. 1701, 1862, is a synonym of the same species. In his Mon. Geom. p. 250, 1876, Dr. Packard creates the genus *Marmopteryx*, but does not correct the synonomy. This insect as noted by Dr. Packard was also afterwards described as *Larentia æneiformis* by Dr. Harvey. So it has been described four times, and referred to five genera!

Thamnonoma marcessaria Gn. (Phal., II, 92, 1857.)

This species was afterwards re-described by Guénée as *Tephrina lorquinaria*, Phal. II, 101.

Caripeta augustioraria Walk. (C. B. M. Geom., p. 1524, 1862.)

My material in this genus is not very large, numbering only 9 specimens of *C. augustioraria*, *C. latioraria* and *C. subochrearia*, Grt., of which latter I have the types. I have also two specimens of *C. æqualiaria*, Grt., for comparison. Four specimens from Mr. W. W. Hill of Albany, N. Y., taken in Lewis Co., N. Y., vary widely among themselves. Two are orange ochreous, two are chestnut brown, two have the central band broad and continuous across the wing, one has it almost, another entirely divided. The hind wings vary also from orange ochreous to brown, or are unicolorous light ochreous. My impression is from what material I have, that these 4 species above are only varietal forms, which may in places become races. But the amount of my material will hardly warrant any such reference at present. The females all seem to be more diffusely marked than the males.

Fidonia fimetaria Grt. and Rob. (Tr. Am. Ent. Soc., III, 182.)

This species, very common in Texas and Arizona, was re-described by Mr. Grote from Arizona specimens as *F. partitaria* (Can. Ent., XV., 130). In the types of this last species the males are exactly the same as those of *F. fimetaria*, while the females are somewhat lighter.

Fidonia stalachtaria Streck. (Rept. Surv. Dept. Mo., p. 1863, pl. 2, f. 6, 1878.)

This was re-described by Mr. Grote as *F. alternaria* (Can. Ent., XV, 27); there is no difference of even varietal value between the two.

Stenaspilates meskearia Pack. (Mon. Geom., p. 213, pl. 13, f. 50.)

Of these species I have already written (Ent. Am., II, 141–142).

Chloraspilates bicoloraria Pack. (Mon. Geom., p. 212, pl. 13, f. 40, 1876.)

Described by Mr. Grote (Pap., II, 80, 1882,) as *C. arizonaria.* Having his types before me I can see no reason for considering it distinct. The only difference noted is the discal ringlet. Dr. Packard had only 1 ♂ to describe from, and it happened it did not have the discal ringlet evident. In a considerable series of specimens from Texas and Arizona the majority have the annulate discal spot, the Texan specimens rather more prominently than those from Arizona; it is as a rule much less marked in the ♂ than in the ♀. At the very best, Mr. Grote's name stands on a very frail basis as a variety, not good enough however to warrant recognition in my opinion.

Aspilates liberaria Walk. (C. B. M. Geom., p. 239, 1860.)

This species was described by Mr. Walker under the genus *Apicia.* and without knowledge of its habitat. Later (C. B. M. Geom., p. 889. 1861), he described it again as *Macaria integraria.* This same species Dr. Packard (6th Rept. Peab. Acad. Sci., p. 44, 1874,) described as *Aspilates lintneraria.* In his Mon. Geom., p. 297, Dr. Packard recognizes that his species is the same as Walker's *Macaria integraria,* but does not change his own name in the description, p. 209; afterwards Mr. Goodell, writing to the Can. Ent. (vol. X, p. 40), says that Dr. Packard has for him identified specimens of *lintneraria* as Walker's *A. liberaria.* How the Doctor came to this knowledge is not stated, but I think on the basis of it we are warranted in considering the three species one and the same. Dr. Packard figures *A. liberaria,* pl. 2, f. 54, and thus probably had a colored drawing of Walker's type.

Aspilates coloraria Fab. (Sup. Sys. Ent., 96, 97, 1798.)

This insect is extraordinarily variable in appearance, as indeed all our species of *Aspilates* seem to be. Dr. Packard places the following as synonyms: *accessaria* Hübn., *cruentaria* Walk., and *sphæromacaria* Harvey. In remarks under this species (Mon. Geom.) he says: "this species is so much like *A. dissimilaria,* that I am inclined to regard it almost as a melanized form of that species." With a large number of specimens to compare, I am certain that the two are forms of the same species. The name will of course stand *A. coloraria.* A number more of Mr. Walker's species will also be rated as synonyms or varieties; how many I do not know, but without doubt the following are: *A. atropunctaria,* C. B. M. Geom., p. 1673, 1862, and *A. olenusaria,* C. B. M. Geom., p. 1675, 1862.

Gorytodes uncanaria Guen. (Phal. II, 180, 1857.)

This species is subject to considerable variation of the cross lines. *Platea californiaria* H. Sch., has been regarded as a synonym, I think

very rightly; and having the types before me, I also so consider *G. personaria* Hy. Edw., the same species.

Gorytodes trilinearia Pack. (Proc. Bost. Soc. N. H., XVI, 24, 1874.)

Having Mr. Grote's type of *G. dulcearia*, (B'kl. Bull., III, 46, 1880,) before me, I am not able to separate it from Dr. Packard's species above. Grote's type has considerable of an ochreous coloring, but all males have more or less of that tint; the females of the species are lighter colored, with more diffuse markings, and with little or no ochreous tendency.

Lepiodes scolopacinaria Guen. (Phal. II, 359, 360.)

This insect has since the time of Guénée remained unidentified in American collections; after a careful study of the description of the genus, I have come to the conclusion that it can be none other than *Tornos*, Morrison; and after a like study of the species, I feel certain that Guénée's insect is the species known as *rubiginosarius* Morrison, Proc. Bost. Soc. N. H., XVI, 218, 1875, typical form. Lepidopterists have undoubtedly been misled by the fact that Guénée placed the genus just after *Eupithecia*. Mr. Morrison in describing, placed the insect among the *Noctuidæ*.

Lepiodes escaria Grt. (Can. Ent., XIV, 186, 1882.)

I have before me the types of all of Mr. Grote's later species, viz.: *L. escaria, interruptaria, ochrofuscaria, eupitheciaria* and *pygmeolaria*, and these in thirty or forty specimens I have compared carefully. As a result, I am forced to the conclusion that *L. pygmeolaria* is a synonym of *L. escaria*, differing in nothing but size. This variation is very great, from 19 to 31 mm., but the specimens before me lie indiscriminately between the two extremes.

Lepiodes interruptaria Grt. (Can. Ent., XIV, 185, 1882.)

This seems to be a good species, but the interrupted cross lines are not specific, as there is every intergradation. The outer cross line seems however to be much more oblique than in *L. escaria*, and the fore-wings are with a more rounded inner angle, and the inner margin very much more rounded. *L. ochrofuscaria* I consider a not very strongly marked color variety of this species.

Lepiodes approximaria Pack. (Mon. Geom., p. 215, pl. 9, f. 40, 1876.)

Of this I consider *L. infumataria* Grt., (Can. Ent., IX, 90, 1877), a synonym. There is, so far as I am able to determine, no difference whatever between the two, save something more of a chocolate tint to Dr. Packard's types.

Chionobas semidea, *Say.*

By A. G. Weeks, Jr.

So little has been said regarding the collecting of our rare mountain butterfly, *Chionobas semidea*, that a few words in that respect, noting the spots on Mt. Washington, where the insect flies, may prove of value to some of your readers.

C. semidea is not found below the timber line, but inhabits the rocky barren ground, five thousand feet above sea level. Those taken by me were found eight hundred to twelve hundred feet below the summit, none being seen above or below this line.

I recommend the ascent from the Crawford House, by the bridle path over Mts. Clinton, Pleasant, Franklin, and Monroe, a distance of eight or nine miles. After passing Mt. Monroe, a level area comes into view, forming a part of Mt. Washington, and about one thousand feet below the summit. This space is one to two miles long, running north and south, bordering Tuckerman's Ravine, and called as it reaches the southern cliffs, Boott's Spur. The butterflies were scattered over this "field", but most commonly in the line of the path and along the summit slope to the cliffs. As one ascends towards the summit they become scarce, and finally disappear altogether about two hundred feet above the level ground. Walking around the summit on the westerly side, none were seen until another comparatively level area was reached, extending from the railroad track easterly to the cliffs overlooking the ravine, called the Gulf of Mexico. Here a number were found, but they were not as plentiful as on Boott's Spur. But few more were found outside of these two spots.

In its flight, *C. semidea* resembles closely our small moths, when roused from their hiding places during the day. Rarely raising more than two or three feet, they drop clumsily into the grass or among the stones, perhaps twenty feet away. When they rise from the ground the wind usually takes them and carries them out of sight, rendering collecting hard and disappointing. Although clumsy and sluggish in the use of their wings, they are not so with their legs, and move about with a quick jerky motion.

Although these butterflies do not gather in swarms, they nevertheless seem to seek companionship, and, one being started, another may be found some five to ten feet away.

They do not stop on flowers or on grass blades. When at rest they either remain on the side of boulders or tucked away *under* the grass, from which it takes them some time to free themselves.

They were not seen flitting about as do their brethren in the valleys. None were seen on the wing unless aroused by some one approaching.

A few Corrections to Henshaw's Check List.

By E. A. Schwarz.

Calosoma tepidum Lec., is not a variety of *calidum* but a distinct species.

Tachys nigriceps Dej., is to be stricken off, = *Perigona nigriceps*, Dej.

Agabus parallelus Lec., is considered by Dr. Sharp as synonymous with *A. seriatus* and, I think, quite correctly so.

Agabus congener Payk. and **A. ambiguus** Say (**ovoideus** Lec.). This nomenclature adopted by Mr. Henshaw leads to confusion and is neither in accordance with that given by Dr. Sharp, nor with Dr. Horn's subsequent remarks (Trans. Amer. Ent. Soc., X, p. 278). The two species should stand as follows:

A. congener *Payk.*
ambiguus Say.
A. confinis *Gyllh.*
ovoideus, Crotch.

Moreover, *A. confinis* should be inserted immediately before *infuscatus* Aub., with which it forms a well-defined group, characterized by the acute ridge on the prosternal process (cf. Sharp, On Aquat. Carniv. Col., p. 520).

Scydmænus cautus Lec. This name appears first in Dr. Leconte's List (Smithsn. Misc. Coll., 140), but has never been backed by a description, and is therefore to be stricken off.

Gymnusa variegata Kiesenw., is to be added after *G. brevicollis*.

Ptilium fungi Lec., appears twice in the List, once as *Nanosella* and a second time as *Ptilium*. The latter reference should be stricken off.

Ptenidium Ulkei Matth. This is the species formerly known to us as *atomaroides* Mots. With the literature at my command I fail to find a description of Motschulsky's species, but if it is described the name has preference over Matthew's name. If it is only a MS. species, it should be dropped from the List.

Ptenidium ? lineatum Lec. I think it was for this species that the genus *Micridium* was introduced in the 2nd edition of the "Classification."

Cybocephalus unicolor Mots. If this name is to be retained at all it should at least be transferred to the genus *Cercyon* in accordance with the author's own opinion, regarding the lost type of his species (cf. Mannerheim, 3ter Beitrag zur Käferfauna etc., p. 110).

Cis bicarinatus Mann., read *C. biarmatus*. This is one of those typographical errors which are likely to be perpetuated in future editions of the List.

Anthonomus signatus Say, is synonymous with *A. musculus* Say (cf. Dr Riley, Rep. of the Comm. of Agric., 1885, p. 281).

Encalus decipiens Lec. The genus *Encalus* is a synonym of *Proctorus*, and the species should be referred to the latter genus (cf. Dr. Leconte, Proc. Am. Philos. Soc., XVII, p. 620). Leconte's rectification was entirely overlooked in the 2d edition of the "Classification", (p. 482).

Pseudobaris albilata Lec., read *albilatus*. Leconte had originally given the correct name; the error was introduced by Mr. Austin in his Supplement to Crotch's Check List. The name *Liopus querci* Fitch, might also advantageously be changed to *quercus*.

Quite a large number of species more recently described by European authors are not referred to in Mr. Henshaw's List, but as most of these species will—so far as I am able to judge—only swell the number of synonyms, their enumeration is better deferred to a paper on Synonymy, which I hope, will ere long be written by a more competent hand than mine.

Ecpanthera reducta, *Grote.*

By David Bruce, Brockport, N. Y.

I captured a female example of this species in Platte Canon, Col., last July—it was flying in the sunshine over low plants. I carefully preserved it alive and was pleased to find next morning that it had deposited a small batch of eggs; these were firmly attached to the bottom of the box and arranged in very regular rows side by side; these resembled tiny pearls, being beautifully opalescent; in two days they turned lead colored, but still preserving the same pearly luster; they hatched on the eight and ninth day after.

The larvæ when first hatched were brownish black; after moulting the hairs on the three last segments were longer than the others and slightly tinged with light brown at the tips, giving a hoary appearance; at the third moult the final change in color took place, and the larvæ, (which hitherto could hardly be distinguished from *Arctia Saundersii* of the same age), presented an entirely different appearance and in markings were unlike any other larva I ever saw; length, when walking extended, from $1\frac{1}{2}$ to 2 inches, the sexes being easily distinguished by the superior size of the females, those that produced male imagos being $\frac{1}{2}$ inch shorter than the others; head and top of next segment pitchy black, feet and naked parts of body a livid purplish flesh color; from the usual verrucose warts on each segment arose spreading tufts of stiff glossy hairs, longer and more spreading than those on the larvæ of *P. Isabella;* the hairs form-

ing the posterior side of each tuft are cinnamon brown, the front hairs of each tuft being brownish black, thus giving a peculiar annulated appearance and making the larva resemble the tail of a "coon" in miniature.—These larvæ are apparently gregarious when young, and are nocturnal feeders They all crept under leaves, and reposed side by side during the day. I fed them on Polygonum and Plantain, but they would eat almost any low plant; when about half grown they ceased to feed and hid under leaves and moss for several weeks, occasionally coming up at night and wandering about, but not eating. I placed them in my "Window Garden" in December; after a few days they commenced feeding on Chickweed and Dandelion, and finally a few went to pupa, emerging as imago 32 days after. Some of the larvæ are still feeding a little, and are large and healthy. The pupæ are rather more pointed than those of the genus *Arctia*, and the anal spine is slightly flattened and bristly; the larval skin is firmly attached and envelops the abdominal segments of the pupa more than is usually the case. Not the slightest indication of a web or cocoon is formed.

A Field Note.

An overflowing brook drove all the *Cicindela sexguttata* from a good locality in Malden, Mass., and since that time (June 28th), only one or two specimens have been seen.

I noticed them first, resting a short distance outside the town on a sandy roadway, and when I disturbed them all flew in a certain direction and were soon lost to sight.

There is a strange scarcity—I should say absolute want—of other species of this genus here; since early in the season I have seen but two species—*C. purpurea* and *C. punctulata*—and only one specimen of the latter; this is the more remarkable because *Cicindelæ* were very common here last year, and this season they are plenty in adjoining towns.

There is a most unusual scarcity of all Coleopterous insects in this particular locality and I can see no reason why there should be, for food plants are plenty and everything seems to warrant a prolific insect life.

There must be a cause for this seeming extinction of local species; but I cannot find any adequate reason for the continued exclusion of insects from a small area while all around within a few miles species are as common as ever.

The Diptera are very scarce, not only in Malden and other towns near Boston, but throughout all eastern Massachusetts, as far as I have collected.

As far as I have noticed, the Lepidoptera are also very scarce here, at least even the more common species have been rarely seen by me, but as an offset for the lack of species of other orders the Hymenoptera are very plentiful.

At one place, north of the town, where a swampy field is full of wild plants, scores of species could be seen flying from flower to flower in such variety that I was greatly tempted recently, to collect them, instead of continuing in my vain search for beetles. L. E. Hood.

Minot has found that even a small piece of the skin of a larva will serve to identify it. In many of them the color of the skin is caused by pigment which may permeate the entire chitinous substance or be confined to the outer cuticular layer, where it is arranged, in combination with the sculpture of the surface, into pretty microscopic patterns, which are different in every species. The larvæ were taken from alcohol, boiled in concentrated potash and the chitinous layer mounted in balsam. In *Danais archippus* the dark brown transverse bands of the mature larva are caused by the coloration of the cuticle; but the color is not evenly diffused, and is confined to small, sharply defined spaces which are elevated in the center, so that the whole has a hilly appearance. A transverse section showed that the coloring matter was contained in a very thin layer of lamellæ upon the base of colorless chitin. In *Cynthia lavinia* the fields are also papillose but grouped in small spots. In *Vanessa antiopa* the skin is evenly papillose; in *Grapta interrogationis* variably so. In *Limenitis disippus* dark papillæ are scattered among the colorless majority. In *Grapta comma* the papillæ are acute and somewhat spiniform and very close together. In *Papilio philenor* this is exaggerated, so as to cause the appearance of a thick fur. In *Heliconia charitonia* the papillæ are more sparse, but unusually thick and convex in profile, while usually they are concave. A remarkable decrease in the number of papillæ is found in *Euptoieta claudia*, while in *Agraulis vanillæ* they are more numerous but smaller. In *Papilio ajax* there are neatly formed pointed papillæ of variable sizes, evenly spread over the surface. In *Anisota stigma* they form small hillocks without distinct apices. In *Datana ministra* as well as in *Cimbex americana* the rounded hillock like form of the colored spaces gives a reticulated appearance. Minot believes, that these modifications of the cuticle have some connection with unknown sensory organs, and that he has discovered a valuable aid to the construction of a natural system.

(Compare Charles Sedgwick Minot, Archiv für mikroskopische Anatomie, Band 28, Seite 37—48, t. 7.—Ent. Nachrichten, XIII, 29.

John B. Smith.

Euerythra trimaculata, *new species.*

By John B. Smith.

Head and thorax white, orbits of eyes and the vestiture of palpi bright red. Abdomen white, the segments ringed with bright red of variable width. In the ♀ the red is sometimes very faint orange covered with white scales. In the ♂ on the contrary the predominating color is sometimes red and it appears white banded. A row of black dorsal spots, which are however often wanting. Primaries with an umber brown or blackish fascia of variable width near the base—broadest at costa, outwardly oblique to the submedian interspace and there usually terminated—occasionally there is a narrower prolongation inwardly oblique to the internal vein; another short band of similar color from the costa near apex inwardly oblique to vein 5. A short upright band from the inner margin near anal angle, to vein 2. In some specimens a double spot at the end of the discal cell. The veins where they cross the brown bands are marked with yellow scales. Secondaries pure white, immaculate. Beneath, the markings of primaries are faintly reproduced. Secondaries occasionally with a discal spot. Anterior coxæ bright orange red, inside of anterior femora and tibiæ brown. Else underside white.

Expands 1—1.25 inches = 26—33 mm. Hab. Texas.

This species has been heretofore confounded with *phasma* Harv., which has the "Fore wings white, crossed by a broad irregular blackish band from base to extremity of veins 3 and 4 where it stains the otherwise white fringes." No trace of this band exists in the present species. The ornamentation is similar in pattern and the present form has been considered as one with the markings incomplete. In addition to the color characters it offers others of a structural nature, to which I will draw attention in a subsequent article.

Notes and News.

Mr. A. G. Butler writes, that while going over their Noctuidæ recently, he caught sight of two specimens of *Nolidæ*, right in the middle of the *Erastriidæ* and described by Walker (Cat. Lep. Het., 33, Suppl., pl. 3, p. 795) as *Erastria pustulata.* It at once struck him that they were identical with *Argyrophyes nigrofasciata*, and he kindly sent us the note.

Nola nigrofasciata was described by Zeller in the Verh. k. k. Zool.-Bot. Ges., XXII, p. 454, pl. II, f. 1 (1872), was first referred by Grote (Buf. Bul., II, 152), to *Rœselia* and afterward (Can. Ent., IX, 237), to *Argyrophyes.* Walker's specific name has of course undoubted priority and the species must be known in future as *A. pustulata* Wlk.

* * *

The following is part of a letter from Mr. A. G. Butler to the former Editor.

"In Rev. G. D. Hulst's article on Geometridæ (p. 222, Vol. II), I am glad to note what he says about the use of the Hübnerian "Tentamen" names; I strongly object to their adoption, on the following grounds:

1.—There is no proof that the 'Tentamen' was ever published; even if Hübner distributed copies amongst his friends, that would not constitute publication.

2.—There were no descriptions of any of the genera published at the time, and a name without even the form of a description is worthless. because—

3.—There is no proof that the species in Hübner's collection, to which a 'Tentamen' generic name was given, was identical with the species now recognized under the same name.

In the 'Verzeichniss', on the other hand Hübner did make some attempt—feeble indeed, but still an attempt—to describe his genera; he usually referred to figures or descriptions of his species and, lastly, his names have been largely adopted and redescribed in detail.

In my opinion my friend Mr. Scudder never made a greater mistake than in dragging to the light that horrible 'Tentamen', a thing less valuable than a bookseller's auction catalogue, yet worshipped (as though it had been a long lost Bible recovered) by a certain class of Antiquarian Entomologists."

* * *

In the Berliner Ent. Zeitschrift for 1886, there are some interesting notes, some of which we reproduce:

In the meeting of Oct. 11th, Mr. Honrath reports from Mr. Ricardo Rohde, that in Paraguay there exists a spider, immense colonies of which web over entire groups of trees. In these nets beetles the size of *D. hercules* were caught, and even moderate sized birds caught in the net are hopelessly lost.

In the meeting of Nov. 8th, there were exhibited some specimens of *Silvanus surinamensis*, and the question of the food of the larvæ and beetles was discussed. It seems yet undecided whether they are grain or animal feeders, and both sides adduce proofs for their convictions. In the Ent. Div. of the Dept. of Agriculture it has been definitely proved that they are grain feeders, for a number of the beetles were confined with perfectly clean grain in a tight jar. The beetles and their progeny ate it all up. On the other hand this does not prove that they do not also enjoy animal food such as eggs and larvæ of other insects, and conflicting observations may be reconcilable in that way.

In the meeting of Nov. 15th, Mr. Honrath explained how he mended butterflies. When a feeler is lost or broken, he carefully bores out the point of insertion with a fine pin, puts in a trifle of fish glue and puts the feeler into the opening thus made. Denuded spots on a wing can be covered with a thin coat of Gum tragacanth, and similar scales from another specimen of the same species can be dusted on.

The method is ingenious and the results no doubt very neat;—but once upon a time I puzzled for some time over a somewhat aberrant specimen which had serrated antennæ, was a female and evidently belonged to a genus where the females had simple antennæ, and it looked common enough, too. I put it aside, and only some time afterward it struck me that the corespondent from whom I had received it, often mended insects. Sure enough, careful inspection proved that the antennæ were pasted on and belonged to a ♂ of some entirely different genus. It makes a collection look well to have insects artificially perfect, but it renders its study difficult, for one must always look carefully to see which is nature and which is art. JOHN B. SMITH.

Book Notice.

Die Formiciden der Vereinigten Staaten von Nordamerica. Von Dr. Gustav Mayr. Verh. k. k. Zool.-Bot. Ges. in Wien. 1886, pp. 419—468.

This pamphlet of 48 pages is the most important work on this group of American Insects that has ever been issued, and puts it within the power of the American Student to at least discover what is known, and to obtain a general idea of the classification of this family. Unfortunately there are no comprehensive synopses or—except in three instances—synopses of species, and the work is thus not so useful as it might be, nor are all the species described which would have greatly enhanced the value of the paper. It is a synonymical, annotated and descriptive list, and as such is a model. The order of genera and the number of species in each, is as follows:

Camponotus, 8; *Colobopsis*, 1; *Myrmecocystus*, 1; *Poligerus*, 1; *Formica*, 7 (*ciliata* n. sp.); *Lasius*, 6; *Brachymyrmex*, 1; *Prenolepsis*, 4; *Iridomyrmex*, 1; *Dorymyrmex*, 1; *Liometopum*, 1; *Tapinoma*, 2; *Dolichoderus*, 4 (*pustulatus* n. sp.), a table of workers being here given; *Odontomachus*, 2; *Proceratium*, 3; *Discothyrea*, 1; *Ponera*, 2; *Lobopelta*, 1 (*septentrionalis* n. sp.); *Amblypona*, 1; *Eciton*, 8, (*subsulcatum* n. sp.); *Atta*, 2; *Aphænogaster*, 9, with table of workers (*brevicornis*, *lamellidens*, *albisetosa*, *Andrei* and *Pergandei* new species); *Pogonomyrmex*, 5; *Myrmica*, 4; *Leptothorax*, 5, with table of workers (*fortinodis* n. sp.); *Tetramorium*, 2; *Stenamma*, 1, (*neoarcticum* n. sp.); *Myrmecina*, 1; *Monomorium*, 2; *Pheidole*, 6, (*commutata*, n. sp.); *Solenopsis*, 4, (*debilis* n. sp.); *Cremastogaster*, 4, (*Ashmeadi* n. sp.); *Pseudomyrma*, 1; *Strumigenys*, 2.

There are therefore 107 species distributed in 34 genera, and of these species there are 14 not heretofore described. It is almost certain that this list does not begin to represent the American *Formicid* fauna, and there is plenty of chance for the enterprising collector and student.

SOCIETY NEWS.

Brooklyn Entomological Society.—At the monthly meeting, March 1st, 14 members where present. A donation of 130 specimens of Coleoptera was made to the Cabinet by Mr. Beutenmueller. Dr. C. S. McKnight and F. H. Chittenden were elected members of the Society. The Librarian presented a copy of proposed rules and regulations respecting the use of books in the library, which were adopted. Election for Editor of Entomologica Americana being in order, a letter from Mr. J. B. Smith was read, declining, on account of residence in Washington, D. C., to be a candidate for re-election. On proceding to ballot, Geo. D. Hulst was unanimously elected Editor, and Chris. H. Roberts Assistant Editor for the ensuing year. Mr. Hulst reported from the Executive Committee that an offer had been made to the Society by Mr. A. C. Weeks to collect and mount 6500 specimens of the local insect fauna in Coleoptera, Hemiptera, Hymenoptera, and Neuroptera, not more than four specimens of a species, on condition, that the Society furnish the pins, card points mounted on pins, and name labels; Mr. Hulst further reported that the offer had been accepted by the Executive Committee.

A paper was read by Mr. Weeks giving the life history of *Tarache delecta* Walk. The larva, which was curiously striped, somewhat resembled the larva of *Alypia octomaculata* and was found feeding on the leaves of the Swamp Rose Mallow (Hibiscus Moscheutos L.), early in September. It pupated in a cocoon, and emerged the next year.

Mr. Weeks also read a paper upon the effect of the weather upon the emerging of imagines from pupæ and of their ability to control the time of their emergence; the paper evoked considerable discussion and disagreement from the author's views.

Entomological Society of Washington. Meeting held March 3rd, 1887.—A communication by Mr. J. D. Sherman, Jr., was read entitled "Notes for the year 1886" and recording the capture or mode of occurence of a number of Coleoptera in the vicinity of Peekskill, N. Y.

Mr. Smith called attention to the peculiar antennal structure of *Cressonia juglandis* which remarkably resembles that of the *Saturniidæ* in the double bi-pectinations. He also showed that two distinct species had been heretofore confounded under the name *Euerythra phasma*, and pointed out the distinctive features of the two forms. He also stated that a careful comparison of the large series of *Callimorpha* in the Museum collection proved the specific distinctness of most of the forms heretofore classed as varieties of *Lecontei*.

Mr. Schwarz exhibited specimens of *Xylechorus pyri* and *X. obesus* and pointed out that in spite of their different appearance they might be the sexes of one and the same species.

Mr. Schwarz gave a list of the *Scolytids* found by him on *Pinus inops* in the vicinity of Washington. The list enumerates 18 species but the mode of work of many of these still remains unknown. Among the less common species is *Pityophthorus pulius*, the galleries of which were exhibited and explained by Mr. Schwarz. The female beetle constructs under the bark a rather large, more or less oval central chamber from which from 3 to 5 long and slightly undulated galleries lead off in various directions but usually more or less up- or downward. The eggs are deposited singly at rather large intervals in these galleries. The greatly curving larval galleries do not present any particular features but are rather shorter than in allied species. All these galleries are more within the bark itself than in the outermost layers of wood.

ENTOMOLOGICA AMERICANA

VOL. III. BROOKLYN, MAY, 1887. NO. 2.

Notes upon certain Pyralidæ.

By Geo. D. Hulst.

In the Transactions of the American Entomol. Society, Vol. XIII, pp. 145–168, I published under the title "Descriptions of new species of *Pyralidæ*", 89 species in that family. The descriptions were in many cases based upon single specimens, and in a few cases upon very indifferent material. Moreover at that time a very large portion of the material was the property of other persons, so that I was unable to make the examinations generally necessary for determination. I also fell into an unfortunate misinterpretation of some statements of opinion by one, whose judgment was by me so highly regarded that I did not consider it necessary to verify it, and this led to more than one error. Almost as soon as the descriptions were published, I became the possessor of the types of nearly all my species. I was thus able to give more complete study, and with further comparisons I became convinced that I had redescribed a number of species. I withheld the publishing of these till I could make still further comparisons, which, upon a recent visit to Prof. Fernald, I was able to do. I took all the types in my possession, with me, and together we went over them, and compared them with his material. He verified in the greater part my own conclusions, and through his superior knowledge, pointed out errors that had escaped me.

As a result of our mutual study, I note the following:

- *Chalcœla gemmalis* = *Choreutes bjerkandella*, Thun.
- *Botis monulalis* = *B. mustilinealis*, Pack.
- *Botis pergilvalis* = *B. coloradensis*, Grt.
- *Botis gulosalis* = *B. magistralis* Grt.

- *Botis uxorculalis* = *Stemmatophora nicalis*, Grt.
- *Botis saltusalis* = *Homophysa eripalis*, Grt.
- *Botis levalis* = *Acrospila gastralis*, Guén., from St. Domingo.
- *Botis bellulalis* = *B. diffissa*, G. & R., variety.
- *Scoparia ninguidalis* = *S. centuriella*, S. & V., variety.
- *Stenurges floridalis* = *S. designalis*, Guén., from the West Indies.
- *Zinckenia perfuscalis* = *Pilocrosis ramentalis*, Led., from the West Indies.
- *Toripalpus taleolalis* = *Tetralopha dillucitella*, Grt.
- *Crambus refotalis* = *C. zeellus*, Fern.
- *Crambus bonusculalis* = *C. plejadellus*, Zinck.

This is as far as we are willing at the present time to assert positively. It may be found that other changes will have to be made, as there undoubtedly will be through the whole family. There are nearly 100 species of Mr. Walker unidentified, the types of which are in the British Museum collection.

There are also a considerable number of the species of Guénée and Lederer still undetermined. As almost all the material of these describers was from the East, their names will probably not much affect my own species.

A Hint to Rearers of Lepidoptera.

Some time since my friend Mr. Seib of Newark, N. J., was so fortunate as to obtain very many eggs of *Sphinx luscitiosa*, and a number of larvæ of *Smerinthus Astylus*. Many went into the pupæ state and were in that condition kept in a cool cellar through the winter; when there was no longer danger of frosts the pupæ were placed in the open air. No imagines emerged, however. Two years ago, I had the same experience with *Smerinthus Astylus* and *Darapsa versicolor*. The pupæ being kept in a cool cellar and removed when spring opened, to the open air. All died and in the pupæ examined afterwards the imagines were found fully developed and ready to emerge. It seems the simple change of condition was sufficient to destroy, though there was never enough of dryness to work by itself any mischief. Having since kept the same insects under the same conditions but without change of atmosphere there has been almost no mortality among the pupæ. Mr. Hulst informs me that he has had a pupa of *Darapsa versicolor* hatch out in June where the larvæ had escaped and pupated out of reach in the slide of folding doors, although the room had been heated all winter with a hot air furnace.

In all cases it seems the pupæ do best when left undisturbed in their cocoons and when not exposed to varying conditions of atmosphere.

Jacob Doll.

SYNOPSES OF CERAMBYCIDÆ.

By Chas. W. Leng, B. S.

(Continued from p. 8, vol. III.)

C. albofasciatus Lap & Gory. Mon., p. 96, t. 12, f. 113.

Length 10 mm. = .40 ins. Hab. Pa., Ohio.

C. ruricola is black, legs, except tip of femora, and antennæ rufotestaceous, banded as follows: thorax entirely margined; elytra with scutellum entirely yellow, a short transverse band behind the base, a deeply sinuate band running at an angle with the suture to about the middle of the elytra and then bending upward and outward to the margin (this band is often broken), and an oblique arcuate band behind the middle.

C. albofasciatus has the thorax always black, otherwise it varies considerably in color from red to black. The bands which are formed of short white hairs are only on the elytra; a short oblique line before the middle and a long arcuate band behind the middle. The apex is also clothed with white pubescence. This species is also much flatter than *ruricola*. An interesting note upon its varieties by Dr. Hamilton will be found in Can. Ent., June 1886. It was bred from Grape and Hickory by him.

MICROCLYTUS, *Lec.*

M. gazellula Hald. Trans. Am. Phil., X, 1847, p. 42; Proc. Acad. Phil., IV, p. 372; Lacord Gen. Col., IX, 1869, p. 89, not 3; *gibbulus* Lec., Agass. Lake Sup., 1850, p. 234; *niger* Lec., J. A. P., ser. 2, II, p. 29.

Length 6—7 mm. = .24—.28 ins. Hab. Middle States to Canada, L. Sup.

A small insect, piceous or reddish brown with the thorax above and the elytra, except about the middle of the suture, black and rather closely punctured. The legs and antennæ always paler. Elytral markings composed of long white hairs arranged as follows: an oblique line from the scutellum, a very short transverse or slightly arcuate line about the middle quite distinct from the next, a broader band immediately behind and nearly transverse, a blotch covering the entire apical eighth of the elytra. The antennæ are as long as the insect ♂, about ⅔ ♀. The tip of the elytra is very slightly truncate ♂, or separately rounded ♀.

This species is the first of the group *Anaglypti* in all of which the elytra are gibbous or elevated in a lump at base. In *Microclytus* the elevation is slight, only a little rounded lump and does not extend obliquely towards the margin as in *Cyrtophorus*.

CYRTOPHORUS, *Lec.*

C. verrucosus Oliv. Encycl. Méth. VII, 1792, p. 458; Ent. IV, 1795, p. 67, t. 8, f. 98; Lec. J. A. P., ser. 2, II, p. 29.

Length 6—10 mm. = .24—.40 ins. Hab. Middle and Eastern States and Canada, N. C., S. C., Ga.

Black, or partly rufous. Elytral bands following the same arrangement as in *Microclytus* but composed of short hairs and narrow and the short transverse band more or less united with the next. The insect is sometimes confused in collections with the preceding but the spine of 3rd antennal joint at once distinguishes it. The 4th and 5th joints sometimes bear shorter spines also. The basal elevation of the elytra is very conspicuous, rising abruptly in front and descending gradually behind until it disappears near the middle of the outer margin.

TILLOMORPHA, *Blanch.*

T. geminata Hald. Trans. Am. Phil., X, 1847, p. 42; *duplicatus* Lec., J.A.P. ser. 2, II, 1850, p. 29.

Length 6—8 mm. = .24—.32 ins. Hab. Mass., N. Y., N. J., Pa., Ga.

Black, or partly rufous, marked with lines of white pubescence. Legs, nearly testaceous. The elevation of the elytra is well marked, rising gradually in front and running obliquely as in *Cyrtophorus* but terminated sharply behind and the arrangement of the bands causes a deceptive appearance of a channel immediately behind it. The white pubescence is almost silver in color and brightness and arranged as follows: two longitudinal lines on the thorax, obliterated in front, two oblique parallel lines on the elytra, close together and immediately behind the elevation, and the apical third except the extreme tip. The rounded eye of this species has been described before

EUDERCES, *Lec.*

The four species of this genus are very easily known by the ivory bands of the elytra. They may be thus separated:

SYNOPSIS OF EUDERCES.

Elytra with one oblique ivory fascia; thorax striate.
  Eye nearly divided, the two parts connected by a thin correous line; prothorax uniformly rounded at the sides.. ..... **picipes.**
  Eye completely divided; prothorax distinctly depressed each side near the anterior margin and subangulate at sides..... **pini.**
Elytra with one exactly transverse ivory fascia; prothorax punctate, not striate; eye completely divided..... **Reichei.**
Elytra with two transverse parallel ivory fasciæ..... **parallelus.**

Eu. picipes Fab. Mant. Ins., I, p. 157; Oliv., Ent. 70, p. 57, t. 4, f. 43, a.b.: Lap & Gory, Mon., p. 107, t. 20, f. 127; Lec., J. A. P., ser. 2, II, p. 30.

Length 5—9 mm. = .20—.36 ins. Hab Dakota, Wisc., Ill., Ga., Tex., Mo., Mass., N. Y., N. J., Canada, Md., Pa., Iowa, La.

Eu. pini Oliv. Ent., IV, 1795, 70, p. 71, t. 8, f. 105, a. b.; Lec., J. A. P., ser. 2, II, 1852, p. 158; *piniadea* Fab., Syst. El., II, p. 353; Lap & Gory, Mon., p. 109, t. 20, f. 129; Hald., Trans. Am. Phil., X, p. 41; *testaceipes* Hald., l. c.

Length 6½—9 mm. = .26—.36 ins. Hab. Tex., Md., Ga., Kans., N. J., Can., La.

(TO BE CONTINUED.)

New Species of Callimorpha.

By John B. Smith.

C. lactata n. sp.

Head and collar yellow; palpi black tipped; antennæ black. Thorax white, immaculate. Abdomen yellow, immaculate. Beneath, thorax and legs yellow, anterior tibia and tarsi, and middle tarsi blackish outwardly. Primaries a very pale creamy white, immaculate. Secondaries yellow, immaculate. Beneath yellow, immaculate.

Expands 2.25 inches = 55—56 mm.

Hab. Texas.

I have seen several of these collections as immaculate forms of *clymene*, corresponding to the *fulvicosta* form of *lecontei*, and possibly it may be so. But *fulvicosta* is a distinct species from *lecontei*, and I believe the present form distinct from *clymene*. At the worst the name will stand for a good variety, though I scarcely believe it such.

C. suffusa n. sp.

Lecontei auct. *reversa* Stretch. Ent. Am., 1, 104 (in part).

Head yellow; palpi black tipped; antennæ black. Collar yellow with a small blackish spot each side of the middle, which is sometimes wanting. Thorax white, patagiæ black margined anteriorly; a broad blackish dorsal stripe. Abdomen white, with a row of small, dorsal dark spots, rarely forming a complete line, and often entirely wanting. Beneath, legs yellow, anterior coxæ with a black spot, tibiæ dark outwardly, fore and median tarsi blackish. Primaries white; a broad brown costal margin nearly to the apex; a broad brown internal margin from base to anal angle; outer margin also black margined from apex to near the anal angle; rarely the margins are connected so that the wing is completely dark margined. An oblique dark band from anal angle to costa about $\frac{2}{5}$ from base. From the middle of this band runs another, to outer margin below apex. From this, close to its inception, a short band runs to costa; at its outer third another spur is sent off, also to the costa, forming thus a series of three white spots below costa, and beyond the first oblique band, and a larger, somewhat triangular spot near the outer margin its broad base near the anal angle. This maculation varies in that the dark veins sometimes divide the marginal spot; or, on the contrary, the dark bands become attenuated, and some of the spots become more or less confluent. Rarely the maculation is almost, but never quite, obsolete. The distinctive feature, which is always noticeable is in the oblique band, which in this species reaches the costa about two-fifths from base, and the white patch on the disk is therefore very obtusely angled on the costa. Secondaries white, immaculate, rarely with a dusky spot near anal angle. Beneath white, maculation of primaries faintly reproduced.

Expands 1.75—2 inches = 43—50 mm.

Hab. Can. to Texas. Atlantic States west to Kansas.

In maculation this species is the exact counterpart of *clymene*, and the size also is nearly the same. The ground color is however always white, and there are other structural features which I will elsewhere call particular attention to.

This is one of the forms usually named *lecontei*, and is the form pro-

duced by the larva, described by Mr. Saunders in Can. Ent. I, 20, and figured by Stretch in his Zyg. and Bomb., pl. IX, f. 4, as typical of *lecontei.*

Canadian Entomologists have very generally contended that there were several species confused under the term *lecontei.* Mr. Caulfield says in the 16th Rept. Ent. Soc. Ont., p. 38: "I am satisfied however that breeding the larva will in time prove that we have three white winged species—*Lecontei, contigua,* and the smaller form which now does duty as *Lecontei.*" Mr Caulfield is right, but he also mistakes the type of *lecontei* which is the smaller, darker form, while, what he calls *lecontei* is the species here described as new.

Mr. Stretch has also mistaken the type of *lecontei,* considering it the same as *militaris* Harr., from which it differs throughout, and he describes as *C. reversa* (Ent. Am. I, 104), three distinct species including the present form, *contigua,* and the typical *lecontei.* I have therefore cited his name as a synonym, the description having no type.

In a paper for the Proc. U. S. Nat'l Mus. I have monographed the genus and carefully pointed out the differences between the species.

EDITOR "ENTOMOLOGICA AMERICANA."

I notice in your "Society News", April Number, it is stated that "Mr. Weeks read a paper upon the effect of the weather upon the emerging of insects from pupæ, and their ability to control the time of emergence."

In connection with this, I wish to relate an experience, which seems to me very much out of the line of what is ordinary.

Last month, that is early in March, I found a cocoon of *Attacus Cecropia,* in an exposed part of a field, on a day when the weather was extremely cold, about 2 to 4 degrees above zero. I placed the cocoon in a box in a warm room about 7 o'clock in the evening. The next morning the perfect insect emerged. There is no doubt that the insect came from this particular cocoon.

In the same box I have some Prometheus cocoons, which have remained there since March 1886. At that time I found 40 or 50 cocoons. About 25 of them came out by the 10th of June, 1886. After that, none emerged until December, since which 2 or 3 have emerged each month. Those that are left seem to be alive and well. J. H. WERUM.

Catocala badia, *G. & R.*

The note on p. 3 on *C marmorata* Edw., I can parallel with another on *C badia*, an insect more common, but withal very rare. A friend, new in the work of collecting, was visited by me, and I spoke of the unusually large series of *C. badia* G. & R., which he had in his otherwise quite deficient collection. He told me he had obtained these on a visit to a country place near Darien, Conn. He there had his first experience in "sugaring." *C badia* came in great quantities to the "sugar." He took a score or so of specimens, then knocked them away as a nuisance, for he found they would not give *Drasteria erechtea*, *Mamestra arctica* and such like any chance, and his collecting was a comparative failure because *C. badia* was so plentiful! G. D. Hulst.

Note on Dytiscus.

There has been some doubt of the occurrence of *Dytiscus hybridus* in this vicinity (New York), a collector of great experience having informed me it was restricted to the Lake region. I want to state that I found last September in a little pond on Staten Island, 5 males and 2 females (smooth). Not a single specimen of *fasciventris* was obtained from the same pond, and only two *verticalis* were found in company with it. In addition to the diagnosis of Crotch as to form of body, form and sculpture of thorax, inner line of yellow elytral margin unbroken, Mr. Sharp points out a difference in the hind coxal plates, which are sub-parallel, while in *fasciventris* they are divergent, the side angles nearly right. The prosternal carina is more compressed. In these two characters *verticalis* is intermediate. The color of the thoracic apex and base as well as of the underside, is very variable, even in living specimens.

The size of these three species Crotch gives as follows : *verticalis* 1.25 to 1.30 inches ; *fasciventris* 1.25 inches (should be 1.025); *hybridus* 1.8 inches (should be 1.08). This may be of interest to local collectors who have no access to Sharp's monograph. M. L. Linell.

Catalogue of the described species of South American SYRPHIDÆ.

Additions and Corrections.

By S. W. Williston.

Baron Osten-Sacken has kindly communicated to me the following list of additions and corrections to my Catalogue of South American Syrphidæ, recently published in the Trans. Amer. Ent. Soc., xiii, 308. They were obtained from comparison with a catalogue of extra-European Diptera compiled by him, which it is very much to be desired that he

will soon publish. Such a general catalogue of the Diptera of the world, prepared by so conscientious an authority as Baron Osten-Sacken, could not help but be of the greatest service to all students of the order, if for no other reason than that of the literature. Five of the species given below were ones omitted accidentally by me in the arrangement of the MSS., or by the printer; others were overlooked, or were in works to which I had no clews. I believe that the list, with these additions, is now essentially complete. Mr. V. v. Roeder informs me that *Xylota cærulea* Rondani, is the same as *Sterphus antennalis* Phil., which must thus give place to the earlier name.

ADDITIONS.

Microdon cyaneus Perty, Delectus, etc.—Brazil.
fulgens Wiedemann, Auss. zw. Ins., ii, 82; Williston, Synopsis, 11; Macquart, Dipt. Exot., 1er Suppl., 122.—N. and S. America.
Syrphus albitarsis, *excavatus* and *albiventris* Rondani, Dipt. Osculati.—S. America.
octoguttatus Jaennicke, Neue Exot. Dipt., 90.—Chili.
similis Blanchard, in Gay's Hist. fis. y pol. de Chile, vii, 410; Philippi, Verh. Zool.-Bot. Gesellsch., xv, 745.—Chili.
Phalacromyia ardua Wiedemann, Auss. zw. Ins., ii, 204 (*Volucella*); Rondani, Esame, etc., 5 (id.); Mik, Wien. Ent. Ztg. 1883, 284.—S. America.
Temnocera metallorum and *fulvolucus* Walker, Dipt. Saund., 252.—Brazil.
Eristalis decorus Perty, Delectus, etc.—Brazil.
inversus Wiedemann, Auss. zw. Ins., ii, 161.—Surinam.
fuscipennis Macquart, Dipt. Exot., 1er Suppl., 128, pl. xi, fig. 5.—Surinam.
pygmæus Macquart, Dipt. Exot., ii, 2, 54.—Surinam.
funescens Rondani, Dipt. Osculati, 4.—Rio Negro.
Helophilus chilensis (Walker?) Guérin, Iconogr., 545, pl. xcix, f. 2.—Chili.

Also the four following from the Galapagos Islands should be included in the South American fauna.

Syrphus albomaculatus Smith, Proc. Zool. Soc., Lond., 1877, 84.
agonis Walker, List, etc., iii, 588.
splendens Thomson, Eugenies Resa, 501.
Baccha facialis Thomson, Eugenies Resa, 504.

CORRECTIONS.

Microdon conopsoides should be stricken out; it is *Mixogaster conopsoides* wrongly placed.
Microdon angustus Macq. Suppl. i, is not the same as *M. angustus* Macq., Suppl. iii.
Pipiza aurantipes Bigot is from Chili, not Brazil.
P. lugubris Jaenn. should read 96, not 4.
For *Volucella polorans* read *plorans*.
Syrphus elegans should have been printed in italics and indented; it is a synonym of *distinguendus*.
Dolichogyna nigripes Bigot, is 1883, not 1884.
Stilbosoma nigrinervis, not *nigricornis*.

Observations on some CAPSIDÆ with descriptions of a few new species.

By P. R. Uhler.

(No. 2.)

Div. CYLLECORARIA.

Pilophorus, Hahn.

This genus was separated by Hahn in his Icones ad Monog. Cim. I, No. 23, to contain a European species the Capsus *bifasciatus* Fab., which is also a synonym of *Cimex clavatus* Linn. Since then two other species have been recognized, and all three have been placed in another genus (*Camaronotus*) by Fieber, in his Europäischen Hemiptera. Still later, Douglas and Scott in their British Hemiptera have gone so far as to base a family upon this genus, to which they have given the name *Camaronotidæ*. North America is not less well provided with representatives of this genus than is Europe, and unless we are mistaken in the value of the characters employed to separate them, the United States has more species than the old world. Dr. O. M. Reuter has recently studied the European forms of the *Capsidæ*, and with a larger amount of material than has been before any previous Hemipterist. Accordingly, with a wider view than any of his predecessors, he has deemed it more accurate to arrange this *Pilophorus*, in company with *Mimocoris*, *Myrmicomimus*, *Cremnocephalus*, *Ethelastia*, *Systellonotus*, *Læmocoris*, *Eroticoris*, etc., in a division *Pilophoraria*.

The genus *Pilophorus* has such a different facies from any of our other known *Capsidæ* that it would seem to be recognizable at once by the shape and adjustment of the head alone. The Ant-like form of the body, especially in the nymph, together with its habit of rapidly coursing over the bark of trees renders it liable to be mistaken for one of the small red or brown Formicidæ. Our American species differ much in the width of the body, the females being more robust than the males, but they are all more or less spindle-shaped, contracted across the basal half of the hemelytra. They have a broad head which curves back beyond the sides of the swollen pronotum, sits close against it, is of a conical form, scooped out behind and below there is a high carina connecting the eyes, and the face is very sloping anteriorly. The males usually have a more parallel-sided prothorax than the females.

1. **P. confusus** Kirschb. Rhynchot, Wiesbaden, p. 133, 9.

This species agrees almost exactly with the insect so named by Kirschbaum, of which I have several examples received direct from Meyer-Dür of Bergdorf, Switzerland, and which were determined by him to be the true *P. confusus*.

In the Atlantic region this insect lives upon willow bushes, and is sometimes rather common in September. It is next to the smallest species of the genus thus far discovered in North America, and will no doubt prove to be extensively distributed on this continent when it becomes more sufficiently known.

2. P. amœnus, new sp.

Piceous, opaque, highly polished beneath; aspect of *P. bifasciatus* Fab., but with a narrower pronotum which differs but very little in the two sexes; with the second joint of antennæ more strongly and abruptly clavate on the apical one-third. Head long and broad, including the eyes about as wide as the base of the pronotum, face obsoletely shagreened, transversely wrinkled, vertex with an impressed longitudinal line running from the middle of occipital ridge, and each side of this a shorter diagonal impression connected inwardly with a depressed point. Rostrum pale rufo-piceous, darker at base, reaching to the middle coxæ ♀, but a little longer in the male; antennæ long, reddish yellow to beyond the middle of the second joint, that joint longer than the head and pronotum united, the last two joints slender whitish, the apical one a little dusky near the tip. Pronotum blackish-piceous, more or less dull, sub-cylindrical, trapezoidal comparatively narrow, obsoletely scabrous and wrinkled, but sinuated on the sides posteriorly, which is caused by the great prominence of the postero-lateral angles; middle line impressed, proceeding from an indentation in front; posterior-margin distinctly concave, and in front of this the surface convexly elevated; pleural flaps transversely wrinkled. Sternum and pleural pieces highly polished, coxæ piceous, anterior wide in the middle, posterior pair broadly white at tip; femora and tibiæ piceous, the former usually paler at base. Hemelytra cinnamon fulvous, piceous across the apical third and including the cuneus, corium with a slender silvery band extending half-way across the middle, a band of the same color forming the basal boundary of the piceous part, and at the inner corner of the cuneus a silvery dot; membrane dusky with a darker spot at base. Scutellum black, tumid, polished, minutely scabrous, the tip much depressed. Venter piceous black, highly polished, a little rufescent when recently excluded.

Length to tip of membrane $4\frac{1}{2}$—$5\frac{1}{2}$ mm.; to tip of venter $3\frac{3}{4}$—$4\frac{1}{4}$ mm. Width of base of pronotum $1\frac{1}{4}$ mm.

This species closely resembles the *P. bifasciatus* Fab., Mantissa Ins. II, 305, 264; of which *P. cinnamopterus* Kirschb., is a synonym.

Our knowledge of the distribution of this species is as yet very inadequate. It sometimes abounds on Pine trees in late June and July in Maryland. When fully matured some specimens have a faint bronze tinge upon the surface of the pronotum, which is not apparent in others. Possibly this peculiarity is due to the influence of the heat generated in their bodies at the period of mateing.

3. P. Walshii, new sp.

This form has been held back for a long time in the hope that other specimens may be secured to enable a wider comparison with the European species.

It is in reality much smaller than the *P. clavatus* Linn., to which it

seems the most nearly allied. Its figure, however, appears broader, the general color is a dark cinnamon fulvous, more or less piceous upon the disk of the pronotum.

Head rufo-fulvous, the face obsoletely transversely wrinkled, having a few impressed points scattered over the surface; base of vertex with a slightly raised deltoid spot; eyes projecting a little wider than the front of the pronotum, but decidedly most prominent in the male; antennæ slender, of medium length, rufo-fulvous; with the apical one-third of second joint fuscous, that joint graduated a little thicker towards the tip, and about as long as the pronotum and eye united; third and fourth joints together shorter than the second, dusky, white at base, the third a little longer than the fourth; rostrum rufous, reaching to the middle coxæ. Pronotum trapezoidal, moderately convex, wide, the lateral margins diagonal, slightly sinuated, but a little more sinuated in the male. Legs, pectus, and basal half of venter pale rufo-fulvous, the apical half of the latter piceous; coxæ more or less white. Scutellum dusky, moderately tumid, a little scabrous, fulvous at tip. Corium and clavus cinnamon fulvous, sometimes darker, the former with a very slender silvery band beyond the base, a second similar, dislocated one behind the middle and a silvery dot at the inner angle of the cuneus; the cuneus and a polished spot near the apex of corium pale piceous; the membrane dusky.

Length to tip of membrane 3—3½ mm.; to end of abdomen 2¾ mm. Width of base of pronotum 1 mm.

This form appears more flat above than is common to the species in this division of the genus.

Several specimens were kindly sent to me by the late B. D. Walsh, who collected them in the neighborhood of Rock Island, Ill.

Pamillia, new genus.

Form of *Pilophorus*, but more close set and with a thicker abdomen. Head deeper and more convex, face narrower and more nearly vertical; occiput with a carina between the eyes; antennæ exceptionally thick, of nearly equal thickness throughout, the second joint as long as the eye and pronotum united, third and fourth together about as long as the second, and both contracted at base, the fourth shortest, conical at tip. Pronotum trapeziform, about as wide as long, very convex, deeply sinuated each side, which causes the posterior angles to prominently project laterally. Hemelytra much widened behind the middle as far as the tip, the outer margin of corium broadly curved, widely reflexed; the cuneus wide and short, acute at tip, feebly incised at base. Legs stout, the hind pair long, and all the tarsi slender.

P. Behrensii, new sp.

Chestnut brown, moderately polished, more robust and wider posteriorly than the average species of *Pilophorus*. The pronotum also proportionately wider, with the lateral margins oblique, concave, and the disk more generally convex. Head convex, shorter, and less compressed than in *Pilophorus*, polished, very minutely scabrous, transversely obsoletely wrinkled, depressed across the base, the middle line

feebly impressed ; eyes pale, more prominent laterally in the male than in the female; antennæ very stout, all the joints of nearly equal thickness, the second joint about as long as the eye and pronotum united, the third and fourth short, both contracted at base, the fourth shortest almost at tip ; rostrum pale rufo-piceous, reaching to tip of the middle coxæ. Scutellum paler brown, yellowish at tip, moderately convex, transversely impressed before the base. Legs piceo-fulvous, a little embrowned at the points of articulation, the posterior acetabular flap white. Pleural pieces fulvous, polished. Hemelytra pale fuscous invested with erect hoary pubescence ; the clavus fulvous, a little embrowned at base, corium with a triangular white spot at base, a pale costal margin and a white oblique band across the broad apex ; cuneus short, triangular, fuscous, margined exteriorly and at tip with white ; membrane dusky, darker at base, venter piceous, sericeous pubescent, fulvous in the basal angle.

Length to tip of membrane 4 mm.; to end of venter $3\frac{1}{4}$ mm. Width of base of pronotum a little less than 1 mm.

Two specimens collected in the neighborhood of San Francisco, were kindly given to me by Mr. James Behrens, to whom I desire to dedicate this species as a slight recognition of the many services he has done in several branches of Entomology.

The thick texture of the integuments, besides the exceptionally stout antennæ, and bent hemelytra, will abundantly separate this species from all its allies thus far recognized.

Diommatus, new genus.

General outline oblong elliptical. Head viewed from above nearly triangular, the face almost vertical, moderately tumid in front, longitudinally indented and excavated above. Superior cheeks short, tapering towards the tip, inferior cheeks wide, oblong, prominent, blunt at tip. Occipital edge carinate. Eyes large, prominent almost spherical (♂), vertical sub-oval ♀. Tylus short, very prominent, cylindrico-convex ; curved beneath. Antennæ about as long as the wing-cover, slender, the joints gradually decreasing in thickness from the basal to the third one ; the basal stout, abruptly contracted at base, but little longer than the apical one, the latter being of the same thickness as the third, the second long, cylindrical, equal to the third and fourth united. Rostrum slender, the basal joint a little longer than the throat. Pronotum trapezoidal, nearly flat, shorter than the width at base, the callosities prominent, and breaking the continuity of the oblique, blunt lateral margin. Scutellum moderately convex, bluntly acuminate at tip. Hemelytra long and narrow, thin, pubescent, the cuneus long, slender and acute at tip, with the outer margin nearly straight, the inner margin concave, and the base very slightly incised. The membrane also long, with the principal cell long and rather narrow. Legs long, slender, the posterior femora stout, compressed, curved ; posterior tarsal joints moderately long, the basal and middle joint subequal, the apical one longest. Abdomen narrow and not distinctly contracted at base.

D. congrex, new sp.

Pale green, shining, feeble, pubescent. Head polished, with either a fuscous circle, or piceous spot overlapping the tylus, between the eyes. Eyes dark brown. Occipital collar ivory-yellow. Antennæ very minutely pubescent, testaceous, more or less infuscated, especially towards the base, the basal joint highly polished. Rostrum scarcely reaching to the middle coxæ, piceous at tip. Pronotum usually with two gradually widening black vittæ each side, or with nearly the whole of the posterior lobe and most of the anterior lobe infuscated; the surface feebly convex, transversely wrinkled, obsoletely punctate, minutely sericeous pubescent; the anterior angles rounded, the posterior ones nearly rectangular. Scutellum either wholly infuscated, or with a black vitta each side, transversely wrinkled, minutely pubescent. Legs pale green, the femora remotely bristly, having a few coarse punctures; the tarsi and tips of femora piceous. Corium pale greenish or whitish, the clavus and a broad vitta, continued on the inner side and along the cuneus, blackish; membrane blackish-fuliginous, pale next the cuneus and on the vein of the cell.

Length to the tip of venter, ♂ $3\frac{1}{3}$, ♀ $4\frac{1}{2}$ mm.; to tip of wing-covers 5—6 mm. Width of pronotum $1\frac{1}{4}$ mm.

It is a common insect in Eastern Massachusetts; and it has also been taken in Maine, Canada and Illinois.

Mr. E P. Van Duzee has kindly sent to me specimens from Lancaster, N. Y., collected on the first of July.

Bolteria, new genus.

Closely related to Labops; form broad and nearly flat. Head broad nearly vertical in front, vertex very short and transverse, depressed, with a high carina between the back part of the eyes; front shield-shaped, tumid, pushed up so as to be all between the eyes; the eyes large, vertical, reniform, projecting sideways beyond and almost in contact with the pronotum; antennæ seated beneath and a little before the lower end of the eyes; tylus almost flat, the jugum is large, triangular and reaching a little more than half way down the tylus; superior cheeks long, elliptical, swollen, the inferior ones small, depressed, triangular; rostrum abruptly reduced in size beyond the basal joint, that joint very broad, compressed, reaching almost to the tip of the cuneus, the basal joint long, stout, contracted at base, the second joint a little less stout, cylindrical, longer than the clavus, third and fourth shorter, not much thinner than the second, hardly setaceous. Pronotum transverse, sloping forwards, almost flat, the sides oblique, decurved, abruptly contracted beneath and with the carinate edge obliterated, anterior margin a little shorter than the basal; callosities small, transverse, long elliptical, widely separated. Scutellum almost flat, with a transverse linear impression at base. Corium wide towards the tip, with the costal margin very moderately curved; cuneus wide at base, acute at tip, concave on the inner margin, the incisure at base deep; membrane with the basal

areole very wide and long, the inner areole very distinct, about one-third as wide at tip as the preceding. Middle joint of tarsi very short, the basal and apical ones long, nearly equal.

B. amicta, new sp.

Ivory yellow, or pale fulvous; form much like that of *Geocoris bullatus* Say. Head smooth, an oblong spot in each angle at base of vertex, a crescent each side bounding the convexity of the face, transverse ridges of the front placed each side of a depressed longitudinal line, three spots above the tylus, middle line of the latter, and margins of all the segments of the cheeks rufous; sockets of the antennæ, basal joint of the same, and basal joint of the rostrum dark piceous. Base of vertex with an impression along the front of the carina, and this connects with the longitudinal indentation each side, and next below which is an arcuated, impressed, scabrous line bounding each side of the front; basal carina almost straight, the occipital area piceous, triangularly excavated each side; antennæ rather slender, excepting the basal joint, dusky, paler at tip, the second joint of equal thickness throughout, much thinner than the basal one, and about as long as the eye and pronotum taken together; rostrum pale piceous beyond the basal joint, reaching over the tip of the posterior coxæ ♀, but extending upon the base of the last ventral segment ♂. Pronotum polished, a little narrower in front than at base, ivory-yellow, roughly unevenly punctate, piceous on the collum, posterior margin, and on the lateral margin at base; fore part of the disk fulvous each side. Margins of the pleural segments, and more or less of the coxæ, rufous. Scutellum ivory-yellow, piceous across the base, polished, minutely wrinkled. Corium feebly polished, opaque, obsoletely punctate, margined exteriorly and interiorly and with a gradually widening curved streak running back to a wavy broad band at tip, piceous; clavus more coarsely punctate, margined on both sides with piceous; cuneus ivory-yellow, broadly piceous at tip and slenderly so on the exterior margin; membrane dusky, paler at base, the nervules of the areoles pale yellow, and the areoles dusky next the tip. Legs dull testaceous, more or less piceous on the femora and tip of tibiæ, tarsi dark piceous. Venter highly polished, the sutures, incisures, ovipositor, and genitalia rufo-piceous or rufous.

Length to tip of venter 4 mm.; to tip of membrane 4½—5 mm.

Mr. Bolter collected several specimens in New Mexico and kindly gave me a pair of both sexes.

Div. PLAGIOGNATHARIA.

Psallus delicatus, new sp.

Rosy pink or testaceous tinged with dull brown; moderately robust, polished. Head almost vertical; face convex, smooth along the middle, and each side of this with a crescent composed of short fuscous transverse lines, the middle line of vertex obsoletely impressed; tylus short, prominent, tinged with pale piceous; antennæ testaceous, dusky on the last two joints, sometimes the basal and second joints pale piceous; basal shorter than the head, the second a little longer than the pronotum; tips of the cheeks and base and tip of the rostrum [illegible] generally piceous, the latter reaching upon the posterior coxæ; eyes dark brown, nearly [illegible] abruptly bowed beneath where bending upon the throat. Pronotum polished, convex, transverse, remotely very obscurely punctate; the lateral margins carinate-reflexed, oblique, hardly sinuated; the callosities generally fuscous in the surrounding depressed lines;

the propleural flap deeply depressed beneath the carinate margin, and broadly indented above the coxæ. Legs dull testaceous, the spines black, and the posterior femora marked with lines of brown dots. Scutellum highly polished, moderately convex, obsoletely minutely rugulose, entire, subacuminate at tip. Hemelytra wide, minutely, remotely pubescent, darker upon the disk than upon the margins, the clavus rather coarsely punctate, the corium obsoletely punctate, but a little coarsely so at base; the costal margin feebly curved, sharply reflexed, pale, becoming gradually wider behind, and at the outer angle jutting beyond the base of cuneus; the cuneus pale across the base and upon the margins, the tips acute; nervules of membrane pale, the membrane sometimes clouded at base and tip. Venter dusky from base to just before the last segment, excepting the connexivum, the edges of the segments testaceous. Sternum sometimes with a dark band across the middle.

Length to tip of venter $2\frac{1}{2}$—3 mm.; to tip hemelytra 3—$3\frac{1}{2}$ mm. Width of base of pronotum $1\frac{1}{4}$—$1\frac{1}{2}$ mm.

The dark variety of this species has been captured in the highlands of Georgia.

Notes on certain North American species of the group called by M. Guénée 'Acronycta'.

By A. G. Butler, L. L. S., L. Z. S.

I propose, from time to time, whilst incorporating the Grote and Zeller collections with the series in the British Museum to publish a few critical notes on the various types or co-types in our possession: the following notes, which are not based upon on my individual judgment alone, but are supported by the opinion of a co-worker, are I believe absolutely correct.

When Messrs. Grote, Robinson and Riley examined our collections they neither had time or opportunity to examine the whole of the specimens in the British Museum, Grote and Zeller collections side by side (i. e. placing the types together upon one piece of pith and critically comparing both surfaces) and therefore it was not to be expected that their published notes should be final.

A. brumosa, Guén.

We possess the types labelled by M. Guénée from W. Doubleday's collection: one of them—the type of the species—is labelled simply *'Acr. Brumosa, Gn.'*; it agrees perfectly with the type of *Apatela persuasa* Harvey, in Grote's collection; the other specimen is labelled *'variety Acron. Brumosa, Gn.'* and agrees with the type of *Acronycta afflicta*, Grote.

The *A. brumosa* of Grote's collection is therefore not Guénée's species but is = *A. verillii*, Grote, = *fusciata*, Walk., = *impressa*, Walk., as pointed out by Grote.

A. hamamelis, Guén.

A specimen, labelled by M. Guénée, of this species evidently represents a dark form of his *A. clarescens* (one of the types of which we also possess, as noted by him). *A. clarescens* is the '*A. hamamelis*' of Grote's collection and therefore quite distinct from *A. clarescens* of Grote, which belongs to another group in which the dagger mark is well defined.

Acronycta noctivaga, Grote.

The *A. longa* of Walker is a synonym of this species and quite distinct from Guénée's insect of which, unhappily, we do not possess the type but which appears to be a form of *A. brumosa* = *persuasa.*

Acronycta subochrea, G. & R.

I cannot distinguish this from the type of *A. impleta,* Walk., which, although broken, is in perfectly recognizable condition.

Acronycta hilus, Grote.

This appears to me to be a small form of *A. modica,* Walk.; it is however paler on the under surface and on the upper surface shows more rufous-brown in the discoidal spots of primaries. I am not usually regarded as a lumper of species, but I should certainly hesitate to consider it distinct; it may be.

Notes on Preceding Paper.

By John B. Smith.

Acronycta hilus, Grt., does not seem to be described; no description is known to me at least. I wrote Mr. Butler on the subject asking whether he knew of a description; his reply is: "With regard to *A. hilus,* Grote, I know of no description of the species, but as Grote had so labelled one of his specimens I concluded that he did know of it, and that you, in America, would be likely to know of it also."

Modica, Walker, has been dropped from our Lists by Mr. Grote. Mr. Butler says further on this subject in the letter above quoted: "I am very doubtful about the identity of *A. exulis* [qy. *exilis* ?] with *A. modica*; it is possible that they are distinct and, in any case, they represent at least two well marked types of one species; at the same time Grote did not possess *A. modica* and the pattern of the two forms is identical: *A. exulis* is smaller, has paler primaries with a little more brown suffusion within end of discal cell; but the two specimens from Grote's collection differ in tint of primaries, the type being paler than the second example; therefore I say that I would not myself venture to separate it as a species."

Mr. Butler's letter leaves it in doubt what relation *hilus* and *exulis* bear to each other; both seem to be hardly distinct from *modica.*

NORTH AMERICAN PYRALIDÆ.

By Prof. C. H. Fernald.

(Mass. Agr. College, Amherst, Mass.)

Crambus bolterellus, n. sp.

Expanse of wings, 22 mm.

Palpi, head and thorax, pale ochre yellow, the palpi being touched with fuscous on the outer side. The patagiæ are overlaid with lead colored scales.

Fore wings white, broadly edged with fuscous along the costa. Behind this edging there is a stripe extending from the basal fourth of the cell to the apex, of a dull leaden color and the remaining intervenular spaces are also of the color. An oblique reddish brown line crosses the wing a little beyond the end of the cell, with a slight inward angle near vein 2, and a pronounced outward angle beyond the end of the cell. A second line crosses the wing rather more than half way from the last to the outer margin, of similar size and color and similarly angulated below the costa but following the outline of the outer margin, below the angle. A row of six or seven black points rest on the intervenular spaces at the end of the wing. Fringes pale silvery metallic. Hind wings sordid white with a fine, pale fuscous terminal line which does not reach to the anal angle. Fringes white. Abdomen pale fuscous, darker beneath. Legs and underside of fore wings, pale fuscous. Underside of hind wings somewhat lighter.

Received from Texas by Mr. A. Bolter, for whom I take great pleasure in naming this species.

Crambus multilinellus, n. sp.

Expanse of wings, 26 mm.

Palpi, head and thorax, dull ochre yellow.

Fore wings, bright ochre yellow. A costal white stripe extends nearly to the apex leaving the extreme edge of the costa fuscous, and a median white stripe extends from the base of the wing along the lower part of the cell out as far as the subterminal line, the outer part of which is separated by an oblique line. The band of yellow between the two white stripes is edged on each side with a fine line of black and metallic lead colored scales, and there are similar lines along the invenular spaces. All these lines terminate just before reaching the subterminal line. Three or four oblique yellow lines, edged on their outer side with white, cross the outer part of the costal white stripe, the third of which is overlaid with metallic lead colored scales and runs down near the outer margin of the wing where it bends and runs to the hinder margin nearly parallel with the outer margin. This is the subterminal line. There is a terminal row of five black points and the fringes are pale metallic lead colored.

Hind wings and fringes, white. Abdomen above and beneath, underside of the body and the legs are dull ochre yellow. Throat and underside of the palpi, white.

Habitat.—Florida.

Crambus behrensellus, n. sp.

Expanse of wings, 23 mm.

Palpi, head, thorax and fore wings, dull ochre yellow and sprinkled with darker, brownish yellow scales. These scales are arranged on the fore wings so as to form two ill defined close bands; the first starting from the middle of the costa extends out to the end of the cell where it forms an acute angle and then extends across the wing to the middle of the hinder margin. The second band starts from the outer fourth of the

costa and runs in a similar direction to the other but does not form so acute an angle. There is a terminal row of seven black points, and the fringes are dull golden metallic.

The hind wings, abdomen above and beneath, underside of the body, legs and underside of all the wings are fuscous.

The venation of this species is quite remarkable and when I take up the structural study of these insects I may find it necessary to place this species in a new genus.

Habitat.—California.

I have named this insect for Mr. James Behrens, who collected and sent it to me with many other exceedingly interesting things, for which I feel a keen sense of my obligations to that gentleman.

I am also under obligations to Lord Walsingham for comparing these species with the Crambidæ in the British Museum.

Scirpophaga fasciella, n. sp.

Expanse of wings, from 14 to 18 mm.

Palpi and face, reddish brown. Head, thorax and fore wings, snow white and somewhat silky, the latter crossed by two orange yellow bands nearly parallel with the outer margin, the first near the middle of the wing and not reaching to the costa, the second towards the outer margin and extending entirely across the wing. At the end of the cell between the two bands and equally distant from each is a prominent spot of the same color, and in some specimens there is a more or less complete orange yellow terminal line. Fringes snow white and silky.

Hind wings white, with the bands of the fore wings continued in part across the hind wings and showing more or less distinctly across the outer part of veins 2, 3 and 4, and also near the origin of vein 2 and at the anal angle. These marks are often more or less obliterated. Fringes white. Abdomen above and beneath, underside of the body and wings, middle and hind legs, white; fore legs fuscous and the basal part of the costal edge of the fore wings is fuscous in some examples.

Habitat.—Florida.

Scirpophaga flavicostella, n. sp.

Expanse of wings, from 12 to 16 mm.

Palpi and face, reddish brown. Head, thorax, abdomen and wings, above and beneath, snow white. The fore wings are crossed by two pale ochre yellow bands nearly parallel with the outer margin. The first band crosses the wing a little before the middle and has an outward angle on the median vein and an inward angle on the fold. The basal part of the costa from the thorax out to this band is also yellow. The outer band which crosses the wing on its outer fourth, is connected by a cross band to the outer margin a little above the middle and has an inward angle on vein 4, which nearly connects with a quadrate spot of the same color which rests on the end of the cell. These cross bands are continued across to hind wings but more or less broken, especially the inner one, and the outer one is connected with the outer margin as on the fore wings. All the wings have the terminal line yellow, and all these yellow bands and spots are edged with scattered scales of a dark brown color. The basal part of the third segment of the abdomen has a yellowish spot on the upper side. The fore legs are marked with reddish brown while the other legs are white.

Habitat.—Florida.

A Voice from the Wilderness!

Key West, Fla., April 15, 1887.

"Dear Mr. Smith:

I yesterday made my first excursion on this Island, and find that collecting is very troublesome here. The whole Island is covered with a dense brush, composed of numerous species, mostly entirely unknown to me, but all being of the hardest and heaviest wood, so that my knife and chisel are entirely powerless to cut out the numerous insects which live in the branches. This brush is liberally interspersed with immense *Cactus* plants so as to be impenetrable in most places. In spite of these unfavorable conditions I see that a great many interesting things can be found, and *most* of the small species I have found are entirely new to me. Of the large beetles found by Ashmead and Morrison, I have seen nothing so far except *Neoclytus devastator*, *Elaphidion* sp., and the holes made by one of those gigantic *Prionids*. *Chrysobothris chalcophoroides*, collected by Morrison, seems to be plentiful, but it is so wild that I have not yet secured a single specimen. * * * * I have not seen a single Noctuid yet, but this section of the country with its numerous evergreen shrubs (not *Conifers*), appears to be an Eldorado for leaf-mining Tineids. The weather is very pleasant, the heat by no means unbearable, though I of course got frightfully sun-burnt on my first excursion. There is fortunately not a drop of fresh water on this Island, but lager-beer is 20 Cents per glass."

Poor Mr. Schwarz! for it is Mr. E. A. Schwarz that writes me as above. The want of water seems bearable for it is unhealthy, but other beverages to be so scare—that is a misfortune!

Mr. Schwarz writes further that he has discovered a beautiful new *Thysanoës* in Fig, (*T. ficus* Schw. MSS.), and a new *Pityophthorus* (*manzanitæ* Schw. MSS.), in the bark of "Manzanita," and no doubt other novelties will be discovered by this careful and industrious collector.

Mr. Palm and Mr. Beutenmüller of our Society are also on a collecting trip in Florida, and no doubt will turn up some fine species.

J. B. Smith.

Book Notice.

The Hawk Moths of North America, by A. Radcliffe Grote, A. M., 8vo., pp. 63, Bremen, 1886. Price $1.00.

By the kindness of the Author, we are in possession of the above work, which, in view of its Author and subject, ought to have more than a passing interest to American Lepidopterists.

The present work is very neatly printed upon good paper and consists in summary of three parts: 1st, On Collecting and Preserving for

the Cabinet; 2nd, The Species of N. A. Hawk Moths, and 3rd, A concluding Essay, entitled L'Envoi. The first part gives directions as its title makes known. The classification follows largely that adopted by Prof. Fernald in his "Sphingidæ of New England." Two new genera are described, *Deilonche*, for *Cherocampa tersa* Linn., and *Atreus*, for *Sphinx plebeius* Fabr. The second part concludes with a discussion of descent, distribution, and a list of genera of food plants. The third part consists in part of remarks upon the author's past work and ideas upon the Lepidoptera, and for the rest of an excursus into the neighboring realm of poetry. The poetical, which indeed colors the whole work, and interpentrates the hard scientific descriptions, gives a delightsomeness to the book rarely found in such works. One unfortunate addition Mr. Grote has made which is evidenced even in the title of the work—viz.: the introduction of so-called "common names." For once the poet has gotten the better of the scientist, and the poet has made a mistake. For "Hawk Moths" and its like are rhyme only; "Sphinx" is the poem and is science as well.—Mr. Grote in his exile does not seem to have kept up thoroughly with American Literature as he makes no reference in his Bibliography to Mr. J. B. Smith's masterly Synopsis of the Genera of the Sphingidæ of North America, for which Prof. Fernald expresses such high regard.

The next meeting of the Am. Ass'n for the Adv. of Sci., will be held in the City of New York, on Wednesday, August 10, 1887. A special effort will be made to have full and interesting meetings of the Entomological Club on this occasion.

Society News.

The **Brooklyn Entomological Society** met in its Rooms, April 5th, 14 members present.

The report of the retiring Editor, Mr. J. B. Smith was read, showing that Entomologica Americana is not yet able to pay its own way, as from it a large deficit falls upon the Society. The report further gave a resumé of Mr. Smith's connection with the Society, and the great benefit which had come to him through it.

Notice was given of the fact that the A. A. A. S. was to hold its next meeting in New York, beginning Aug. 10, 1887. On vote, the President was authorized to appoint a Committee of five members to make arrangements for the suitable reception and entertainment of visiting Entomologists.

A pleasant feature of the evening was the reception of a large photograph giving in a group six of the prominent Entomologists of the Pacific Coast. A vote of thanks was rendered to the donors. It was a pleasant thing to the Society to see that among these were two of its own members in former times, one of them one of the original members of the Society.

The rest of the evening was spent in a discussion upon the genus *Acronycta*, with a bearing upon its classification, and also upon the species of the genus, specimens of which had been brought for comparison and identification by the members.

ENTOMOLOGICA AMERICANA

VOL. III. BROOKLYN, JUNE, 1887. NO. 3.

Some New Bombycidæ.

By Edw. L. Graef.

Alypia gracilenta n. sp.

Allied to *A. octomaculata*; its wings are however narrower, longer, and considerably more pointed toward the apex. Head black; eyes brown, margined with sulphur yellow; palpi and antennæ black. Thorax black; tegulæ sulphur yellow; abdomen black, slightly sprinkled with yellow on middle segment. Legs black, tibiæ entirely, femora only outwardly, orange. Anterior wings black with steel blue scales, especially marked near the base. Yellow patches much as in *A. octomaculata* excepting the one on the primaries near the base is more kidney shaped, while in *A. octomaculata* it is semispherical with the base toward the interior margin. The costal nervure is very much enlarged towards the middle of the anterior wings, and is here margined with sulphur yellow. Secondaries black, with the pale yellowish patches placed as in *A. octomaculata* except that the one near the base is much smaller and does not reach the inner margin. Below, all the markings reproduced.

Expands $1\frac{3}{8}$ inches.

Described from 3 ♀♀ from Texas. Collection of E. L. Graef.

This species can be readily separated from *A. octomaculata* by its narrower, and more pointed wings, and the greater length of the abdomen; *A. octomaculata* ♂ has a dorsal stripe of sulphur yellow, extending along its entire abdomen, widening towards the anal extremity, while in *A. gracilenta* the abdomen is entirely black with a few, hardly noticeable yellow scalès on middle segment; also by the yellow patch in the middle of costal nervure.

Harrisina nigrina n. sp.

This species in shape and size closely resembles *H. americana*, but can be at once recognized by the absence of the orange prothorax. The entire insect dull black, the abdomen with a bluish lustre.

Expands $\frac{3}{4}$ inch.

1 ♀ from Texas. Collection of E. L. Græf.

Crocota diminutiva n. sp.

This is the smallest of all known *Crocotæ* ; in color it is of a brilliant, uniform, orange above, and below, the primaries somewhat paler, and devoid of all markings whatsoever. Eyes brown.

Expands $\frac{5}{8}$ inch.

1 ♂ and 1 ♀ from Texas. Collection of E. L. Graef.

Crocota opelloides n. sp.

Shape and size of *C. opella*. Primaries immaculate dull grayish orange, except the costa, which is of a bright orange. Some slight indications of orange in the discoidal cell. Eyes brown ; collar orange ; thorax and tegulæ gray orange as primaries. Secondaries bright orange ; immaculate. Below, all the wings pale orange.

Expands $1\frac{1}{8}$ inches.

1 ♂ and 1 ♀ from Texas. Collection of E. L. Graef.

Crocota intermedia n. sp.

This species stands intermediate between *C. ostenta* and *C. treatii*, but more closely allied to the latter. Head, thorax and primaries immaculate, light olive brown. Collar orange. Secondaries orange, with a broad black border extending two-thirds the expanse of the wing. Abdomen black. Below, all the wings orange, with a broad black border on the margins.

Expands 1 inch.

1 ♂ from Texas. Collection of E. L. Graef.

It would almost seem out of place to add to the many already described species of *Crocota*, but the threes pecies here enumerated are so well defined and unique, that I do not doubt they are good species. *C. ostenta*, *treatii*, and *intermedia*, although my specimens are easily recognizable, still may prove to be identical. If this should be the case, it would only be another proof of the worthlessness of specific separation based on the maculations of the secondaries in the *Arctiidæ* to which I have already referred in an article on *Arctia figurata* (Bull. B'klyn Ent. Soc., vol. I, p. 4).

Euchætes immaculata n. sp.

All the wings pure immaculate white above and below. Head, antennæ and thorax white ; eyes brown, slightly fringed with crimson. Abdomen light crimson with a white line along the dorsum. Below, white ; legs white.

Expands $1\frac{9}{16}$ inch.

1 ♀ from Florida. Collection of E. L. Graef.

This species can be easily separated from its nearest congener, *E. elegans*, by its white antennæ and white line on abdomen. It is larger and its anteriors more pointed.

Euchætes murina Stretch, in MS?*

All the wings light slate color, the veins on primaries lighter near the discal

* This species was originally described by Mr. R. H. Stretch in MS., but as I never saw his description and his new work on the *Arctiidæ* is so long delayed, I believe I am securing him priority by describing the species here, and crediting him with its discovery.

region. Head and thorax light slate color; collar light crimson; eyes and antennæ black; abdomen light crimson; below, slate color. All the wings below uniform slate color.

Expands $1\frac{5}{16}$ inch.

2 ♂♂ and 1 ♀ from Texas. Collection of E. L. Graef.

This species is nearest to *E. eglenensis*, but is a much slighter insect. In color it is darker, and it lacks the black abdominal spots, as also the white anal tuft so conspicuous in *E. eglenensis*.

Euchætes scepsiformis n. sp.

All the wings uniform dark blackish gray, the secondaries transparent from the base to middle of the wing. Head, antennæ and thorax dark gray; eyes black; collar slightly scaled with crimson; from this along the shoulder to beneath the base of primaries a band of white. Legs dark gray, coxæ of first pair crimson. Abdomen bright crimson with black dorsal and subdorsal spots; beneath dark gray.

Expands $1\frac{1}{8}$ inch.

5 ♂♂ from Texas. Collection of E. L. Graef.

This is a well marked species, and easily distinguished from any of its congeners. It is a robust insect, and the semi-transparent secondaries remind one of the genus *Scepsis*.

Spilosoma nigroflava n. sp.

Primaries, cream white with markings of black placed as follows: four lateral black dashes, the first and largest near the inner angle along and almost touching the interior margin; the other three above this, equi-distant from each other and gradually nearing the exterior margin. Two small black dashes in apical region, below which are two dots of same color. In middle area a heavy black dash extending along the costa below which outwardly are two dots of black, then, below, a heavy dash of black, somewhat of the shape of an irregular arrow-head, the point directed toward the base of wing. Below this two spots, the lower the larger, succeeded below again by a heavy dash of black resting on the interior margin. A small dash of black in the basal region and a few slight spots of same color at the base. Thorax, same color as primaries; tegulæ bordered inwardly with black, outwardly with pale yellow. Head white; eyes shining slate color; antennæ white above, and black beneath. Legs white, edged with black outwardly at the joints; tarsi black. Abdomen white, with five large black dorsal spots, with a like number of smaller ones at the sides; between these rows of spots the abdomen is light yellow; below, white. Secondaries immaculate, snow white. Beneath, the whole insect is white, the markings on primaries reproduced.

Expands $1\frac{3}{4}$ inch.

1 ♀ from Texas. Collection of E. L. Graef.

This species has somewhat the appearance of *Seirarctia clio*, but while the latter species has the black markings in continuous lateral stripes, these are in *S. nigroflava* disconnected. It is a beautiful insect, and quite distinct.

SYNOPSES OF CERAMBYCIDÆ.

By Chas. W. Leng, B. S.

(Continued from p. 24, vol. III.)

These two species have been much confused. Both vary in color from entirely black to nearly entirely rufous, the tip of the elytra remaining black in all I have seen. There is usually in *pini* an oblique line of silvery pubescence but it is (rarely) scarcely visible and though usually absent in *picipes* it is sometimes indicated. The thorax of *picipes* scarcely shows a sign of the lateral depressions forward which are conspicuous in *pini*, making the subangulate form more pronounced and finally the difference in the eyes is conclusive. Dr. Leconte mentions that the subbasal elevation of the elytra is more prominent in *pini* but poorly developed specimens occur in both species in which the difference is not appreciable.

Eu. spinicornis Chev., (*elegans* Lap), has occured in Mexico near the boundary and is easily known by the long spine of the 3d joint of antennæ.

Eu. Reichei Lec. S. M. C., No. 264, 1873, p. 202.

Length 4 to 5 mm. = .16 to .20 ins. Hab. Texas, Illinois.

Easily distinguished by the direction of the ivory band. The prothorax also is punctured not longitudinally striate as in the other species.

Eu. parallelus Lec. l. c.

Length 5 mm. = .20 ins. Hab. Lower California.

The anterior ivory band extends from the suture to the outer third, the hinder one is entire. This species I have not seen.

* * *

Since writing the note on *N. approximatus* (Ent. Am., vol. III, p. 7) I have seen several specimens of that species in Mr. Henry Ulke's collection—all identical with Dr. Horn's specimens. Chas. W. Leng.

Mr. Leng (Ent. Am., vol. III, p. 6) says of *Neoclytus scutellaris*: "the [middle] band of thorax is always distinct." I have seen specimens in which it must have been totally lost by abrasion if it ever existed. The form of the scutellum is characteristic and readily separates it from *N. luscus*, from which in this case it would otherwise be undistinguishable. In the latter it is transverse oval; in the former elongate triangular with the apex rounded—characters I have not seen mentioned in the literature of the species. *N scutellaris* is comparatively rare in the North, and a form of *N. luscus* with a red interrupted fascia occupying the same position is put for it in exchange. This fascia, however, is one of integumental coloration, and not a line of pubescence, as in *N. scutellaris.**

John Hamilton.

* Dr. Hamilton is quite right, though the character is not very apparent without careful comparison of both species. Ass't Ed.

New Genus and Species of POLYDESMIDÆ.

By Charles H. Bollman.

In examining the material of this family in the Museum of the Indiana University and my own collection, I have found the following new species. The types are deposited in the Museum of the Indiana University.

Genus I. **POLYDESMUS,** Latreille.

1. Polydesmus nitidus, sp. nov.

Dark shining brown, beneath lighter, lateral plates reddish-brown; antennæ dark. Moderately slender and depressed, acuminate anteriorly and posteriorly, but not so much as in *canadensis*. Antennæ exceeding the length of body, subclavate. First dorsal plate wide, angles a little produced, sides one-toothed; posterior border with a row of fine, ciliated spines; anterior row of scale barely distinguishable, middle row of four, large scales, posterior of three, small ones in the middle and two larger ones at both ends, anterior side scale small, other one (repugnatorial pore scale) large, elongate. Other dorsal plates with the scales distinct, anterior angles rounded, posterior produced, lateral margins 3—4 toothed, posterior border of anterior segments ciliated; anterior border divided by the median dorsal line into two large scales, middle row consists of four scales, posterior of six, outer larger, anterior side scale large and swollen, repugnatorial pore scale large and elongate; scales of last segments more elongate, marked with fine, irregular lines, the last row projecting behind.

Feet long, strongly crassate in the male and the femur swollen above, in the female somewhat crassate. ♂ copulation foot large, slender and curved; apex beneath with several bunches of flat, spiny hairs, below this are four tubercles, the two lowest ones on the inner side largest, elongate, the last one pointing towards the coxæ, piligerous pulvillus large, above which is a moderately long, topering branch and below a tubercle.

Length of body 15—18 mm.; width 2.8—3.5 mm.

Hab. Pensacola, Florida.

I have examined 15 specimens of this species, collected by myself in the vicinity of swamps. This species is related to *canadensis*, but is easily distinguished by the long, slender tubercles of the male genitalia.

Genus II. **CHÆTASPIS,** gen. nov.

Body slender, not much depressed, more convex than in *Polydesmus*, but not so much as in *Scytonotus*.

Antennæ with the third and sixth joints equal, the latter strongly swollen, second and fifth subequal, fourth equal to seventh and eighth. Segments 20; lateral plates distinct, but not as in *Polydesmus*, slightly angled, serrate; dorsal plates smooth, excepting a row of indistinct, setigerous tubercles along the anterior and posterior margins, no median, dorsal line; last acuminate. Repugnatorial pore rather large, placed on a moderately large and round tubercle, near the outer border of the 5, 7, 9, 10, 12, 13, 15, 16, 17, 18, 19 dorsal plates. Pairs of feet, ♂ 30, ♀ 31.

This genus is related to *Polydesmus* and *Scytonotus*, but can be easily separated by the character of the dorsal plates.

2. Chætaspis albus, sp. nov.

White throughout. Slender, small, slightly acuminate before. Antennæ exceeding the width of body, subclavate. First dorsal plate large, semicircular, angles not produced, provided with five rows of hairs. Other dorsal plate with the posterior angles a little produced, lateral margins with 3—4 setigerous teeth ; rows of hairs 2 to 3. Feet rather long, ♂ crassate, ♀ slightly crassate. ♂ copulation foot erect, not as in *Polydesmus* ; composed of two pieces, the outer curving outwards and then inwards, so that the ends almost touch over the median line of body, rather robust, somewhat flattened, the end apparently divided into three pieces—a small lobe, followed by a long and slender one with the end turned sharply downwards and this by a large, flat bifid piece ; inner piece narrow and thin, sickle shaped, the end curving up between the branched lobe of the outer piece ; coxæ with a few long hairs. Seventh dorsal plate enlarged.

Length of body 6—7.5 mm.; width .3—.5 mm.

Hab. Bloomington, Indiana.

I have examined 4 ♀♀ and 3 ♂♂. It seems to be more underground in its habits than the other species of this family known to me, I have always found it under logs buried rather deep in the ground. I thought at first this may be the young of some other *Polydesmidæ*, but having found several males and taken a pair in the act of copulation, I have decided that it must belong to a new genus.

Genus III. **SCYTONOTUS,** Koch.

3. Scytonotus cavernarus, sp. nov.

Allied to *nodulosus* Koch. Pure white throughout. Slender, somewhat depressed, acuminate anteriorly. Antennæ exceeding the width of body, clavate. First dorsal plate elliptical, angles sharp ; scales arranged in five, transverse series, anterior row sharp, setigerous, all covered with fine granulations. Other dorsal plates with all the lateral sides sharply and deeply four or five toothed, scales arranged in four rows, the posterior row more or less setigerous, on the posterior segments the anterior row is not very distinct. Repugnatorial pore scale large and swollen. Legs moderately long and slender.

Length of body 11 mm.; width 1.5 mm.

Hab. Mayfield's Cave, Bloomington, Indiana.

This species is described from one female found crawling on the floor of the above cave, in October, 1886. As already stated, this species is more nearly related to *nodulosus*, but as *granulatus* is the only species found so far in the vicinity of Bloomington, I suppose it is descended from *granulatus*.

Food Plants of Geometridæ with other Notes.

By David Bruce, Brockport, N. Y.

In the following list of food plants there is this distinction to be made: 1st, there are given the natural food plants of the larvæ, that is, the plants I have found the larvæ feeding upon in a wild state, and 2nd, there are given the plants I have fed to the larvæ raised from eggs laid by captured females, which may or may not be the food plant in nature; these latter are marked "bred" in the list following. I may add that I usually find the larvæ of the *Geometridæ* are best dislodged from young trees by a sudden smart blow with a heavy club. Sweeping with a net in the evening is the way I have found best results with those species that feed on low plants. I have followed Grote's Check List in names and numbers.

1. *C. clemataria.* Double brooded; fed in large numbers upon the Elm, and raised in fine variety. Bred, (Pyrrhopappus, Clematis).

2. *C. transversata.* Raised from larvæ beaten from most forest trees, though not from Oaks, which do not grow in my vicinity. (Clethra, Myrica, Geranium.)

13. *T. crocallata.* One larva on Spice Bush. Bred. (Sumach, Chestnut).

18. *M. inatomaria.* Found moth emerging from a pupa in a crevice in bark of Cottonwood near Denver, Col. Very common in that locality on trunks of Cottonwoods, and at light.

23. *C. confusaria.* Larva swept from Wild Clover by roadside.

27. *E. alniaria.* Bred from the egg, and found many larvæ on Elm. The eggs are laid in a band, and look like a small tape worm. The pupa is in a thin web in a leaf. A large Elm in my door yard was full of the larvæ every year. (Universal feeder.)

28. *E. subsignaria.* Elm and Maple. (Feeds on all trees.)

29. *S. kentaria.* This moth flies at the end of April and beginning of May. The eggs are green, turning to reddish brown, hatching in 14 days. The larvæ fed on Maple, and the moth emerged in July. It is thus double brooded. Bred. I have beaten the larvæ from Beech and found one full fed on Basswood. (Birch.)

31. *A. hubnerata.* Raised from the egg on Maple. Bred.

40. *E. bilinearia.* I found a larva on Choke Cherry near Denver, Col., which produced this moth. I have not been successful with this genus (*Endropia*). I have tried to rear many of the species from the eggs, but the larvæ would not feed.

52. *T. fervidaria.* Larvæ found on most forest trees, Beech, Birch, Cherry, Elm, etc.

53. *T. endropiaria.* Beaten from Hornbeam. (Oak.)

55. *M. margaritata.* Hornbeam and Birch. One of the first larvæ to be found in the Spring. (Oak, Willow, etc.)

56. *A. pulveraria.* Beech and Maple. (Willow, Hazel).

63. *A. crocataria.* Wild and cultivated Currant, and the yellow flowering Ribes in gardens. (Strawberry.)

64. *N. filimentaria.* Wild Currant and Gooseberry, also Maple and other trees. (Strawberry.)

70. *P. fervidaria.* Maple. I picked a larva from Ash also. It did not feed after, but buried in the moss, and pupated. Imago appeared in 3 weeks.

71. *P. phlogosaria.* Beaten from Wild Cherry.

73. *H. amicaria.* Beaten from Beech, Hornbeam, Birch, Alder. Have also frequently beaten the pupæ from the trees into my net. (Hypericum.)

99. *E. chloroleucaria.* Larvæ common on Strawberry and Black Raspberry in my garden.

101. *D. abortivaria.* Have tried many times to rear this from the eggs without success. The larva fed a little on Wild Cherry, but did not thrive. (Grape is the food plant given by Saunders and French.)

103 or 104? I have raised an *Ephyra* from the Wax Myrtle growing in a bog near my home. I think it is *E. pendulinaria* (The food plants of *E. pendulinaria* are given by others as Birch and Sweet Fern.)

105. *A. ossularia.* Raised several times from a larva obtained from sweeping a bank at night. Ate Strawberry leaves in confinement. (Galium.)

113. *A. insularia.* Fed larva from egg on Galium. Bred. (Celastrus.)

127. *A. ennucleata.* Raised larva from egg on Galium. Bred. (Rhexia.)

155. *C. amorata.* Raised from a short pinkish larva found on trunk of Hemlock.

156. *S. pustularia.* Larva common on Maple. Two brooded.

164. *C. vestaliata.* Larva beaten from Hornbeam.

171. *S. bisignata.* Larva beaten from Birch.

204. *M. strigularia.* Raised from larvæ swept from Boneset (?) in July. When I visited the place in August the moths were flying or sitting on the leaves, with the wings closed like Butterflies, by thousands.

213. *T. wauaria.* Larva on Wild Currant and Gooseberry.

214. *T. subcessaria.* Larva on Wild Currant and Gooseberry.

222. *L. defluata.* Raised from long larva swept from coarse grass, etc., on edge of woods.

225. *E. ribearia.* Larva on the yellow Ribes in the garden. (Wild Currant, Gooseberry.)

235. *F. notataria.* Raised from larva found on trunk of Hemlock. Also beaten from Tamarack.

239. *H. grataria.* Larva on Chickweed, also bred from eggs on Polygonum aviculare.

240. *C. catenaria.* Larva on Blackberry. (Oak, Myrica, Carex.)

257. *E. spinataria.* Raised from an undetermined plant near Denver, Col. Larva rather short and stout, clay color with darker markings: Imago emerged in two weeks. I then visited the spot and found the moth pretty common.

262. *C. pulchraria.* Raised from larvæ beaten from Tamarack very early in Spring. (Pine.)

274. *C. umbrosaria.* Beaten from Horse-Chestnut and Elm.

278. *C. pampinaria.* Larva beaten and bred from Ash, Elm, and Maple.

282. *C. crepuscularia.* Larvæ live on most forest trees. (Elm, Maple, etc.)

285. *T. canadaria.* Larva beaten from Tamarack and Myrica. (Hemlock, Spruce.)

291. *P. subatomaria.* Larva beaten from Spruce Fir. (Pine, Poplar.)

293. *P. deplanaria.* Larva beaten from Beech, Alder, and Basswood. (Spruce.)

294. *Biston ursarius.* Larva found on Elm.

296. *E. cognataria.* Larva beaten from Elm, Ash, and Basswood. Bred from the egg on cultivated Plum. (Spiræa, Birch, Chestnut, Maple, Willow, Honey Locust, Melilotus.)

300. *H. tiliaria.* Common on all trees in spring.

301. *P. strigataria.* Larva beaten from Birch, Maple and Elm. The larva hides in holes in the bark by day. (Rose.)

304, 305, 306. *A. vernata, A. autumnata,* and *C. boreata.* Larva found on Apple, Elm, and Maple. (Cherry, Ash.)

316. *B. albovittata.* Raised from a long, thin larva, found on the flowers of Hypericum.

321. *L. vernata.* Larva found on Amelanchier canadensis.

325. *T. indubitata.* Raised from stout rough larva on Barberry in garden. (Plum, Cratægus, Rhamnus.)

329. *H. undulata.* Raised from larva that webs the ends of the twigs of the Wild Cherry, and lives gregariously in the web. (Willow.)

330. *P. latirupta.* Larva raised from the egg, fed on Polygonum aviculare. Bred.

332. *A. vasillata.* Larva beaten from Wild Rose in June. The moth is common on bloom of Sallow in early spring.

334. *R. ruficillata.* Larva beaten from Birch.

338. *R. intermediata* (?). Bred from the egg on Elm, which is I think the natural food plant, as I find the moth on the trunks of Elms. This is the first of its genus to appear in spring, appearing at Sallow with the Tæniocampæ, etc.

339. *R. lacustrata.* Larva found on wild and cultivated Raspberry. The larva however will eat anything.

346. *O. ferrugata.* Raised from larva found on Smartweed. Bred from the egg on Polygonum aviculare. Very pretty and variable as bred. (Nepeta glechoma.)

347. *O. designata.* Larva found on Peppergrass, also on Radish in the garden. (Cabbage, Water Cress.)

356. *P. diversilineata.* Larva common on Grape and Ampelopsis; it is long and slender and in color varies from yellow to brown.

358. *P. testata.* Raised from larva found on cultivated Bean, but it would not eat after capture. (Birch, Willow.)

366. *P. truncata.* Raised from larva beaten from Alder. I found larvæ, which seemed to be exactly the same, on Willow, but did not raise them.

367. *H. trifasciata.* Raised from a short thick larva found in a web in a Willow leaf at Denver, Col. (Alder.)

371. *E. perlineata.* Beaten from Beech and Birch.

373. *P fluviata.* Raised from a larva found on Elm. (Polygonum.)

376. *P. multiferata* Raised from the egg on Polygonum aviculare. Bred.

390. *E. miserulata.* Beaten from Tamarack. I have found this larva, or something very like it, on Amelanchier canadensis, and the moth is common about its flowers in spring. (Juniper, Fruit of the Currant.)

393. *E. absynthiata.* Found in plenty by sweeping or searching the flowers of Golden Rod, etc., by night. (Flowers of Senecio, Artemisia, etc.)

Note by the Editor.

The above list of food plants was sent to me, in answer to a request made for private purposes. I have thought it too important a paper to be kept from the public, and so, with as little change as possible, have published it. To each species I have added in parentheses other food plants upon which the larva are known to feed. Thus all the food plants known to me of the species given above, are placed together before the reader. There are of course many species not given in this list, of which the food plants are known. Before giving these, I solicit from Entomologists any information they may have of the food plants of the *Geometridæ*, that at some time in the future I may give not only additions to the above, but as complete a list as possible.

Notes on certain Psychidæ, with descriptions of two new Bombycidæ.

By A. S. Packard.

From material kindly given me by Messrs. Graef, Hulst and Edwards, I have been able to review the characters of our two true Psychids, and to add another fine species from Texas to our fauna. I also offer a description of a very pretty Lithosia from Northern Maine, and of a small Cochlidian from Texas.

Psyche carbonaria n. sp.

2 ♂♂. This is the largest species yet known from this country, the wings expanding a fifth of an inch more than those of *P. confederata*. The head and thorax are very hairy; front of head wide, much as in *P. confederata*, and the eyes of the same proportional size. Antennæ with long pectinations. Wings uniformly smoky black, not quite so black and thickly scaled as in *P. confederata*. They are slightly narrower than in that species; the costa of both pairs not so full, and the apex of the primaries is more pointed. The venation of the fore wings differs from that of *P. confederata*, besides other less important respects in the 4th median venule,* the origin of which is in common with the 3rd, and not widely detached from it as in *P. confederata*. In the hind wings the costal vein sends off backwards a slight spur towards the costal edge, and there is an oblique veinlet, connecting the costal and subcostal veins and situated on the inner fourth of the wing; beyond this the costal does not unite with the subcostal on the apical fourth of the wing, as is the case in *P. confederata*. There are other differences which can be only described by aid of a figure. The male genitals are longer, slenderer, and more pointed than in *P. confederata*.

Expanse of wings, 21—22 mm.; length of body, 8 - 9 mm.

Two males from Texas. Collection of Mr. Edward L. Graef; one of these by the kindness of the author retained in my own collection.

Note on Platœceticus gloveri Pack. It will be remembered that this genus and species was described in my "Guide" from the drawings of the late T. Glover. Having been favored with several specimens from Crescent City, Fla., received through the kindness of Mr. H. G. Hubbard, I have been able to compare this species with *Psyche confederata*, with which it might at first sight be confounded. But by a study of the venation it is evident that the two moths belong to different genera. Besides minor differences *Platœceticus* differs from *Psyche* in having, so to speak, two independent venules arising from near the middle of the discal space, i.e. besides the usual four median venules, and five (the 5th in *Psyche* forming the "independent") subcostal venules there is an extra independent venule

* The author here wishes to protest, with Westwood, against the custom instituted by Herrich-Schaefer and followed by other German and American writers, of counting the branches beginning at the anal angle from 1 to 12. To do so is irrational and unscientific. As is well known, there are at least 5 main veins, of which the subcostal and median are always branched. As heretofore we count the first branch to be thrown off from the main stem as venule 1, and so on. To count only the branches without reference to the main stems, would be as unscientific as to count the fingers of our hands from 1 to 10.

not present in *Psyche* or in *Thyridopteryx*. In the hind wings, however, there are the same number of veins as in *Psyche confederata* and *carbonaria*.

Platœceticus however not only differs in the venation, but has larger eyes, while the front of the head is narrower than in *Psyche*. The species may be distinguished from *P. confederata* by the shape of the wings; moreover the body and the wings are much paler, being mouse-brown, (while *P. confederata* is black), with the scales less numerous or thinner, and the genital plates are longer, narrower, and more pointed. Moreover the pectinations of the antennæ are shorter. The wings expand 18 mm., and the body is 7 mm. in length. Specimens in alcohol of the larva, pupa and female are very desirable for a complete history of the genus.

Lithosia rubropicta n. sp.

1 ♀. Front of the head as broad as long; palpi quite long, brown, scarlet beneath on the basal joint. Head brown, with a scarlet occipital stripe passing around the underside of the head. Fore wings dark brown, without any markings, except that the costa is edged with scarlet on the basal two-thirds. Hind wings scarlet on the basal half; the outer half dark brown, concolorous with the fore wings. Abdomen deep scarlet above and on the sides, with a dorsal row of seven brown median spots; beneath dark brown. Underside of the fore wings with the costa more broadly edged with scarlet than above; hind wings as above.

Expanse of wings, 28 mm.; length of body, 9 mm.

Of this fine species I captured a single specimen on the shores of the Rangeley lakes, Maine, in July. It is quite unlike any other Lithosian we have, as observed to me by Mr. Henry Edwards. It is a true *Lithosia*, with the outer edge of the fore wings quite oblique, the wings being broader and more triangular than in *Hypoprepia* or *Anatolmis*. The hind wings are much rounder and fore wings wider than in *L. casta* or the other known American species. It is certainly a very beautiful addition to our lepidopterous fauna.

Lithacodia græfii n. sp.

1 ♂. Body and fore wings deep ochreous; hind wings yellow, unspotted. Fore wings with a linear brown line, beginning on the middle of the hind edge, crossing the wing obliquely outwards and forming a broad loop not reaching the costa, returning by a course not quite parallel with the outer edge and ending at the inner angle. On the underside this line does not re-appear; both wings are more ochreous than above.

Expanse of wings, 12 mm.; length of body, 5 mm. Texas.

This little species, the smallest of the genus, is congeneric with *L. fasciola* and *L. flexuosa*, being closely allied to the latter species, but differing in the direction of the dark line on the fore wings, and in its smaller size.

I am indebted to Mr. Edward L. Graef, for the privilege of describing this species, represented by three specimens in his collection, one of which he kindly gave me. On showing it to Mr. H. Edwards he regarded it as undescribed.

On the Life-History of Lygæus turcicus, *Fab.*

By C. H. T. Townsend.

As far as known to me, the habits of this insect have not heretofore been much investigated. The imagines are common here during July and August, but until lately I had not observed the species closely enough to discover it in its early stages.

Mr. Uhler, in his paper on the Hemiptera Heteroptera of the Harris Collection (Proceedings B. S. N. H., vol. XIX, p. 365–446), gives the following after the name *Lygæus turcicus* Fab.

"No. 21, Harris' Collection. 'On *Asclepias syriaca*, July 10, 1822. Larvæ on Asclepias, Oct. 15, 1832. North Cannon, Mich., T. E. Wetmore.' Westfield, Mass., Dr. S. Shurtleff."

Thus it seems that the larvæ were observed as early as 1832, and in this State (Mich.). The township of Cannon is in Kent County, immediately north-east of Grand Rapids township, with which it joins corners.

In regard to the food habits of either the larvæ or the perfect bugs of this species I have never seen anything published, except a short statement by Glover, and one or two similar ones by others, having no doubt the statement of the author named for their authority. In his paper on the Heteroptera, presented in the Report of the U. S. Entomologist for 1875 (Report U. S. Com. Agric., 1875, p. 114–140), Glover states that *L. turcicus* "has been observed once or twice preying on the small caterpillars feeding on the *Asclepias*, or milkweed." An allied species, *Oncopeltus fasciatus* Dallas, is given on the next page as "having been found in great abundance in Maryland on flowers of the *Asclepias* in company with caterpillars of *Euchetes egle*," adding that "it probably feeds also upon them." In his paper on Insects frequenting the Cotton plant (Agricultural Report, 1855, p. 64–119), Glover also states that a nearly allied bug, supposed to be a species of *Lygæus*, the larvæ of which he found in injured cotton shoots, was seen to kill and suck the juices from members of his own species, and also to suck the sap from the cotton plant. It seems that the food habits of the *Lygæidæ* and *Pyrrhocoridæ* have not been much inquired into (with the exception of two species, the chinch-bug and the cotton-stainer), a few notes like the preceding concerning some of the species being all I find upon the subject.

L. turcicus is seldom found here on any other plant than *A. tuberosa*, though sometimes on *A. syriaca*. The only exceptions to its Asclepias-habit, that have ever come under my observation are three instances, an individual being taken each time on rag-weed, a tall weed, and a flowering-almond; and these I think were accidental occurrences. The earliest date at which I have taken the species is March 3, (1882), when

a specimen was taken flying; the latest, Oct. 23, (1886), when a nymph was taken on the ground in a field. The earliest occurence of the insect on the *Asclepias* that I have recorded is June 22, (1886). Thus it ranges on the plant here from June to September. A specimen was taken April 25, (1886), in a crack in a rotten stump; no doubt the species hibernates in sheltered places (probably in the imago), as this and other early occurrences would show. Some facts would tend to show that it may occasionally winter in the nymph state as well as in the imago, as the late occurrence of the larvæ taken at North Cannon, Mich., Oct. 15, 1832, also the nymph taken here, Oct. 23, (1886), and as will be shown further on, the female taken Oct. 8, (1886), which contained 13 eggs. Some further observations on the subject will be needed however before deciding.

Inasmuch as this species is so confined to the *Asclepias*, it has long been my opinion that in their early stages as well as in the imago they suck the juices of this plant. This is a direct inference; for if they fed on other insects, why should they be so confined to this one plant, more especially as I have never noticed any *Euchetes*, or other larvæ to speak of, on the *Asclepias* here? With this idea in view I observed the species quite closely last season (1886) and was well rewarded.

On August 14, while watching a nymph that I had just discovered on a green seed-pod of *A. tuberosa*, I perceived it insert its rostrum slowly and nearly its whole length, into the pod and suck the juice therefrom. Most of the insects were at this time on the pods. The same day I observed the perfect bugs, both sexes, do the same thing, even puncturing yellowed pods as well as the green ones. The same was again observed on August 21st and 26th, numbers of the imagines puncturing the seed-pods. Some of the specimens examined were found to contain a considerable amount of green fluid in the alimentray canal, which was no doubt the juice they had been extracting from the pods. They are seldom found on the leaves after the pods are well formed. The natural food of *L. turcicus* is undoubtedly the juice of the stems and pods of the *Asclepias*, though occasionally they suck the juices of insects as do many nearly allied species. As they are so constant on the *Asclepias*, it is not likely that they will seriously injure or even attack any cultivated plants.

During the season I examined many of the specimens that came in my way, to ascertain if possible something of the breeding-habits. The following are the results:

The only date of the species being *in coitu* that I have recorded is August 13th.

July 28th.—Of four specimens taken on leaves and flowers of *A. tuberosa*, three were males, while the fourth was a female and contained 29 yellowish-tinted eggs.

August 4th.—Took on a leaf of the flowering-almond a female, which contained 24 eggs.

August 12th.—Took two on green seed-pods of *A. tuberosa*, both of which proved to be males.

August 13th.—On green seed-pods of *A. tuberosa* took a pair *in coitu*, and a single individual. Of the two *in coitu* the female contained 35 eggs. The single one, which was also a female, contained 26 eggs.

August 14th.—Of twenty taken on *A. tuberosa*, ten were males and ten females. Of the 10 females, one contained 6 and another 10 eggs, while the remaining eight were destitute of eggs.

August 16th.—Took a female on rag-weed. It contained 16 eggs.

August 21st.—Took on *A tuberosa* eleven specimens, of which three were males and eight females. Of the eight females, none contained eggs.

August 26th.—Took on a weed a specimen which proved to be a male.

September 10th.—An imago taken on a full grown seed-pod of *A. syriaca*. I regret to say that I neglected ascertaining the sex.

October 8th.—A female taken running on one of the boards of an old fence. It contained 13 eggs. This was somewhat unexpected, as I had supposed the laying time to be over at this date, and indicates that the species may sometimes winter in the nymph state.

Nymphs were taken on green seed-pods of *A. tuberosa* August 13th and 14th, and one on the soil of a potato-field, October 23rd.

In a recent article in Science, by Le Metayer de Guichainville, père et fils, we learn in six columns of type that we have here in America a species of *Orgyia*, which is very destructive and which is not the *antiqua* of Europe. It may however be the *leucostigma* of Abbot and Smith, though this is not certain. We learn also something of the life-history and are comforted by the assurance that it will be completed by the authors, while we are astounded to hear that no one seems to know anything of this insect in this country.

A grosser specimen of ignorance it is impossible to imagine. The authors know nothing whatever of the literature of American Entomology, nor apparently of American Entomologists. That Science should have printed such an article is more than passing strange and does not speak well for the editors who should have known that this subject of *O. leucostigma* has been treated of by Riley, Lintner, Packard, Thomas and many others—that all stages have been figured again and again and that Le Metayer de Guichainville, père et fils, should have been advised to study their subject before printing. JOHN B. SMITH.

Notes on Apion, with Description of a New Species.

By John B. Smith.

In the Trans. Am. Ent. Soc., XI, 41–68, I gave a synopsis of the North American *Apionince*. In the genus *Apion*, I based my first section of the genus on the presence of a distinct tubercle on the inner side of the anterior femora, and found four species so distinguished, agreeing also in the elongate cylindrical thorax and generally graceful form. The second section contained a much greater number of species, many of which agreed in general form with those of section I. Collections made by Mr. Ulke make it certain that the femoral tubercle is a male character, and that all of the species of the first section are males of some of the second. I have no excuses to make for my mistake in describing the two sexes under different names. Nothing was known of such a secondary sexual structure in the genus, and I am not the only one that has made a similar blunder. As near as it is possible to make out now the synonymy is as follows:

A. erraticum Sm. ♂ = **A. estriatum** Sm. ♀.

A. obsoletum Sm. ♂ = **A. ovale** Sm. ♀.

A. erythrocerum Sm. ♂ = **A. cribricolle** Lec. ♀. Leconte's name has priority.

A. robustum Sm. ♂ = **A. obesum** Sm. ♀.

Except in the case of *cribricolle* where Dr. Leconte's previously described species displaces my name, I have retained the name proposed for the males. Large collections seen and received since the publication of the synopsis have discovered several new species, and have also disclosed an unexpected amount of variation which may interfere somewhat with the scheme proposed by me. It is likely that other sexual characters will be discovered which will afford a sounder basis for a division of the genus. One prominent form is new and merits description.

A. lividum n. sp.

Belongs to group *ventricosum* of Section IV and nearest in form to *turbulentum* Smith. Color, a uniform rather pale red brown, differing thus, at once not only from all the species of the group, but from all others in the genus. The head is punctured between the eyes; the latter black, distinct, but hardly prominent; rostrum somewhat dilated near base. Thorax closely and distinctly punctured; a larger linear fovea at base, sides slightly arcuate. Elytra deeply striate, the striæ distinctly and deeply punctured, intervals narrow, convex, smooth.—Length 1 mm.—Hab. Florida.

Two specimens in my own collection, several with Mr. Ulke. There will be no difficulty in recognizing this species, as it is unique in the genus.

Collectors would do a great deal to aid in straightening out this family if they would carefully mount all specimens taken *in copula* on the same pin, and note the fact that they were so taken. This, systematically done, would often save such blunders and avoid a cumbrous synonomy.

Book Notices.

Systema Geometrarum zonæ temperatioris septentrionalis. — Systematische Bearbeitung der Spanner der Nördlichen Gemässigten Zone, von C. Freih. v. Gumppenberg. 1ster Theil mit 3 Tafeln. Nova Acta der Ksl. Leop. Carol. Deutschen Akademie der Naturforscher. Band 49, Nr. 4, Halle, 1887, Seite 229—400, Taf. 8—10.

It is generally unfair to pass judgment upon a work when only in part completed. But the above work is one of so great importance that some particular mention ought to be made of its publication, even in part. Moreover its aims, its plans, its argument and its synopses are included in the 172 pp. already issued, so that it seems one ought without unfairness to be able to summarize the intention and accomplishment of the author.

The work as may be gleaned from its title is an ambitious one. It endeavors to cover in some respects the whole field of the family of the Geometridae of the Northern temperate Zone ; it treats of descent, climatic variation, influence and distribution ; it discusses classification and nomenclature ; it gives finally a Synopsis of Genera and a systematic description of Genera and Species. It aims to be to the North temperate Zone very much what Dr. Packard's great work was to the Geometrid Fauna of our own country.

In the discussion of descent, variation, and distribution there is nothing that specially claims our attention. So far as it touches our fauna it is only a following of Dr. Packard's views given in his Monograph.

The author's views upon classification are novel and radical, and they are expressed with a point and frankness which leaves no doubt as to his meaning. His argument is that the systems of the past are artificial, unscientific, and worthless. He endeavors to show by arguments as well as by the confession of the authors, that the systems of Herrich-Schaeffer and Lederer, based on venation cannot be received by students. He endeavors also to show that the systems of Guénée and Packard founded more especially upon the structure of head, body and appendages, are no less valueless.

After all this iconoclasm the author proceeds to unfold what he calls the Natural System. As the corner stones of his structure he lays down the following :

1st.—The one who seeks by examination to determine an insect unknown to him, must use means as simple as possible, and nothing shall have standing with him which is ascertained only by dissection, by means of the microscope or by the mutilation of the insect.

2nd.—One must in his observations take account only of distinctions which are possessed by every species of the same genus and every specimen of the same species as well as in both sexes if the female is perfectly developed.

As based upon these laws venation, head and palpal structure, the legs and their armature are none to be reckoned in generic determination. Classification practically rests 1st—upon the visible and evident shape of the wings, and 2nd—upon the method of the design of the markings of the wings. For the first account is taken of the various edges, whether rounded, angulate, straight or concave—of the various angles, whether sharp or rounded; for the second account is taken of the number of cross lines upon the fore and hind wings, and their shaping in lines, bands, points, &c.

Following this, the author gives his rules of nomenclature, &c., tables of the altitude and geographical distribution of species. These are followed by a synopsis of genera and a general description and systematic arrangement of species. The three plates given so far with the work are intended to place before the eye the author's ideas of influences, cold, heat, elevation, plant life, &c., which in the North temperate Zone have affected and which now to an extent modify its Geometrid Fauna.

With regard to the System of the author, after a detailed examination we fail to see how it can be called more natural or less artificial than systems based upon venation or the structure of the various parts of the body. We fail to see either right or reason in forbidding for the determination of genera the use of structural distinctions which are ascertained only by use of the microscope. We fail to see anything of exactness gained by using for determination things so variable as wing shape, or so wonderfully changeable as the design of the markings upon the wings. We fail to see that this latter which is unsafe for specific determination, can be used in any way as a basis for generic distinction. The system seems to be the outgrowth of a feeling we have often realized, viz.: that the systems of the past are unsatisfactory, and to an extent artificial. But we would not think it either rational or necessary to cast away all the past has done, because we find its work incomplete or disappointing.

Some of the innovations of the author we are inclined to endorse. Among the number we note the Latinizing and correct spelling of generic names, as Eubœa for Eubyja, Marmoropteryx for Marmopteryx, Loxogramma for Lozogramma, &c.

The author in his Bibliography makes no reference to the Bulletin of the Brookl. Ent. Soc., Entomologica Americana, Papilio, the Canadian Entomologist, or any works issued by our Government, except Dr. Packard's Monograph. Dr. Packard's work seems to have been the sole

means of knowledge used by the author in his work. It does not appear that he had any personal knowledge of the insects of our fauna, or of the fact that since the publishing of Dr. Packard's Monograph above 185 species have been described by various authors or have been found in our faunal limits. The author will without doubt be informed upon these matters in time to incorporate the most of them in his work, but it is a serious drawback to the value of the work in the eyes of American Students and gives a suspicion that sufficient personal investigation and study has not been given to that fauna which includes nearly one-third of the species of which he treats.

However in its system of classification the work is a very notable one and in that respect will rank among the few great works upon this family of the Lepidoptera, even though the system must be condemned.

GEO. D. HULST.

* * *

Synopsis of the North American Syrphidæ, by Samuel W. Williston, M. D., Ph. D. Bull. U. S, Nat'l Mus., No. 31. 8°. pp. I to XXX, and 1 to 335, pl. XII. Washington, 1886.

This Bulletin has just been distributed, and is by all odds the most valuable recent contribution to American Dipterology. It contains first a "Classification," in which a synoptic table of the subfamilies and genera are given, and second, "Descriptions," in which all the genera and species are carefully described, the synonomy and bibliography given and all information on the species collated.

The best praise that can be given this book, is to say that no intelligent student can fail to identify his specimens from it. More such works would quickly increase the number of students and consequent knowledge of the order.

JOHN B. SMITH.

EDITOR ENTOMOLOGICA AMERICANA.

Dear Sir:—There are few beetles, or indeed insects of any order more beautiful than are the *Buprestids* of the genus *Brachys*. We have just reared in our Laboratory two species, *B. ovata* Web., and *B. ærosa* Mels. The former was taken last October in leaves of the Poplar (Populus tremuloides) and the latter in leaves of Oak. The larvæ were mining under the epidermis, and were like all the larvæ of this genus. The head is prominent, and the borer or miner tapers gradually to the pointed posterior end. The *B. ovata* came forth as a mature beetle the last week of April, while *B. ærosa* came forth from the pupa state to-day, May 9th.

Last year, 1886, peach trees in portions of Michigan were seriously injured by a Longicorn borer. The twigs were cut off so as to nearly destroy some of the trees. The beetles are just now emerging from twigs kept over winter in the Laboratory. They prove to be *Elaphidion parallelum* Newm.

A. J. COOK.

The current numbers of the 'Entomologische Nachrichten' contain interesting reading. First Dr. Kraatz "goes for" Dr. Kolbe, proves him an ignoramus and himself the exact contrary. Then Dr. Kolbe proves Dr. Kraatz an exceedingly bad man, unworthy the confidence of his fellows, and that he not only knows nothing, but never did know anything. As said, it is interesting reading—and all this because these two gentlemen are not agreed as to the value of the genus *Orinocarabus* and of the position of some of the species. JOHN B. SMITH.

Society News.

The **Brooklyn Entomological Society** met in its rooms Tuesday Evening, May 3rd. The President reported the following Committee to represent the Society in the Meetings of the A. A. A. S. to be held in New York, August 10th,—Henry Edwards, Ed. L. Graef, Chas. S. Leng, G. W. J. Angell and Geo. D. Hulst.

Mr. Weeks read a paper upon various methods of preserving duplicates of Coleoptera.

In response to a question by one of the members opinions were given as to the best method of collecting Coleoptera when off on a distant collecting trip. The large majority favored the collecting of all Beetles in pure alcohol rather than in any other way.

Ent. Soc. Washington, April 7th, 1887.—Mr. E. A. Schwarz read a paper, "In Memoriam of Thomas Say." He showed two photographs of the monument erected to his memory at New Harmony, Ind., and a copy of the inscriptions on it. After describing the life of Thomas Say, Mr. Schwarz feelingly remarked, that the importance of Say's work had never been duly recognized by the Scientific Societies of Philadelphia to which he belonged and of one of which he was one of the founders.

Mr. Smith read a short paper on specific characters in the genus *Arctia*, finding the pattern of maculation constant and reliable for specific distinction when the tendency or direction of variation was understood. He gave a rough outline of a scheme to distinguish the species.

Mr. Ulke made some remarks on exchanging and dealing in Insects, criticising to tendency to use numbers instead of names, as a source of many erroneous determinations, as an error in a single figure would sometimes put the specimen in an altogether different family.

May 6th, 1887.—Mr. Smith gave some notes on the *Smerinthinæ*—first giving a brief history of the modifications and subdivisions of the original genus *Smerinthus* until to-day we have seven genera for eight species. He called attention to the uncertainty which writers seemed to labor under as to the real limits of genera, and pointed out a series of characters which will, he believes, prove satisfactory in separating the forms now known to us.

Dr. Marx gave some brief notes on his recent studies in *Scorpionidæ*, and also on the effects of their poison on the human system. Mr. Lugger and Mr. Smith made some remarks on the latter subject.

Mr. Howard recorded the presence of *Hydroptsyche* in all stages of growth at this season, and also the presence of great swarms of *Simulium* larvæ.

Mr. Lugger read a note on an Entomological curiosity.*

* Which will be printed in full.

ENTOMOLOGICA AMERICANA

VOL. III. BROOKLYN, JULY, 1887. NO. 4.

The Scolopendridæ of the United States.

By Lucien M. Underwood, Ph. D.

Through the kindness of the curators of the U. S. National Museum I have had the opportunity to study its collection of Myriapoda[1] which though not a large one is especially rich in the larger centipedes of this country. Recent studies by Kohlrausch[2] and Meinert[3] have greatly modified the subject of specific determination in this family and have reduced many of the species described by Newport, Wood, Koch, Saussure and Porath so that an extensive array of synonyms stands as the result of their labors. Characters now known to be individual have been relied on hitherto as specific, and the study of larger numbers of specimens has made in some instances sweeping reductions. As an example forty specific names now stand as synonyms of *Scolopendra morsitans.*[4]

[1] There is a division among Zoologists as to the orthography of this word. The orthography *Myriapoda* used above is in accordance with the usage of Newport, Gervais, Lucas, Wood, Meinert, L. Koch, C. Koch, Bergsoe, Porath (earlier papers), Palmberg, Ryder, Sager, Cope, Fanzago, Saussure, Humbert, Haase and De Borre. The form *Myriopoda* is used by Karsch, Latzel, Packard, Stuxberg, Butler, Harger, Peters and Porath (later papers).

[2] Gattungen und Arten der Scolopendriden, in *Archiv für Naturgeschichte*, 1881, 50—132.

[3] Myriapoda Musei Cantabrigensis, Part I Chilopoda, in *Proceedings American Phil ical Society*, XXI, 161—233 (1885).

[4] Of the 38 species of *Scolopendra* described by Newport in his classic (Trans. Linn. Society, 1844) only *eight* have not yet been reduced to synonyms. Of the 25 species described by Wood, *nineteen* are not now regarded as valid species and not one of the other six has been identified a second time. In the light of these facts it is the part of wisdom to move slowly in the description of new species.

The **Scolopendridæ** may be readily distinguished from all other Chilopoda in the possession of either 21 or 23 pairs of legs. The body segments being so similar the essential characters are drawn from the head and its appendages, the first body segment *(basilar segment)*, and the last segment with its so-called anal legs; other characters are drawn from the spiracles, the armature of the femoral joints and of the tarsi; sexual characters have never been used in classification. A vast amount of work must be done in studying the early stages of not only this family but all other families of the Myriapoda before specific lines may be regarded as settled.

The reported occurrence of a tropical genus in the Southern States necessitates an enlargement of the synoptic table given in the first volume of this journal.[5]

The genera may be distinguished as follows:

A.—With 23 pairs of legs, all 5–7-jointed; ocelli wanting; antennæ 17-jointed... **Scolopocryptops** Newp.

With 21 pairs of legs ..... **B**

B.—With nine pairs of simple stigmata[6] ..... **C**

With ten pairs of stigmata, which are inclosed in a deepened, wrinkled, gill-like integument; antennæ 17–21-jointed ..... **Branchiostoma** Newp.

C.—Ocelli four each side of head; cephalic segment overlapping the first dorsal... **Scolopendra** L.

Ocelli inconspicuous or wanting ..... **D**

D.—Last dorsal scutum enlarged; prosternal teeth present; labrum one toothed.. **Opisthemega** Wood.

Last dorsal scutum not larger than the others; prosternal teeth wanting; labrum 3—5-toothed ..... **Cryptops** Leach.

In the following enumeration of species those represented in the National Museum are marked with an asterisk; localities from whence species are represented in the same collection are followed by a point of exclamation.

I. SCOLOPOCRYPTOPS Newp.

Seven nominal species have been described which are here reduced to three, and it is possible that two of these are separated by characters that will not prove constant.

The species may be thus distinguished:

A.—Anal legs (except the femoral joint) more or less densely pubescent; prosternal teeth present..... **lanatipes** Wood.

[5] The North American Myriapoda, Entomologica Americana, I, 141—151, (1885).

[6] In the common *Scolopeodra heros* these stigmata appear as horizontal slit-like openings above the legs on the 3rd, 5th, 8th, 10th, 12th, 14th, 16th, 18th and 20th body segments. In *Branchiostoma* the 7th segment bears stigmata in addition to those above named.

Anal legs glabrous, armed with two spines, one within, one beneath.....B

B.—Head suborbicular; prosternal teeth wanting, the margin straight or obscurely sinuous ..... *sexspinosus Newp.

Head subovate; prosternal teeth two; last 17 dorsal scuta margined; animal smaller... ..... Georgicus Mein.

DISTRIBUTION AND SYNONYMY.

Californica Humb. et Sauss. = *lanatipes* Wood.

Georgicus Meinert. Proc. Am. Phil. Soc. XXI, 180 (1885).—Georgia.

gracilis Wood = *lanatipes* Wood.

lanatipes Wood. Jour. Phila. Acad. V, 39 (1862); Trans. Am. Phil. Soc. XIII, 175 (1865).—California.

sexspinosus (Say) Newp. Trans. Linn. Soc., XIX, 407 (1845).—"Eastern U. S." (*Wood*); Illinois! Washington, D. C.! N. Y., Pa., Iowa. Va., W. Va., Md., Mass., Ohio, Ky., Cal.

spinicauda Wood = *sexspinosus* Newp.

Scolopendropis helvola Koch = ? *sexspinosus* Newp.

II. BRANCHIOSTOMA Newp.

Only one species is reported from the United States by Saussure and Humbert.[7]

B. celer Humb. et Sauss. Revue et Mag. de Zool. 1870, 202.—Carolina, Jamaica, Nicaragua.

III. SCOLOPENDRA L., Newp.

Numerous species of this cosmopolitan genus have been described from the United States, but the number is here reduced to seven, with an additional species which cannot be recognized from its description and must stand until its type (supposed to be in Paris) can be re-studied.

The species may be distinguished as follows; (full descriptions of the species will be found in Meinert, *l. c.*, 190, *et seq.*):

A.—First body-segment with a well marked transverse groove.....B

First body-segment not grooved ....D

B.—First tarsal joint of anal legs armed with a spur; antennæ 23—30-jointed...C

First tarsal joint of anal legs unarmed; antennæ 17-jointed; anal legs short, thick, armed with 11—12 spines, the angular process simple or bifid..... **Woodii** Mein.

C.—Species large (100—150 mm. long in adults); prosternal teeth large; anal legs with 17—25 spines; antennæ 24—30-jointed.....*heros Girard.

Species smaller (60 mm. long); prosternal teeth small; anal legs very short, armed with 10—17 spines; antennæ 23—24-jointed.....*viridis Say.

D.—Femora of penultimate legs spinulose distally; femora of anal legs armed with 40—60 spines, the angular process with 6—8 or more; antennæ 17-jointed.. *crudelis Koch.

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[7] Mission Scientifique au Mexique etc. 6ieme partie: Etudes sur les Myriapodes, p. 192. This work contains a valuable catalogue of American Myriapods, which was nearly complete at the date of publication, 1872.

Femora of penultimate legs not spinulose ; spines of anal femora less numerous ..... E

E.—Femora of anal legs armed with 10—14 spines (4—6 within, 6—9 beneath, arranged in a triple series); the angular process with 3—4 spines ; antennæ 17—22-jointed..... * **morsitans** L.

Femora of anal legs with 2—5 spines, the angular process simple or bifid ; antennæ 17—20-jointed..... F

F.—Spines of anal femora 4—5, always two beneath ..... ***subspinipes** Leach.

Spines of anal femora only 2, both within..... ***De Haanii** Brandt.

DISTRIBUTION AND SYNONYMY.

bispinipes Wood = *De Haanii* Brandt.

byssina Wood = *subspinipes* Leach.

Californica Humb. et Sauss. = *morsitans* L.

castaneiceps Wood = *heros* Girard.

Copeiana Wood = *heros* Girard.

crudelis Koch. Syst. der Myriapoden, 170 (1847); Die Myriapoden, II, 36, t. LXXVII, LXXVIII (1863).—Florida, Tortugas ! Key West ! Hayti.

De Haanii Brandt. Recueil, 59 (1841).—California ; tropical regions generally.

heros Girard in Marcy's Exp. Red River, App. F., 243 (1853).—Florida ! Louisiana ! Texas ! Kansas ! New Mexico ! Arizona ! Utah ! Mexico ! Ga., Ala., Ky., Neb., Cal., Panama, Guatemala, Porto Rico. The report by Meinert (*l. c.*) of a specimen from Westfield, N. Y., must have arisen from an error in the label !

inæquidens Gervais. Apteres, IV, 277 (1847).—New York. This species is as yet unidentified ; the type is supposed to be in Paris.

inæquidens Wood = *Woodii* Mein.

longipes Wood = *crudelis* Koch.

marginata Say = *morsitans* L.

morsitans L., Kohlrausch. Archiv f. Naturg., 1881, 104.—West Indies ! Surinam ! Florida, "Southern States" (*Wood*); tropical regions generally.

pachypus Kohlrausch = ? *heros* Girard.

parva Wood = *viridis* Say.

pernix Kohlrausch = ? *heros* Girard.

polymorpha Wood = *heros* Girard.

punctiventris Newp. = *viridis* Say.

subspinipes Leach., Kohlrausch. Archiv f. Naturg. 1881, 96.—West Indies ! Surinam ! Florida ; tropical and subtropical regions generally.

viridis Say. Proc. Phila. Acad. II, 110 (1821).—Lookout Mountain, Tenn. ! Tortugas, Fla. ! Georgia !

Woodii Meinert. Proc. Amer. Philos. Soc. XXI, 198 (1885).—Va., N. C., S. C. (*Meinert*); Illinois (*Wood*).

IV **OPISTHEMEGA** Wood.

The species are thus characterized :

A.—Femora of anal legs armed with a spine at the internal superior angle ; antennæ 16—17-jointed, distally pubescent..... ***spinicauda** Wood.

Femora of anal legs unarmed ; antennæ 17—18-jointed..... B

B.—Antennæ (except first four joints) pubescent ; anal legs very short and stout .. **crassipes** Mein.

Antennæ not pubescent ; anal legs short, punctate ..... ***postica** Wood.

DISTRIBUTION.

crassipes Meinert. Proc. Am. Phil. Soc. XXI, 209 (1885).—Va., Ky., Fla.

postica Wood. Jour. Phila. Acad. V, 35 (1862); Trans. Am. Phil. Soc. XIII, 169 (1865).—North Carolina, Virginia.

spinicauda Wood. Jour. Phila. Acad. V, 36 (1862); Trans. Am. Phil. Soc. XIII, 170 (1865).—Pennsylvania, Illinois.

V. **CRYPTOPS** Leach.

The species of this genus have scarcely been collected in this country. Up to the time of Wood's principal publication in 1865 two species had been described, neither of which were known to him. Wood described a third species in 1867 and Meinert a fourth in 1885. *C. hyalina* sent by Mr. Bollman is all I have seen. If the descriptions can be depended on they ought to be distinguished by the following table:

A.—Antennæ 19-jointed.....**asperipes** Wood.
Antennæ 17-jointed.....**B**

B.—Third joint of anal legs armed with five spines.....**hyalina** Say.
Anal legs unarmed.....**C**

C.—Antennæ elongate, moniliform, the segments nearly equal, mostly smooth....
Milbertii Gervais.
Antennæ short, thickened at base, densely hirsute.....**sulcatus** Mein.

DISTRIBUTION AND SYNONYMY.

asperipes Wood. Proc. Phila. Acad. 1867, 130.—Virginia.

hyalina Say. Jour. Phila. Acad. II, 111 (1821). Collected Writings (Leconte's Ed.) II, 30.—Georgia, Florida, Indiana.

Milbertii Gervais. Apteres, IV, 592 (1847).—New Jersey.

postica Say = *Theatops postica* Newp.[8]

sexspinosa Say = *Scolopocryptops sexspinosa* Newp.

sulcatus Meinert. Proc. Am. Phil. Soc. XXI, 211 (1885).—Kentucky.

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[8] The genus *Theatops* has had a strange history and after all its vicissitudes may as well be consigned to oblivion. It was first described by Say (1821) as *Cryptops postica* from Georgia and East Florida. Newport in 1844 established the genus *Theatops* on type specimens sent by Say to Leach and deposited by him in the British Museum. Newport says "it approaches *Cryptops*, but differs from that genus in the distinctness of the ocelli and in the possession of the labial teeth." Gervais in the 4th volume of Apteres (1847) re-unites it to *Cryptops* and yet adds: "On devra tres-probablement la reunie aux veritable Scolopendres." Wood in 1862 and later in 1865 quotes Newport's description, stating that he never saw a specimen of it. Latzel (1880) in the first part of his "Myriopoden der Oesterreichisch-Ungarischen Monarchie" makes it a probable synonym of *Scolopendra*, while Kohlrausch (1881) enumerates it as a valid species of *Theatops* in his "Gattungen und Arten der Scolopendriden." It thus appears that Say and Newport are all who saw specimens and their statements are opposed to each other in regard to the position of the eyes. It will probably never appear again; at least is it not necessary to include it in future lists.

Larva of Sisyrosea inornata, *Grt. and Rob.*

By Geo. D. Hulst.

In September, 1886, I found a curious and very beautiful caterpillar on Bayberry (Myrica cerifera), at Shelter Island, N. Y. It fed in confinement until the latter part of October, when it went into a close oval cocoon. The cocoon in shape and color was apparently identical with those common to the Limacodes. The cocoon was kept in a warm room, and the imago emerged May 27th, 1887, as *Sisyrosea inornata*, G. & R. The larva is of an oval shape, the longitudinal diameter being about twice the lateral diameter. It is very remarkably flattened, its perpendicular depth being not more than one-third its width. It has thus very much the shape of the fish known along the coast as the "flounder." The head is strongly bifid, projecting forward over the mouth parts, and is edged with pink. Dorsal space running the width of the head, slightly spreading at anal extremety, edged with a yellowish raised line, and having a slightly raised line in middle. Also a raised cross space on each segment, the enclosed spaces between the lines having each a lighter spot. On the 8th and 10th segments the cross space is bright red. From the dorsal space the sides slope gradually to the extreme lateral edge, which is very narrow. There is on this sloping portion a longitudinal raised line, and the raised cross lines on each segment are continued to the edge, thus forming enclosed spaces somewhat square in shape, and so the whole surface has under a lens a strongly groined appearance. There is a small tuft of hairs on each segment, just beyond the dorsal space, and another on each segment at the extreme edge. These latter are flattened, spreading, each tuft on a projecting tubercle, are dull white in color, and give to the margins a lace-like fringe. The tubercles at end and on sides are pink. Like the most of the family the hairs are probably poisonous.

I found the larva some years since in New Jersey, feeding on Wild Cherry, but it did not reach the imago stage.

The imago emerged by the pupa breaking open a circular cap at the end of cocoon. The pupal skin was left protruding from the cocoon.

The Transactions of the Ent. Soc. Lond., 1886, which have just come to hand, contain a very timely article by Dr. Sharp "On some proposed transfers of names of genera," (pp. 181—188). The article is too long to reprint, and too concise to abstract, but it treats of the priority question, and as to its enforcement in regard to genera. The article is a very good one, and to be commended to those who, following out their idea of what the law of priority demands, would create confusion worse confounded in our collections and lists. And the difficulty is, too, that as soon as we had familiarized ourselves with one change, another would come along, prove definitely or to his own satisfaction that a particular species could not be the type of a certain species, but some other must be, and so on. John B. Smith.

Observations on North American CAPSIDÆ with Descriptions of New Species.

By P. R. Uhler.

(No. 3.)

Div. MIRARIA.

TERATOCORIS, Fieb.

1. T. herbaticus, new sp.

Pale greenish yellow, or straw color, moderately polished, minutely pubescent; the head shorter and wider than in the next related genera; the body much narrower in the male than in the female. Vertex broadly depressed behind, with the occiput raised into a transverse curved ridge, which rests intimately against and a little over the front of pronotum; the middle line impressed only near the base. Male with a narrow black vitta extending from behind the tylus to the tip of scutellum. Eyes pale brownish, more prominent in the male than in the female. Antennæ about as long as the entire body to the tip of the wing-covers, moderately dusky, gradually becoming more slender towards the tip, the second joint longest, the third longer than the fourth. Rostrum reaching to the middle coxæ, pale piceous at base and tip.

Pronotum trapezoidal, moderately flat, the sides slightly excurved behind the middle, the anterior portion of the lateral margin strongly reflexed, the posterior margin distinctly sinuated, with the postero-lateral angles callous and prominent, the surface rugulose, coarsely punctate behind the discal prominence, posterior lobe depressed; anterior submargin resembling a wide collum with an impression in the middle; and the males have a dark streak in the suture of the anterior angle. Legs minutely hairy, tinged with brown around the knees and on the tarsi, and the femora marked with a few dark points. Scutellum moderately convex, widely uncovered at base, the tip smooth, prominent, cylindrico-convex. Hemelytra narrow and almost parallel sided in the males, but wider exteriorly, more curved, and with the costal margin more reflexed in the females; the surface obsoletely wrinkled and obscurely punctate, and sometimes a little dusky on the inner margin of corium and on the base of the elsewhere colorless membrane. The corium, clavus and membrane of the female are shorter than in the male and the surface of the two former is more coarsely and distinctly scabrous. Venter of male much narrower than the wing-covers; of the female almost as wide as the wing-covers; the male genital segment is set with stout-erect bristles, and the appendage of the sinistral side is composed of a long compressed basal strap to which is attached a longer curved corneous tapering hook.

Length to end of venter ♂ $3\frac{1}{4}$—$3\frac{1}{2}$, ♀ 4—$4\frac{1}{4}$ mm. To tip of membrane ♂ 4 to $4\frac{1}{2}$, ♀ $4\frac{1}{2}$ mm. Width of base of pronotum 1—$1\frac{1}{4}$ mm.

Specimens of the male are in the collection of the United States National Museum, which were obtained in the vicinity of Ungava Bay, Labrador, and presented to that institution by L. M. Turner. In my own collection is a mutilated female (alcoholic), which was taken near Hopedale, Labrador, by Dr. Packard, who kindly gave it to me. It seems likely that this species is closely related to *T. hyperboreus* Sahlb., which is found in Lapland; but in the absence of specimens for comparison it is impossible to decide with certainty.

2. T. discolor, new sp.

Form of a narrow Nabis; fuscous or rufo-fuscous, with the hemelytra, sides of pronotum, base of coxæ and disk of venter pale testaceous. Head moderately wide, dull, dark fuscous or piceous including the eyes, base of antennæ, and base of the rostrum; vertex and face concurrently convex; eyes nearly globular, very prominent; antennæ somewhat longer than the body with the wing-covers, pale rufous, a little dusky towards the tip, the basal joint stout, a little bent, rather shorter than the pronotum, the second joint nearly as long as the clavus, the third much shorter, about as long as the basal and longer than the fourth; rostrum reaching to the middle coxæ, fuscous at base and piceous at tip. Pronotum campanulate, dull fuscous, with two indistinct yellow spots behind the head, scabrous, more coarsely punctate on the posterior lobe, anterior lobe sub-cylindrical, plane above, almost as long as the intermediate lobe, the latter tumid, transversely indented on the middle, the posterior lobe a little longer, somewhat flattened, broadly and deeply indented each side next the middle lobe, with the lateral margins more broadly reflexed, and postero-lateral angles produced; posterior margin arcuated. Legs long, pale dull rufous, darker on the knees and tarsi, paler at base of femora. Scutellum moderately flat, dull piceous, with a smooth tubercle at tip. Hemelytra minutely pubescent, pale testaceous, tinged a little with dusky upon the nervures and clavus, in pale specimens the discal and inner portions are rosy; membrane whitish, the nervure dusky. Prosternum and a broad vitta each side extending along the sides to the tip of venter fusco-rufous; the edge of the connexicum ivory yellow. The red vittæ of the venter are sometimes expanded so as to cover the sides and leave only the disk and margins testaceous.

Length to tip of hemelytra $5\frac{1}{2}-6$, to end of venter $4\frac{1}{4}—4\frac{1}{2}$ mm. Width of base of pronotum $1—1\frac{1}{4}$ mm. ♀.

Old and thoroughly matured specimens have the dark parts of the pronotum and underside of the body black, and this causes the two yellow spots behind the head to appear very distinct. Only females have thus far been brought to notice.

One specimen from near St. Louis, taken in May; another from the vicinity of Boston, and a third is in the National Museum at Washington, which was captured near Garland, Colorado, on June 18th.

Div. **PHYTOCORARIA,** Reuter.

MELINNA, new genus.

Oval, or oblong-oval; closely related to *Megacœlum* Fieber, but having the head set closely into the thorax, and without the neck-like contraction behind the eyes. Head short, nearly vertical, a little sloping forwards, with the eyes vertical, globoso-ovate, occupying most of the side of the head, and curving upon the gula in the male, a little less prominent in the female. Tylus almost vertical, a little curved beneath; superior cheeks short, wide, blunt, tumid, inferior cheeks bluntly triangular. Vertex longitudinally impressed. Antennæ cylindrical, stout, the two apical joints scarcely thinner than the preceding one, basal joint a little thickened apically, the second as long as from the front of the eyes to the base of the pronotum, third and fourth united, not quite as long as the second, the fourth shorter than the third, acuminate at tip. Rostrum moderately stout, the basal joint thick, short, barely reaching upon

the prosternum. Pronotum trapezoidal, shorter than wide, convex; almost bald, rapidly tapering towards the head, a little narrower there in the male, the lateral margins rounded down, particularly in front, posterior margin curved, bent down. Scutellum almost flat, sub-equilateral. Femora normal, the posterior pair curved; basal joint of tarsi shortest, the apical one nearly as long as the other two united. Hemelytra nearly parallel-sided, very feebly curved and widened before the apex; claval incisure distinct, but not deep, the clavus short and wide, very feebly incurved on the outer margin, but strongly excurved on the inner one.

1. M. modesta, new sp.

Dark brown, or paler chestnut brown, tinged with rufous when freshly excluded. Long, narrow oval, narrowest headwards, moderately polished, more pubescent upon the hemelytra than upon the head and pronotum. Surface of the head a little rough, remotely pubescent; the antennæ delicately sericeous pubescent, the second joint in the male a very little thickened apically. Rostrum pale piceous, darker at tip, reaching to the posterior coxæ. Pronotum moderately polished, coarsely unevenly punctate, remotely pubescent, most convex across the base; sternum and coxae pale yellowish brown. The legs pale brownish, more piceous upon the femora and tarsi. Scutellum remotely pubescent, somewhat scabrous, coarsely punctate. Corium dull, closely yellowish pubescent, (often with an oblong yellowish spot at base), moderately scabrous, minutely remotely punctate; in some specimens with a whitish transverse streak at the incisure next the cuneus; membrane paler smoke brown; wings almost hyaline, with the nervures dark brown. Venter highly polished, smoke brown, or rufo-piceous.

Length to tip of venter ♂ 3¼ mm., ♀ 4 mm., to tip of membrane ♂ 4, ♀ 4½ mm. Width of base of pronotum about 1½ mm.

This is often a common insect upon Pine trees in the vicinity of Baltimore, and it occurs from the latter part of June until near the middle of July. Later it may be found during the month of October. Most likely it may be found at intervals throughout the summer and autumn, since specimens have been taken in Pennsylvania and New York in the month of August. I have also captured it during July and August in Eastern Massachusetts. Mr. J. Petit has sent specimens from Grimsby, Canada; others were kindly collected for me near Rock Island, Ill., by the late Mr. B. D. Walsh; and recently I have received a pair from Mr. E. P. Van Duzee, which were taken in August, at Lancaster, N. Y. Dr. Asa Fitch obtained a specimen in Washington County, N. Y., and it is the *Phytocoris carbonarius* of his collection.

2. M. fasciata.

This is the *Megacœlum fasciatum* Uhler, published in Hayden's Bull. U. S. Geog. Surv. Territ., VIII, p. 421.

Since the above description was published I have taken specimens of this species from the Alder in Eastern Massachusetts.

3. M. pumila, new sp.

Form of *M. fasciata.* Chestnut brown or dark tawny, finely yellowish pubescent; head, venter, and cuneus generally rufous, but in old specimens dark brown.

Head moderately polished, obsoletely wrinkled and punctate, remotely pubescent, unevenly indented on back of vertex; gula, rostrum, sternum and legs yellow, but posterior femora more or less piceo-rufous. Antennae flavo-testaceous, minutely hairy, the apical joint and tip of the third one commonly pale piceous. Rostrum reaching to the tip of the intermediate coxae, with the apex piceous. Pronotum transverse, moderately convex, closely set with fulvous pubescence, rugulose and obsoletely punctate, color sometimes tawny across the base. Scutellum rather flat, finely rugulose and obsoletely punctate basally, the apex smoother, pale tawny. Hemelytra finely yellowish pubescent, moderately polished, obsoletely punctate, usually paler on the costal margin and inner edge; cuneus broad, deeply incised, acute at tip, the inner edge concave and the outer margin convex, with the surface highly polished, obsoletely rugulose; membrane very pale fuliginous, with the basal edge white and the cell nervule dusky. Pectus broadly vittate with piceous on each side. Venter highly polished, paler along the middle and tip.

Length to tip of venter 3—3¼ mm., to tip of membrane 4—4¼ mm. Width of base of pronotum 1—1¼ mm.

In Maryland this species occurs abundantly in June and July, upon *Crataegus*, and I have also found specimens upon Willows as late as the middle of October. Specimens have also been collected near Chicago, and at Rock Island, Ill., by B. D. Walsh. Others have been sent to me from Waco, Texas, by Mr. Belfrage, and I have captured a few others in Eastern Massachusetts.

MEGACŒLUM, Fieb.

1. M. grossum, new sp.

Elliptical, dark brown, opaque, but conspicuously polished upon the pronotum. Head rounded, dull brown, paler before, incised on the middle line, indistinctly pubescent, the front with transverse ribs of dark brown, between which the surface is minutely shagreened, tylus and lower part of the cheeks piceous-rufous, highly polished, constriction at base of head piceous, polished; rostrum stout, reaching upon the fourth ventral segment, piceous, commonly paler at the incisures, the basal joint extending to the tip of the *prosternal scutum*; antennae stout and long, pale yellow, flecked with brown, the apical joint entirely brown, and about two-thirds as long as the third joint; eyes brownish black, having the posterior canthus bordered with yellow. Pronotum moderately convex, a little wider than long, piceous brown, the sides rapidly obliquely narrowing anteriorly, the outer margin widely reflexed, pale, smooth, a little sinuated; posterior lobe uneven, coarsely, remotely, in part confluently punctate, the callosities prominent, convex, minutely punctate and scabrous; posterior margin moderately curved, the edge ivory yellow, humeral angles almost acutely prominent; pro-pleura polished, anteriorly minutely scabrous, posteriorly coarsely remotely punctate. Sternum, trochanters, tips of coxae, and middle line of venter testaceous, more or less tinged with rufous. Legs pale piceous, with a band of yellow near the tip of all the tibiae. Scutellum dark brown, yellow at tip, minutely transversely wrinkled. Corium pale brown or fulvo-testaceous, sometimes pale clouded with brown; the costal margin whitish, broadly recurved. Clavus and inner submargin of the corium with lines of coarse punctures, the disk of the latter with obsolete remote small punctures; cuneus rufous brown at base interiorly and at tip,

margined on both sides with white ; membrane dusky, with the nervule darker, often with a whitish spot next the base and near the tip adjoining the cuneus. Abdomen dull above, polished beneath, dark piceous on the sides of venter, often tinged with rufous.

Length to tip of venter ♂ 6¼, ♀ 8 mm., to tip of membrane 7½—9 mm.

The male in this species has the eyes very prominent and the face correspondingly narrow, forming a decided contrast to the wider and more close-set female.

It is sometimes moderately common on Pine bushes in Maryland, Pennsylvania, and Massachusetts, during the month of July. Specimens have also been sent to me from Texas and Florida.

2. M. pusillum, new sp.

Rather narrower than the *M. inflatum* H.-Schf. of Europe. Pale tawny, or delicate rufo-testaceous. Head moderately rounded ; face diagonally, obsoletely wrinkled each side of the middle impressed line ; eyes brownish black ; antennae testaceous, a little sprinkled with red on the basal joint, and more or less red on the tips of the second and third joints, the apical joint nearly as long as the third, fuscous; rostrum reaching to the middle of the venter, yellowish, the basal joint red, the apical one piceous. Pronotum transverse, moderately convex, unevenly moderately coarsely punctate, the edge a little raised and white all around ; callosities less convex than in *M. grossum*, minutely scabrous ; lateral margin a little sinuated, the posterior margin moderately convex, the posterior angles nearly rectangular, with the humeri very feebly prominent. Scutellum convexly tumid, feebly wrinkled, indented behind, acuminate at tip, tawny, or rufous. Legs honey yellow, the femora and tibiae more or less tinged with rufous. Pro-pleura yellowish, coarsely punctate ; sternum, coxae, trochanters bright yellow. Hemelytra pale yellowish testaceous, thin, obsloetely and remotely punctate, costal margin abruptly reflexed, ivory yellow ; base of corium rufescent, the apex with a broad dark red band which is protracted in a slender line across the base of cuneus ; cuneus deeply incised at base, the apex margined with red, and the inner edge ivory white to beyond the middle ; membrane a little dusky, the nervule much darker. Venter polished, rufous each side and on the incisures of the segments.

Length to tip of venter ♀ 5 mm., to tip of membrane 6 mm. Width of base of pronotum 2 mm.

Collected in Arizona by Mr. H. K. Morrison. Thus far, I have examined only females. These have agreed almost exactly in color, size and form, and are about as narrow as the males of the preceding species.

3. M. mundum, new sp.

Form similar to that of the preceding species, pale fulvous, or bright yellow, tinged beneath more or less with rufous. Head with a very distinct neck in both sexes, and also with the eyes quite prominent in both. Face almost vertical, distinctly depressed in the male, moderately convex in the female, scabrous, opaque, transversely wrinkled in both sexes, and with the middle line deeply impressed as far as the collum ; antennae stout, yellow, the basal joint rufescent, set with long erect bristles, the apical one infuscated and not much shorter than the third ; rostrum rufo-testaceus,

reaching to near the tip of the posterior coxae, the basal joint not extending to the tip of the prosternal scutum. Pronotum moderately convex, dark piceous, polished, coarsely but not deeply punctate, transversely rugulose, the sides very oblique and not distinctly sinuated, the callosities much more elevated in the female than in the male; posterior angles almost acute, bent under in one female, the humeri acutely prominent, pro-pleura coarsely punctate, piceous above. Entire underside of body yellowish testaceous, rufous, or rufo-piceous on the sides. Legs fulvo-testaceous, sprinkled with red on the femora. Scutellum piceous, tumidly convex, feeble rugulose, longitudinally indented, and conspicuously impressed next the tip, the tip acute. Hemelytra with a piceous band across the tip of the corium, and including the base and apex of the cuneus; claval sutures distinctly coarsely punctate, the surface of corium remotely obsoletely punctate, membrane faintly brown, with the nervule darker.

Length to end of venter ♂ 4, ♀ $5\frac{1}{4}$ mm., to tip of membrane ♂ $4\frac{3}{4}$, ♀ 6 mm.; width of base of pronotum ♂ $1\frac{1}{2}$, ♀ nearly 2 mm.

Specimens of this species were sent to me from Eastern Georgia by Mr. H. K. Morrison, and I have examined others from various parts of Florida. Mr. Bolter kindly gave me a ♀ specimen which he captured near Enterprise, Fla., in the month of March.

Larva of Aplodes rubrolinearia, *Pack.*

By Geo. D. Hulst.

The larva of this Geometer I found feeding on Bayberry, (Myrica cerifera), in September 1887 (?), at the east end of Long Island.

It was in general color chocolate brown, with a reddish brown line on dorsum. Head with eyes rounded, but deeply channeled between, both in front and on summit. Segments deeply indented between. On each segment, just below dorsum, on each side, was a projection, most prominent on anal segment. Below these, just above spiracles, are very large projections, pointed, turned forward a little, becoming obsolete on anal segment. A reddish ochreous sub-stigmatal line, with a furcation on each segment, running up in front of lateral projections. Body rounded below; legs 10 in number, light chocolate in color, the anal ones rather ochreous from the extension upon them of the sublateral line. The whole body, projections, head, eyes, and legs strongly rugose.

The larva was, in superficial appearance, very much like the larva given in Dr. Packard's Monograph of the *Geometridæ*, plate XIII, fig. 23.

The pupa was formed in a very slight cocoon of a few strands of silk, partly drawing together a leaf. It was dull light green in color, and having been kept in a warm room all winter, the imago emerged early in March, 1887.

Studies on the North American PROCTOTRUPIDÆ, with Descriptions of New Species from Florida.

(PART I.)

By William H. Ashmead,
Jacksonville, Florida.

The Hymenopterous family *Proctotrupidæ*, is an extensive one, comprising, for the most part, parasitic species of minute size, all of the greatest economic importance, their natural food being the eggs and and larvæ of the more destructive insect pests, and to the husbandman their services are invaluable.

The species composing the subfamily *Bethylinæ*, seem to confine their attacks to Lepidopterous larvæ belonging to the family *Teneidæ*; the *Ceraphroninæ*, principally to Dipterous and Hymenopterous larvæ, although species in the genera *Lygocerus*, *Megaspilus*, and *Ceraphron* are found parasitic in plant-lice, belonging to the Homopterous family *Aphididæ* in the bodies of which they live and undergo their transformations.

The species in the subfamily *Scelioninæ* are almost entirely egg parasites: *Scelio* is a parasite in grasshopper eggs; *Telias* and allied genera in the eggs of moths and butterflies; while *Telenomus*, *Hadronotus* and *Prosacantha* live parasitically in the eggs of various bugs (*Hemiptera*).

The extensive subfamily *Platygasterinæ*, comprises numerous genera and species, generally of the smallest size, and of a black color, all of which are found parasitic in Dipterous larvæ, belonging principally to the families *Cecidomyidæ* and *Tipulidæ*.

The *Diapriinæ* destroy fungus eating *Diptera*; while the subfamily *Myrmarinæ*, among which are the smallest Hymenopters known, are egg parasites. They have been reared from the eggs of moths, butterflies and sawflies, and a few of the species are parasitic on scale insects, belonging to the Homopterous family *Coccidæ*.

Thus we see, the study of these little insects is of the greatest economic importance, and the species and their habits ought to be made known as soon as possible, so that when practicable, they may be reared in quantities, colonized, distributed and utilized for the destruction of insect pests and the benefit of man.

In the following memoir, I have brought together, arranging them as far as possible in their proper genera, all the described species known to me to occur in our fauna North of Mexico, and give descriptions of such of those in my collection that appear to be new or unknown to science, reared or collected by me, during several years study of the family.

Subfamily **HELORINÆ.**

I. **HELORUS** Latreille.

1 1. **Helorus paradoxus** Prov. (*Copelus paradoxus* Prov.) Petite faune Ent. du C, II, p. 539—40.
Hab.—Cap Rouge, Canada.

Subfamily **DRYININÆ.**

II. **DRYINUS** Latreille.

2 1. **Dryinus atriventris** Cress. Trans. Am. Ent. Soc. IV, p. 193.
Hab.—Texas.

3 2. **Dryinus bifasciatus** Say. Leconte's Ed. Say's Works, I, p. 384.
Hab.—Indiana.

4 3. **Dryinus alatus** Cress. (*Gonatopus alatus* Cr.) Trans. Am. Ent. Soc. IV, p. 193.
Hab.—Texas.

III. **GONATOPUS** Lynngh.

5 1. **Gonatopus decipieus** Prov. Add. et Corr. a la Faune Hym., p. 179.
Hab.—Canada.

6 2. **Gonatopus contortulus** Patton. Can. Ent. XI, p. 65.
Hab.—Connecticut.

IV. **LABEO** Haliday.

7 1. **Labeo incertus** n. sp.

♀. Length .08 inch. Black, polished. Occiput deeply concave. Antennæ and palpi, pale yellow. Mesothorax smooth without grooves; metathorax rugulose. Legs, including coxæ, pale yellow, middle and posterior femora and tibiæ brownish. Abdominal petiole, long, it with most of the abdomen testaceous. Wings hyaline, veins pale, the stigma large with a clear spot at base; no stigmal vein.
Hab.—Florida.

V. **CHELOGYMUS** Haliday.

VI. **ANTEON** Jurine.

8 1. **Anteon tibialis** Say. Leconte's Ed. Say's Works II, p. 730.
Hab.—Indiana.

VII. **MYSTROPHORUS** Foerster.

VIII. **APHELOPUS** Dalman.

9 1. **Aphelopus americanus** n. sp.

♂. Length .06 inch. Black, subopaque, covered with fine, whitish pubescence. Head punctate. Antennæ long, scape brownish yellow, flagellum dark brown. Mesoscutum with two delicately indicated grooves and some sparse widely separated punctures. Legs, including coxæ, pale yellow, the posterior femora and tibiæ, along upper surface, and claws, brown. Abdomen black, shining. Wings hyaline, veins pale, two basal cells, stigma large, lunate, brown, stigmal vein as long as the stigma, pale.
Hab.—Florida.

This species approaches very closely to a European species in my collection, *Aphelopus melaleucus* Dalm., but the color of the legs, and wing veins easily distinguishes it.

Subfamily **EMBOLEMINÆ.**

IX. **EMBOLEMUS** Westwood.

10 **1. Embolemus nasutus** n. sp.

♂. Length .08 inch. Robust, black, subopaque. Head finely punctate; ocelli prominent; eyes large, arched, giving the insect a peculiar appearance, as the head is short, vertically; the black mandibles are long, strongly curved, with a long tooth near tip. Antennæ 10-jointed, black, pubescent, the first two joints short, third longest, following joints subequal. Abdomen sessile, black. Legs black, knees and tarsi, pale or whitish. Wings hyaline, veins hyaline, almost invisible; there is one basal cell and a clear space in the stigma.

Hab.—Florida.

Described from one specimen taken in a low marsh. The mandibles project slightly in the form of a little snout, which suggests the name.

X. **PEDINONEMUS** Foerster.

Subfamily **BETHYLINÆ.**

XI. **SCLEROCHROA** Foerster.

11 **1. Sclerochroa gallicola** n. sp.

♀. Length .07 inch. Smooth, polished, honey-yellow, including legs and antennæ. The oblong head is smooth without ocelli; the eyes small, round, placed well forward near the anterior corners. The antennæ issue from the forward part of the head, just above the mouth, are 12-jointed and about as long as the head; the first joint long, somewhat dilated, the second much shorter, while the following joints are very small, sub-moniliform. Abdomen, pointed ovate. No wings.

Hab.—Florida.

Described from one specimen, reared from cynipidous oak gall *Andricus foliatus* Ashm.

12 **2. Sclerochroa cynipsiphila** n. sp.

♀. This species, in size and general appearance, exactly resembles the preceding, but the head, thorax, and legs are reddish or rufo-testaceous; the metathorax waxy-white, while the abdomen is black.

Hab.—Florida.

Described from one specimen, reared from cynipidous oak gall *Holcaspis omnivora* Ashm.

13 **3. Sclerochoa macrogaster** n. sp.

♀. Length .12 inch. This species, which was taken at large, differs from the others, in color and in its much larger and more elongated form. The head is black, polished; antennæ honey-yellow; metathorax, knees, and tarsi honey-yellow; legs and thorax rufo-piceous. The abdomen, which is about two and a half times longer than the thorax, is elongate, pointed ovate, black and polished, with a few hairs at tip.

Hab.—Florida.

Described from one specimen. This genus seems to be identical with genus *Microps* Haliday.

XII. **SIEROLA** Cameron.

14 **1. Sierola maculipennis** n. sp.

♀. Length .08 inch. Black, polished. Mesothorax without grooves. Antennæ and legs honey-yellow (antennæ? 15-jointed). Wings hyaline, veins brown. The

radial cell is narrow, closed; the stigma broad, thick, with a clear spot at base; the basal nervure is strongly curved and thickened, in a dusky cloud; there is another cloud at and below stigma and base of radial cell.

Hab.—Florida.

XIII. PERISEMUS Foerster.

15 1. **Perisemus floridanus** n. sp.

♂, ♀. Length .12 inch. Black, finely punctate. Head with some coarser, scattered punctures. The 12-jointed antennæ, palpi and legs, honey-yellow. All femora and middle and posterior tibiæ, black. Wings hyaline, veins pale, stigma brown. The male is slightly smaller and the antennæ toward apex brownish.

Hab.—Florida.

This species approaches quite closely to a European species in my collection, *Perisemus triareolatus* Foerst.

16 2. **Perisemus mellipes** n. sp.

♀. Length .13 inch. This species differs from *P. floridanus* in its larger size and the uniform dark honey-yellow legs. The antennæ are infuscated toward tips: wings hyaline, stigma black.

Hab.—Florida.

XIV. GONIOZUS Foerster.

17 1. **Goniozus foveolatus** n. sp.

♀. Length .12 inch. Black, finely punctate, with coarse, scattered foveæ. Antennæ 13-jointed, honey-yellow. Legs black, the knees and tarsi honey-yellow. Wings hyaline, stigma black, basal cells, two.

Hab.—Florida.

18 2. **Goniozus grandis** n. sp.

♂, ♀. Length .25 inch. Black, highly polished with a few coarse, scattered punctures. Antennæ and legs rufous. The head and thorax in certain lights have a bluish tinge. Wings subhyaline, veins yellowish. The ♂ differs from ♀ in having a much narrower head, longer, darker antennæ and clear hyaline wings.

Hab.—Florida.

XV. EPYRIS Westwood.

19 1. **Epyris analis** Cress. Trans. Am. Ent. Soc. IV, p. 193.
Hab. – Texas.

20 2. **Epyris læviventris** Cress. l. c. p. 190.
Hab.—Texas.

21 3. **Epyris rufipes** Say.
Bethylus rufipes Say. Leconte's Ed. Say's Works, I, p. 221.
Epyris rufipes Cress. l. c. p. 194.
Hab.—Missouri, Texas.

XVI. ISOBRACHIUM Foerster.

22 1. **Isobrachium floridanum** n. sp.

♀. Length .10 inch. Black, subopaque, finely punctate, sparsely pubescent. Antennæ and legs ferruginous, femora with a dark line above. Wings fusco-hyaline, pubescent; veins brown; stigma small.

Hab.—Florida.

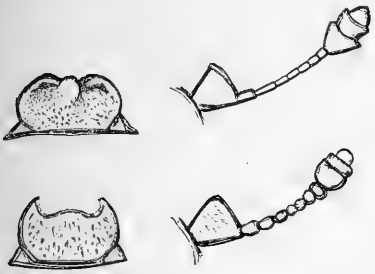
This genus is distinguished from *Perisemus* and *Goniozus* by the basal vein not having a backward directed branch.

(TO BE CONTINUED.)

A New Species of Amphotis.

By Hy. Ulke.

The discovery of a new species of *Amphotis* induced not only a comparison of the two species now found in our country, but also of the two genera *Soronia* and *Amphotis*, which have been united by Dr. Horn under the name of the first genus.



EXPLANATION OF FIGURES:
Upper figure: Mentum and antenna of *Soronia undulata* Say.
Lower figure: Mentum and antenna of *Amphotis Ulkei* Lec.

The separation of the two genera was chiefly based upon the difference in the antennal grooves, which are convergent in *Soronia* and parallel in *Amphotis*.

Soronia undulata however represents an intermediate form and makes this character less important.

The structural characters which eventually may lead to the re-establishment of *Amphotis* are found in the mentum, antennæ and elytra. The costate opaque elytra are so characteristic, that I recognized the genus at once—when I first discovered *Amphotis ulkei*—by the excellent figure given by Du Val.

Amphotis schwarzii, n. sp.

Elongate oval, light brown, opaque. Head densely punctured and sparsely covered with short yellow setae. Antennae less slender, club abrupt. Thorax twice as wide as the length at middle, narrowed in front, apex deeply emarginate, base bisinuate, sides arcuate, broadly explanate and the margin slightly reflexed, hind angles rectangular, densely punctured and sparsely covered with short yellow setae. Elytra as wide at the base as the thorax, humeral angles slightly dentiform, sides broadly reflexed, disc somewhat depressed, with a sutural, a short scutellar, five discal costae and two additional smaller ones between the fifth costa and the margin. The irregular coarse punctures of the intervals and the summits of the costae bear short yellow setae. The inflexed portion of the margin is more finely punctured. Body beneath is equably punctured, punctures with short yellow setae.—Length 5—6 mm.

This species is very much like *A. ulkei*, but the uniform, pale brown color and the additional ridges in the inflexed portion of the elytral margin will at once distinguish it.

I take great pleasure in dedicating this interesting addition to our fauna to my friend, Mr. E. A. Schwarz of Washington, who is so well known to every scientific Entomologist of the country.

It would be interesting to know the habits of this new species. Mr. Schwarz collected it in numbers on the beach near Fortress Monroe, Va., where they had been washed ashore.

Since my first discovery of *Amphotis ulkei* I have found it every year, early in Spring, in the nests of a small black ant (*Cremastogaster lineolata* Say), and only this year I collected them in numbers among *Formica rufa*. The only species in Europe: *Amphotis marginata* Fab., is said to be found on flowers, Erichson however found them abundantly in the nests of *Formica fuliginosa*.

Notes on Erebus odora, *L.*

By H. T. Fernald, B. S.

During a recent sojourn at Nassau, N. P., the capital of the Bahama Islands, I devoted a portion of my time to the study of the insect fauna of the island.

At every turn strange and striking forms presented themselves, among which an occasional glimpse of a familiar species seemed like an unexpected meeting with an old friend.

This was particularly the case when on the morning of April 26th of this year a large *Erebus*, unfortunately somewhat battered, was shown to me. I captured it with some difficulty as it apparently flew as well as at night. Just a month later, on the evening of May 26th, I succeeded in obtaining a perfect specimen, and the next day a third was given to me.

Alluding to their (to me) unusual abundance, in conversation with her Excellency, Mrs. Blake, to whom and to his Excellency, Governor H. E. Blake, I am indebted for very many favors, I learned that the "*Black Witch*," as the *Erebus* is there called, is quite abundant at Nassau, a season rarely passing in which a collector might not obtain a number with ease. Indeed they are attracted to lights in houses and fly about like bats till caught or driven out.

On inquiry as to the larva, Mrs. Blake stated that she had endeavored to obtain it to add to her series of paintings of the early stages of Bahaman Lepidoptera, but that she had thus far been unsuccessful. She had been informed by the natives, however, that the larva was very large, fed on the wild fig (*Ficus trigonata*), and was nocturnal in its habits, hiding in holes in the trunk during the day. She also stated that the moth was even more abundant in Jamaica than at Nassau.

As the *Erebus* has such a powerful flight, its extended habitat (from Canada to Brazil) is not as remarkable as it would otherwise be, but the capture of fresh and perfect specimens at the extreme limits of this range would indicate that this species breeds, at least occasionally, in our Northern States.

If its food in the West Indies be indeed the fig, it may be safe to suggest that in our climate it would probably feed on some of the *Urticaceæ*, that being the family to which the fig belongs.

A New Genus and Species of Arctiidæ.

By John B. Smith.

Among material received some time since from Texas, by a number of collectors as well as myself, were quite a number of specimens of a pretty species of a Lithosiiform appearance. Its characters prevent its association with any genus heretofore described. It resembles *Emydia* in wing form, and *Ocnogyna* in tibial structure, while presenting peculiarities of venation and head structure, which effectually distinguish it from either.

CERATHOSIA, n. gen.

Body slender, graceful, untufted. Head distinct, rather prominent; palpi slight, reaching the middle of the front, the terminal joint minute. Tongue moderate in length. Eyes hemispherical, prominent; ocelli distinct. Antennae simple in both sexes. Front depressed, excavated, with a circular sharp, somewhat irregular rim; in the centre of the depression is a cylindrical projection with a truncate and somewhat cup shaped tip. Thorax ovate, with smooth, scaly vestiture. Abdomen elongate, slender, cylindric, smooth. Legs slender, smoothly scaled, increasing in length posteriorly. Anterior tibia shortest, rather stout, with a moderately long, curved spine at tip; middle tibia with one pair, posterior with two pairs of spurs, not spinulose.

Primaries narrow, elongate, subequal, outer margin slightly oblique, arquate: 12-veined; accessory cell present; internal vein not furcate at base; veins 3, 4 and 5 nearly equidistant from the end of the median; 6 from lower margin of accessory cell, 7, 8 and 9 on a short stalk from the end of accessory cell, 8 to the apex, giving off 9 at about its middle; 10 from upper angle of accessory cell.

Secondaries large, rounded. Two internal veins: 2 from median at its outer third; 3 and 4 on a short stalk from the end of the median; 5 wanting; 6 and 7 from a short stalk at end of subcostal; the costal, (vein 8,) from the subcostal about $\frac{2}{3}$ from base.

Supra anal plate of ♂ triangular; hook somewhat irregular, thickened in the middle, with a pointed tip, but little curved. Side pieces subequal, with an obliquely curved tip.

C. tricolor, n. sp.

Head, thorax, and primaries above, glistening pure white, spotted with black; secondaries and abdomen uniform glistening clay yellow.

Palpi black tipped; tip of frontal projection also black; a black spot at the inner base of antennae. Collar with a black dot each side of the middle; thorax with four black spots, two on each side of the middle; patagiae with two black spots.

Primaries with black powderings along costa, forming an elongate costal patch at outer third, in which are three white costal dots. The black spots on primaries are rather irregularly arranged, and variable: there is a series along the median vein and another along the subcostal; in some specimens there are two rather indistinct transverse bands formed. At outer fourth is usually a sinuate, narrow, black transverse line, often broken up into spots and sometimes not traceable as a line—there is some difference too in the form of the line when it is present. A series of intra venular spots parallel to and not far from outer margin always present: a series of terminal lunules: fringe white. Secondaries and abdomen immaculate. Beneath, secondaries and abdomen as above; abdomen with a more or less complete series of narrow black spots on each side of the middle. Legs white, black marked. Tarsi black or brown,

ringed with white. Primaries yellow to near outer margin, where it is separated from the white terminal space by a broad blackish shading which extends inward on the costa. A series of black terminal lunules.

Expands, 1—1.37 inches = 25—35 mm. Hab. Texas.

Many specimens from Texas, where it seems to be not uncommon. The species is very distinctly marked and easily recognized by the pure white, spotted primaries and yellow secondaries. It has the wing form of *Utetheisa*, and the genus may precede it in the lists. Types in my own collection. Others in the National Museum, Coll. Graef, Tepper, Hulst, Bolter, et al.

Book Notices.

Synopsis of the Families and Genera of the Hymenoptera of America, North of Mexico, together with a Catalogue of described species and Bibliography. Compiled by E. T. Cresson. Part I. Families and Genera. Trans. Amer. Ento. Soc. Phil. 1887.

The above work, Part I of which is completed and before us, marks an era in the mapping out of another part of the great field of American Entomology. One by one Specialists are bringing facts, which are chaos to the ignorant, into order, by the ascertaining and publishing of the relations and likenesses which reveal the "unity in diversity" of Nature. And of this task, no little portion is set before us in the above work. Mr. Cresson is the more worthy our thanks, as his labors have been in what is one of the most difficult of all suborders. With this work in the possession of the student, he can with little difficulty arrange his Hymenoptera in their proper families and genera. We can not too highly recommend its use to those whose taste leads them to collect and to strive after a scientific knowledge of the Hymenoptera. GEO. D. HULST.

* * *

On the classification of the Pterophoridæ, by E. Meyrick. Tr. Ent. Soc. London, 1886, p. 1—21.

Mr. Meyrick discusses the location of the family and says on this point: "My own conclusion is that the group constitutes a family of *Pyralidina*, of similar value with the *Botydidæ*, and other allied families, and that it may be placed, together with the *Tineadidæ* and *Oxychirotidæ*, as I have elsewhere defined them, next the *Crambidæ* and *Scopariadæ*." A synoptic table of the known genera is given, and other new genera and species are described.

No American forms are treated of, but the paper is nevertheless an interesting and valuable one to the American student of the groups.—J. B. S.

Society News.

Brooklyn Entomological Society, June 7th. Apart from the regular business, Mr. Wm. Beutenmueller gave an account of a collecting trip in Florida, from which he had just returned. He was located at Kisimmee and Enterprise. Collecting in the pine woods was very unremunerative. The hummocks gave much better results, but it was evident that later in the season there would have been much greater success. Coleoptera were much more plentiful than Lepidoptera.—The next regular meeting will be in September, but the President was requested to call a special meeting early in July, to arrange, if thought desirable, for the meeting of the A. A. A. S.

ENTOMOLOGICA AMERICANA

VOL. III. BROOKLYN, AUGUST, 1887. NO. 5.

NEW NORTH AMERICAN MYRIAPODS.

By Charles H. Bollman.

The types of the following new species are deposited in the Museum of the University of Indiana.

Subgenus **PARAJULUS.**

1. Parajulus rugosus sp. nov.

Brown, segments banded with dark gray posteriorly, black dorsal line and lateral row of spots distinct, vertex black, feet banded with brown. Moderately slender, rough, not pilose. Vertex wrinkled, median sulcus plain, setigerous foveolæ present. Eyes distinct, triangular, almost trapezoidal; ocelli 50–55, arranged in 8 or 9 rows. Segments 51—54. Sides of first segment only marginate, other segments moderately striate beneath, with punctations and short lines above. Last segment produced into a sharp, robust spine, projecting beyond the anal valves, which are scarcely marginate, anal scale large, obtuse, very sparsely pilose. Repugnatorial pore large, not touching the transverse suture, which is bent. Pairs of feet 96—104, exceeding the width of body. Male: mandibulary stripes strongly produced beneath at the anterior angle. Coxæ of the second pair of feet produced as in *impressus*. Genitalia; anterior part of first plate shorter than posterior part, round, slightly bent outwards, pilose; posterior part flat, angularly spatulate, presenting the broad side outwards; anterior division of posterior plate curving up around in front of anterior, end bifid, slightly margined beneath; posterior part lanceolate, slender, about as long as anterior division.

Length of body, ♂ 35 mm., width 2.2 mm.; ♀ 40 mm., width 3 mm.

Hab. – Monongahala City, Washington Co., Pennsylvania.

In the plan of the male genitalia this species is related to *ellipticus*, but differs greatly from that species especially in the form of the posterior plate.

This species is described from two males and two females, collected by Mr. Albert Gregg.

2. Strongylazoma poeyi sp. nov.

Dark green, lateral plates and feet pale. Robust, not smooth, shining. Antennæ subclavate, longer than the width of body. First segment rather large, convex, scarcely punctate. Other segment punctate, transverse suture deep, not tuberculate. Lateral plates thick and obtuse, scarcely produced. Repugnatorial pore situated on the posterior third and slightly beneath, sunken. Male: genitalia long and slender, somewhat expanded and excavated towards the end, which is bifid.

Length of body 27 mm., width 2.3 mm.

Hab.—Havana, Cuba.

This species is described from one male and one female, both in a rather bad condition. I have named this species after its collector—Dr. Felipe Poey,—who also sent me in the same collection *Orphæneus braziliensis*, *Mecistocephalus guildingis*, *Scolopendra alternans* and *Newportia longitarsis*.

3. Geophilus salemensis sp. nov.

Frontal plate present; anal pores moderate. Light red, head, antennæ, last segment and feet orange. Robust, slightly attenuated anteriorly, more strongly posteriorly, moderately smooth, sparsely punctate and pilose. Prehensorial feet punctate and pilose; sternum wider than long (8.6), anterior margin not produced; coxæ scarcely longer than wide (3,5:3), unarmed; one small tooth. Cephalic plate longer than wide (7:5,5), suboval, sparsely punctate and pilose; prebasal plate exposed; basal plate about three times wider than long. Antennæ moderate, joints rather long, two preceeding the last not noticeably shortened. Dorsal plates plainly bisulcate; anterior predorsal plates equal to posterior, median longest; ventral plates with a median foveolæ, sparsely punctate. Spiracles round, anterior large, median and posterior small. First pair of feet moderately short and slender, anterior and posterior subequal. Posterior coxæ moderately inflated, pilose, pores few and mostly concealed by the last ventral plate, which is wide, with the sides substraight and rapidly converging. Pairs of feet of male 51—54, last strongly crassate and densely pilose, armed; female 54 - 56, last slender, armed and pilose.

Length of body 35—60 mm.; width 1 – 2 mm.

Hab.— Salem, Indiana.

I have examined five males and four females of this species. It is more related to *Geophilus rubeus* Say.

4. Geophilus setiger sp. nov.

Frontal plate absent; anal pore large, concealed. Orange, head and antennæ brown. Slender, moderately attenuated posteriorly; smooth, sparsely pilose. Prehensorial feet sparsely pilose, smooth, not punctate; sternum wider than long (4.3), anterior margin not produced; coxæ wider than long (2:1.5), unarmed; one single acute tooth. Cephalic plate suboval, longer than wide (4:3.5), smooth, sparsely pilose; basal plate much wider than long (4:1.3), partly covered by cephalic plate. Antennæ short, joints moderate, two preceeding last subequal. Dorsal plates distinctly bisulcate; anterior predorsal plates short, median longer than posterior; ventral plates with three longitudinal depressions. Spiracles round, anterior scarcely enlarged, rest nearly equal. First pair of feet short, anterior and posterior subequal, former more robust. Posterior coxæ moderately inflated, pilose, pores few (5—6),

arranged along the ventral plate, which is wide with the side straight and strongly converging. Pairs of feet of male 43, last moderately thickened, pilose and armed; female 45, last rather slender, less pilose than male, armed.

Length of body 18.5—21.5 mm.; width .7—1 mm.

Hab.—Salem, Indiana.

I have examined a male and a female.

Subgenus **ARCHILITHOBIUS.**

Lithobius holzingeri sp. nov.

Chestnut brown, head dark, antennæ and feet paler. Robust, smooth, sparsely pilose; head subrotund; somewhat wider than long. Antennæ moderately long, joints 20—28, long. Ocelli 15—20, arranged in 5 or 6 series. Prosternal teeth 4. Coxal pores 3, 4, 7, 3—5, 6, 1, 5, somewhat transverse, large. Spines of first pair of feet 2, 3, 2; penultimate 3, 3, 2; last 1, 3, 2, 0—1, 3, 3, 6. Posterior pair of feet moderate, in the male the fifth joint is produced on the inner side into a short blunt pilose lobe. Claw of the female genitalia short, wide, tripartite; spines short and stout, subequal.

Length of male 16—21 mm.; female 12—18 mm.

Hab.—Winona, Minnesota.

This species is related to *trilobus*, but is distinguished from it by the greater number of antennial joints, coxal pores and the larger size. It is described from three males and nine females; I have named it in honor of its collector, Mr. J. M. Holzinger.

An Entomological Curiosity.

By O. Lugger.

Once upon a time—about the year 1866—I formed the acquaintance of a rather peculiar entomologist, in the city of Detroit, Mich. This collector, an Irish-man, had become aquainted with Mr. Andrews of Brooklyn, who at that time was very anxious to bind together all American entomologists with a silken bond spun by the oak-feeding *Yamai mai*. Mr. Andrews' success was only limited, but Mr. O'M. proved himself otherwise. He was an unmarried man, a painter by trade, and was living in a small house in the suburbs of Detroit. This house consisted of two rooms and a garret, that is to say, it was intended to consist of these apartments; they were never finished. Behind the house was a rather large garden, to furnish him and his mother who kept house (?) for him, all the necessary vegetable food, if—our friend had not found another use for this garden. All kinds of plants that would furnish food for caterpillars were there found in dense profusion, but nary a potato, tho' this fruit and the imported delicacy, salt-herring, were about the only food ever consumed inside the house; however, an occasional loaf of bread brought variety into this bill of fare.

Mr. O'M. was the owner of a fine collection of butterflies; he had arranged the specimens in a very unique fashion. Carefully leading you upstairs—and care was quite necessary—you would face a large case, about 4 feet long, 6 feet deep and 2 feet wide. There was a curtain over the glass; after putting you upon a kind of spring-board in some way connected with the case, he would pull the curtain, and your amazed eyes would see a wonderful sight. The background of the case showed a nicely painted landscape; on the sides of the case were artificial trees of various kinds, in full foliage; in the front of the case was a little pond formed of glass. All the insects in this case were mounted in natural positions, some were fastened to very long and invisible fine steel-wires, and were flying (the spring-board giving motion to them); others were resting in various positions on leaf or trunk. The caterpillars were feeding in their proper positions, and there was not a leaf upon any of the plants that did not show the effects of some insects upon them, such as leaf-miners, etc. All these leaves were cut out of paper, and they were all carefully painted from nature. Water-beetles and bugs were swimming in the pond—even the common house-fly could be seen, cleaning itself, of course, *Canthon hudsonias* and his ball had not been left out in this picture of still-life.

A further exploration of this garrett was somewhat dangerous, owing to several large nests of hornets, which Mr. O'M. had trained as watchmen, and quite successfully so, as a large bump on my head could vouch for. House-painting occupying too much time, and preventing Mr. O'M. from feeding his various pets, the caterpillars, he had evolved a very good plan of making a living and raising butterflies at the same time. He had built himself a three wheeled hand-cart, upon which he had a photographing outfit and breeding cages. According to an agreement I met him one fine morning outside the city to have a days collecting together; he with an eye to business as well. After travelling several miles we came to a blacksmith's shop on the road, well shaded by some beautiful old oaks. A farmer and his wife wished to have their pictures taken. Mr. O'M. put them in a graceful position against the ivy-covered wall, fixed his camera, and cried: "Steady." Then he went through the motion of looking at a watch—which he did not possess. But just at this critical moment a beautiful *Papilio thoas* hove in sight and—everything about the art of photography was forgotten, and Mr. O'M. was in full chase after this prize. He succeeded in this but not in the picture. The worthy old couple stood like posts, and eventually obtained a photograph, but not a likeness.

NOTES ON COLEOPTERA.

By Frederick Blanchard.

Dyschirius hispidus Lec. Besides the distinctions given in the synoptic table in the Bulletin of the Brooklyn Ent. Soc., vol. II, p. 17, this species is readily known by having only the normal number of setigerous punctures on the thorax, namely, an anterior and a posterior one on each side, while in *setosus* and *pilosus* there are several intermediate ones. 4—5 in *setosus*; the other I have not seen.

Stenus. Lieut. Casey has said,—Revision of Stenini, p. 5,—that the tibiæ are unarmed in this genus, or group, as he prefers to consider it. Two exceptions have come under my notice:

In **Stenus strangulatus** Casey, the hind femora of the ♂ are each armed with an acute tooth inside near the base. The femora are also all stouter in the ♂.

Again in **Stenus erythropus** Mels., the ♂ hind tibiæ have each an obtuse tooth inside one-fourth from the apex. In this species the mesosternum of the ♂ is furnished with a tuft of long yellow hair.

Stenus juno Fabr. This species also has in the ♂ a mesosternal tuft of long hair as in *erythropus*, not observed by Lt. Casey, although mentioned by Fauvel, "Faune Gallo-Rhénane," III, 246. There is also a conspicuously longer and more dense pubescence on the basal half of the posterior femora of the ♂ on the inner side not mentioned by either author.

Hister repletus Lec. This species, which appears in the Henshaw List in the position originally given it by Maj. Leconte, should follow *subopacus*, it belonging to the section *Psiloscelis* and conforming in habits with the other species, being found in the nests of a small black ant.

Prionus laticollis Drury. The entire surface of the metasternum and of the hind coxæ in the ♂ is clothed with a long pubescence which also extends more or less upon the mesosternum and its side pieces. In the ♀ however the hairs are so short and inconspicuous as to give the under surface the appearance of being quite glabrous. In *pocularis* both sexes are similarly clothed beneath with a long pubescence. Of the other species of the genus I can only say now, owing to the absence of specimens, that the ♀ of *californicus* and the ♂ of *imcricornis* are pubescent beneath, while the ♀ of *palparis* has the underside entirely glabrous.

Prionus.—At my request Dr. Horn has kindly sent me the following additional notes on the presence or absence of metasternal vestiture:

In *californicus* ♂, the pubescence is moderately long over the whole metasternum. In the ♀ it is sparser and shorter and usually there is a triangular median space naked.

P. imbricornis ♀ is entirely naked beneath.

P. fissicornis ♂ as in *imbricornis*, ♀ entirely naked but with the metasternum more thickly punctulate than in *imbricornis*.

P. palparis ♂ with a shorter pubescence than has *imbricornis*, ♀ as in *imbricornis*.

Homæsthesis integer ♂ has the pubescence very short The ♀ is naked and quite smooth.

H. emarginatus ♂, has the pubescence much longer. The ♀ is as in *integer*.

In *Tragosoma Harrisii* both sexes are similarly hairy.

Mecas inornata Say. Among three specimens given me many years ago as *Stenostola saturnina*, from Texas, one was found to have the claws much more deeply cleft and with the inner divisions broad, lobe-like and rounded and approximate at tip instead of being moderately cleft with the inner divisions acute. While it is perhaps possible that an extensive series may show this to be but an extreme variation, it is proposed that Say's name be used for this form and Leconte's name *saturnina* for the other until evidence occurs to show that they should be reunited. In examining the Leconte types recently with Dr. Horn it was found that the type of *saturnina* was of the form referred to above under that name. The Leconte specimens of *inornata* averaged a somewhat larger size and where rather more ochreous in color. The pair of small denuded spots on the thorax were present and absent in specimens of both forms. Both sexes occurred of each. In comparing my own single specimen of *inornata*, which is a ♀, with *saturnina*, the elytra appeared to be somewhat less punctured and with the punctures becoming obsolete at tip, while in *saturnina* the punctures, although finer, are distinct at tip. In my specimens the size would afford no criterion, they being all about the same. *M. inornata* is from Dak., Kans., Tex. *M. saturnina* is from Kans., Tex.

Magdalis armicollis Say. This and *pallida* Say are retained as distinct in the Henshaw List. The latter name belongs to the ♂ and the former to the ♀ and both should be known as *armicollis*. The ♂♂ are usually darker, either entirely brown, or with the head and thorax dark and the elytra pale, while the ♀♀ appear to be always pale above. The eyes of the ♂ are a little larger and more approximate above; the antennæ are a little longer, the scape passing back of the front margin of the eyes but in the ♀ only barely reaching them; the abdomen is somewhat flattened in

the ♂ and with a rather broad, impunctured, glabrous, median vitta, bordered with erect hairs, extending from base to apex; the last ventral is broadly emarginate and the sixth is frequently visible; the pygidium is truncate. In the ♀ the ventral segments are convex, punctured and pubescent and the last one and the pygidium are rounded.

Anthonomus pusillus Lec. This species has occurred occasionally in sweeping grass and weeds in May and June in the vicinity of Lowell, Mass., and lately, June 16, it was found in considerable numbers on the *Helianthemum canadense*, or frost weed, growing in dry old fields. This was described from a single specimen from Texas, which was undoubtedly a male. The variation in size is very great, some females exceeding the smallest males six or eight times in bulk, so that unless the sexes happened to be taken at the same time they would hardly be recognized as belonging to the same species. The males are also generally darker colored than the females. The tooth of the front thighs is very strong, that of the middle moderate in size, that of the hind thighs very minute; the tibiæ are strongly bisinuate inside and the pygidium is convex and perpendicular and a little inflexed below as described of *A. elegans*. In both sexes there is a small acute tubercle on the inner side of the anterior coxæ near the apex, but sometimes observed with difficulty in the more minute specimens on account of the scaly vestiture.

It seems probable that this species breeds in the seed pods of *Helianthemum*, but I have not been able to verify this.* *Miarus hispidulus* has been observed to breed in the seed capsales of *Lobelia inflata*. Larva, pupa and imagines, all having been taken from them. It, no doubt, breeds in other species of *Lobelia* and here frequently occurs on the flowers of *L. spicata*.

Tychius lineellus Lec. This appears to have been described from females only. In the ♂ the beak is shorter, coarsely punctured and striate with a small smooth space above near the tip and with the antennæ inserted far in front of the middle instead of at the middle as in the ♀. The abdomen is impressed at base and the front tibiæ are armed inside at about the middle with an acute tooth which is absent in the ♀.

Barinus cribricollis Lec. In the Bull. Cal. Acad. Sc., II, 6, p. 255, Lieut. Casey has defined the genus *Barinus* and he has also described *Barinus squamolineatus* from an Ill. specimen, sent to him by Mr. F. M. Webster. I have also what I take to be a similar specimen sent me by Mr. Webster from Ill. Dr. Horn and myself have compared my specimen with Dr. Leconte's types of *Barilepton* and have found it to agree

* Since the foregoing was written, larvæ, undoubtedly of this species, have been observed in the seed vessels.

well with *cribricolle*. A little further examination showed that the species *lutescens*, *albescens*, *lineare* and *bivittatum* described by Leconte under the genus *Barilepton* might also be placed in Mr. Casey's new genus, they having two connate claws instead of a single claw as in *Barilepton* proper. Dr. Horn has informed me later that in the type of *albescens* the claws are extremely closely connate; and furthermore that this species is not at all like *lineare* of which it appears as a synonym in the Henshaw List. He also suggests the possibility of *albescens* and *lutescens* being respectively ♂ and ♀ of the same species.

CALLIMORPHA.

Will all collectors who may be in the position to do so, please collect as long series of any species of this genus found in their locality as possible, with the view of getting at the range of variation. Also where that is possible, obtain eggs or larvæ in numbers, and raise them to maturity, preserving specimens of each stage, either blown or in alcohol. Eggs or larvæ forwarded to the undersigned, will be carefully raised, and duly acknowledged.

A study of the species of this genus recently made, the results of which will appear shortly in the Proc. U. S. Nat'l Museum, makes it probable that there are 9 species instead of three, as our lists now show. In order either to prove, or disprove this conclusion, I beg my friends and correspondents in the U. S. and Canada to assist by supplying me with what notes or material they can. If larvæ or eggs are sent, please send name of the food plant from which taken.

JOHN B. SMITH,
U. S. Nat'l Mus., Washingt., D. C.

Cockroaches!

In "The Entomologist" Vol. XX, p. 47, appears a notice of a book by Prof. L. C. Miall & Alfred Denny on "The Cockroach: An Introduction to the Study of Insects," and among the quotations from it we were interested in one from page 27, *Uses*: "Of the uses to which cockroaches have been put we have little to say. They constitute a popular remedy for dropsy in Russia; and both cockroach-tea and cockroach-pills are known in medical practice in Philadelphia. Salted cockroaches are said to have an agreeable flavour, which is apparent in certain popular sauces!"

May be some of our medical readers from Philadelphia will enlighten us as to the particular diseases for which these medicaments are used. Also what price they bring per thousand—though perhaps the writers of the book can give more information on that score, for it often happens that European works give startling information on American affairs of which we are here grossly ignorant.

JOHN B. SMITH.

Apparently New Species of Mexican HETEROCERA.

By Henry Edwards.

(No. 5.)

The species described in the following paper were collected (as indeed were the rest of the series) in the province of Vera Cruz by William Schaus, Esq., Jr.; and as I find no reference to them in any books at my disposal, I conclude them to be new, and so describe them. The four forms of **Sphingidæ** have been compared by Mr. Schaus himself with the collections in the B. Museum, and are undoubtedly unknown to science. In all cases, unless otherwise indicated, several specimens have been examined.

Fam. **SPHINGIDÆ.**

Chœrocampa turbata n. sp.

Rather pale fawn color in the ground color of the wings, primaries with a deep brown, strongly marked, and very characteristic oblique stripe running from the internal margin near the base, quite to the apex but becoming a little fainter as it reaches that position. This stripe is geminate, united at the internal margin. There is a small black discal spot, some darker fawn shades about the disk, and some waved dark fawn color submarginal lines. The secondaries have their ground color a little paler than the primaries, with a broad median shade of brown, and the margin moderately of the same color, becoming obsolete as it reaches the anal angle. Costal margin also shaded with brown. Beneath both wings are yellowish fawn color, covered with numerous black irrorations, and blackish shades, the margins faintly indicated by brownish bands. There is a submarginal row of distinct black spots, common to both wings. Thorax above olivaceous fawn color, with the sides whitish. Abdomen wholly fawn color. Thorax, legs, and abdomen beneath, paler than above. Antennæ with the shaft whitish above, pectinations fawn color. Head same color as the thorax, with the sides whitish.—No. 13. Exp. wings, 68 mm. Length of body, 40 mm.

This appears to be allied to *C. fugax* Bdv.

Diludia lanuginosa n. sp.

Primaries greenish drab, mottled with brown over the whole surface. There are indications of 5 slightly waved brown lines, the two nearest the base being only apparent at the costa, the remaining 3 being more distinct—the first slightly arcuate, and not reaching the internal margin, the second distinctly waved, becoming inwardly arcuate from median nervure to internal margin, the outer line more deeply toothed, and from it runs a slightly bent brown line quite to the apex. The fringe is pale drab, the intersections of the nervures marked with brown. Secondaries very pale fawn-drab, with brown shade which resolves itself into three brownish slightly dentately-waved bands, none of which reach the anal or abdominal margins. Underside of both wings fawn-drab, with faint median band common to both wings. Antennæ fawn-drab above, brownish beneath. Thorax concolorous with primaries. Abdomen olivaceous fawn color, grizzled with black and brown, a faint brown line at the junction of each segment, and triangular brown patches along the sides of the 3 basal segments these gradually becoming lines upon the posterior segments.—No. 25.

Exp. wings, 85 mm. Length of body, 42 mm.

Protoparce dilucida n. sp.

Of the group to which *Carolina* and *Cestri* belong, but much darker than these or any other species known to me. The ground color of the primaries appears to be

sordid white, but it is almost lost in the heaviness of the markings. These are blackish brown, which color occupies the whole of the disk, enclosing a very distinct whitish discal spot. It is bounded also behind the middle by a waved blackish band, edged within by whitish, more especially towards the internal margin. Behind this band are some olivaceous shades, mixed with brownish, and from it proceeds a deeply dentate black line, reaching to the apex, and edged above with white. There is also a submarginal whitish dentate band cut by 3 black spots. The fringe is clear white, intersections of the nervules brownish black. Along the internal margin near the base is a whitish shade, edged with blackish, the whole surface of the wing being more or less flecked with blackish-brown scales. Secondaries blackish-brown, sordid white at base, and a rather narrow sordid white median band. Fringe clear white. Beneath both wings pale brown, with waved median pale band, surmounted above with darker shade, which is dentate, and common to both wings. Discal white spot very distinct. Secondaries whitish at base along abdominal margin. Antennæ white above, pale brown beneath. Head and thorax blackish-brown, speckled with whitish, the sides clear white, and a whitish band along base of thorax. Abdomen above, grizzled, with white band at junction of the segments. Sides with 4 subquadrate orange spots. The anal segments have these spots represented by a few orange scales. Thorax and abdomen beneath clear white, feet and legs brown, banded with white.—No. 21. Exp. wings 100 mm. Length of body, 44 mm.

Isognathus inclitus n. sp.

Primaries blackish with gray shades. Base of the wing, and a large space along internal margin blackish, mottled with gray scales. Beyond the base on costal half is a grayish space, enclosing 3 waved black lines. This space is limited by the median band which does not reach the internal margin, and from which proceed towards the inner margin two lines of alternate black and white following the course of the nervules to the extreme edge. Behind the median band on the costa is a subquadrate gray patch, beyond this a blackish shade, and this is followed by a broad oblique whitish shade, running from costa to near internal angle, through which the course of the nervules is marked by alternate black and white points. The apical region is grayish, with a bright velvet-black patch about 10 mm. from the apex, and near the middle are two very conspicuous white teeth. The edge of the wing is deeply notched, and is alternately gray and blackish. Secondaries bright orange, the margin very broadly blackish, not reaching the anal angle, and terminating in a geminate bluish gray band, which color also obtains slightly on the extreme margin. Underside of wings much paler brown with blackish irrorations. Half of the basal portion of primaries, and a still larger portion of the secondaries, pale orange at the base. There is a double waved darker band, common to both wings, but lost in the orange of the secondaries. Antennæ, white above, blackish beneath. Thorax black in front, grayish black on disk, with 4 black lines. Abdomen dull black, posterior edges of the segments and the sides sombre gray. Beneath thorax and abdomen grizzled. Exp. wings, 105 mm. Length of body, 50 mm.

This species is allied to *I. Laura* Butler, and *I. rimosus* Gr.

Fam. **AGARISTIDÆ.**

Eusemia Schausii n. sp.

Rich velvety black. Collar, thorax beneath, and abdomen broadly at the sides bright orange. On the primaries is a basal streak of orange, extending to the extremity of the cell, and an oblique sub-apical streak of the same color. In the middle of the secondaries is a broad streak of orange, almost a point at the base, but widen-

ing out and extending nearly to the margin of the wing. This is of a richer shade than the patches of the superior wings. Anal tuft black. The markings are repeated beneath. Exp. wings, 55 mm. 3 examples.—No. 59.

This beautiful insect has very much the system of coloration of the species of *Iosiades*.

Fam. **ZYGÆNIDÆ.**

Triprocris basalis n. sp.

Head, thorax, abdomen, legs and upper surface of primaries bright brassy greenish black. Secondaries with wide dull black margins, the discal area sordid white, seemingly somewhat transparent. Under surface of both wings brassy black, the whitish patch less distinct than above.—No. 96. Exp. wings, 25 mm.

Ctenucha imitata n. sp.

Head black, with the front orange, with black hairs intermixed. Collar, base of palpi, pectus, base of femora, lower side of abdomen, and the last segment above, bright orange. The rest of the body and wings dull brassy black. Lower wings dull black.—No. 99. Exp. wings, 36 mm.

Nearly allied to *C. modulata* Hy. Edw., but abundantly distinct.

Ctenucha scepsiformis n. sp.

Thorax, abdomen, and lower wings, bluish black. Primaries dull black, with a greenish shade. Head with the front and base of antennæ bright crimson. Base of palpi also crimson, the tips black. Clypeus brassy.—No. 98. Exp. wings, 28 mm.

With the aspect of *Scepsis*, and probably uniting that genus with *Ctenucha*. It has however no vitreous space in the lower wings.

Lycomorpha augusta n. sp.

Wings a little wider than is usual in the species of *Lycomorpha*, the antennæ are longer, and with deeper pectinations. It may thus form the type of a new genus.

Head, antennæ, thorax, abdomen and legs bright bluish black. Primaries very vivid crimson, with bluish black border, very broad apically, narrowing along posterior margin, very narrow on interior margin, and a mere line on costa. Apex clear white. Below this the fringe is dusky. Secondaries dull black, costal edge crimson, apex white, and fringe dusky. The markings are repeated on the lower side.

Exp. wings, 35 mm.—No. 97.

A very magnificent species.

Fam. **ARCTIIDÆ.**

Euhalisidota lurida n. sp.

Entire color very pale, testaceous, with a few faint darker dashes, obliquely from base to apex of primaries, and a dark shade on the middle abdominal segments of the ♂. The primaries are sharply produced at the apex in both sexes, and the lower wings are slightly hyaline. Antennæ of the ♂ dark testaceous, very long, and deeply pectinated—those of the ♀ are concolorous and simply serrate.

Exp. wings, 52 mm. Length of body, 25 mm.—No. 67.

Fam. **BOMBYCIDÆ.**

Bombyx habitus n. sp.

Mouse color. Thorax whitish on the disk, and at the sides. Base of the primaries with a white blotch, interrupted by the ground color. The exterior line is also white, dentate from internal angle to behind the cell, where it is lost in a whitish cloud, containing a round mouse-colored spot. The space between this and the base

is darker than the rest of the wing, especially on the costa. The posterior space is clouded with white. Fringe concolorous. Hind wings paler than primaries, particularly at the margin. There is a slight olivaceous cast over the whole upper surface. Beneath, wholly mouse-drab, whitish along the internal margins of primaries. Feet and legs concolorous. Abdomen with faint traces of paler band.

Exp. wings, 32 mm. 1 ♂.—No. 10.

In color and general appearance somewhat recalling the European *B. populi* L.

Apatelodes diffidens n. sp.

♂. Pale olivaceous drab, with all the marks and lines rather indistinct. There is on primaries an oblique line from near the base of costa to near internal angle, terminating on a sinuo-dentate submarginal line which runs from costa to internal angle. Between these, there are on costa two short dashes, an apical spot, and a distinct spot near base of internal margin. These marks are all light brown. The sub-basal spot on internal margin is bordered outwardly with white, and there are olivaceous cloudings over the whole surface of the wing. The secondaries are pale drab, with a brown dash on the abdominal margin, edged above and below with white. Underside has the apex of primaries dark brown with a white streak, and a pale submarginal line. The secondaries have the central portion much darker olivaceous brown, shading in the centre to dark brown, in the form of a broad streak, and limited by a broad and distinct submarginal pale line. Outside of this line the border has a yellowish tint. The abdominal margin is pale at the base. Thorax, antennæ, legs and abdomen concolorous. ♀. In this sex, the whole of the markings above and below, are more pronounced and vivid in color.

Exp. wings, ♂ 43 mm.; ♀ 51 mm.—No. 72.

Fam. **NOCTUIDÆ.**

Dipthera spissa n. sp.

♂. Primaries very pale greenish-yellow, with the black markings in very strong contrast. The base is pale, and contains a minute black dot. T. a. line indicated by a pale streak, suddenly dentate on internal margin, and almost obsolete on the costa. In front of the line is a dark shade. The t. p. line is oblique from the middle of internal margin, to about 5 mm. from apex, turning rather abruptly as it touches the costa, and surmounted by 3 pale oblique streaks. The median space is thickly clouded with black, leaving the orbicular mark very distinct. Submarginal line slightly dentate behind and also shaded with black. The posterior margin has deep teeth between the nervures. Fringe black, except at the nervures, where it is cut by the ground color. Secondaries smoky, darkest along abdominal margin. Fringe flecked with white. Head yellowish. Thorax same as primaries, yellowish green, with black markings, those of the disk transverse, while the tegulæ bear a lunate spot, open in the centre, and showing ground color. The abdomen is smoky above, yellowish at the tip and beneath. Lower side of wings smoky, with yellowish marks on costa, and posterior margin of primaries. Legs yellowish, ringed with black. Eyes and antennæ jet-black. ♀. The markings of the primaries are much less pronounced than in the other sex, and the secondaries and abdomen are clear white, the fringe marked with black. The underside also is yellowish white throughout, the black markings of primaries being faintly shown. In one ♂ specimen the ground color is clear white with the markings all brownish black, giving the insect a very different appearance. I cannot however regard it as other than a variety, which may be known as *D. Pollux* n. var.—No. 87. Exp. wings, ♂ 44 mm.; ♀ 58 mm.

Parorgyia Parallela *Grote* and its Variations.

By Otto Seifert. New York.

While hunting for *Noctuidæ* at night from July 8th to 13th (Green County, Catskills), about 12 "*Parorgyia*" caterpillars were found on the trunks of Oak trees; two more specimens were found during the day-time concealed under stones at the foot of Oaks; between all these not the slightest difference was discernible. They pupated from July 13th to 17th, save two, which had been infested by some species of *Microgaster*. The first imago (♂) appeared July 28th, all the rest during the first week of August (4 ♂♂, 7 ♀♀). The difference in the coloration of the moths was very remarkable, some ♂♂ and ♀♀ being the typical *Parorgyia parallela* Grote, others (♂♂ and ♀♀) lacking altogether the characteristic dark brown line along submedian vein.

On August 1st a fine typical female and a male without the dark line were confined in a large gauze-gage, they copulated during the night and remained so till noon. About 250 eggs in two very regular triangular patches were deposited by August 3rd; they are smooth, apple-shaped, of a whitish-green color and were glued to the leaf by a silvery, shining mass, intermixed with a few hairs. August 10th the eggs turned more opaque, the slight excavation on the top of the egg seemed deeper with a dark spot forming in the middle, and August 12th, early in the morning, they commenced to hatch. The young larvæ ate their egg-shells.

August 15th. Length of caterpillars when crawling, about $\frac{3}{20}$ of an inch. They arrange themselves while feeding in a semi-circle, wholly denuding the leaves of their epidermis; disturbed, they suspend themselves on a fine silken cord, and so drop down. During the day-time they conceal themselves on the underside of the leaves. They are whitish, head dark brown, mouth parts yellowish; all segments with 8 fleshy, hair-bearing protuberances or warts arranged as dorsal, supra-stigmatal, sub-stigmatal and pedal lines, the substigmatal warts giving rise to very long hair, spreading like a fringe. The protuberances on all segments are light brown, variegated with pale yellow, except on 3rd and 8th segments, where dorsal warts are whitish. On first segment the two infra-stigmatal warts are of about twice the size of the others, fleshy and projecting forward, tipped with black and bearing long brushes of hair. These brushes on first segment and the corresponding ones on anal ring are projecting and of about the size of the larva. Venter whitish, transparent, showing the line of intestines.

First moult, August 18th. Length, when moving, $\frac{4}{20}$ of an inch. Ground color greenish-white, also ventral area. Supra-stigmatal warts yellowish-brown from their base, giving this area the appearance of a

broad brownish line, broken by the segment joints. The two long projecting brushes on first segment and the less prominent ones on anal segment are black, while almost all the hair of the larva is of its own pale color. All the hair is very soft and beautifully feathered in different patterns. The joint between first and second segment has dorsally a slate-colored patch. Dorsal warts on first segment have brown tips, those on second and third are plain; on fourth segment the dorsal warts bear dense, even, slate-colored hair-tufts, these dark hairs being a little longer than the light hair on adjoining warts. Warts on 5th, 6th and 7th segments tipped with brown, on 8th segment whitish, on 9th, 10th, 11th and 12th segments the brown color prevailing. On 9th and on 10th segments, between the dorsal warts, appears a small, pearl-like, yellowish-white excrescence, which the larva is able to retract.—Having been fed only on different species of Oak leaves before this, Wild Cherry, Beach and Birch leaves were given, to all of which they took, but preferred Oak to all others.

Second moult, August 22nd. Length, about $\frac{5}{20}$ of an inch, when crawling. Larvæ look very different after this moult, most so on 4th and 11th segments, where on dorsal warts dense, brush-shaped, dark-brown hair-tufts arise. The spreading whitish hair on sub-stigmatal warts very much developed; 9th, 10th and 11th segments light brown.

Third moult, August 27th. Growth of caterpillars comparatively very slow; length, $\frac{7}{20}$ of an inch. Ground color dorsally and laterally dark slate with narrow, subdorsal whitish line; stigmatal area and underside light olive-green. Hair on sub-stigmatal warts whitish; on dorsal and supra-stigmatal warts mouse-gray. The two projecting brushes on 1st segment, a few long projecting hairs on anal ring, and dorsally on 4th and 11th segments a very dense hair-tuft, slightly overreaching the gray hair, are of a deep, black color. From 4th to 8th segment the vestiture is densest and richest.

Fourth moult, September 1st. Length about $\frac{1}{2}$ inch. Apppearance of larvæ very little changed. Underside olive-green, legs and pro-legs lighter, also stigmatal area of a lighter shade.

Fifth moult, September 5th. Length about $\frac{3}{4}$ of an inch. No material change took place. Dorsal tufts on 5th and 6th segments and the front of dorsal tufts on 7th segment profusely mixed with black hair, single dark hairs interspersed on all tufts. After every moult the hair appears richer and more feathery, giving the resting insect an almost rounded appearance. The larvæ, when disturbed, roll themselves up.

Sixth moult, September 10th. None of the caterpillars reaching one inch in length (measured from head to anal segment always), but they look almost $\frac{1}{2}$ inch wide with the fringe-like hair.

Seventh moult, September 18th. The full grown larvæ before pupating

measure from 1 (♂) to 1½ (♀) inch. Head shining, dark brown, rather hairy, mouth-parts lighter. Ground color dark slate, almost black, velvety; stigmatal region light yellowish-gray, almost the color of vestiture; this color spreads in fine lines across segment-joints; stigmata whitish, ventral area almost black; legs whitish, rather hairy. The hair of the larva is mouse-gray, feathered and soft. On 2nd and 3rd, but far more so on 4th, 5th, 6th and 7th segments, the dorsal protuberances are ridge-like, enlarged but low, and the hair-tufts arising from these large bases cover the dorsal region of the resting insect entirely; when moving, only the joints are visible. Supra-stigmatal warts on first segment without the feathery hair, the small warts bearing some plain, spreading hairs, on all other segments these warts are ornamented besides with bushy rounded tufts of feathery hair. Infra-stigmatal protuberance with longer, bushy, fringe-like, spreading tufts; pedal line of warts similarly provided. The slender black brushes on 1st segments, which project from the centre of infra-stigmatal tufts are of about ⅓ the length of larva and composed of differently feathered hair; corresponding to these are a few single black hairs on anal segment. The black, dense tuft on dorsal warts on 4th segment slightly overreaching the surrounding hair; dorsal tufts on 5th, 6th and 7th segments mixed with dark hair. On 11th segment the rounded black tuft arising from the two warts is still higher. The vestiture on 9th and 10th segments is more scant and the larva-skin always visible. The amber-colored, cylindrical excrescences between the dorsal warts on these segments are scarcely ⅓ the length of the adjoining hair. The larva, when resting, bends the head down, and as the vestiture on the next segments is richest and longest, the insect gets an almost hunched appearance.

The larvæ commenced to form their cocoons September 26th, about two-thirds went into the pupa state by Sept. 30th; all the rest but one or two had spun by Oct. 5th. They mostly spin at night; having covered the resting place first with a fine web, they form a very fine net-work, into which they twist all their own hair. The cocoon is thin, easily torn, and of an almost regular, oval shape. The empty larva-skin, stripped of all its hair often adheres like a tail to the cocoon, which by the peculiarity of the hair of which it is formed and a few spun threads, is securely fastened to sheltered places on stones or wood. The pupa itself is about ¾ (♂) to 1 inch (♀) long, rather stout, ending in a spine with which it is fastened to the cocoon. The color is light yellow-brown, wing-cases and stigmata dark brown; thoracic region, the segment joints and cremaster are brown. All the warts, even the pedal line, seem to be retained on the abdominal segments as minutely granulated patches, covered with short hair. The six dorsal warts on 5th, 6th and 7th segments are represented by six rosette-shaped, lichen-like formations of yellowish-gray color, the two warts

on each segment almost confluent with an oval patch. The chitin-cover is very fragile.

First imago appeared Oct. 22nd; by November 1st mostly ♂♂ emerged; after this time ♀♀ predominated. Nov. 28th the last perfect insect appeared: they generally left the pupa shell after sunset. The majority of the darker shaded variety appeared first. Altogether 53 ♂♂ and 44 ♀♀ were the result of this brood, while about 50 larvæ hibernated. These stopped feeding after fifth moult; neither artificial heat nor the choicest food could induce them to quit their lethargic state. They were transferred Sept. 22nd to a common flower-pot upon damp moss and covered with Oak-leaves, then placed outside the window-sill, protected against rain, snow and the sun by a loosely fitting tin-cover. They gregariously gathered on underside of the leaves and so passed the winter.

Of the many interesting facts which the rearing of this species reveals, the most curious is the variation in the coloration of the imagines. They appear in almost equal numbers in two well defined forms, including both sexes, but most striking in the ♀ individuals.

Exp. ♂ 1.25 to 1.55; ♀ 1.50 to 1.90.

Those specimens belonging to the typical form (♀) (Grote, Proc. Ent. Soc. Phil., VI), are all easily recognized. They only vary among themselves in the more or less profuse brown clouding, the lighter or darker shade of this brown color on primaries and the intensity of markings.

The aberrant form is entirely destitute of the black longitudinal stripe, which in the typical specimens runs from the base of the wing to beyond the t. p. line, also of the black scales on median nervure and fourth median nervule. The median space is free from all brown clouding, it is "olivaceous-cinereous," often lighter, and always "sparsely sprinkled with black scales"; the whitish, more or less prominent discal space, with a more or less distinct reniform ringlet. Outside t. p. line a part of the brown cloudings is left in the form of a pale brown, narrowing, very variable shade, which is margined exteriorly by a broader or narrower whitish band, following the brown shade in all its irregularities. Hind-wings like typical form or paler, discal spot and band often visible. Underneath, band and discal dots often very plain; often spots obsolete, and bands only indicated by a dark dash from costa. The males are of a darker and brighter "olivaceous-cinereous" color, hind wings dark gray. In whitish discal spot on primaries the brown, mostly reniform ringlet always present. Markings the same as in ♀. Underneath dots and bands very distinctly marked, though often irregular; sometimes subterminal band is followed by a more indistinct one, or by a row of blunt spots. The males of both forms taken as a whole look more uniform, since the typical form has no perceptible brown clouding within median space, and the characteristic black stripe along sub-median vein is less striking on the darker ground color. Nevertheless, they are as variable as the females: entirely pale specimens with faint markings very rare.

Studies on the North American PROCTOTRUPIDÆ, with Descriptions of New Species from Florida.

(PART I.)

By William H. Ashmead,

Jacksonville, Florida.

(Continued from p. 76, vol. III.)

XVII. BETHYLUS Latreille.

23 1. **Bethylus armiferus** Say. Leconte's Ed. Say's Works, I, p. 383.
Hab.—Indiana.

24 2. **Bethylus celluris** Say. l. c. II, p. 726.
Hab.—Indiana, Florida (Ashm.).

25 3. **Bethylus musculus** Say. l. c. p. 726.
Hab.—Indiana.

26 4. **Bethylus pedatus** Say. l. c. p. 727.
Hab.—Indiana.

27 5. **Bethylus centratus** Say. l. c. p. 727.
Hab.—Indiana.

28 6. **Bethylus prolongatus** Prov. Petite Faune Ent. du Can., II, p. 563.
Hab —Canada.

29 7. **Bethylus formicoides** Prov. Add. et Corr. a la Faune Hymn., p. 177.
Hab.—Canada.

XVIII. ATELEOPTERUS Foerster.

30 1. **Ateleopterus nubilipennis** n. sp.

♀. Length .12 inch. This species resembles a *Goniozus*; it is black, finely punctate and shining, but without the coarser, scattered punctation so common in that genus. The antennæ are 13-jointed, first joint and the legs brownish yellow, flagellum dark brown. The abdomen is pointed ovate, wings dark fuscous, and without a marginal or a stigmal vein.

Hab. Florida.

XIX. HOLOPEDINA Foerster.

31 1. **Holopedina nubilipennis** n. sp.

♀. Length .07 inch. Rufo-testaceous; eyes brown; antennæ 12-jointed, infuscated. Middle of femora and tibiæ, and abdomen towards tip, dusky. Wings dark fuscous, without a marginal or a stigmal vein; but there is one basal cell.

Hab.—Florida.

Subfamily CERAPHRONINÆ.

XX. SYNARSIS Foerster.

XXI. LAGYNODES Foerster.

XXII. CERAPHRON Jurine.

32 1. **Ceraphron macroneurus** n. sp.

♂. Length .04 inch. Black, shining. Antennæ stout, scape half as long as flagellum, brownish yellow, flagellum dark brown. Legs and abdomen yellow. Wings

hyaline, the stigma brown, not large, from which issues a very long stigmal vein, forming a narrow radical cell open only at tip.

Hab.—Florida.

A single specimen was raised from an aphis on Iron wood.

XXIII. TRICHOSTERESIS Foerster.

33 1. **Trichosteresis floridanus** n. sp.

In stature similar to *Trichosteresis clandestinus* Foerst. Black, finely, confluently punctate. Head and thorax sparsely pubescent. Antennæ 10-jointed, black, terminal joint longer than the preceding one. Legs black, knees honey-yellow, tarsi white. Wings hyaline, not pubescent, the large stigma and stigmal vein pale.

Hab.—Florida.

XXIV. LYGOCERUS Foerster.

34 1. **Lygocerus armatus** Say.

Ceraphron armatus Say. Leconte's Ed. Say's Works, II, p. 724.

Hab.—Indiana.

35 2. **Lygocerus stigmatus** Say.

Ceraphron stigmatus Say. l. c. p. 724.

Hab.—Indiana.

36 3. **Lygocerus floridanus** Ashmead.

Cheirocerus floridanus Ashm. Trans. Am. Ent. Mo. Proc. 1881, p. 34.

Hab.—Florida.

XXV. ATRITOMUS Foerster.

37 1. **Atritomus rufiventris** n. sp.

♀. Length .10 inch. Robust, black. Antennæ pale yellow, scape short, slightly broadened. Mesothorax smooth, without grooves. Legs pale brown, posterior femora above infuscated. Abdomen rufous, blackish above towards tip. Wings hyaline, stigma thick, broad, with a short stigmal vein, nearly parallel with costal edge.

Hab.—Florida.

XXVI. MEGASPILUS Westwood.

38 1. **Megaspilus luceus** Prov. Petite Faune Ent. du C., II, p. 808.

Hab.—Canada.

39 2. **Megaspilus hyalinipennis** n. sp.

♀. Length .08 inch. Robust, black, pubescent. Eyes pubescent; antennæ 10-jointed, filiform, dark brown, pubescent, first two joints rather short, third and following joints much longer. Legs light brown, the femora and tibiæ obfuscated. Wings hyaline, stigma large but pale, with a long stigmal vein.

Hab.—Florida.

Subfamily PROCTOTRUPINÆ.

XXVII. PROCTOTRUPES Latreille.

40 1. **Proctotrupes caudatus** Say. Leconte's Ed. Say's Works, I, p. 221.

Hab.—North West Territory.

41 2. **Proctotrupes obsoletus** Say. l. c. II, p. 725.

Hab.—Indiana, Canada.

42 3. **Proctotrupes abruptus** Say. l. c. p. 725.
Hab.—Indiana, Canada.

43 4. **Proctotrupes pallidus** Say.
Codrus pallidus Say. l. c. p. 725.
Hab.—Indiana.

44 5. **Proctotrupes flavipes** Prov. Petite Faune Ent. du C., II, p. 562.
Hab.—Canada.

45 6. **Proctotrupes rufigaster** Prov. l. c. p. 561.
Hab.—Canada.

46 7. **Proctotrupes crenulatus** Patton. Can. Ent., XI, p. 64.
Hab.—Connecticut.

47 8. **Proctotrupes melliventris** n. sp.

♂. Length .18 inch. Stature and form of *P. obsoletus* Say. Head, thorax and antennæ, black. Metathorax, rugosely punctate with a slight median carina. Legs and abdomen, honey-yellow. Wings fusco-hyaline, a darker colored cloud beneath stigma.

Hab.—Florida.

Subfamily **SCELIONINÆ.**

XXVIII. **THORON** Haliday.

48 1. **Thoron pallipes** n. sp.

♀. Length .08 inch. Similar to *Thoron metallicus* Hal., but smaller. Black, polished. Antennal scape, pedicel and legs, pale yellowish brown, funicle joints and the large inarticulate club, dark brown, third funicle joint, very small. Wings hyaline, veins brown, stigmal vein hardly developed, postmarginal vein wanting.

Hab.—Florida.

XXIX. **BÆUS** Haliday.

XXX. **ACOLUS** Foerster.

49 1. **Acolus rubriclavus** n. sp.

♀. Length .14 inch. Testaceus. Eyes, ocelli and flagellum, red-brown ; first flagellar joint slightly shorter than pedicel, following three joints very short, club thickened, inarticulate, but apparently composed of six closely joined joints. Disk of metathorax convex, black. Abdomen pointed, fusiform, dusky at tip, first segment longitudinally striate.

Hab.—Florida.

Described from one specimen taken on Ocean Beach at San Pablo.

XXXI. **BÆONEURA** Foerster.

50 1. **Bæoneura cinctiventris** n. sp.

♀. Length .08 inch. Slender pale brownish yellow. Eyes, the large inarticulate antennal club, the disk of metathorax and broad bands at base of second, third and last abdominal segments, brown. Wing hyaline. Legs, pale brownish yellow, the femora and tibiæ slightly dusky in middle above.

Hab.—Florida.

51 2. **Bæoneura floridana** n. sp.

♂, ♀. Length .14 to .15 inch. A slender, greatly elongated species. Black rugoso-punctate and pubescent. Antennæ dark brown, scape paler, the first funicle

joint is longer than the pedicel, ♂ filiform, ♀ ending in six-jointed club Legs brownish yellow. The slender, greatly elongated abdomen, which extends considerably beyond the tips of wings when folded, is over thrice as long as the thorax, strongly carinate along lateral margins, and the first and second segments are longitudinally striate. Wings hyaline, the marginal and postmarginal veins are very long, the stigmal short.

Hab.—Florida.

XXXII. **XENOMERUS** Walker.

52 1. **Xenomerus rubicola** n. sp.

♂. Length .10 inch, Black, head polished; antennæ filiform with long hairs, scape short brownish-yellow. Thorax finely punctate, pubescent, with two grooves. Scutellum convex, rounded behind. Abdomen about as long as the thorax, somewhat narrow. Legs: femora excepting tips, black, tibiæ pale yellowish. Wings hyaline, veins pale, the marginal vein is very long, the stigmal long, curved upwards, while the postmarginal is also long, one-third longer than the stigma.

Hab.—Florida.

Described from one specimen reared from a dipterous larva, living in the stems of the black berry *Rubus villosus.*

XXXIII. **TELEAS** Latreille.

53 1. **Teleas sphingis** Ashmead.

Hab.—Florida.

This species was described in my work for the Department of Agriculture last summer.

54 2. **Teleas orgyiæ** Fitch.

Telenomus orgyiæ Fitch. Eighth Report N. Y. Stat. Ag. Soc. p. 679.

Hab.—New York.

55 3. **Teleas dolichocerus** n. sp.

♂. Length .04 inch. Black, polished. Legs pale brown. Wings hyaline. Antennæ 12-jointed, long, reaching beyond tip of abdomen, dark brown, the fourth joint is nearly as long as the scape, fifth as long as pedicel, following joints subequal.

Hab.—Florida.

56 4. **Teleas infuscatipes** n. sp.

♂, ♀. Length .04 inch. Black, polished, sparsely pubescent. Legs brown with femora and tibiæ obfuscated in middle. Antennæ in ♂ long, filiform, third joint incrassated, ♀ antennæ ending in 4-jointed club, joints broader than long.

Hab.—Florida.

XXXIV. **PROSACANTHA** Nees.

57 1. **Prosacantha americana** n. sp.

♀. Length .06 inch. Robust, black, finely pubescent. Head and thorax evenly, coarsely punctate. Antennæ including scape, black, club 4-jointed. Metathorax with a spine. Legs rufous, all coxæ black. Wings hyaline, veins pale, the marginal vein is not long and the stigmal vein is very short, almost punctiform.

Hab.—Florida.

(TO BE CONTINUED.)

ENTOMOLOGICA AMERICANA

VOL. III. BROOKLYN, SEPTEMBER, 1887. NO. 6.

Proceedings of the Entom. Club of the A. A. A. S. at the New York Meeting, August, 1887.

During the meeting the following were present at some or all the meetings of the Club: Prof. J. H. Comstock, Pres.; Mr. J. B. Smith, Sec'y.; and Messrs. C. V. Riley, J. A. Lintner, A. J. Cook, Geo. D. Hulst, E. L. Graef, Mr. and Mrs. H. F. Bassett, Geo. Dimmock, J. H. Emerton, G. W. J. Angell, P. R. Hoy, Mr. and Mrs. E. D. Southwick, Wm. Saunders, J. G. Morris, A. S. Fuller, Wm. Beutenmüller, F. B. Chittenden, Mr. and Mrs. E. W. Claypole, Dr. Maury, Mr. E. C. M. Rand, and several others who failed to register.

Tuesday, August 9th, 1887.—Club called to order at 2:30 P. M. Prof. Comstock, the President, in the chair, 15 persons present. In the absence of the Secretary, Mr. Reed, Mr. J. B. Smith of Washington was elected Secretary *pro tem.* Prof. Comstock then read his annual address, giving a history of the various systems of classification of Insects since the time of Linnæus, and especially dwelling on the more recent subdivisions of some orders by Brauer and Packard. He explained the difficulties in the way of too minute subdivision, and the peculiar associations caused by the wide definitions of our older authors.

He exhibited tabular statements of the various classifications, and diagrams of some of the structural differences upon which some of the systems were based.

Finally, he said, it left him somewhat undecided, and at a loss, with a decided disinclination to accept all the subdivisions proposed.*

* As the substance of this address is to appear at an early date in the initial numbers of a new Introductory work of Entomology it is not printed here.

Prof. C. V. Riley, commenting on the address, said the paper was an important one, and he fully realized the difficulties in coming to a final and satisfactory conclusion. For his part he liked the old classifications, based on the trophi and pterostic characters. They had the merit of being well defined and easily limited. He did not believe in the creation of numerous orders, but would rather consider them aberrant groups or sub-orders, if necessary. Classification however for some time to come must be a matter of opinion. Many classifications have been proposed since that of Linnæus, have had their day, and have been forgotten. He had the highest respect for Dr. Brauer, but did not entirely agree with him. He did not think too much stress ought to be given to the adolescent states, which, more than anything, were subject to independent changes by the environment. There was difficulty in recognizing the *Dermoptera* as belonging to the *Orthoptera*, but he believed they should be considered rather as a sub-order than an order. He did not feel like placing the *Thripidæ* for instance on an equality with, say the *Hemiptera*, and did not believe in the creation of orders with few species or genera —he would rather consider them as aberrant members of a class. Classification after all is only a means to an end, and whatever may be ultimately adopted, embryology will give many important guides in questionable cases, and will modify our views of the relationship of species.

Mr. J. B. Smith said he was glad Prof. Comstock had chosen the subject he did, for he had long wished that the gist of Brauer's classification could be presented in an accessible form to American students, and Prof. Comstock's paper did that to some extent. He agreed thoroughly with Prof. Riley in his estimate of the value of the adolescent stages. In the Lepidoptera for instance the larvæ of *Alypia*, *Psychomorpha* and *Eudryas* are scarcely distinguishable, while the imagoes certainly belong to different families. He thought it required considerable courage often, to carry out consistently the idea of giving value to structure, irrespective of number of species or genera. In the Coleoptera only they have consistently based families on structure, whether there was one species or thousands.

Prof. Comstock stated that at the standing committee meetings he had announced the hour of meeting of the Club at 9 A. M., and asked the pleasure of the meeting as to further dates. After some discussion it was decided to meet at 9 A. M. on the 10th, and to decide at that time on future dates.

Under the call of papers, Mr. Smith read from printed proofs a paper on the species of *Callimorpha*, prepared for the U. S. Nat'l. Mus. Proc., illustrated by blackboard sketches. He made 9 species of the American

forms instead three as heretofore recognized, and pointed out the differences between them, making the pattern of maculation the criterion of his species.

Mr. Graef expressed his dissent from Mr. Smith's views, and showed how in his opinion the maculation could be so modified as to produce the different forms.

Prof. Riley commenting on Mr. Smith's paper said that he did not agree with him at all. He thought that there was but a single white species and possibly there may be three rather well marked species, with three moderately well marked larval forms. He said that in variation not only color changes but sometimes the pattern does, also. Especially is this true in forms that have more than a single brood annually. He instanced cases in the *Tortricidæ*, where forms appear, so different in pattern that there seems no possible connection between them, but bred from the same hatch of eggs.

Mr. Hulst also expressed his dissent from Mr. Smith's views. He thought that the variability of other species in the *Arctiidæ* was well established by breeding, and it should be at least considered probable that other species in the same group varied as much. He had taken specimens numerously, and it seemed to him that he had taken forms from the lightest to the darkest under such circumstances as to make it very certain they were one species.

Mr. Smith replied briefly, admitting the possibility that the white forms may be albino forms of dark species but again emphasizing the differences in pattern as indicative of specific value.

Mr. Hulst stated that Mr. Bruce had taken an insect in New York which Mr. Edwards after examination said must be new and allied to *Seirarctia*. Before dying the moth had laid some eggs, and larvæ hatching from them seemed rather unlike anything known to Mr. Bruce—he took them with him to Colorado, where they completed their transformation, giving forth *Spilosoma virginica*.

Prof. Riley said in addition to his previous statements that species sometimes vary in certain definite directions. He also called attention to the fact that Mr. Smith had described a new species of *Euerythra*, while that same form had been bred from the same larva with *E. phasma*.

On behalf of the Brooklyn Ent. Soc. Mr. Angell welcomed the members to the city, and anounced that arrangements had been made to join the Botanists in their excursion to Highlands in N. J. and distributed tickets and circulars giving date and place of starting.

On motion of Dr. Morris the meeting adjourned until Wednesday, August 10th, at 9 A. M.

August 10th.—Club met at 9:20 A. M., 14 members present, Prof. Comstock in the chair. The minutes of the previous meeting were read and approved, and the officers for the next meeting were elected as follows: President, Mr. J. B. Smith, Washington, D. C.; Vice-President, Prof. J. A. Lintner, Albany, N. Y.; Secretary, Prof. A. J. Cooke, Lansing, Mich. It was then resolved to meet again, immediately after the adjournment of Section F on Thursday.

Prof. Comstock appointed Messrs. Smith, Cook and Hulst a committee to obtain papers and prepare programmes for the meetings of the Club.

Mr. Bassett asked whether any one could tell him positively how many broods of the Currant Worm there are annually.

Prof. Cook said in Michigan there are two; Dr. Morris said two near Baltimore; Prof. Riley said probably three in the South—this is not certain, for the insect is rarely injurious there, and attracts less attention, he believes that from information he has received, but that northwardly where it is injurious, there are two broods only. Prof. Comstock said they have two broods.

Mr. Bassett said that until recently he had believed the same, but last Summer a friend brought him every few days eggs and larvæ in all stages throughout the season—whereat he was very much surprised and thought it indicated more than two generations.

Prof. Riley replied that this was true—they did appear in that way but that was merely a difference in the time required for development, some running through their transformations much more rapidly than others. There are however only two well marked broods which overlap and leave probably none or only a short interval between them.

Prof. Cook confirmed this statement. They have in Laboratory experiments carried over the pupæ of the spring brood until the following Summer, and in the same way the Coddling moth has been carried over.

Prof. Cook asked for information regarding the whereabouts of the early broods of the Hessian fly—stating that he failed to account for the large numbers there appeared, by what he found in Volunteer wheat, and that he had found them nowhere else.

Prof. Riley said the subject is too large a one for discussion in the few minutes before adjournment and proposed an adjournment of the matter, to which Prof. Cook agreed.

Mr. Angell on behalf of Mr. E. L. Graef invited the members to an informal reception at his house in Brooklyn.

The meeting then adjourned to Thursday, after the adjournment of the Biological Section.

Thursday, August 11th.—Club met pursuant to adjournment, 18 persons present, Prof. Comstock in the chair.

Mr. Saunders of Ottawa gave a brief review of what had been done recently in the way of establishing Experiment Stations in Canada, at which Entomology in its relations to Agriculture formed one of the subjects of Experiment. Five Stations are proposed—a central station at Ottawa, a 2nd in the Maritime Provinces, a 3rd in Manitoba, a 4th in the N. W. Territory and the 5th in British Columbia. At the Central Station an Entomologist—Mr. Fletcher—has been appointed, and a collection of Insects of all the sections will be formed there. It is intended also that Bulletins be issued several times in the course of the year to interest the public in the work and demonstrate its general utility. He had been travelling about a great deal during the past year and had done little Entomological work; but he had noticed this Spring near Ottawa the larva of *Vanessa antiopa* in immense numbers, stripping willows. It is not usually common with them. In Nova Scotia he saw *Satyrus alope* and *nephele* in great numbers, with all sorts of intergrades between. He also found the potato beetle there, which appears in this section for the first time. The growers there follow the old fashioned plan of knocking them into a pan with a stick.

Dr. Morris stated that *Criocerus asparaga* had reached them at Baltimore and proved very destructive.

Mr. Saunders said it was not yet found in Canada.

Prof. Comstock said he had found it as far West as Geneva, N. Y. The insect seems to have started from Long Island.

Prof. Cook said that the method of knocking the potato beetles from the plants with a stick, is both old and new, for one of the largest growers of potatoes in his section of the country had returned to it after trying all kinds of poisons. He claimed it was cheaper for him to destroy them in that way and while Prof. Cook did not understand how this could be possible, yet this farmer claims it is so and follows out his belief.

Mr. Saunders said that in the Maritime Provinces, Nova Scotia and New Brunswick, he found the larch saw-fly *(Nematus erichsonii)*, extremely abundant and destructive.

Mr. E. C. M. Rand of New York exhibited some specimens of Coleoptera taken from a mummy, and suggested they might be of interest, as perhaps old types. The mummy dated back at least as far as 1200 B. C., and he explained the number of wrappers and method of covering, and stated that channels had been made in the wrappers, and in these some of the beetles were found.

Various suggestions were made by the gentlemen present but none cared to make positive identifications.*

Prof. Claypole explained the use of Gasoline for collecting purposes. He finds that it acts more rapidly than Cyanide and is more certain of effect than chloroform. For Museum pests there is nothing superior. It does not hurt the insects in any way and he has no hesitation in submerging his choicest species in it. To rid a badly infested case he submerges it entirely in Gasoline for a few minutes A few drops will kill a *Cecropia* instantly. He also exhibited an insect case used by him which he claims superior to any equally cheap contrivance. It consists of a box frame into which a glass top is permanently fixed. The bottom is corked, or not as desired; is filled with insects, and then screwed to the frame.

Prof. Cook said he has tried Gasoline and found it much less rapid and certain than Cyanide well prepared. He does not believe in it at all.

Mr. Smith objected to Prof. Claypole's case that it was too inconvenient to use as to get at an insect meant unscrewing the bottom and replacing it. A collection so preserved was useless except for the most superficial comparisons.

Prof. Comstock explained a contrivance to watch the early stages of Hymenoptera nesting in stems. He took a number of slender glass tubes covering them with an outer sheet of a dark paper, and hung them on bushes frequented by such bees. He exhibited several of these tubes in which bees had nested, containing larvæ in various stages of development. The whole life history can thus be watched with very little trouble.

Mr. Smith read a paper on the specific characters in the genus *Arctia.***

The date of the first meeting for next year was then discussed, experience having shown that the first meeting as now held, on the day preceding the general meeting of the Ass'n, was generally poorly attended, and the Presidents' address read to empty benches.

After some discussion is was resolved to have the first meeting of the Club in future at 9 A. M. of the first day of the meeting of the Ass'n.

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* The specimens were handed me at Prof. Riley's request for comparison and determination. Mr. Schwarz kindly took the work off my hands, and makes the specimens: *Anthrenus varius* (one broken specimen); *Conpretes* sp. (two broken wing-cases); *Gibbium scotias* (several specimens); *Lasioderma serricorne* (one specimen [but this was the form most numerous in the wrappings]); *Alphitobius* sp.? (one broken wing-case); *Tribolium ferruginum* (1 specimen); ? *Calcar* sp. (one wing-case).

** Published in full in Ent. Am. Vol. III, p. 109–112.

Dr. Maury of Goshen stated that the larva of *Agrotis messoria* and a Wire-Worm had done great injury to the Onion Crop in his vicinity, and asked whether any serviceable remedy had been discovered.

Prof. Riley referred him to the recent Reports of the U. S. Department of Agriculture, where all the known remedies as applied to this species were treated in detail.

On motion of Prof. Cook the Club adjourned to 9 A. M., Friday, August 12th.

Friday, August 12th.—The Club met pursuant to adjournment, Prof. Comstock in the chair. Prof. Riley gave a short history of the discovery of the ♀ of *Phengodes*. To his idea they represent the most thoroughly undeveloped ♀ that we have any knowledge of. He knows of no instance in which it is so difficult to distinguish between the beetle and the larva than in these cases. He showed figures of the various forms of ♀♀ and larvæ known to him. Between the 4th and 5th segments, and on all the others to the last, there are spiracular openings, which seem to be glands of some kinds, since they have no internal opening. What they are, he cannot tell. Another point is, that the insect probably requires only one year to go through its transformations, and the reason it has been so seldom found, is that it is subterranean, feeding on *Iulus* and *Polydesmus* and only comes to the surface when it has attained the adult form. The natural history of *Phengodes* and *Zarhipes* is yet very incomplete. Of the ♀ the imago and the small larva as well as the egg is known, but no young of the ♂.*

Prof. Riley also spoke on *Pronuba* and its connection with the pollination of *Yucca*. He has published nothing on the subject since the paper in the Proc. A. A. A. S., but he has experimented annually since then and he emphasizes the fact that *Pronuba* is the only creature that does and can fertilize the plant. One interesting fact:—while in the beginning he was led to believe, and in fact suggested, that many of the actions of the moth were selfish and unconscious, he is now convinced it has no reason save the desire to propagate. It does not derive any benefit from the liquor. Trealease showed there was no nectarine in the stigmatic liquor. What there is of that nature is secreted and empties outside of the flowers. His own observations confirm all Trealease has published. Of the insects found on the flowers *Chauliognathus* with its snout-like mouth would seem well fitted for possible fertilization, but it gets its food outside of the pistil. *Pronuba* gets the pollen in a lump and trusts it in. He finds that it is possible to fertilize the flowers artifici-

* Prof. Riley read a communication on the same subject before the Biological Section of the Association, in which details of the discovery of the ♀ were given. A complete paper on the subject is also in course of preparation by Prof. Riley.

ally—but it is difficult to do so and get good fruit. It is always more or less imperfect. *Pronuba* always succeeds. It makes two or three punctures, and gets all around the tube, bringing the pollen into contact with every part of it. There are from 4—500 Yuccas in the Dep't Grounds where he passes daily, and during the entire season he found but a solitary bee on two successive mornings and none of the others in the Dep't observed any. This bee was not inside, but tried to get at the nectar from the outside of the flower.

Mr. Bassett asked whether this is ever repeated—whether a flower is visited by more than one moth. Prof. Riley thought not—but it may be. He has no direct evidence on that point.

He also spoke of a new species of *Lecanium* found on the Austrian pine, in Wisconsin, of which the males were numerous. The males of this species have been heretofore found very rarely and of many they are entirely unknown. In France the ♂ of *Lecanium hesperidum* has been found in the body of the ♀ which it never leaves. It is a very much degraded form.

Prof. Riley quoted Moniez's observations on this species as given in the Ent. Mo. Mag. for July 1887, showing the development of the ♂ and the bearing of the discovery on the question of parthenogenesis. He remarked upon the fact that discoveries are often made in widely different localities by observers, of the same facts, instancing several cases where at about the same time males of this genus have been discovered. Mr. Koebele has in California reared the males of two different species having wings and other distinctively male characters.

He also said that he finds *Crioceris asparagi* extending South—it has been found at Falls Church, Fairfax Co., Va.

The present year there has been a most remarkable swarming of *Apatura celtis* in the Southern States. These migrations generally take place in the Fall, but this was in the Spring. The only way of accounting for it is that the conditions where unusually favorable for their hibernation and development.

Prof. Cook said they have many *Yucca filamentosa* and he has found bees on them very abundantly. So far as he knows they have not the *Pronuba* in Michigan.

He had not noticed particularly what part of the flowers the bees visited.

Prof. Riley said that in Colorado on a species of *Yucca* he discovered a most remarkable species of *Pronuba*, flat-bodied with dusky wings, looking almost like a cross between a saw-fly and a *Phryganid*.

(TO BE CONTINUED.)

What Makes a Species in the Genus Arctia.*

By John B. Smith.

Mr. Stretch has asked this question, not so long ago, and answered it in a manner eminently unsatisfactory to himself and to others. He, however, gave in great detail a list of features which are *not* sufficient to make a species; including in this category maculation or color of secondaries, of abdomen, and of primaries to some extent. Messrs. Hulst and Neumoegen have discussed the question of specific identity of some forms recently, and they have not agreed in result at all.

In arranging the Nat'l. Museum material, I followed the order of Mr. Grote's List, and while putting in the species tried to discover the reason for the sequence adopted—without much success I must say. It appeared to me then, that a better scheme was possible—something like that proposed by Mr. Stretch in his book on the Zygænidæ and Bombycidæ. I think too, that I found an answer to Mr. Stretch's question, which will decide many cases, and that is, that specific characters are found in modifications of the pattern of markings of the primaries. The secondaries may be indifferently red or yellow, sometimes black—the body may be maculate or immaculate, without affecting the species; but the pattern of markings of primaries remains constant. The markings may vary very largely in completeness, but some peculiarity—the specific character—sticks. I will now say however that I have not examined the species in any way except as to maculation, and while I am confident that other and better characters will yet be discovered, yet still they will, I am equally confident, confirm the conclusions reached from a careful study of the maculation.

According to pattern of maculation the first series in the genus would be that in which all the veins are marked with yellow or white. All of these species have toward the outer portion of the wing a ≶ shaped mark. *Virguncula* and *quenselii* differ at once from all the others of the group by lacking the transverse line at the back of this W. All the others have this line in more or less perfection. *Virguncula* is large, broad winged, with yellow secondaries. *Quenselii* is small, narrower winged, with gray secondaries. The synonomy of the latter is involved. The species have the pale lines narrow, as is also the pale margin.

The next point of difference in maculation which will serve as a basis of further subdivision is in the cross bands. Usually there are two of these, sometimes three and they are very variable in extent and in completeness. Yet, variable as they are, they afford a safe character—so far as my observations go at least. In the first series none of these cross bands ever go *below* the submedian pale streak. If a line is partly ob-

* Read before the Ent. Club A. A. A. S., August, 1887, reprinted as part of the Proceedings of that Club.—Ed.

solete, it is the lower part that is first lost and the upper portion is present. In no case are all the transverse lines entirely wanting.

In the second series some one of the transverse lines *always* comes below the submedian pale streak. This is invariable. Sometimes the outer two lines join at the streak and a single spur crosses the line to the margin or at least to the internal vein. The basal band when present, also crosses this streak. If a line is partly wanting, it is the upper portion, while the lower portion is distinct. In all specimens I have seen, some one of the lines, usually the outer, is distinct.

To the first section containing species in which the transverse bands do not cross the streak, belong *rectilinea, anna,* with the variety *persephone, virgo* and *saundersii,* and possibly some of the species unknown to me—for I want to say right here that I have made no attempt to classify the species not known to me either autoptically or through a figure; this paper being intended to be suggestive merely.

Rectilinea differs from all of these in having the transverse line rigid, and even—resembling *phyllira* very strongly indeed in the heavier maculation, and differing only in the pale veins.

The other species all have the transverse lines more or less irregular and bent, never rigid, and except the outer they are quite generally more or less wanting.

Virgo is the largest of these species, with red underwings, and with the latter maculate outwardly and basally.

Parthenice, the *saundersii* of Mr. Grote, is very closely allied, but smaller, and so far as I have found, without the basal maculation of secondaries, the outer spots being closely as in *virgo.* I believe with Mr. Hulst that Kirby's species referred to this smaller form and not to *virgo.* Mr. Stretch's *intermedia* is not a synonym of this species as Mr. Grote classes it, but belongs to the next section.

Virgo appears very rarely with yellow secondaries. *Anna* has black secondaries, while its variety, *persephone,* has them yellow with black outer margin, sometimes broken into spots, and connecting with the black form by an infinite series of variations. Though first described, *anna* is much the rarer form.

The second of the sections, with the transverse band coming below the longitudinal stripe contains *intermedia,* of which *stretchii* Grt., is a synonym, *dahurica, edwardsii, achaia,* and possibly *complicata.*

Intermedia is the largest of these, and rather a larger-winged form in appearance, with a few outer spots on the red secondaries. *Stretchii* is the form in which the basal band is distinct, but in a large series of Texan specimens this feature is seen to be a very gradually evanescent character, all sorts of intergrades being found. In fact, the form figured by Stretch

as *intermedia* shows an indication of the basal band. *Dahurica* and *edwardsii* are identical, and differ notably in the very uneven, rather tremulous—if such a term is allowable—transverse lines. The secondaries are more profusely spotted. *Achaia* is a more robust, shorter winged form, with more rigid lines, the secondaries with a strong tendency to become yellow, the black markings heavy, basal as well as outer, and sometimes suffusing the entire wing.

The other species known to me, in which the veins are all pale, are *argе* and *michabo*, easily distinguished by the broadly pale margins and the broad stripes—in fact in some forms of *argе* the pale markings become so broad, that the black is fragmentary, consisting of angular marks, and it is not always easy to make out the pattern. *Michabo* may be a good species. It is much redder than any *argе* I have seen, and the markings are not nearly so broad; and, while in *argе* the tendency seems to be toward albinism, and reducing the black to fragments, *michabo* retains the pattern intact and the tendency is rather to melanism, the pale markings becoming more or less obsolete. On the other hand *dione* A. & S., which Mr. Neumoegen has recently restored to rank as a species, is unquestionably a synonym of *argе*. A long series of Texan specimens, from the extreme of immaculate forms both as to body and secondaries and pallor of primaries, shows a regular and unbroken series to our more typical northern form. Mr. Neumoegen unfortunately had only the extreme Texan form and that certainly looks different at first sight, but with between 30 and 40 specimens, most of them from Texas, the gradation is easy and the relationship apparent.

The remainder of the species known to me have the veins not pale, the median vein only being sometimes discolored. The same type of maculation exists as in the previous group, and the same divisions are possible.

The first series is that in which the markings are usually complete, well defined, and the transverse markings—the second band at least—come below the submedian streak.

The species are first: *incorrupta*, *mexicana*, *geneura*, *nevadensis*, *arizonensis*, *behrii*, and *autheola*, which are probably all one, or at most two species, to which also some of those not known to me may be referable; and second, *superba* and *bolanderi*, which appear to be good species. *Bolanderi* has very much the markings of *incorrupta*, but has an additional band nearer to base of wing, which I have seen in none of the preceding species. In *superba*, all the markings are very narrow and fine.

In the first series above enumerated there is great variation in the ground color, some in the width or partial obsolescence of the bands, and a sexual difference in the color of the secondaries. I feel tolerably certain that there is only a single species, and not a very greatly variable

one at that. In the other groups of this section, the transverse lines never come below the submedian streak. There are a few species here and probably a number of others with which I am not acquainted.

Phyllira is always easily distinguished by the rigidly oblique transverse lines, the two outer lines being nearly parallel. The W may be more or less obsolete and so may the inner cross band, but the rigidity of the lines is always traceable.

Cervinoides is closely allied, but is smaller. I know it only from Strecker's figure.

Figurata is always distinguishable from *phyllira* by the lack of rigidity in the transverse lines, the outer line being usually somewhat bent in the middle, and the two lines slant in opposite directions. The W is more usually obsolete in this than in the *phyllira* form and thus we get *F. pallida* Strk., in which it is wanting entirely. The secondaries of this species have generally a broad black margin, never broken up as in *phyllira*, and sometimes the secondaries become entirely black, and thus we get *excelsa* Neum.

Finally is a series of species, closely allied in which there is no W but an ✕ beyond the middle.

These are *celia*, *nais* and *decorata*, the two latter at least of which, are forms of the same species, whether the first is, or not, I am not certain—perhaps I have mistaken its type. At all events the pattern of maculation is very distinct from that of the other species. I have no idea that the interval between this and the *phyllira* series can be bridged. There is a sharply defined sexual difference in color and wing form in *nais* and the secondaries also vary considerably in maculation. Sometimes it is spotted only—generally in the males—at others there is a wide black margin, often taking up half the wing—this is the tendency in the ♀, which is also as a rule much redder than the ♂. On the primaries the tendency is to an obliteration of the outer ✕ and attendant marks, leaving only the submedian stripe—and this variation is the only one shown by the species.

The other species I do not know sufficiently to care about discussing them. I will again finally declaim the idea of making critical notes on the genus as a whole. My only idea is to call attention to some characters which do not seem to have been sufficiently emphasized heretofore, and to express my conviction that the species of *Arctia* are not nearly so variable as has been supposed and that every good species is capable of accurate definition. A goodly number of species have been described from single, somewhat aberrant examples, and the names hang on in the lists, though the species may have been recognized as synonyms long since—especially is that true of the *autheola* group, in which Mr. Neumoegen has done some judicious lumping recently.

Notes upon some of Mr. Walker's Species of Geometridæ.

By Geo. D. Hulst.

Not long since by the kindness of Dr. Packard, I received from him for study, some 36 colored drawings, prepared for him in London, of types of American *Geometridæ* in the British Museum collection. Dr. Packard had these drawings when he prepared his Monograph, and some of Walker's species were thus made known to us, and these, with others not identified, were represented in his plates at the end of the Monograph. From a study of these drawings I make the following notes after comparison with material in my possession.

Caberodes antidiscaria Walk. (C. B. M. Geom. p. 1513, 1862). I find, I have been mistaken in my determination of this species from the figure in Packard's Monograph; and as a result I redescribed it, as *Endropia lentaria*. The species seems to be a good one.

Endropia tiviaria Walk. (C. B. M. Geom. p. 250, 1860), seems from the drawing to be a variation of *E. obtusaria* Hübn. But the drawing does not seem in coloration to agree with the description of Walker. As it stands, however, I would call it a variety of *E. obtusaria* Hübn. The description seems to be nearer than the drawing.

Azelina rectisectaria H. Sch. (Aus. Schm., f. 325). Under this name Herrich-Schaeffer describes an insect from Brazil, which is, I think, the insect afterwards described as *A. zalissaria* by Walker. The colored drawing does not show this insect to be so pinkish as many ♀ specimens from Florida. Among my ♂♂ however I have specimens exactly agreeing with Mr. Walker's insect, except that they do not have pectinated antennæ. But for this I would look upon it as a not very aberrant variety of *A. hubnerata*, so far as the males go, but with the females quite considerably differing. At any rate I would take Walker's *zalissaria* to be a synonym of *rectisectaria* H. Sch.

Selenia alciphearia Walk. (C. B. M. Geom. p. 184, 1860). This is not the insect represented by Dr. Packard's figure and description, but is the same exactly with *Selenia kentaria* Grt. and Rob. So the latter name falls. Of the insect which Dr. Packard supposed to be *S. alciphearia*, I have never seen a counterpart; but it is very close to the spring form of Walker's species, and that is what it possibly is. As with the European species the two broods very materially differ.

Geometra inclusaria Walk. (C. B. M. Geom. p. 508, 1861.) This is without doubt the same as the insect afterwards described as *Aplodes rubrolineata* by Dr. Packard. The red edging to the wing is somewhat heavier in the more southern specimens.

Acidalia impauperata Walk. (C. B. M. Geom. p. 721, 1881). This, from the description and drawing, I would not think to be distinct from *A. inductata*, Guen. Mr. Walker in the description says the median line runs through the discal point, but the drawing does not correspond with this description.

Semiothisa æquiferaria Walk. (C. B. M. Geom. p. 886, 1861). This is in my mind, beyond doubt, the same insect that was afterward named *S. bisignata* Walk., and under which name it is now generally known. Dr. Packard says (Mon. Geom. p. 295), that *Macaria postrema* Walk., is described from a rubbed specimen of this same species.

Acidalia tacturata Walk. (C. B. M. p. 721, 1861). This species, I am strongly inclined to believe, is a varietal form of *Ephyra pendulinaria* Guen. I have some specimens of the latter which duplicate it in every way but in the absence of the discal ringlet. But in view of the uncertainty, we let it remain as it has been.

Napuca orciferaria Walk. (C. B. M. Geom. p. 1693, 1862). For notes upon this species see *Phrsiane aberrata* Hy. Edw. above, Vol. II, p. 233.

Tephrosia scitularia Walk. (C. B. M. Geom. p. 406, 1860), is very close to *Cidaria cambricaria*, and it is quite likely that it is a synonym of that species. But in view of the doubt we look upon it as a good species, till further comparisons are made.

Cidaria inclinataria Walk. (C. B. M. Geom. p. 1727, 1862), is in my opinion the insect afterwards described as *Larentia perlineata* by Dr. Packard, (Proc. Bost. Soc. N. H., XVI, 19, 1874). It is figured by Dr. Packard (Mon. Geom. pl. 8, f. 25) as *Epirrita perlineata*.

Eupithecia implicata Walk. (C. B. M. Geom. p. 1241, 1862). This, from the colored drawing, I would not hesitate to believe to be the insect afterwards called *E. miserulata* by Mr. Grote.

Tephrosia abraxaria Walk. (C. B. M. Geom. p. 403, 1860), is a synonym of *Boarmia crepuscularia* Treit.

Anaitis continuata Walk. (C. B. M. Geom. p. 1445, 1862), is the same as *Anaitis orillata* Walk., (C. B. M. Geom p. 1740, 1862). Dr. Packard places the insect under *Phasiane*, and it is known in collections as *Phasiane orillata* Walk. The latter will have to give way to the older name however, and the species be known as *Phasiane continuata* Walker.

Selenia æsionaria is beyond doubt a synonym of *Hyperetis amicaria* H. Sch. (*nyssaria* Guen.). As far as the returns are in, this species has been described eleven times, in five genera, being thus a good

third, with *Caberodes confusaria* Hübn., in advance, described under fourteen names, in four genera, and *Semiothisa granitata* Guen., leading, described under eighteen names, in six genera, and in three subfamilies! I speak of this not with any thought of disrespect towards the systematists of the past, but to bring out two points: 1st, the extreme variability of the species, and 2nd, the extreme uncertainty of the place of a species under the different systems of classification. The three great systems of Herrich-Schaeffer, Lederer, and Guenée, very widely differ from each other. The same names are to a great extent used for genera by all, but in each case they often have very different meanings. And insects are tossed about according to the Author that is followed. If the new system of Von Gumppenberg ever obtains a standing, it will very materially add to the confusion. As it is, one may put a Geometer in almost any of the older genera, and be sure he can find some systematist to quote as an authority for the reference.

Synopsis of the North American Species of Lordotus.

By D. W. Coquillett, Los Angeles, Cal.

1—Scutellum not grooved, rounded behind ..... 2.
Scutelium with a deep, longitudinal groove ..... 1. **canalis** n. sp.

2—Pile of head, pleura, breast and legs largely white or yellow ..... 3.
Pile of head, pleura, breast, venter and legs wholly black; legs black ..... 6. **apicula** n. sp.

3—Second antennal joint not over once and a half as long as wide; pile of body largely whitish ..... 4.
Second antennal joint twice as long as wide; pile of body largely yellowish .... 2. **gibbus** Lw.

4—Abdomen partly black pilose, wings destitute of brown clouds ..... 5.
Abdomen destitute of black pile, wings with several brown clouds ..... 3. **planus** O. S.

5—Abdomen with cross bands of white tomentum, the second and third segments with black pile; legs black ..... 4. **miscellus** n. sp.
Abdomen destitute of white tomentum, second and third segments destitute of black pile; legs yellowish ..... 5. **zona** n. sp.

1. Lordotus canalis n. sp.

Wholly black, except legs and base of tarsi, which are yellowish. Front white tomentose and yellowish pilose, face yellowish white pilose. First two antennal joints mixed black and white pilose above, densely white pilose below. Occiput grayish pilose. Thorax grayish tomentose, pleura white pilose. Scutellum shining black, divided into two equal parts by a deep longitudinal groove. Abdomen grayish tomentose; venter same. Legs whitish, tomentose, bristles black. Wings hyaline, the following spots brown: on prefurea, on vein at base of discal, and of fourth posterior cell, in apex of anal cell, on veins at apex of marginal cell, at base of

third submarginal cell, near apex of anterior branch of this vein, and of vein between first and second, and second and third posterior cells, also a large one on veins at bases of first, second and third posterior cells.

Length 5 mm. Cal. A single female, in May.

This species will doubtless require the formation of a new genus on account of the peculiar structure of the scutellum, but until the described species of *Lordotus* become more numerous than at present, this species may remain in the latter genus, with which it agrees in all other important characters.

2. **Lordotus gibbus** Lw. (Cent. IV, 53; syn. *Adelidea flava* Jaen. (Neue Exot. Dipt., 39.)

Length 7 to 10 mm. Col., N. M., Cal., Mex.

A single female from New Mexico.

3. **Lordotus planus** O. S. (West. Dipt. 258.)

Length 7 to 9 mm. Cal. 5 ♂♂ and 4 ♀♀, in May.

4. **Lordotus miscellus** n. sp.

Wholly black. Front of female grayish pollinose and yellowish white pilose; face white pilose; first two joints of antennæ short, yellowish and black pilose above, longer white pilose below; first antennal joint about two-thirds as long as the third, second joint about once and a fourth as long as wide, third joint longer than the first two taken together. Occiput white tomentose and pilose. Thorax yellowish tomentose and pilose in middle of dorsum, elsewhere the tomentum and pile is white; pleura, breast and coxæ white pilose. Scutellum white tomentose and white or yellowish pilose. Abdomen shining; a white tomentose cross-band at base of each segment; pile white, that on dorsum of the second, third and fourth segments in the female, and also on the fifth and sixth segments in the male, largely black or blackish; venter wholly white pilose in the female, that on the fifth and sixth segments in the male largely black. Legs densely white tomentose; first joint of tarsi usually white tomentose. Wings pure hyaline, costal cell yellowish.

Length 5 to 8 mm. Cal. 5 ♂♂ and 6 ♀♀, in Sept.

5. **Lordotus zona** n. sp.

Differs from *miscellus* as follows: First joint of the antennæ about three-fourths as long as the third, second joint about once and a half as long as wide, the third joint about as long as the first two taken together. Abdomen destitute of white tomentose cross-bands, black pile confined to the fourth and fifth segments, most abundant on the fourth. Apex of each ventral segment reddish. Legs wholly yellowish, not very densely tomentose. Base of first tarsal joint reddish, this joint not densely tomentose. Costal, first basal, and basal two-thirds of marginal cell, yellowish.

Length 10 to 12 mm. Cal. 3 ♂♂, in Sept.

6. **Lordotus apicula** n. sp.

Differs from *miscellus* in having the pile of the front in the female largely, of the antennæ, face, palpi, pleura, breast, coxæ and legs wholly black; (pile and tomentum of thorax, scutellum and abdomen largely rubbed off in my specimen).

Length 8 mm. Col., A single female (Morrison).

Studies on the North American PROCTOTRUPIDÆ, with Descriptions of New Species from Florida.

(PART I.)

By William H. Ashmead,
Jacksonville, Florida.

(Continued from p. 100, vol. III.)

(XXXIV. PROSACANTHA Nees.)

58 2. **Prosacantha mandibularis** n. sp.

♀. Length .07 inch. Robust, black. Thorax finely punctate and covered with fine pubescence, metathorax spined. Head, smooth, polished. Antennæ short, entirely black, the club stout, 4-jointed. Mandibles long, curved, with one long tooth near tip, tips and tooth black. Pleuræ and abdomen polished. Legs pale brown. Wings fusco-hyaline, marginal vein but slightly developed; there is no stigmal vein.

Hab.—Florida.

59 3. **Prosacantha macrocera** n. sp.

♂. Length .07, ♀ .10 inch. Black, subopaque, fine punctate, pubescent. Antennæ in ♂ 12-jointed, filiform, much longer than the body. Legs rufous, cöxæ black at base; abdomen short, broad. Wings dusky hyaline.

Hab.—Florida.

60 4. **Prosacantha fuscipennis** n. sp.

♂. Length .09 inch. Black, subopaque, punctate and pubescent. Head on vertex polished. Antennæ 12-jointed, long, black, scape rufous at base. Legs rufous. Abdomen longer than thorax and head combined narrowed at base, first and second segments striate. Methathorax spined. Wings dark fuscous, veins black.

Hab.—Florida.

61 5. **Prosacantha minutissima** n. sp.

♀. Length .03 inch. Entirely black, polished. Legs red, femora pale at base. Abdomen slightly longer than the head and thorax combined. Metathorax spined. Wings sub-hyaline, the hind margins of anterior wings with long ciliæ.

Hab.—Florida.

XXXV. TRISACANTHA n. g.

This genus is easily distinguished from *Prosacantha* to which it is most closely allied by having three spines on the metathorax, and its polished, alutaceous surface.

62 1. **Trisacantha americana** n. sp.

♀. Length .10 inch. Black, smooth, polished. Antennæ 12-jointed, filiform, longer than body, pedicel annular, following joints long, cylindrical, the fourth joint shorter than fifth, other joints longer. Mesothorax without grooves. Scutellum lunate, convex. Metathorax with a large central spine, and and two shorter lateral ones. Legs red. Wings fusco-hyaline, veins as in typical *Prosacantha* but with a veinlet projecting forward from tip of stigmal vein.

Hab.—Florida.

XXXVI. **TELENOMUS** Haliday.

63 1. **Telenomus brochymenæ** Ashm. Fla. Agric. IV, 1881, p. 193.
Hab.—Florida.

64 2. **Telenomus anasæ** Ashm.
Hab.—Florida.

This species was reared from the eggs of squash-bug *Anasa tristis* in my work for the Department of Agriculture, last Summer.

65 3. **Telenomus stygicus** Prov. . Add. et Corr. a la Faune Hym., p. 180.
Hab.—Canada.

XXXVII. **ANTERIS** Foerster.

66 1. **Anteris elongata** n. sp.

♂. Length .18 inch. A greatly elongated form. Black; head, thorax and abdomen finely punctate, sparsely covered with a white pubescence. The 12-jointed, filiform antennæ and the legs are pale brown, the former being infuscated toward tips and hardly as long as head and thorax combined. Wings fusco-hyaline, veins dark brown; the submarginal vein is very long, marginal slightly longer than stigmal, while the postmarginal is very long.

Hab.—Florida.

XXXVIII. **BARYCONUS** Foerster.

67 1. **Baryconus floridanus** n. sp.

♂? Length .14 inch. Black, finely rugosely punctate, slightly pubescent. Antennæ 12-jointed, filiform, scape brownish-yellow, flagellum darker; the pedicel is small, the first flagellar joint slightly longer than any of the others. The mesonotum has two longitudinal grooves on its disk. Legs and coxæ pale brown. The abdomen is slightly longer than the head and thorax combined and the lateral carina are prolonged into two points projecting beyond tip of abdomen. Wings dusky-hyaline, with brown veins; the marginal vein is very short, half the length of stigmal and the postmarginal vein is long.

Hab.—Florida.

XXXIX. **SPARASION** Latreille.

68 1. **Sparasion famelicus** Say. Leconte's Ed. Say's Works, II, p. 723.
Hab.—Indiana.

XL. **TRIMORUS** Foerster.

XLI. **APEGUS** Foerster.

XLII. **GRYON** Haliday.

XLIII. **HADRONOTUS** Foerster.

69 1. **Hadronotus leptocorisæ** Howard. Hubbard's Ins. Affecting Orange Trees.
Hab.—Florida.

70 2. **Hadronotus floridanus** n. sp.

♀. Length .08 inch. Robust, black. Head and thorax coarsely punctate and sparsely covered with white pile. Antennæ slightly longer than head and thorax combined, scape pale brown, dusky at tip, flagellum dark brown. Mesothorax not grooved; metathorax rugose. Legs, uniform brownish-yellow. Abdomen rather broadly rounded, punctate, second segment longest, first segment longitudinally striate. Wings hyaline, veins brown; the marginal vein is slightly longer than half the length of the stigmal vein, and the postmarginal vein is long.

Hab.—Florida.

Described from three specimens. Its much larger size will at once distinguish it from *H. leptocorisæ* How., which has been described as having been reared from the eggs of *Leptocorisa tipuloides*. This is a mistake, it should have been the eggs of *Belus longipes* L. var. *bilobus* Say, Mr. Hubbard, having incorrectly identified, figured and described this species in his work referred to above.

XLIV. **SCELIO** Latreille.

71 1. **Scelio ovivora** Riley.

Calaptenobia ovivora Riley. First Rep. U. S. Ent. Com. p. 306.

Scelio famelicus Say. Riley's Second Rep. U. S. Ent. Com. p. 270.

Hab.—Western States.

Prof. Riley, in the "Second Report U. S. Ent. Comm." says this species is identical with *Sparasion famelicus* Say, a statement in which I cannot agree, for Say in his description of *Sparasion famelicus* distinctly says: "*two distant dorsal longitudinal impressed lines on thorax,*" a feature not characteristic of the genus *Scelio*, and of the several species of *Scelios* in my collection, not one exhibits this character; moreover, neither in Prof. Riley's figure of *ovivora*, nor in his description is this character given.

72 2. **Scelio hyalinipennis** n. sp.

♂, ♀. Length .13 to .15 inch. Black or brown-black, rugoso-punctate. Face with coarse grooves converging toward mouth. Antennæ, including scape, brown-black. Posterior angles of metathorax prominent, sub-acute. Legs rufous, the femora blackish. Abdomen finely punctate and covered with fine pubescence, first segment campanulate, strigose, second segment more finely striate. Wings and veins hyaline, stigmal slightly tinged with brown.

Hab.—Florida.

73 3. **Scelio fuscipennis** n. sp.

♀. Length .14 inch. In stature and general appearance this species resembles the preceding, but the wings are fuscous and the legs pale yellow-brown. It also resembles a European species, *Scelio inermis* Zett, but in that species the legs are black.

Hab.—Florida.

XLV. **INDRIS** Foerster.

Note.—A species, belonging to the genus *Goniozus* Foerster, described by Mr. L. O. Howard in a note to "Hubbard's Insects Affecting Orange Trees" [app. p. 217], was accidently overlooked by me in preparing a list of the subfamily *Bethylinæ*, and should be added to the two species described in Entom. Amer., July, p. 76, as follows:

3. **Goniozus Hubbardi** How. Hubbard's Ins. Aff. Orange Trees, app. p. 257.

Hab.—Florida.

I have had the pleasure of seeing Mr. Howard's type, in the collection of the U. S. Department of Agriculture and it is very distinct from the other two forms in our fauna. Mr. Hubbard reared the species from a Tortricid (*Platynota rostrana*).

Notes on American Lepidoptera.

By A. G. Butler, F. L. S., F. Z. S.

We have received the following notes from Mr. A. G. Butler of the British Museum. They are of very great interest to American students, and we are heartily thankful to Mr. Butler for recording his observations upon the Collections of American Lepidoptera under his care.

"In the Zeller Cabinet I find six examples of a *Lithosid*, which is the same as *Repa cana* Walk., the first specimen in the series bearing a ticket with the legend '*Clemensia albata*, Pack.', and the fifth '*semilunella*, Nord America.' We have thus the fact of the identity of Walker's and Packard' species made evident. *Uxia albida*, Walk., is the small wither form the same species."

In another letter Mr. Butler says: "I am arranging our speci *Nola*. In the Grote collection I find three specimens of a species l as *N. minuscula*, Zeller, and a fourth of the same thing exactly labelled *N. fuscula*, Grote: other specimens labelled as *fuscula* differ in being a little darker or lighter, but with a less brown tint; the pattern in all is identical."

Myriopoda or Myriapoda?

This word, as stated by Dr. Underwood (on p. 61) is differently spelled by Zoologists. It was written *Myriapoda* in the earlier editions of my "Guide to the Study of Insects," but on looking into the derivation of the word it seemed evident that the correct orthography was *Myriopoda*; so at considerable expense the plates of that book were changed and the spelling corrected. The word is derived from *Myrios*, thousand, and *pous, podos*, foot, hence the natural spelling is Myriopoda, rather than Myriapoda. I have submitted the point to a well known Greek scholar, and he agrees with this orthography.

The word was spelled by Latreille *Myriapoda* and is so given in Agassiz' Nomenclature, but even if the appellation of a class is not correctly spelled, whatever scruples we may feel at changing the original spelling of a generic or specific name, the most extreme purist should not, I think, adhere to a wrong, or even slightly incorrect orthography in any of the comparatively few class or ordinal names in Zoology.

A. S. Packard.

Columbia, O., June, 1887.

Editor Ent. Am Dear Sir:—Would some reader of Ent. Am. be kind enough to advise me through your valuable Journal, of a way to successfully winter larvæ of Cælodasys, Heterocampa, Cerura, &c.

The larvæ of these moths complete their growth, change color and construct their cocoons in the Fall, but do not pupate until Spring.

I have found it very difficult to winter them.

Yours respectfully, W. N. Tallant.

ENTOMOLOGICA AMERICANA

VOL. III. BROOKLYN, OCTOBER, 1887. NO. 7.

Proceedings of the Entom. Club of the A. A. A. S. at the New York Meeting, August, 1887.

(Continued from p. 108, vol. III.)

Prof. Lintner spoke of the alarming increase of the Larch Saw-Fly, *Nematus erichsonii*. He gave a history of the dates and places at which it had been heretofore observed, and the injury it had done.

On July 7th it was reported to him from St Lawrence Co., N. Y., where it appeared on three Tamaracks growing in a door-yard. About the 10th of July they appeared in countless hosts completely covering the trees so that the end of a finger could not be placed on a branch of one of them without touching one or more of the worms. They also cov ered apple and maple trees and shrubbery but ate nothing but Tamarack.

About the same time examples of the larva were received from Otsego Co. taken from the European Larch. The pupæ were found after July 12th under moss some little distance from the trees. It has done considerable damage also in Hamilton County in the Adirondack region. Every Tamarack for miles around was entirely stripped, and looked as though the fire had been through it. Dr. Packard says the attack is not fatal to the trees and near Lake Pleasant early in August he observed the Tamaracks putting out new buds. The larva were attacked by a *Podisus* allied to *modestus*, and the pupæ were eaten by ants. In Europe the species seemed to be kept in check pretty well by its parasites and it has never been destructive there.

Prof. Riley said we can hardly hope with Dr. Packard that the attack will not be fatal to the trees. When he went over the ground in Maine with Dr. Packard this spring, many trees were already dead.

Club then adjourned to Monday August 15th, at 9 A. M.

In the evening a very pleasant party met at Mr. Graef's residence in Brooklyn where the evening was spent in examining Mr. Graef's collection and discussing the merits of the collation provided.

Monday, August 15th.—Club met pursuant to adjournment, 8 members present. In the absence of Prof. Comstock, Prof. Lintner was elected President *pro tem.* Mr Emerton read a paper by Prof. L. M. Underwood on the literature of the North American Spiders, reviewing the work thus far done in the *Arachnidæ.**

Mr. Smith made some rêmarks on the paper mentioning the work being done by students of the group and that the U. S. National Museum was accumulating a very fair collection in the class. He also defended the practice of describing species as justifiable under some circumstances in stimulating or exciting interest and claims that nothing is so discouraging to beginners as a lot of material which is unnamed and unnameable until some one monographs the whole.

Mr. Emerton said that he intended to continue his work on the New England Spiders and will keep his types at least until the work is all done. He was opposed to hasty descriptions, and to hasty identification of old species where there is nothing to identify them by. He preferred to give a new name to an insect to identifying it with an old name unless he was perfectly sure of his identification.

Dr. Hoy spoke on the peculiarities of the Lepidopterous Fauna of Racine, describing the location of the place and enumerating some of the Southern butterflies and moths that have been taken there—among them *Terias mexicana, Apatura celtis, Argus labruscæ, Dilophonota ello* and *Erebus zenobia.*

Adjourned until Tuesday, August 16th, at 9 A. M.

On the afternoon of the 10th the Entomologists and Botanists joined in an Excursion by Steamer to Sandy Hook which proved an interesting and agreeable one.

Tuesday, August 16th —Club met at 9 A. M. 4 persons present. In the absence of the President, Prof. Lintner was elected Chairman *pro tem.*

It was resolved that the minutes of the meetings be published as usual in Ent. Am. and that the Secretary furnish an abstract for publication in the proceedings of the A. A. S. S.

Prof. Lintner spoke on the larva of *Haltica alleni,* Harris—now known as *H. bimarginata* Say, which he found near Lake Pleasant skeletonizing Alder, in great numbers, exhibited specimens of the larva and

* This paper will appear in full in the American Naturalist.

pupæ. The latter are found naked in Moss. It was yellow when found and not white as described by Dr. Packard.

Mr. Angell stated that he had recently for the first time heard *Polyphylla* stridulate. Mr. Dimmock said that *Cerixa* sometimes makes quite a loud stridulating noise.

Some general remarks and questions concerning captures at Sandy Hook followed, and the Club then adjourned for the session to meet again at 9 A. M. of the first day of the next meeting of the A. A. A. S.

JOHN B. SMITH, *Secretary*.

Cryptorynchus lapathi, *Linn.*

BY WM. JUELICH.

Early in June this year I found on one of my excursions near West Bergen in this vicinity, a large branch of a Willow tree, blown down by a recent storm. Examining it closely I found it full of holes, with fresh borings at the ends. Thinking this the work of *Saperda concolor* which I often found on similar occasions, I did not take the trouble to examine the larvæ but merely took a small piece of the branch about two feet long and an inch thick along, and placed it in a box to satisfy myself about the inhabitant. To my surprise, I found 2 fine specimens of the European *Cryptorhynchus lapathi* Linné emerging on the 3d of July and succeeded in getting about 10 more since, from pieces of willow, obtained from the same locality—the large branch "full of them" having disappeared in the meanwhile.

Five years ago I took a fine specimen of this same species on Willow near Williamsbridge, at least 12 miles distant from above locality, and last year, Mr. Ottomar Dietz showed me another one, taken on Staten Island. The breeding of this beautiful *Cryptorhynchus*—the only one found in Europe—on Willow here, is the more interesting, as it is known to occur to breed on Elder over there. I am afraid it will become a great scourge to the Willow, from what I have seen of it and there is no doubt now, that *Cryptorynchus lapathi*, Linné is not more an accidental importation, but should have a place in our catalogue.

Fortunately it appears to have found its enemy already to check its too rapid progress, for I found 3 active Ichneumon flies emerging from the same Willow branches, about a fortnight after the last beetles made their appearnace. No other larvæ or insects had lived in the branches as I found by cutting them open. Mr. E. T. Cresson has kindly identified the Ichneumon as a small variety of *Ephialtes irritator*, Fab.

A living Ixodes said to have been four months in the ear of a man.

By Dr. H. A. Hagen.

I received July 16th, 1887, from Mr. John Orne Green, M. D., Chemical Instructor in Otology at the Harvard Medical School the following letter together with the specimen.

"I removed it alive from the ear of a man on Thursday last (July 14). The symptoms, only itching and obstruction of the passage, date back to a residence on a cattle ranch in Arizona in March and April last. The singular things about it were the absence of pain, usually very great from a live insect and the fact of the bug remaining alive in the ear for such a long time." The rather strange case induced me to ask if perhaps a clerical error or a chance of misunderstanding could have happened. In a letter, July 23d, Dr. Green states: "Certain is it that it came out of his ear, that it had produced no irritation and that the symptoms date back to March or April. The tenacity of life is also remarkable."

This is all I know of this very strange case; indeed so strange, that I answered, there would be many unbelievers, and that I had not been able to find a similar case quoted in the literature. Nevertheless if somebody would peruse Dr. Dieffenbach's article in Rust's Magazine—corpora aliena in corpore humano—he will find reported some very strange cases.

The insect is a Tick (*Ixodes*) long, 12 mm. broad 6 mm. It arrived in my hands, not only living, but still lives to-day, Sept. 28, without having taken any food. It changed its skin in August. In Packard's Guide p. 663 is mentioned *Ixodes bovis* pl. 13 f. 10 as the common cattle tick of the Western States and Central America. It lives on horned cattle, upon the Rattlesnake, the Iguana and small mammals. It was received from Missouri from Mr. Riley and very abundantly on horned cattle from Mr. McNiel in Nicaragua. A large number of this species with Dr. Packard's label *Ixodes bovis* Riley; Polyon, Occident. Depart. Nicaragua, McNiel coll., formerly in the Peabody Academy is before me, and they are apparently of the same species. I can not find the species mentioned anywhere except a notice "Ticks and Texas fever," Americ. Entomol. I, p. 28 where it is said that specimens sent from Illinois and St. Louis are but the common cattle tick. A description by Dr. Packard is given Rep. Peabody Acad. p. 68. This figure in the Guide has the feet too long.

I do not know if the changing of the skin of *Ixodes* is described. The skin splits a little above the mouth transversally and then along both sides to the hind angles; both sides of the skin are connected behind, after the animal has crawled out.

I have taken considerable care to find in the literature similar cases reported. The only remark I know is in Peter Kalm's travels in N. Ameri-

ca; it is re-printed in the Swed. Vetensk. Acad. Handl. 1754, T. 16. *Ixodes americanus* Linn. is very obnoxious, when it goes in the ears of men. It is very diffcult to remove, because it fastens itself strongly and sometimes in places, where it not easy to be reached. There are cases that the swelling of the ear has arrived to the size of a human fist.

Notes on Stenus and Barinus.

By T. L. Casey.

In some very interesting notes on Coleoptera recently published in this journal by Mr. F. Blanchard, several subjects are touched upon which have been the subjects of more or less study on the part of the writer.

Mr. Blanchard's observations in Stenus are perfectly correct but by no means new. In the very thorough treatise on the Stenini of France by Mr. C. Rey, several forms of toothed tibiæ are illustrated, and in the Biologia Centrali-Americana, Dr. Sharp has described other peculiar modifications of those parts. These exceptions, however, do not invalidate the rule that in the Stenini the tibiæ are simple and unarmed. If my memory serves me correctly, however, the language made use of in the Revision of the Stenini has reference to the general absence of terminal spurs. I would also add that I have considered Stenus as a genus belonging to the group Stenini; this is so evident that the statement made by Mr. Blanchard seems quite inexplicable.

With reference to Barinus, I have been much interested in the recent studies of the author quoted, but am inclined to believe that the specimen of *B. squamolineatus*, referred to by him as having been received from Mr. Webster, must be more or less rubbed and imperfect, as it is impossible to reconcile Dr. LeConte's careful description of *cribricollis* with the perfect representative of *squamolineatus* which I have before me.

In this description of *cribricollis* the author writes as follows: "White scales denser on the second interval for four-fifths the length; on the sixth a basal line extending to one-fourth of the length," while in *squamolineatus* the white scales of the second interval extend in a broad dense line throughout the entire length of the elytra, becoming even broader and denser at the apex, and the broad line of the sixth interval extends for fully one-half the length. Without alluding to other differences such as the apparent absence of a median line of scales on the pronotum of *cribricollis*, and the probably denser punctuation of that species, I believe that enough has been stated to show that these two species should not be united without further study of more perfect specimens, especially in consideration of the widely different habitats, Florida and Illinois.

Method of Oviposition of Tachina.

By Archibald C. Weeks.

An opportunity to observe a female *Tachina* in the act of ovipositing is, I presume, of comparitively rare occurrence and as such an opportunity was vouchsafed me, I may, perhaps, without trenching upon what has been previously noted, describe the process.

On September 3d of this year, noticing a small Hickory almost entirely denuded of foliage by a brood of Datana larvæ, I stopped to watch the industrious feeding of a cluster of them.

Upon one of the leaves near the heads of the larvæ was a female Tachina standing unusually erect and regarding the larvæ very intently. Divining her purpose I remained quiet. After the lapse of several minutes she cautiously approached the head of the nearest and thereafter constantly adjusted her position so as to face the larva as it moved in feeding at a distance of rather less than a quarter of an inch. Seizing a moment when the head of the larva was likely to remain stationary the fly stealthily and rapidly bent her abdomen downward and extended from the last segment what proved to be an ovipositor. This passed forward beneath her body and between the legs until it projected beyond and nearly on a level with the head of the fly and came in contact with the eye of the larva upon which an egg was deposited in addition to five already there. So gently was this done, that the larva did not at first appear to be disturbed, but presently the adhesion of a foreign substance seemed to annoy it and it scraped its eyes against the bitter edge of the leaf in a vain effort to rub off the barnacle-like ova. The fly then proceeded to several other larvæ, which had been previously similarly stung, and repeated the process, always ovipositing on or between eyes at which place at least a dozen had been attacked, and nowhere else. The presence of other ova did not deter the fly from adding to the number. The ovipositor was viscous of a pale yellow, tapering, and elastic to such a degree that the entire abdomen could hardly have contained it as expanded.

It was interesting to note that the fly carefully avoided allowing her ovipositor to come in contact with the fine long hairs of the larvæ which hung over the eyes, withdrawing it instantly upon their slightest movement. Judging from the fact that no ova appeared to have been deposited on the segments it is safe to assume that even the sparse hairs of the Datana larvæ constitute a barrier which the moist and highly sensitive ovipositor of the Tachina can not overcome.

We have here an additional proof that even the slightest hair or spine development adds to the safety of its possessor.

NORTH AMERICAN PYRALIDÆ.

By Prof. C. H. Fernald,
Amherst, Mass.

Diathrausta octomaculalis, n. sp. Expanse of wing, 18 mm. Palpi, head, thorax, abdomen and upper side of all the wings, dark brown or nearly black with greenish reflections in certain lights. There is a fine white line on each side of the face in front of the eye and three white spots on the fore wing, one across the end of cell, another on the middle of the cell and the third immediately below the last on the fold. The inner line is scarcely perceptable, nearly straight and crosses the wing quite near the base. The outer line, which is not very well defined, starts from a small white spot at the outer fourth of the costa runs down at right angles with the costa, a little outside of the outer spot, then runs nearly into the spot on the fold where it turns again and runs in a more or less wavy line to the outer third. This line is continued across the hind wings with an inward curve below the cell so that the lower part of it appears as a straight line extending from a white spot on the end of the cell to the anal angle. The fringes of the fore wings are black except at the anal angle and below the apex where they are white. The fringes of the hind wings are black at the base and white beyond. The segments of the abdomen are edged with white. The underside of the wings is somewhat paler than above with the white markings reproduced. The underside of the body and thorax are lighter than above. Pectus and base of the palpi beneath, white.

Hab.—Pa., N. Y., Ontario, July 3, 1886, at electric light (H. S. Saunders).

Hydrocampa nebulosalis, n. sp. Expanse of wings, from 12 to 17 mm. Face and outer end of the palpi, white. Basal part of the palpi on the outside, top of the head, thorax, abdomen and upper side of all the wings, bright ocher yellow and marked with white and sooty brown. The thorax is marked with transverse streaks of white and the terminal edge of the abdominal segments is white. The fore wing is crossed by five white lines. The first is very near the base and indistinct ; the second is near the basal fourth and is zig-zag; the third starts from near the basal third of the costa, runs nearly straight towards the anal angle as far as the median vein where it forms an acute angle and then runs in a somewhat waved line to the basal third of the hinder margin ; the next starts from the costa a little beyond the outer fourth, runs obliquely outward for a very short distance, then forms a wide inward curve down as far as vein 3, where it turns and runs towards the base of the wing nearly to the preceding line, then turns and runs to the outer third of the hinder margin in an outward curve. The outer line is sinuous and extends from the apex to a point near the anal angle. The three outer lines are edged or overlaid more or less with dark sooty brown ; and the whole outer part of the wing beyond the third line is more or less heavily clouded with the same, except the terminal space and an area on the costa between the third and fourth lines, which extends down across the cell. Hind wings white on the costa and base, and crossed by three wavy lines, the outer one of which is white and edged on the outside with brown, the inner ones are brown and edged on each side with white. A yellow spot sometimes edged with brown rests on the cell between these two lines and another within the inner line which does not reach the costa. The inner lines sometimes fuse together as they approach the anal angle. All the fringes are fuscous and cut with white between the veins. The underside of the wings is similar to the upperside except paler.

Hab.—Florida.

Tetralopha baptisiella, n. sp.

Expands 21 mm. Tongue gray in front. Palpi gray, fuscous brown in front. Head and thorax nearly white with intermingled russet fuscous scales. Abdomen light gray at base, beyond with segments ringed anteriorly with fuscous. Wings, ♂ light fuscous with a slight ocher tint, heavily marked with darker fuscous on the costal region, running from a point on costa at base, along and parallel with the inner margin to outer cross line forming a triangular space, the lighter ground color showing distinctly between the veins. Inner cross line obsolete, or showing in a faint curved gray shading. A black point of raised scales at middle of basal field. Outer cross line $\frac{3}{4}$ out; sub-parallel with outer margin except a bend outward towards posterior angle, straight at costa, otherwise evenly dentate wavy. On the middle field just out from the first cross line is a cross line of lengthened scales whiter than the ground color. Outer field fuscous, lighter posteriorly and at veins. A marginal row of lengthened black points. Fringe grayish fuscous interlined. Hind wings fuscous with faint indications of outer lighter band. ♀ with lines as in the ♂ but with basal field much lighter, the central cross band of long scales almost white, and the rest of the wing washed with russet ocher, the veins on the outer middle field blackish. A narrow gray shading next the marginal black points. Hind wings as in ♂. Beneath, ♂, ♀, fuscous on costal half of fore wings, light ocher fuscous otherwise with faint outer band on all wings.

2 ♂♂, 2 ♀♀. Hab.—Mo., N. Y. Raised by Miss Murtfeldt on *Baptisia tinctoria*.

Description of a New Proctotrupid.

By William H. Ashmead.
Jacksonville, Florida.

Since the publication of my "Studies on the N. A. Proctotrupidæ," in going over my Braconids, two specimens of a very remarkable form in this family were discovered belonging to a genus not yet noticed as occurring in the North American fauna. The genus is recognized by the brevity of the otherwise fully developed wings, the elongated prothorax and its rather prominent eyes and triangular head. The species may be identified from the following description:

VII. MYSTROPHORUS, Foerster.

1. Mystrophorus americanus, n. sp. ♀. Length .25 inch. Color: Head, thorax and legs, brownish-red; head above dusky; eyes dark or blackish; antennæ dusky toward tips, while the abdomen is polished black. The head when viewed from the front is triangular, finely, regularly punctate. The antennæ are 10-jointed, the third joint of which is as long as the 4th, 5th and 6th joints together. The prothorax is much elongated with parallel sides, narrower and more than thrice longer than the mesothorax, and microscopically sculptured. The short, spoon-shaped wings are hyaline, excepting a broad, smoky, transverse band across fore wings, broad enough to include stigma and stigmal vein. The venation is exactly as in the genus *Goniozus*.

Hab.—Florida. Described from two specimens, captured in the Spring of 1886.

NEW SPECIES OF PYRALIDÆ.

By Geo. D. Hulst.

For a number of years I have been gathering material in the family *Pyralidæ*, and in Transactions of the American Entomological Soc. Vol. VIII, pp. 145–168, July 1886, published a number of new species. Since that time very much material has come to me from various sources, and again I find myself with many insects, which neither our best specialists nor myself can identify; and once more I take myself to the task of describing what seems to me to be new to science.

The sub-families in which are the species described in the present paper I have for a considerable time given very diligent study. My former determinations were hastily made, without opportunity to study venation, and the species were by necessity in many cases incorrectly referred. Those described in the present paper, as far as genera exist for their reception, are I believe correctly referred, and can be relied upon.

Of the species in Grote's Check List, I have nearly all before me. I have all the species described since the issue of the Check List. Moreover Prof. C. H. Fernald and Mr. Henry Edwards, both among the most generous of Lepidopterists, have placed their entire collections at my disposal, so I have in material unrivalled facilities for comparison and study. And it is with all this, that I deem the following to be new species, and therefore describe them.

EPIPASCHIÆ, Grt.

Toripalpus adulatalis, Sp. nov. Expand 26 mm. Head black with light gray scales intermingled. Tongue light gray. Labial palpi black, slightly mixed with gray, extending half the length of the thorax. Antennæ dark brown, strongly pubescent. Scaled process of the ♂ antennæ reaching beyond the collar. Ocelli distinct. Thorax reddish brown in front, gray behind. Abdomen gray, blackish at base, with lateral scale tufts on the 2 segments preceding anal segment. Wings on the basal field dark brown mixed with gray scales with a longitudinal light gray dash in center, running two-thirds the length of the field and ending in a black point of raised scales preceded by another. The field is limited quite distantly from base by a light gray strongly thrice waved line which has beyond it a shadow line of dark brown. Beyond this the middle field is gray, very light costally and centrally, darker posteriorly. Anteriorly slightly washed, and shaded with a black discal point of raised scales, posteriorly strongly shaded with brown which at the outer edge of the field is slightly reddish. The light gray centrally extends to the outer margin of the wing. Outer line clear at costa, shaded inwardly and outwardly with black, the outward shading making a large apical blotch. The line ends at the extension of the gray central field $\frac{1}{4}$ from costa in a black longitudinal dash. It shows somewhat indistinctly on the posterior $\frac{1}{3}$ in the continuation of the reddish brown of the middle field, and is there waved inwardly, dentate outwardly, and shaded on both sides with blackish. Outer field narrow, gray, except towards posterior angle where it is brown, slightly reddish. A black marginal line cut by the veins. Fringes interlined.

Hind wings light yellowish-white, somewhat fuscous, subpellucid. An outer line dentate outwardly on veins. A black marginal line cut at veins. Fringes interlined. Beneath dark fuscous washed over dirty white, an outer indistinct dentate white line on fore wings. Hind wings nearly as above but duller.

1 ♂. S. Cal. Nearest *T. breviornatalis* Grt., but apart from color differences, a very much frailer insect.

Toripalpus incrustalis, Sp. nov. Expands 25 mm. Head, thorax and abdomen ochery brown, the palpi with an orange, the collar with a violet tinting. Fore wings light ocher washed and spotted with ocher fuscous with a black point of raised scales at middle of base and on disc. Basal field quite dark. Basal line of ground color indistinct but shown by the darker shadow lines. Middle field quite clear inwardly, ochery fuscous outwardly, this color divided by the veins which are light ocher. Outer line parallel with outer margin, waved inwardly, dentate outwardly. Outer field ochery fuscous, lighter on veins. A marginal row of black points. Hind wings even fuscous, lighter towards base, with a marginal black line. Beneath fuscous with a reddish shading except on inner margins, the reddish being especially marked along costa of fore wings.

1 ♀. Col. It is thought by many that in this and other subfamilies no insect ought to be described unless from the ♂, as that alone furnishes the generic characteristics. I take a pleasure in naming from the ♀ only, as a protest against the founding of genera upon secondary sexual characters.

Toripalpus lunulalis, Sp. nov. Expands 22 to 25 mm. Head and collar yellowish brown, strongly washed with violet. Palpi brownish gray or yellowish gray in front, the last member short and distinct. Ocelli present. Thorax dark fuscous. Abdomen light fuscous, the segments ringed with dark fuscous, extremity tufted in ♂ with lateral tufts on 2 segments preceding anal segment. Fore wings much rounded at apex, generally light even blue gray in color with a strong shading of fuscous on basal and outer fields. A dark broken cross line close to base not always distinct; near the outer edge of the field a dark line consisting of lengthened and raised scales, and extending quite across the wing. The line limiting the field is very indistinct and is evidenced rather by its hardly distinct shade lines. Middle field with three raised scale tufts, one discal small, the second extra-discal, more prominent and lengthened, the latter shaded outwardly, with fuscous, and a third near center of the field one-third from inner margin, black. Outer line quite distinct near costa, becoming obsolete posteriorly, shaded as usual, this shading being broad and diffuse near costa and outwardly occupying the whole apical space. The outer line forms a large sinus from the costa, and this with the shading and posterior obsolescence gives a distinctly lunular appearance to the apical markings. Outer field anteriorly fuscous divided by the yellow fuscous color of the veins—fading into the ground color posteriorly. Hind wings fuscous, smooth, dark at margin. Beneath fuscous on fore wings with a costal band lighter, the whole with a reddish tinge quite marked at apex. Hind wings reddish at angle, otherwise fuscous.

2 ♂♂, 2 ♀♀. Col. Perhaps not properly congeneric with *Toripalpus*, as there is a difference in the shape of palpi, and veins 4 and 5 of hind wings are from a stern.

PHYCITIDÆ. Rag.

Nephopteryx carneella, Sp. nov. Expands 23 to 25 mm. Head fuscous black. Collar, thorax and abdomen even bluish gray, washed with maroon red. Fore wings bluish gray, marked with light maroon red. This is especially marked on the borders of the gray cross lines, and is most lacking just at end of basal field, along outer margin, and costally and centrally on the middle field. On either side of the basal cross line there are more or less black scales. A faint fuscous marginal line. Hind wings fuscous, rather yellowish, fuscous margined outwardly. Beneath fuscous, smooth, somewhat reddish on fore wings, lightening posteriorly on hind wings.

1 ♂, 1 ♀. N. Mex.

Nephopteryx amatella, Sp. nov. Expands 27 mm. Head light gray; palpi fuscous; collar light gray. Thorax fuscous in front, gray behind. Abdomen gray with the segments banded with fuscous anteriorly, and a black spot on dorsum. Fore wings brown with some reddish posteriorly, 3 white cross lines, the first extra basal diffuse, broad, edged outwardly with black; the second central, twice angulate inwardly, lined outwardly with black, which is followed centrally by a whitish blotch; the third submarginal, with large sinus inwardly below costa, and a dentation before middle, then curved to inner margin; it is lined inwardly with black which is preceded by a diffuse lengthened whitish blotch, confluent with the rather large white discal spot. Margin a black line, preceded by a gray band. Hind wings fuscous, with black marginal line. Beneath dark fuscous with lighter fuscous outer line, less distinct on hind wings.

1 ♀. Fla.

Nephopteryx furfurella, Sp. nov. Expands 22 mm. Head, thorax and fore wings smoky blue gray. Abdomen yellowish fuscous; fore wings with a black spot along inner margin, one-third from base, with a sub-obsolete russet band, extending from this towards costa, but not reaching beyond middle, when apparent. Hind wings fuscous, lighter basally. Beneath fuscous, darkest along costa of fore wings.—2 ♂♂, 2 ♀♀. Fla., Tex.

Nephopteryx caliginella, Sp. nov. Expands 21 mm. Head fuscous gray. Palpi black with a few gray scales. Thorax gray in front, fuscous behind. Abdomen ocher fuscous, the segments darker anteriorly. Fore wings very much the color of *Phycita indiginella*, light gray on anterior portion of basal and central field, fuscous on posterior portion. Basal cross line sub-parallel with outer line, twice dentate outwardly, clear white anteriorly, gray towards inner margin, shaded outwardly. Outer line gray sub-parallel with margin, with large sinus outwardly near middle, faintly shadowed on both sides. Outer space fuscous, shading into gray towards margin. An interrupted row of black points on margin with fuscous gray fringes not interlined. Hind wings light fuscous with dark fuscous marginal line. Beneath dark fuscous on fore wings, and at apex of hind wings, the latter otherwise light fuscous.

1 ♀. Ariz.

Nephopteryx tenebrosella, Sp. nov. Expands 18 mm. Head parts and thorax dark smoky fuscous. Abdomen ringed with fuscous and black. Fore wings blackish fuscous. Basal line broadish, gray, outwardly oblique, broken at the middle. Outer line faint gray, near outer margin, with a long outward sinus at middle. Gray scales at margin. Fringes light fuscous, faintly interlined. Hind wings dark fuscous with black marginal line. Beneath very dark fuscous, a light line along costa. Hind wings as above.—1 ♀. Tex.

Nephopteryx hapsella, Sp. nov. Expands 22 mm. Tongue gray. Palpi and head russet gray. Thorax russet fuscous. Abdomen yellowish fuscous. Fore wings brown with a faint russet shade, costa to outer line much lighter. A gray patch at middle of basal field. Basal line far from base, fine, white, finely dentate. A faint discal dot, darker than ground color. Outer line very near margin, beginning very near apex, slanting inwardly, and then parallel with margin, finely dentate. Submarginal space grayish. Marginal line of black points. Hind wings light fuscous, with black marginal line. Beneath fuscous, the hind wings slightly lighter.

1 ♂. Fla. The wings are much narrower than usual and the insect has much the appearance of *Anerastia.*

Nephopteryx bifasciella, Sp. nov. Expands 20 mm. Head, thorax and fore wings light whitish gray, dusted with black. Abdomen ocher fuscous. Fore wings with basal band of ground color, edged on both sides with distinct black shadow lines once angled outwardly. Outer line near margin, of ground color, with narrow black shadow lines especially distinct at costa; the lines slightly bent. Marginal line of dentate black points. Hind wings light yellowish fuscous, pellucid. Beneath, fore wings light fuscous, hind wings as above.

1 ♂, 2 ♀♀. Arizona.

Nephopteryx odiosella, Sp. nov. Expands 24 to 25 mm. Head, thorax and fore wings white, with scattered black and fuscous scales, giving a brownish cast. Maxillary palpi with hair pencil at end, of a yellow brown color. Abdomen rather more fuscous than thorax. Fore wings with white basal band, shadowed at costa outwardly, and at inner margin inwardly, with blackish, which is broad at the respective margins, and becomes obsolete before crossing the wing. A black diffuse somewhat kidney shaped discal spot. Outer line white, shadowed with black on both sides, the shadows becoming broad and heavy at costa. The line is more bent than usual at the middle. A marginal row of black spots, pointed inwardly. Hind wings white with an ocher cast, pellucid. Beneath, fore wings faintly fuscous, yellowish along costa. Hind wings as above.

1 ♂. Col. This species and the one above, *N. bifasciella*, belong more properly to *Salebria.*

Nephopteryx subrufella, Sp. nov. Expands 12 to 14 mm. Head and thorax purple fuscous. Abdomen ocher fuscous with purple tinge on dorsum. Fore wings ocher fuscous at base. Basal line black or purple black, sometimes obsolete. Middle and outer fields reddish fuscous, generally with a purple stain, except along costa which over the middle space is marked with a grayish stripe. Outer line faint, edged on each side with purple reddish. A small black discal point. Hind wings light fuscous. Beneath, light ocher fuscous.

5 ♀♀. Fla. This insect has the appearance of *Ephestia* or *Anerastia.* It is with doubt I call it *Nephopteryx.* Vein 8 of fore wings is hardly determinate when the wings are entirely denuded and under a compound lens. Vein 8 of hind wings is in the same condition. It is a question whether they are realities or suggestions only. There is considerable variation of the costal stripe in the insect, the ground color of the wing encroaching so much at times, as almost or quite to obliterate it.

Pinipestis cacabella, Sp. nov. Expands 25 mm. The whole insect dull even smoky fuscous. Fore wings with a basal line indeterminate, and evident only by the faint lightening of the fuscous color. Outer line lighter fuscous than the ground color, with a deep bend inward on the anterior third of the wing in ♂, diffuse and straighter in the ♀. Two black discal points, confluent, edged with the lighter fuscous color. Marginal line black. Hind wings dull fuscous of the shade of the lines of fore wings with black marginal line. Beneath fuscous, lighter on hind wings.

1 ♂, 1 ♀. N. Y. This insect may possibly be a form of *P. abietivorella* Grt., but it differs decidedly in coloration, and is a *Pinipestis* only in venation. The ♂ antennæ are bent over the root, with a scale pad in the bend. Mr. Grote however did not know the male, and so could not base his generic reference upon any ♂ characters. As already said my own generic references in the present paper are based in case of doubt on the venation and attention is called to the variation of the sexual characters. I speak of Mr. Grote as the author of *P. abietivorella* as he, not Dr. Packard, described and published it.

Etiella villosella, Sp. nov. Expands 24 to 27 mm. Labial palpi russet gray above, gray below. Maxillary palpi yellowish, brown on end. Head, collar and fore thorax, orange fuscous. Thorax behind fuscous gray. Abdomen fuscous. Fore wings mouse color, consisting of bluish gray, overlaid partly with fuscous. A broad white stripe extending from base along costa to apex. Extreme edge of costa of ground color broadening outwardly just beyond middle and fading away towards apex. A dull yellowish basal stripe reaching from white costal stripe to inner margin, edged inwardly with a row of maroon brown scales, the scales being longer than usual. Hind wings fuscous, deepening outwardly, with dark marginal line.

Beneath even glistening very light fuscous.

3 ♂♂, 2 ♀♀. N. Y., Fla., Col. This insect which in America has in the past been considered *Epischnia farrella* is very close in appearance to the European *E. Zinckenella.* The most marked difference between the two is the labial palpi. The end member in the American insect is very short, not more than one-fifth the length of the middle member, while the European, according to Authorities, is one-half the length of the middle member.

Pempelia mulleolella, Sp. nov. Expands 13 mm. Palpi smoky black. Head and thorax dark fuscous with a reddish tinge. Abdomen fuscous. Fore wings wine red; cross lines white, distinct, scarcely shaded; the first is twice dentated outwardly, the outer near margin, very nearly straight. Outer margin with color deepened. Hind wings fuscous. Beneath, fore wings wine reddish on front half, fuscous posteriorly, the lines quite distinct. Hind wings fuscous.—1 ♀. Fla.

Pempelia albipenella, Sp. nov. Expands 20 mm. Palpi whitish fuscous at tip. Head, body and fore wings dull white, a little ocher stained. Fore wings with faint fuscous shadings, revealed in a faint basal patch, a discal spot, and a faint oblique band running from just before apex inwardly. Hind wings fuscous.

Beneath smooth light yellowish fuscous, a little darker on fore wings.

1 ♂. Cal.

Pempelia quantulella, Sp. nov. Expands 11 mm. Palpi dark fuscous. Head and thorax fuscous gray. Abdomen fuscous. Fore wings narrow, rounded and oblique on outer margin, steel gray in color. Two cross lines, white, the first nearly at the middle, broad diffuse, obsolete at both costa and inner margin, slightly lined outwardly with black; outer line close to margin, three times dentate. Hind wings fuscous. Beneath dark fuscous, the costal region of the fore wings very dark.

1 ♂. Texas. I am not sure that this insect is correctly referred. It is very frail, and I have but one specimen, so I can not study the venation fully enough to satisfy myself with absolute certainty as to the number of veins on the fore wings.

Spermatophthora gemmatilla, Sp. nov. Expands 26 mm. Palpi ocher, with a reddish tinge. Head, thorax, abdomen and fore wings ocher washed with bright reddish wine color. This on the fore wings is lighter on subcostal and costal veins forming a light ocher line, and the red is slightly darker just behind the subcostal space, and is somewhat brighter basally and apically. Hind wings light fuscous. Beneath fuscous, lighter on hind wings.—1 ♂. Illinois.

Spermatophthora multilineatella, Sp. nov. Expands 18 mm. Head parts, thorax, abdomen and fore wings light ocher yellow. Maxillary palpi strongly developed, turned upward between the labial palpi, and reaching beyond the summit of the head. Fore wings with the veins marked by distinct narrow even fuscous lines; there is also a corresponding line at the middle of the space between the veins, except between 1 and 2 where there are two lines, as there are also between 1 and inner margin. Hind wings, pure silky white. Beneath as above, with the lines of fore wings a little indistinct.—2 ♂♂. Fla.

Spermatophthora montinatatella, Sp. nov. Expands 25 to 27 mm. Head, thorax and abdomen fuscous with a tinge of reddish on the patagiæ. Fore wings bright reddish gray, except a broad costal stripe reaching from base nearly to apex, which is white with scattered reddish scales. Very faint indications of basal and outer gray cross lines by a lightening of the red color on the lines, and a deepening of it on either side. Margin and fringe grayish fuscous. Hind wings fuscous, with black marginal line. Beneath, dark fuscous, with a reddish tinge on fore wings; fuscous on hind wings.

1 ♂, 1 ♀. Sierra Nevada Mts., Cal. Very nearly in color appearance to *Pempelia petrella* Zell., or rather the insect which goes under that name in America. Prof. Fernald has of the latter a specimen identified from a specimen of Zeller's in the Cambridge Museum but is not at all a *Pempelia,* and there may be some mistake somewhere. The insect however corresponds with Zeller's description; and those who know Prof. Fernald know that it is hardly possible that he should have been guilty of an error.

Spermatopthora Graciella. Sp. nov. Expands 28 mm. Palpi fuscous gray whitish above. Head light gray. Thorax light fuscous in front, gray at middle blackish behind. Abdomen gray. Fore wings white on anterior half fuscous white on posterior half. Veins sharply lined with black or fuscous black and a blackish line dividing the discal cell. Cross lines faintly indicated, the basal by a black line close to the base and present only near costa, the outer by a black patch near apex. A marginal line of somewhat lengthened black points. Hind wing light shining fus-

cous. Beneath fuscous the posterior portion of fore wings and the whole hind wings light fuscous.—1 ♂, Col.

Spermatophthora (?) **bonifatella.** Sp. nov. Expands 21 mm. Palpi, head, thorax and light fuscous. Addomen mouse colored fuscous. Fore wings ocher fuscous, the veins slightly lighter. At the posterior side of the cell near the cross vein is a whitish dot with a black dentate spot at each end. A faint line of dark points on margin; fringe ocher. Hind wings dark smoky fuscous. Beneath fuscous.

1 ♂. Col. Not by any means entirely congeneric with *Spermatophthora* but placed there provisionally.

Acrobasis alatella, Sp. nov. Expands 18 to 22 mm. Palpi dark gray, white in front, fuscous at tip. Head and thorax fuscous gray. Abdomen fuscous anteriorly, ocher fuscous posteriorly. Fore wings narrow, strongly arched on outer third, apex rounded, outer margin oblique, inner angle rounded, light gray in color, much marked with fuscous. Posterior portion of basal field fuscous. Basal line white, rounded, and extending outwardly towards inner margin, edged outwardly with black. Middle field with anterior half dusted with fuscous, posterior half fuscous, with a longitudinal white dash between the two portions. Outer line oblique from towards apex, faint, diffuse, edged with indistinct diffuse fuscous. Outer field heavily dusted with fuscous. Fringes gray. Hind wings light fuscous, becoming fuscous at tip, sub-pellucid. Beneath, smooth, even fuscous on fore wings; hind wings as above.—3 ♂♂, 1 ♀. Cal.

Acrobasis hystriculella, Sp. nov. Expands 18 to 20 mm. Head parts smoky fuscous. Thorax smoky fuscous on sides and front, ocher fuscous on dorsum and posteriorly. Abdomen yellow fuscous. Fore wings light gray, powdered with fuscous. Extreme base fuscous. Outer basal field with two short longitudinal black dashes, one at the middle of wing, the other near anal margin, these edged more or less distinctly with white. Basal line well out, white, twice dentate outwardly, shadowed narrowly with black on both sides. On middle field a large faint fuscous oval discal spot with white center; outer posterior middle field fuscous, extending across outer line over the whole outer field, though less marked along margin. Outer line even, curved outwardly, shadowed on both sides. A marginal line of confluent dentate black points. Hind wings light ocher fuscous, with black marginal line. Beneath fuscous on fore wings; hind wings as above. 2 ♂♂, 2 ♀♀. Tex.

Myelois aliculella, Sp. nov. Expands 21 to 23 mm. Labial palpi gray white in front, black at tip. Maxillary palpi orange fuscous. Head gray. Thorax gray. Abdomen ocher fuscous or fuscous. Fore wings white, heavily dusted with black scales, giving a gray appearance. Base blackish. Basal line white, angulated outwardly, with a heavy black marking outwardly at costa, sometimes extending on disc to discal ring; within with a reddish band sometimes quite obsolete. A discal circle of black quite large on middle field, this often very indistinct. Outer line white, fine, angulated at middle, then curved to inner margin, lined finely with black within, with more diffuse fuscous or reddish fuscous without. A row of marginal black points generally strongly dentate at middle portion of the wing, and reaching sometimes to outer shadow line. A short longitudinal black dash at the center of the outer middle field edged with white. Hind wings light ocher fuscous, pellucid.

Beneath, fuscous on fore wings. Hind wings as above.

5 ♂♂, 5 ♀♀. Ariz. I place this insect in this genus on account of the venation and in what is required in venation follow VonHeineman. In the palpal and antennal structure of the ♂ the insect is like *Salebria.*

Myelois zelatella, Sp. nov. Expands 20 mm. Palpi dark fuscous, whitish at joints and extreme tip. Head gray ; thorax fuscous ; abdomen with dark fuscous anteriorly, light fuscous posteriorly. Fore wings with a broad costal band, white, dusted with fuscous, extending from base to outer line, and more faintly reaching towards apex. On the extreme costa is a narrow black stripe, beginning at basal line where it is widest and extending to beyond the middle of the wing. Fore wings otherwise fuscous, merging gradually with the white band. Basal line very indistinct. Outer line distinct, slightly bent, slightly and finely wavy, dentate. Margin blackish. Hind wings deep fuscous with black marginal line. Beneath, dark fuscous.

3 ♂♂. N. Y., Can. This insect has the aspect of some specimens of *N. indiginella*, Zell. In referring it, a difficulty presents itself much as in the previous species. For while the venation is that of *Myelois*, (in sensu VonHeinemani), the antennal structure of the ♂ is that of *Nephopteryx*. However the stem of veins 4 and 5 of fore wings is very short, and unless examined in Balsam might be regarded as separate.

Myelois (?) Georgiella. Sp. nov. Expands 26 mm. Palpi head thorax and abdomen white washed with light fuscous. Fore and hind wings pure glistening silvery white the hind wing with a faint fuscous stain. Beneath fore wings fuscous with middle and edges much lighter ; hind wings as above.

1 ♂ Col. Placed provisionally in this genus to which it does not belong rightfully. Indeed the insect is decidedly un-Phycid like in appearance, and in some respects in palpal structure and venation. The reference is made on the basis of the number of the veins rather than upon the details which are in many respects quite aberrant.

Dioryctria unicolorella, Sp. nov. Expands 20 mm. Head and thorax even mouse gray. Abdomen with segments ringed, fuscous in front, light ocher fuscous behind. Fore wings even light mouse gray. Basal line whitish, obsolete, except at inner margin. Costa with a patch darker than the ground color. Outer line very near margin, very faint, bent outwardly. Hind wings light fuscous mouse gray, subpellucid with black marginal line. Beneath, light fuscous, the hind wings lighter.

1 ♂. Washington, D. C. Another rather composite insect, having the venation of *Dioryctria*, and the head parts of the ♂ as in *Salebria*.

Dioryctria bistriatella, Sp. nov. Expands 18 mm. Head and thorax fuscous gray. Abdomen fuscous, the segments narrowly black in front. Fore wings fuscous gray, or blue fuscous gray. Base, lighter antereriorly. Basal line straight, a little outwardly oblique, whitish somewhat broad and diffuse, less distinct costally, pure white towards inner margin, forming there a lengthened white spot ; it is shadowed outwardly by a broad dark fuscous band. The wing lightens beyond disc, and reveals two black discal points one preceding the other, somewhat confluent. Outer line whitish, slightly bent, subparallel with base, shadowed broadly both sides with dark fuscous. A row of black points on margin. Hind wings light fuscous, fuscous at apex, with black marginal line. Beneath dirty fuscous on fore wings, apex and anterior part of lined wings ; hind wings otherwise, very light. 2 ♀, Washington, D. C.

Dioryctria minutularia, Sp. nov. Expands 13 mm. Head body and fore wings even dark gray, consisting of black ground dusted quite evenly with white

scales. Fore wings pointed at apex, strongly arched, inner line white, nearly straight, edged outwardly with a distinct black band. Two black discal points. Outer line faint, fine, angulated, very oblique. Hind wings fuscous, blackish gray along anterior margin. Beneath, fore wings dark fuscous, hind wings light fuscous. 2 ♂♂, Tex.

Glyptoteles rhypodella, Sp. nov. Expands 20 mm. Tongue white. Palpi dark fuscous, gray in front. Thorax fuscous, patagiæ fuscous gray. Abdomen fuscous. Fore wings light gray, overlaid with fuscous shades. Base fuscous. Basal line close in, light gray, wavy, bent, shaded outwardly on the costal half of the wing with a broad fuscous black band. Discal spot large, blackish diffuse. Outer line light gray with a large outward sinus below costa, bent around posterior to discal spot, then at a right angle running to inner margin. The sinus is filled with dark fuscous reddish in the middle, reaching to the discal spot, and partly enveloping it ; a faint dark edging inwardly at inner margin also. Outwardly a large reddish fuscous blotch along costa nearly round, and another along inner margin, which following the line becomes obsolete at middle of wing. Apex and anterior marginal space gray. A faint marginal line of black points. Hind wings dark fuscous, sub-pellucid. Beneath, fuscous with indications of the outer light line on fore wings, and of a fine dentate darker line on hind wings. 1 ♂. Oregon.

Stenoptycha pneumatella, Sp. nov. Expands 18 mm. Head blackish gray. Thorax fuscous gray. Abdomen with segments ringed, dark fuscous in front, light fuscous behind. Fore wings blue gray, quite even in color over the wing. A small white spot at center of basal field, sometimes obsolete. Basal cross line well out, wavy angulate, shadowed by black outwardly which is heavier and more diffuse near costa. Two black discal points, generally confluent, often followed by white. Outer line fine, white, angulated from costa first inwardly then outwardly, then nearly straight to inner margin, shadowed inwardly and outwardly with black, the inner line being the heavier. A marginal line of black points. Hind wings smoky to ocher fuscous, sub-pellucid. Beneath fuscous, the outer line of fore wing sevident ; hind wings as above.

8 specimens N. Y. N. C. Mo. Food Plant Elm. The generic reference is based upon the venation. The head parts of the ♂ would place it in *Pempelia.*

Stenoptycha pallulella, Sp. nov. Expands 18 to 25 mm. Tongue light gray. Palpi fuscous. Head and thorax dark olive fuscous. Abdomen ocher fuscous. Fore wings light gray with reddish brown and black markings. Basal field reddish brown, except along costa, deepest along the basal line. Basal line white, far out at the middle of the wing, twice angled inwardly, scalloped outwardly. Middle field narrow, bright black, with more or less of white scales, except along inner margin which is reddish brown. A white discal point. Outer line distinct, white dentate sinuate, with two angles more or less rounded inwardly, edged within with a sharp black line Outer field reddish brown except apically which is light gray. A marginal black line cut by the veins. Hind wings smoky fuscous with black marginal line. Beneath fuscous, fore wings lighter on outer field, and hind wings with outer line faintly indicated. 6 ♂, 5 ♀, N. Y., N. C., Utah, Wash. T.

Anerastia electella, Sp. nov. Expands 15 to 24 mm. Palpi fuscous, dark fuscous at tip. Thorax dark fuscous. Abdomen ringed with dark and light fuscous

on each segment. Fore wings light fuscous, dusted with fuscous scales. A narrow costal stripe of ground color, without the intermingling fuscous, extending from base nearly to apex. A faint diffuse outer line, oblique, and in good specimens dentate. Hind wings light fuscous pellucid. Beneath, fore wings fuscous, hind wings lighter.

6 ♂♂, 3 ♀♀, Tex. This insect is variable much beyond what is ordinary in the genus; the general coloration of the specimens is somewhat different, they differ much in size and there is some difference in the venation of the fore wing, the stem of veins 4 and 5 being longer in some than others.

Anerastia illibella, Sp. nov. Expands 16 mm. Palpi light ocher fuscous. Head and thorax light ocher with fuscous tinge. Fore wings, light ocher, lightest along costa, forming an indistinct stripe, and darkest just behind subcostal vein. A slight powdering of fuscous scales, more marked on the veins. Hind wings white. Beneath light ocher on fore wings, white on hind wings.

2 ♂♂, 1 ♀, Tex. Not properly congeneric with *Anerastia* on account of a remarkable development of the clypeus, but I place it here till a genus is created for the species.

Anerastia opacella, Sp. nov. Expands 22 mm. Palpi dark gray. Head and thorax fuscous brown. Abdomen light ocher. Fore wings with the portion anterior to the median line white, posterior portion blackish gray. The two colors somewhat merge into each other, and the white, especially posteriorly and outwardly, is dusted with black and fuscous scales. Hind wings ocher fuscous. Beneath, fuscous on fore wings, light fuscous on hind wings.

1 ♂, 2 ♀♀. Tex.

Ephestia opalescella, Sp. nov. Expands 14 to 18 mm. Palpi, thorax, and fore wings dull even ocher white, the head parts faintly washed with fuscous. A faint extra basal fuscous point on fore wing at center, showing probably the location of an obsolete cross line. A faint discal point of same color. Extreme outer edge a little fuscous, with fringe composed of intermixed white and dark scales. Hind wings light ocher, with fuscous tinge, stained darker along margin. Beneath, light ocher, with outer margins slightly stained.

3 ♂♂. Cal.

Ephestia Ella, Sp. nov. Expands 14 to 18 mm. Head parts very dark fuscous. Thorax very dark fuscous in front, lighter behind. Abdomen orange fuscous on anterior segments, light fuscous on posterior. Fore wings even blackish brown, with a costal stripe between subcostal and edge, clay white in color, with a slight intermixture of brown scales, beginning at base, running to a point and becoming obsolete just before apex. The division between the two colors of the wing is sharp, and they stand in strong contrast. The males seem to be slightly lighter in the prevailing color of the fore wing. Hind wings dark fuscous. Beneath dark fuscous.

3 ♂♂, 2 ♀♀, Fla. Differs from the typical *Ephestia* in palpal and antennal structure in the ♂.

Descriptions of New Species of North American TINEIDÆ.

By Wm. Beutenmueller.

Through the kindness of Rev. G. D. Hulst who has given me his entire collection of *Tineidæ*, and Mr. Henry Edwards who has placed at my disposal all the material of his extensive collection, I have been enabled to become acquainted with the following described species, which appear to be new to science. The types are all in my collection.

Acrolophus violaceellus, n. sp. ♂. Head and antennæ, yellowish brown; labial palpi thrown over the head and thorax, the scales beneath of equal length on all the joints, yellowish brown, except on the outside of the basal joint which is fuscous. Primaries, fuscous, with a strong violet reflection, without markings except an indistinct discal spot and a few marks on the costa before the apex. Secondaries, fuscous, without the violet reflection. Thorax, abdomen, legs and the underside of wings, fuscous. ♀, much larger than ♂. Primaries and secondaries, fuscous, with the violet reflection present on both, and the discal spot almost invisible. The wings are also much broader than those of the ♂, and the costa of the primaries more arcuate. Expanse of wings ♂ 26 mm. ♀ 34 mm. 4 ♂ and 1 ♀. North Carolina.

This species can be at once distinguished by its plain color, and violet reflection.

Acrolophus Hulstellus, n. sp. ♂, head fuscous, with rather long scales on the vertex projecting backwards; labial palpi re-curved over the head and thorax, first and second joints with short fuscous scales on the underside, third joint brush-like with long diverging scales. Antennæ pale brown, very long, nearly half the length of the fore-wing. Primaries, fuscous, covered irregularly with rust colored scales, an obsolete dark brown basal streak below the subcostal vein, running outwardly to nearly the middle of the wing, immediately below and a little beyond a small spot of the same color. The apical portion of the wings deep brown, limited by an oblique patch running from the end of the discal cell to the internal angle. Secondaries, thorax and abdomen, fuscous. ♀, labial palpi very short and not erect. Primaries, stone drab, covered, with bluish gray scales about the lighter portion; the basal streak absent, the base being covered with a number of dark brown scales instead, the oblique patch much larger and more suffused. Expanse of wings, ♂, 20 mm., ♀, 24 mm, 1 ♂, Indian River, Fla. 1 ♀ Kissimmee, Fla.

Very distinct from all its congeners hitherto described and easily distinguished by the oblique patch on the primaries. I have gratefully dedicated this singular insect to my good friend Rev. Geo. D. Hulst, who has given me so much encouragement in the study of the *Tineidæ*.

Acrolophus Davisellus, n. sp. Head and thorax, fuscous, mixed with grayish scales, labial palpi short, ascending, but not recurved over the head and thorax, deep brown outside, and ochreous inside. Primaries, fuscous, irregularly mottled with deep brown patches, forming a sub-lunate dash, running from the disc nearly to the apex, and another patch on the fold about the middle of the wing, below which there is a dirty white space running along the middle third of the internal margin, other dirty white scales scattered over the wings, cilia brown, with pale spots. Secondaries and cilia fuscous. Expanse of wings ♂, 28 mm. ♀, unknown. 1 ♂, Arizona.

The species is allied to *A. arcanella*, Clem. Named in honor of my friend Wm. T. Davis of Staten Island, N. Y., an earnest and closely observing entomologist.

Acrolophus plumifrontellus, Clem., var. **angustipennella**, n. var.

This variety differs from the type form in having the wings much narrower, and the markings almost absent. It is also much smaller.

Expanse of wings 25 mm. 6 ♂, Georgia and Fla.

A remarkable Arctian and a history.

By David Bruce, Brockport, N. Y.

In the beginning of June this year a friend in Batavia, N. Y., captured a strange moth at light, which I saw and pronounced an undescribed species. It was in general appearance something like a large dark colored *Euchætes egle*. The head, body and legs sooty brown, small black dorsal spots on body; all the wings brownish mouse color. The veins on fore wings distinctly white as in *Ct. venosa* and *Cressonana*; it was a ♀ in fair condition, and reviving from the effect of a weak cyanide bottle she laid about 2 dozen eggs on the setting board. I took charge of half the eggs, they were yellow and hatched in a few days. I fed them on leaves of Plum at first, then found they would eat Plantain on which I reared them. I carefully watched and noted every change and observing how much they resembled *Spilosoma*, I compared them with several larvæ of *S. Virginica*, which were abundant by the roadsides in Denver, but these though varying much were mostly nearly white, while my larvæ were of a rich chestnut brown with black heads, hairs on second and third segments velvety black. I carried them with me everywhere. They were 2 weeks above timber line. They all flourished and pupated and in 12 days after, the whole lot emerged from the cocoons in splendid condition, but to my disappointment and disgust—were examples of *Spilosoma Virginica*. I think this is a remarkable case of melanism and deserves recording. If my friend had not preserved the eggs and I had not reared the larvæ, this would certainly have been named as a new species and would have been a standing puzzle to Entomologists.

In the Tidschrift vor Entomologie, Vol. XXX, Prof. P. T. C. Snellen has an extended article on the Lepidoptera of the Island of Curacao, W. I., in which a number of species are described and figured. Among these p. 54, pl. 4, f. 6, is one described as *Thelcteria costomaculalis*, which is the counterpart of *Emprepes novalis*, Grt. In the same article reference is made to the fact that *Zophodia (Megaphycis) Bollii* Zell., is found in the Island, and the species is described p. 64, and is figured pl. 5, f. 6. Geo. D. Hulst.

ENTOMOLOGICA AMERICANA

VOL. III. BROOKLYN, NOVEMBER, 1887. NO. 8.

NOTES ON LACHNOSTERNA.

By George H. Horn, M. D.

There is probably no genus of Scarabæidæ in our fauna about which so little is known by the numerous collectors in our country as Lachnosterna. This too in face of the fact that the species are for the most part of large size and abundant whenever found. Unfortunately there are no striking differences between the species which arrest the first glance. A few seem to have met easy recognition and are correctly named in every series examined such as *crenulata*, *hirsuta*, *hirticula*, *micans*, *tristis* and *fusca* although several species are often mixed under the latter name.

It is not surprising that attention has not been given to the species as the literature at present available does not give great assistance, and in my own case there was almost equal difficulty in arriving at a correct determination of the species with the types for comparison along with the literature.

Lachnosterna is certainly one of the most difficult genera in our fauna and the correct determination of the species has been rendered uncertain by the large proportion described from uniques.

For more than twenty years I have had in mind a careful study of the genus and have allowed no opportunity to escape that would add to the material on hand and many a time in the slow accumulation my Lachnosterna boxes have served as a relaxation when other work has been burdensome.

While on a visit to the Museum at Cambridge during the past Summer I had an opportunity through the kindness of the Curator, to compare a selected series from my own cabinet with the types of Dr. LeConte. With this as a basis it became necessary to go over the works of previous authors to verify the determinations and eliminate error as far as possible.

In the present short essay I propose to give the results of my synonymical study, or at least my present determinations, as a closer study when the descriptions are to be written may possibly modify the views here given.

In a paper published by me (Trans. Am. Ent. Soc. '78, p. 137–138) I have shown that Tostegoptera, Eugastra, Endrosa and Gynnis should be united with Lachnosterna. This view I have seen no reason for changing.

Among the species at present in our lists there is some confusion and more synonymy. In order to make the synonymy clear I propose to take the authors by date of seniority.

Froehlich describes *fusca* and *crenulata.*

Fabricius describes *tristis.*

Knoch describes *quercus, micans, ilicis, hirticula, hirsuta, pilosicollis* (=tristis) *quercina* (=fusca).

Gyllenhal describes *fervens* (=fusca) *Knochii* and *georgicana* (=crenulata).

Say describes *longitarsis, ephilida, balia* and *lanceolata.*

Harris describes *fraterna;* Hentz describes *porcina* (=ilicis).

Melsheimer describes *rugosa* and *pruinosa* ‖ (=prunina Lec).

Blanchard (Ent. Mus. Paris) described many species from our fauna and quotes a number of others some erroneously. As many of those species were unknown to Dr. LeConte, it has been thought advisable to condense what is known of them. They are all described as Ancylonycha.

L. profunda Bl. distinct species allied to rugosa and Knochii.

„ *brevicollis* Bl. a race of fusca.

„ *fervida* ‡ Bl. is crassissima Bl.

„ *puncticollis* Bl. probably a good species allied to fusca.

„ *fervens* ‡ Bl. is congrua Lec.

„ *uniformis* Bl. is ephilida Say.

„ *pruinosa* ‡ Bl. is gibbosa Burm. (*futilis* Lec.)

„ *crenulata* ‡ Bl. is hirticula,

„ *crassissima* Bl. subsequently described as obesa Lec.

„ *longicornis* Bl. I have examined the type but it is doubtful as a member of our fauna, all the other species given by Castelnau are from Brazil.

„ *micans* ‡ Bl. is prununculina (*cerasina* Lec.)

„ *diffinis* Bl. is allied to fraterna, has a very long antennal club and the last ventral ♂ not impressed. It is from South Carolina, M. Sallé informs me, not Texas.

Burmeister (Handbuch 1855) follows with a much greater series, described as Ancylonycha and Trichestes.

L. quercina Kn. is fusca.

„ *fraterna* ‡ Burm. I have no doubt that this is prunina Lec. from which the prulinosity of the surface has been removed by alcohol. By admitting this, some of the following descriptions may be better understood and the species identified.

L. micans Knoch, correctly identified.

„ *cognata* Burm, is correctly determined by Leconte.

„ *gibbosa* Burm. The following remark is added to the description "One of the two specimens before me shows a remarkable anomaly; the ventral segments usually connate are free, in their middle convex resembling the appearance of barrel-hoops." By this seemingly unimportant note I have discovered specimens of futilis Lec. which agree as well in the anomaly as in the description.

L. Forsteri Burm. seems to be that described as lugubris Lec.

„ *Knochii* Gyll. Burmeister described from the type.

„ *ilicis* ‡ Burm. I have specimens which seem to agree and will require a new name.

L. fimbriata Burm. is the true ilicis Knoch.

„ *crenulata* Fröhl, and *hirticula* Knoch are correctly determined.

„ *albina* Burm. Known to us but rare.

„ *rugosa* Mels. correctly determined.

„ *comata* Burm. is balia Say.

„ *quercus* Knoch. correctly determined.

„ *lanceolata* Say, under Tostegoptera, correctly determined.

The following are described as Trichestes.

L. tristis Fab. correctly determined.

„ *comans* Burm. subsequently described as rufiola Lec. determined from a duplicate in Zimmerman's old collection.

L. crinita Burm. subsequently described as glabripennis Lec.

„ *ephilida* Say. correctly determined.

„ *longitarsis* Say. correctly determined by Burm. notwithstanding LeConte's opinion to the contrary.

L. prununculina Burm. since described as cerasina Lec.

„ *gracilis* Burm. since described as volvula Lec.

„ *dispar* Burm. Subsequently described as Gynnis debilis Lec.

The Revision of the Melolonthidæ by Dr. LeConte appeared nearly two years after the work of Burmeister. The species of Lachnosterna were described in part as Eugastra, Endrosa and Gynnis, while Tostegoptera was then suppressed. The following are the species:

L. ventricosa Lec. with cribrosa Lec. as synonym.

„ *quercus* Knoch. correctly determined.

L. volvula Lec. is gracilis Burm.
„ *lanceolata* Say, correctly determined.
„ *æqualis* and *farcta* Lec. valid species. The first is represented by an unique.
L. torta Lec. a very distinct species.
„ *frontalis* Lec. is scarcely a variety of longitarsis Say.
„ *dispar* Burm incorrectly determined, is clemens Horn.
„ *latifrons* Lec. a good species.
„ *cerasina* Lec. is prununculina Burm.
„ *ephilida* Say, correctly determined.
„ *Burmeisteri* Lec. a smaller race of ephilida. The name was given under the supposition that Burmeister had incorrectly determined longitarsis Say,
L. glaberrima Bl. correctly determined.
„ *inana* Lec. is the same as volvula and is gracilis Burm.
„ *congrua* Lec. a valid species.
„ *futilis* Lec. is gibbosa Burm.
„ *fusca* Fröhl. correctly determined.
„ *cephalica* Lec. very closely allied to fusca.
„ *decidua* Lec. is comans-Burm.
„ *sororia* Lec. is a composite species, the ♀ type is a micans the ♂ is comans Burm.
L. micans Knoch, correctly determined,
„ *serricornis* Lec. is the ♀ of futilis and is gibbosa Burm.
„ *semicribrata* Lec. a mere variety of lugubris.
„ *lugubris* Lec. without much doubt Forsteri Burm.
„ *cognata* Burm. correctly determined.
„ *fraterna* Harr. correctly determined.
„ *lutescens* Lec. a slight variety of lugubris.
„ *corrosa* Lec. a valid species.
„ *calceata* and *marginalis* Lec. valid species.
„ *obesa* Lec. is crassissima Bl.
„ *prunina* Lec. (for pruinosa ‖ Mels.) a good species.
„ *rugosa* Mels. correctly determined.
„ *affinis* Lec. a good species.
„ *Knochii* Gyll. correctly determined.
„ *ilicis* Knoch, correctly determined.
„ *ciliata* Lec. possibly a race of ilicis.
„ *subtonsa* Lec. is ilicis Burm.
„ *hirticula* Kn. and *hirsuta* Kn. correctly determined.
„ *balia* Say, correctly determined.
„ *vilifrons* Lec. a good species.

L. hirticeps Lec. does not differ from vilifrons.

„ *nitida* Lec. Of this I have seen two ♀ specimens, while possibly a valid species it may be an anomalous fusca.

L. rufiola Lec. is comans Burm.

„ *robusta* Lec. is crassissima Bl.

„ *integra* Lec. This name is preoccupied, *clypeata* is suggested instead.

„ *crenulata* Fröhl. and *albina* Burm. correctly determined.

„ *parvidens* Lec. and *rubiginosa* Lec. valid species.

„ *submucida* Lec. and *glabricula* Lec. valid species.

„ *glabripennis* Lec. is crinita Burm.

„ *tristis* Fab. correctly determined.

„ *crinita* ‡ Lec. is a race of tristis Fab.

„ *debilis* Lec. (Gynnis,) is dispar Burm.

„ *errans* Lec. a valid species.

„ *maculicollis* Lec. and *nitidula* Lec. are good species and constitute a special division.

A few other species have been described but these do not affect synonymy and are left for a fuller bibliography.

From what precedes it may be scarcely necessary to say that my work on a monograph of the species has fairly begun and has progressed so far that the species are well separated and the synoptic tables prepared subject to such modification as may be found necessary when descriptions are written.

While I must frankly admit that I do care to be interrupted in the work of writing descriptions of about eighty species, I am perfectly willing to return the names to any one who will send carefully compared duplicates of any species, preferably both sexes. I cannot at present consent to receive any which must be returned.

Some Additional Synonymy.

Agrilus texanas Crotch, on comparison this species proves to be *cavata* Chev.

Cymatodera fallax Horn, is *balteata* Lec. My error resulted from an accidental change of label in the Leconte collection.

Trox foveicollis Har., is *insularis* Chev.

Early Stages of Orgyia nova, Fitch.

By Henry Edwards.

The egg mass, differing only in being surrounded by a web of darker color than *O. leucostigma* was found attached to a species of *Pinus* at Houghton, Michigan, Oct. 1885. The larvæ emerged May 1–8, 1886.

Young larva. Ground color of the body, dull brown, with the tubercular bases of the long hairs, distinctly black, Head rather large, jet black, shining. The second segment, (that immediately adjoining the head) also swollen, with its lateral tubercle, larger than the rest. Across the 3d and 4th segments is a dull pale streak, and a narrower one also across the 8th segment. The hairs are spread out widely at the sides and posteriorly, and are nearly as long as the body of the larva. Under side mouse color, with the feet black, shining. Before shedding its first skin, the small tubercle at the base of the 2d segment becomes indistinctly coral red. This color does not appear until just before the shedding of the skin. There is also some variation in the ground color; some specimens becoming sordid white, with all intermediate shades to a pale brown. At this period, the little caterpillars put out a long silken thread, sometimes to the extent of 18 inches, which in their natural condition, doubtless enables them to pass to other portions of their food-plant. The length of the caterpillar at 3 days old, was about 3 mm. to 4 mm.

After 1st moult (May 9.) The head, 2nd, 4th to 8th segments inclusive, the 10th, 11th and 12th are now rich velvety black, the segments divided by a waved streak of sordid white. The 3d and 9th segments are dul white, the latter with dull yellow dashes anteriorly. At the base of the 2nd segment are two tubercular proceesses, red at their base, and there is a coral-red spot on the 10th and 11th segments respectively. Underside as well as the legs and feet dull black. Length 5–6 mm. As the larva increases in size before again moulting, the whole of the black space becomes a dull pale brown, and there appear on the 10th and 11th segments two very strongly marked red sealing wax like tubercles, those of the same color on the 2d segment becoming also more distinct. The tubercles of the other segments are now rich black, very strongly shown in contrast with the ground color. The yellow dashes of the 9th segment are now bright rich orange color.

After 2nd Moult (May 18.) The usual tufts of hair common to the genus now appear, and all the colors are bright and clear. Head jet black, shining. Mouth parts sordid white. Second segment also black, with white hairs in centre and with two long pencils of black hairs, thickly massed at their summit. At their base, the two reddish tubercles formerly noted. Dorsal region of segments three and four yellowish white with black median streak. Sides black. Segments five and six

surmounted by large velvety black tufts of hairs; seven and eight by tufts of shorter clear white hairs; 9th segment bright orange, with whitish waves; 10th and 11th with the red tubercles very distinct, 12th with pencil of black hairs, directed backwards. Anal segment, dull brown. Along the lateral region which is black, are some faint and slightly waved dull yellow lines. Under side dull slate color, feet and legs concolorous.

Length, 11 mm.

After this moult, there is no change in the larva except in size until it attains its mature growth which has been fully described in Proc. Cal. Acad. Sc. and Papilio by myself and Mr. R. H. Stretch.

It is a question for doubt as to whether this form is, or is not, the same as the European *Org. antiqua* L. I have elsewhere stated it as my opinion that the two are identical, but there is certainly a considerable difference in the larval stages. My specimens fed upon *Pyrus communis* and Wild Cherry, though the many ♂♂ I took in Michigan were hovering around a species of *Pinus* on which I also found several ♀♀. The species appears to be northern in its habitat, as I first took it in Vancouver Island and have observed it also in Northern Ontario and in Quebec.

Ed. Ent. Am.

Dear Sir,

In reference to the interesting contents of the last number of your Journal I would state that *Nola fuscula* is founded on a Colorado example which seemed to belong to a larger and paler species than the Texan *minuscula* in my collection. It is probable, as I at the time suspected, that it is only a local variety. In separating *A. virgo* and *Saundersii*, I referred to the character of the narrower stripes and the W or M mark; I think the x mark may be derived from the W. In my list the species are not arranged with exactitude. At that time there was no certainty (nor is there now) as to their real standing. In my opinion no lumping of our Arctias can be called "good" which is not based on breeding and a knowledge of the variations of the larvæ. As to Mr. Walker's names, care must be taken that we have to do with his real type and that his printed description bears the species out. Between my first and second visits to the British Museum specimens had been added. I refer to my already printed papers for instances where specimens of several species appeared under one label.

A. R. Grote.

The Collection of Insects in National Museum.

We learn that the U. S. National Museum has acquired by purchase Mr. J. B. Smith's Collection of Native and Foreign Insects.

Mr. Smith's collection of American Coleoptera contained nearly 5000 species, and was especially rich indeed almost perfect in the *Cicindelidæ* and *Carabidæ* and in some families, notably the *Mordelidæ*, it was typical. Of European and other Exotic Coleoptera there were fully 5000 species.

In the Lepidoptera, while the collection was not so complete as in Coleoptera, yet in some families it was scarcely excelled by any collection. The British Museum with the possession of Mr. Grote's collection has many more types in the *Noctuidæ*, but Mr. Grote's collection was by no means so complete in species; among these of the Museum are many types and typical specimens.

From what we are able to learn the collection of insects in the National Museum at Washington is rapidly and steadily becoming the best in the country. It contains the following individual collections.

Collection of Prof. C. V. Riley, a statement of which was published Ento. Am. Vol. I, p. 55, consisting of 17,225 species in various orders, with 115,058 specimens. This is incomparably rich in examples of larval development and history.

Collection of Prof. C. V. Riley of adolescent stages in alcohol, and minute insects and larvæ in Balsam.

Collection of O. Meske of Albany, at one time one of the most valuable in the country, and containing many types.

Collection of J. B. Smith above mentioned.

Collection of Belfrage, contained in part in the Riley Collection, the large lot of Exotics however coming through the Department of Agriculture.

The Burgess Collection of Diptera, also forming part of the Riley Collection.

The Morrison Collection purchased from his relatives.

Dr. Williston's types of the Syrphidæ are also to go to the Museum, as he states in his Monograph.

To these are to be added the vast and varied accumulations of the Entomological Division of the Department of Agriculture. The Collections of this Division Prof. Riley has wisely placed in the National Museum.

Also large increase has been made through the ordinary channels of exchange. The collection is therefore one of exceptional value and in view of the certainty that hereafter it will be in the care of some specialist as Curator or Assistant it offers itself as a safe and proper depository for the collection of specialists.

Observations on Capsidæ with descriptions of new species.

By P. R. Uhler.

(No. 4.)

Div. BRYOCORARIA.

ECCRITOTARSUS Stal.

E. elegans, new sp.

Elliptical with the hemelytra parallel-sided, the pronotum transverse and steeply sloping in front, the upper surface opaque, strongly pilose. General color fuscous, the head, legs, antennæ, base of rostrum, most of the pectoral and ventral surfaces, and the collar of the pronotum pale rufous. Head clothed with minute pubescence, vertex very short, transverse almost horizontal, not as wide as the apex of the pronotum, the eyes small, round, prominent. Face nearly vertical, the tylus prominent. the rostrum reaching to the posterior coxæ, fuscous from beyond the base to the tip. Antennæ thick, as long as the hemelytra, the basal joint about as long as the head, the second equally stout, curved, as long as the pronotum and head united, the third slender, nearly as long as the second, the fourth equally slender, a little longer than the basal one. Pronotum transverse, gently arched transversely, a little convex, fuscous, clothed with fuscous erect pubescence; the collum not apparantly pubescent, rufous, acutely prominent, connected on the middle with a raised slender line that runs back to base, an impressed transverse line bounding the base of the anterior lobe; lateral margin sinuated, at the humere prominent, with the angles subacuminate. Scutellum nearly equilateral, almost flat, rufous, somewhat indented near the middle. Legs long, rufous sometimes piceous on the tarsi and end of tibiæ; the posterior pair very long, with the femora incurved, but not clavate. Hemelytra testaceous, or whitish, clothed with erect slender, gray pubescence; the clavus and inner margin of the corium marked with fuscous, together forming a large suboval spot which extends to behind the middle of the corium; tip of corium crossed by a band of the same color, and the apex of the cuneus is also fuscous; membrane fuscous or black. Venters short and broad, blunt at tip, but a little more than one half as long as the hemelytra, rufous marked with black, or sometimes entirely black, or fuscous.

Length to tip of venter ♀ $1\frac{3}{4}$—2 millims, ♂ $1\frac{1}{2}$ millims, to tip of membrane ♀ 2 –$2\frac{1}{2}$, ♂ 2 millims.

This beautiful little insect has been collected in Central Texas by Mr. Belfrage; in Riley County, Kansas, by Prof. Poponoe, and in Illinois by Robert Kennicott and Prof. Forbes. A specimen from Los Angeles, Cal., is in the U. S. National Museum. As is the case in many genera of the *Capsidæ*, the head of the male is shorter, the vertex more depressed, and the face less convex than in the female.

It should be noticed that the genus *Sixeonotus* Reuter is preoccupied by *Pycnoderes* Guerin; the latter name having priority by many years over the former.

Monacoris ficilis Linn., proves to be widely distributed in North America. It has been brought from the vicinity of Fort Simpson on the Mackenzie River, by Robert Kennicott; and spreads South as far as Tamaulipas, Mexico. On the Eastern side of the continent, it has been found from Chicontimi and Montmorency, Province of Quebec, through all the United States southward into Florida.

Div. CYLLECORARIA.

EUCEROCORIS, Westw.

E. guttulatus n. sp.

Elongate subcylindrical, contracted behind the head, dull cinnamon-fulvous, more or less springled with rufous, with a pale yellow, transverse spot at the base of the cuneus, and with the antennæ, excepting the terminal joint, the tibiæ, posterior pair of coxæ and base of venter whitish-yellow. Head bluntly rounded, opaque, sparsely pubescent, more or less rufous; face nearly vertical, vertex a little longer than the width of the eyes, with a slender groove extending from the base to before the middle, the eyes black, oval, prominent, almost vertical, separated from the thorax by a contracted collum; front moderately convex, the tylus long and prominent; rostrum reaching to the posterior coxæ, pale yellowish, the basal joint stout, rufous or brownish, extending to a point on a line with the base of anterior coxæ, the apical joint mostly piceous; antennæ much longer than the body and hemelytra united, filiform, not tapering, the basal joint a little stouter, the apical one very short, black or piceus. Pronotum campanulate, very sparsely pubescent, the posterior lobe polished, a little longer than the anterior one, anterior lobe convex in both diameters, paler and more rufous, depressed on the middle, the anterior and antero-lateral margin bluntly recurved, supra-coxal lobe lunate, vertical, strongly defined by deep sutures. The two anterior pairs of coxæ flecked with rufous; femora long, the two anterior pair slender, tinged with rufous above and on the outside, especially at tip, posterior femora stout, long fusi form, a little curved, mostly piceo-rufous, tibiæ still longer and more slender, pale testaceous, minutely piceous at tip, armed with long, slender, dark spines, of which those on the posterior proceed from black dots, the tarsi a little infuscated at tip, with the nails piceous, basal joint nearly as long as the apical, the intermediate joint very short. Scutellum strongly convex, accuminate and pale at tip. Hemelytra long and narrow with a broader rounded membrane, dull tawny, minutely pubescent, having a minute, pale dot on the corium next the apex of the clavus, and a pale, transverse line at base of the cuneus, membrane pale, marked with a spot of fuliginous at tip which is sinuous on its inner border; veins of the areole, and also of the wings, red. Abdomen much contracted on the basal third, polished, tawny, darker posteriorly, the venter with a large white spot extending to beyond the middle.

Length to tip of venter: ♂ 4½, ♀ 5¼ mm.; to tip of membrane: ♂ 6½, ♀ 6—7 mm.

Taken from the Liriodendron and from Grape vines in several parts of Maryland, from the Eastern shore of Chesapeake Bay to the hills of Frederick County, at various times between July 18th and August 14th. It occurs also in Texas and Western Illinois. The swollen figure of the

venter, especially in the female, gives a decidedly *Polistes*-like aspect to this remarkable form, and it also bears some resemblance to our forms of *Alydus* and *Berytus*. It can hardly be the species *E. nigriceps*, described by Prof. Westwood, London Entom. Soc. Trans., v. II, 1837, p. 22, pl. II, fig. 7, as the type of his genus; but the proportions in form there given would seem to approach very nearly to those of our species, notwithstanding the disparity in the colors of the two insects.

The genus *Xenetus* established by Mr. Distant in the Biologia Centrali-Americana will, no doubt, prove upon actual comparison of the types to be the same as this *Eucerocoris* of Prof. Westwood. In the former, the eyes are stated to be "contiguous to the anterior margin of the pronotum," but in all the numerous specimens that I have examined only the immature females seem to have a corner of the eye in contact with the pronotum. In the males, the eyes are, as in many genera of *Capsidæ*, widely remote from the collum of the pronotum, while in the females they are in direct contact therewith. No contact is seen in the figure of *Xenetus bracteatur* Dist., which exactly agree in form with our species of *Eucerocoris* described above.

An interesting New Genus of South American Tachinidæ.

By Prof. S. W. Willrston.

In a valuable collection of South American Diptera, received from Mr. H. H. Smith for study, I have found a very singular species of *Tachinidæ*, of sufficient interest to justify its description in advance of a more extended paper now in preparation. The species differs not much in structure from some of *Jurinia*, save in the antennæ, but the structure of these, at least in the male, is the most remarkable that I have seen in the order. The peculiarity of structure is essentially sexual, though the female antennæ shows a trace of the male structure, sufficiently unique in itself to distinguish the species generally with sharpness. The singular development is in the third joint alone, which as a whole is of very large size and composed of elongate slender rods enclosing a deep narrow basket-like cavity. How such a peculiarity should have arisen, and what service it can be to the male fly are speculations, which, like those on many other striking sexual peculiarities of structure so common among Diptera, must for the present remain as speculations. Here, as is so generally the rule among Diptera, and indeed among all forms of animal

life, the peculiarity, so far as it is sexual, is a male character; but it is in this family where we find more frequently than in any other, definite female sexual structural peculiarities—I mean the flattened front tarsi; similar and striking female characters I have observed in several South American *Syrphidæ*, but I can recall few other instances in the order.

The structure of the antennæ in the present case, as well as I can describe it, is as follows: The first joint is short; the second stout, and about twice as long as the first, its width at the tip nearly as great as the length. The third consists essentially of two very slender processes or branches, which give off twelve pairs of slender rods symmetrically. The upper branch, the shorter, extends forward parallel with the upper border of the second joint; the other springs at a right angle from the extreme base, and descends to the oral margin, curved throughout, and forming the convex hypothenuse of the right-angled triangle, the other two sides of which are straight. From the upper branch there arise four, from the lower eight pairs of rods, which are slender, horizontal and parallel, separated by about their own width from the adjoining ones on each side, and gently curved outward to enclose the deep bilaterally symmetrical cavity. They all terminate in a vertical plane, and form, in front view, an elongate elliptical figure four or five times as long as wide. The rods become successively shorter, the two last pairs being very short, and from between the branches of the upper terminal pair arises the stout, three-jointed arista. — The whole structure might be compared with the ribs and keel of a very narrow deep-ship.

In the female the structure is very different, more like that of the ordinary antenna of a *Jurinia*, except that there is a deep fissure from the anterior inferior margin, running parallel with the upper margin, two-thirds or more of the way to the base and dividing the joint into two unsymmetrical parts. The tendency toward the remarkable fissural structure of the male is yet further shown on one side only of one of the two females, where the upper portion has yet another, more shallow, emargination, forming two points to the division, and in the other female where the lower part has two very shallow emarginations of its border. The second joint is more slender than in the male, scarcely half the length of the third. The other generic characters are as follows:

Talarocera, gen. nov. Eyes small, bare. Front broad in both sexes; in the male with a single row of bristles, descending below the insertion of the antennæ; in the female with two additional bristles without, directed anteriorly. Fossulate portion of the face broad and shallow, the sides of the face rather narrow, and wholly without bristle; epistoma strongly projecting forwards; bristles confined to lowermost portion and oral margin, more on the cheeks; a single stout one at lower end of lateral ridges. Palpi projecting beyond the oral margin, broad and flat, spatulate.

Occiput thickly hairy. Second segment of the oval abdomen with two median posterior bristles; third segment with about eight on its posterior margin. Legs with moderately strong bristles. Neuration as in *Jurinia*; first posterior cell narrowly open before the tip, its posterior angle rectangular and with a minute appendiculation; posterior cross-vein oblique, its junction with the fourth vein twice as remote from the anterior cross-vein as from the angle of the first posterior cell.

Talarocera Smithii, n. sp. Head yellow, the front reddish or somewhat brownish. Third joint of antennæ yellowish red, in the female broadly brownish in front, the arista black. Palpi yellow; proboscis black, its horizontal portion about as long as the front tibiæ. Hair of occiput light golden yellow. Thorax deep shining, somewhat bluish black, lightly pruinose and with two slender stripes in front when seen from behind. Abdomen reddish translucent black, shining, the tip triangularly reddish yellow. Legs deep black. Wings and tegulæ deep brown. Length 14—15 mm.

Three specimens, Capada, Brazil (December and January), collected by Mr. H. H. Smith, well known as a writer on Brazil, and for his extensive South American natural history collections.

A NEW SPHINX.

By J. B. Smith.

Sphinx coloradus, sp. nov.

Fuscous or ashen gray, dorsum of the thorax a little darker. A broad, deep brown band from base of antennæ forming thence a broad margin to the patagiæ. This band narrowly margined with white on either side. Metathoracic tuftings blackish. Abdomen with dorsum fuscous or brownish gray, with a narrow, darker dorsal line. A broad lateral black band, interrupted by the narrow white margining of the segments forming very narrow demi-bands. Beneath, dull ashen gray. Primaries with a whitish shade through the center of wing from base to apex, this shade inferiorly margined by another of deeper more fuscous gray. Though this darker shade is a series of short, black, interspaced marks, the apical oblique dash formed by a somewhat incomplete union of three of these dashes. Parallel with, and rather near to the outer margin is a somewhat sinuate black line, with a paler gray shading on either side, the line attaining neither the inner margin nor the apex. Fringes pale, cut with darker gray. Secondaries brownish gray, immaculate; fringes pale, cut with darker gray. Beneath, uniformly brownish gray, with the apical dash faintly reproduced.

Expands 1.2 inch. = 28 mm.—Hab. Colorado.

The type is a male in Mr. Graef's collection. The species differs from all in this group with immaculate secondaries by the paler subcostal shade, which, with its darker inferior margining is characteristic of the species. The palpi are short and slender, hardly exceeding the front. Fore and middle tibia spinose, first joint of the tarsi with three longer, stout spines on outer side. The spurs are weak and short.

Notes on Diludia, *G. & R.*

By John B. Smith.

The genus *Diludia* was created by Messrs. Grote and Robinson in 1865 with *Sphinx brontes* as type, and with it were associated *florestan* and *collaris*—all West Indian or South American species (see Proc. Ent. Soc. Phil. 1865, 163 and 188). In describing the genus they say that *Sphinx jasminearum* and *S. leucophæata* would probably be referable to the same genus when identified.

The genus is said to have the "head large and salient; prothoracic parts well advanced before the insertion of the primaries." In the figure of *D. brontes*, pl. 1, f. 5, these characters are well marked, and with the genus as based on this species I have no present quarrel, though some of the species referred to it come uncomfortably near to *Protoparce* or *Macrosila*.

Besides the characters of *brontes* noted by Messrs. Grote and Robinson it may be stated that the eyes are not lashed, the tibiæ unarmed, fore tarsi heavily spinose, but not with heavier outer armature. I have seen no specimens from the United States, nor do I believe the species properly referred as part of our fauna. In 1868 Messrs. Grote and Robinson referred to the genus *Diludia* the species *jasminearum* and *leucophæata*, the latter unknown to them, and in Mr. Grote's subsequent list of Sphingidæ the species are—*jasminearum*, *brontes* and *leucophæata*.

Leucophæata I have seen from Mexico, and believe its presence in Texas whence Clemens received it, was accidental. In habitus it somewhat resembles *brontes*, but the head is not so prominent. The eyes are lashed, the fore tibia spinose, fore tarsi with a series of longer, stout outer spines. In structure therefore it is most like *Hyloicus*, and indeed the species is close to *lugens*, which it also resembles in type of maculation—differing however in the longer, more acute primaries. It is not congeneric with *brontes*, but best referable to *Sphinx* and associated with *lugens*.

Jasminearum differs from both the above species by the retracted head and the prothorax not produced before the base of the primaries. The legs are rather short and entirely unarmed; the fore tarsi have only the ordinary small spines. In habitus it certainly does not at all resemble *brontes*, and comes much closer to *Daremma* from which it differs however in the lack of tarsal armature.

I would propose for *jasminearum* the generic term *Chlænogramma* distinguishing it from *Diludia* and *Daremma* by the characters above mentioned. From *Sphinx* it differs among other things in having unlashed eyes.

Diludia not containing any American species must be dropped from our lists.

Hemipterological Contributions.

By William H. Ashmead.

(No. 1.)

Family BERYTIDÆ.

HOPLINUS, Stal.

Hoplinus multispinus, n. sp.

Length .20 inch. Pale yellowish brown, tarsi and terminal antennal joint, black. Head armed with three spines, one median on a line with base of antennæ, prominent but blunt, and one on each side just back of antennæ. There is a prominent acute spine at base of scutellum, two short sharp spines at tip of abdomen, and one on each pleura, extending and slightly curving over at base of elytra. Prothorax long, narrowed before, more than twice the length of the width at base, punctured, with a slight median carina, the narrow transverse portion just before the middle impunctured. The legs are long and thin, the posterior femora reaching beyond the tip of the abdomen.

Hab.—Florida.

This interesting addition to our fauna, is the first of the genus to be recognized in our fauna.

The genus was erected by Prof. C. Stal to contain a Chilian species, *Neides spinosissimus* Signoret, described by Dr. V. Signoret in Ann. Soc. Ent. de France, 1864, and the above is, I believe, the only other species known.

Family CAPSIDÆ.

RHINOCLOA, Reuter.

Rhinocloa citri, n. sp.

Length .05 inch. Black, shining, sparsely covered with little clumps of silvery white hairs. Antennæ long, first joint longer than head, rather stout, second joint longest, black at the base and tip, yellowish in the middle, third not quite two-thirds the length of second, yellowish, somewhat brownish or infuscated towards the tip, fourth setaceous, yellow. The thorax is trapezoidal, somewhat convex, declining before. The tip of cuneus yellow. The abdomen and all the femora excepting at tips are black, tips and anterior and middle tibiæ and tarsi yellowish, posterior tibiæ blackish at base becoming a yellowish brown towards tip, tarsi yellowish. All claws black.

Hab.—Florida.

Described from many specimens. These little Capsids are very instrumental in destroying scale insects, as I have detected them destroying various species of *Aspidioti* and *Dactilopii* on my Orange trees.

The species is very closely related to *Rhinocloa forticomis* Reut., described from Texas; but the color of the legs and antennæ will readily separate them.

Family TINGITIDÆ.

SPHÆROCYSTA Stal.

Sphærocysta Peckhami, n. sp.

Length .16 inch. Head and body black. Cells large, veins brown. On the head are five long, slender, black spines; the pronotal vesicle is very small extending but slightly over the head; the discal vesicle very large and high spherical but divided into two parts with the cells slightly clouded; the lateral lobes are greatly dilated, arcuated and containing but four cells, the three anterior ones very large, transverse, the posterior one small. A high arched, inflated carina extends about midway between the discal vesicle posteriorly over the scutellum. The hemelytra are dilated and extend posteriorly beyond the tip of abdomen, the basal angles deeply sinuated, posterior angles rounded, outer row of cells large, transverse. Antennæ and legs brownish.

Hab.—Milwaukee, Wisconsin.

This genus was erected by Prof. C. Stal for two South American species—*S. inflata* and *S. globifera* Stal, from Rio Janeiro and the above is the first of the genus to be recognized in North America.

Two specimens were sent to me by Prof. Geo. W. Peckham, of Milwaukee, Wis., in honor of whom the species is named.

Coleopterological Notes.

By Wm. Beuttenmueller.

Osmoderma scabra Beauv., I found in the larval state, living socially in decayed wood of Sweet-Gum, Hickory, Poplar, Willow, Sycamore, Sassafras, Maple, Tulip-tree, Oak and Chestnut.

Cucujes clavipes, Fab. This beetle was found by Mr. O. Dietz and myself at Fort Lee, New Jersey, Oct. 1887, under the bark of White Oak. About 100 specimens were taken. I have also bred it from Willow, Poplar, Hickory and Chestnut.

New Localities for Pterostichus tartaricus Say, (*Lophloglossus strenus* Lec.). Since the note by Mr. C. Fuchs on "a lost locality" of this beetle, published in the Bull. B'klyn Ent. Soc., Vol. V, p. 81, 1883, no specimens have been taken in the vicinity of New York, N. Y., by any of our collectors. I was fortunate enough to capture a single specimen at Astoria, Long Island, Sept. 1887. Other specimens have also been taken at the foot of the Palisades, near Hoboken, N. J. The beetle frequents damp situations.

Pasimachus sublævis Beauv. At Sandy Hook, New Jersey, Aug. 15, 1887. I captured three specimens of this insect, under boards in dry sandy places, and eleven specimens were taken in similar positions on Stone Island, Lake Monroe, Florida, May 1887.

Food-Plants of Lepidoptera.

By Wm. Beutenmueller.

[No. 5.]

(ŒDEMASIA CONCINNA, A. & S.)

Rosaceæ.

Prunus Cerasus, Juss. (Common Garden Cherry.)
Prunus domestica, L. (Common Plum.)
Rubus villosus, Ait. (Blackberry.)
Cratægus oxycantha. (Hawthorn.)
Pyrus malus, Tourn. (Common Apple.)
Pyrus communis, L. (Common Pear.)

Cornaceæ.

Cornus florida, L. (Flowering Dogwood.)

Hamamelaceæ.

Liquidambar styraciflua, L. (Sweet Gum.)

Ebenaceæ.

Diospyros Virginiana, L. (Persimmon.)

Styracaceæ.

Halesia tetraptera, L. (Snow-drop Tree.)

Myricaceæ.

Myrica cerifera, L. (Bayberry, Wax Myrtle.)

Salicaceæ.

Salix alba, L. (White Willow.)
Salix lucida, Muhl. (Shining Willow.)
Salix Babylonica, Tourn. (Weeping Willow.)

Juglandaceæ.

Carya alba, Nutt. (Shell-bark Hickory.)
Carya porcina, Nutt. (Pig-nut Hickory.)
Carya microcarpa, Nutt. (Small Fruited Hickory.)

[No. 6.]

(THYRIDOPTERYX EPHEMERÆFORMIS, Haw.)

Magnoliaceæ.

Liriodendron tulipifera, L. (Tulip Tree.)

Berberidaceæ.

Berberis vularis, L. (Common Barberry.)

Tiliaceæ.

Tilia Americana, L. (Basswood.)
Tilia heterophylla, Vent. (White Basswood.)
Tilia Europeæ, L. (European Linden.)
Tilia alba, Waldt. & Kit. (White Linden.)

Sapindaceæ.

Æsculus hippocastania, L. (Horse-Chestnut.)
Acer rubrum, L. (Red Maple.)
Acer dasycarpum, Ehr. (White or Silver Maple.)
Acer pseudo-platanus, L. (Mock Plane Tree.)
Negundo aceroides, Moen. (Box Elder.)

Rhamnaceæ.

Rhamnus catharticus, L. (Buck-thorn.)

Leguminosæ.

Cercis Canadensis, L. (Red-bud or Judas Tree.)
Gleditschia triacanthos, L. (Honey Locust.)
Robinia pseudacacia, L. (Common Locust.)
Robinia viscosa, Vent. (Clammy Locust.)

Rosaceæ.

Prunus serotina, Ehr. (Wild Black Cherry.)
Prunus Virginiana, L. (Choke Cherry.)
Prunus maritima, Wang. (Beach Plum.)
Prunus Cerasus, Juss. (Common Garden Cherry.)
Prunus domestica, L. (Plum.)
Pyrus Malus, Tourn. (Common Apple.)
Pyrus communis. (Pear.)
Cydonia vulgaris, Pers. (Quince.)
Spiræa opulifolia, L. (Nine Bark.)
Cratægus oxycantha, L. (English Hawthorn.)
Amelanchier Canadensis, Tor. & Gr. (Service-berry.)

Caprifoliaceæ.

Viburnum Lentago, L. (Sweet Viburnum.)
Viburnum acerifolium, L. (Maple-leaved Viburnum.)

Hamamelaceæ.

Liquidambar styraciflua, L. (Sweet Gum.)
Hamamelis Virginica, L. (Witch Hazel.)

Ericaceæ.

Gaylussacia resinosa, Torr. & Gr. (Huckleberry.)

Ebenaceæ.

Diospyros Virginiana, L. (Persimmon.)

Oleaceæ.

Fraxinus Americana, L. (White Ash.)

Lauraceæ.

Sassafras officinale, Nees. (Sassafras.)

Urticaceæ.

Ulmus fulva, Michx. (Slippery or Red Elm.)
Ulmus Americana, L. (Am. Elm.)
Ulmus campestris, L. (English Field Elm.)

Platanaceæ.

Platanus occidentalis, L. (Sycamore.)
Platanus orientalis, L. (Oriental Plane.)

Cupuliferæ.

Quercus alba, L. (White Oak.)
Quercus obtusiloba, Michx. (Post Oak.)
Quercus macrocarpa, Michx. (Bur Oak.)
Quercus Prinus, L. (Chestnut Oak.)
Quercus coccinea, Wang. (Scarlet Oak.)
Quercus rubra, L. (Red Oak.)
Quercus palustris, Du Roi. (Pin Oak.)
Castania vesca, L. (Chestnut.)
Fagus ferruginea, Ait. (Am. Beech.)
Fagus sylvatica, L. (Wood Beech.)
Fagus v. purpurea, Ait. (Purple Beech.)
Fagus v. laciniata, Lodd. (Cut-leaved Beech.)
Carpinus Americana, Walt. (Hornbeam.)

Betulaceæ.

Betula alba, L. (White Birch.)
Betula v. populifolia, Spach. (American White Birch.)
Betula papyracea, Ait. (Paper Birch.)
Alnus serrulata, Ait. (Smooth Alder.)
Alnus incana, Willd. (Speckled Alder.)

Salicaceæ.

Salix alba, L. (White Willow.)
Salix fragilis, L. (Brittle Willow.)
Salix Babylonica, Tourn. (Weeping Willow.)
Salix lucida, Muhl. (Shining Willow.)
Populus alba, L. (Silver Poplar.)
Populus grandidentata, Michx. (Large-toothed Aspen.)
Populus tremuloides, Michx. (American Aspen.)
Populus angulata, Ait. (Angled Cottonwood.)

Coniferæ.

Abies Canadensis, Michx. (Hemlock Spruce.)
Larix Americana, Michx. (Am. Larch.)
Cupressus thyoides, L. (White Cedar.)
Taxodium distichum. (Bald Cypress.)
Thuja occidentalis, L. (Arbor Vitæ.)
Juniper communis, L. (Juniper.)
Juniper Virginiana, L. (Red Cedar.)

A Note on the European Parasites and Food-Plants of Cryptorhynchus Lapathi.

By L. O. Howard.

In view of the interesting note of Mr. Jülich in the October numher of Entomologica Americana for the current year, upon the establishment of *Cryptorhynchus lapathi* in this country and its damage to Willows in the vicinity of New York, it may be interesting to record the European parasites of this somewhat destructive beetle. These are, among the Ichneumonidæ, *Ichneumon hassicus* Ratz., *Pimpla cicatricosa* Ratz., *Limneria ruficeps* Holmgr., and *Ephialtes tuberculatus* Fourc. Among the Braconidæ, *Rogas marginator* Nees, *Rogas* sp. undet., and *Bracon immutator* Nees, have been reared from this insect; while a solitary Proctotrupid—*Diapria melanocorypha* Rtz. —was reared from it by Ratzeburg.

But one of these parasites has been found in this country and this is *Ephialtes tuberculatus* Fourc., recorded by Mr. Cresson from U. S. and Can., and bred from the *Cryptorhynchus* by Ratzeburg and by him described as *Campoplex gracilis*. It will be noticed that the only parasite reared by Mr. Jülich—*Ephialtes irritator* Fabr.—is congeneric with this last, and it will be interesting to observe, as the beetle becomes more thoroughly domiciled with us, whether the native parasites which will

attack it will all approach its European enemies in structure so closely as the one already reared.

I may state also that Mr. Jülich conveys a wrong impression in only giving "Elder" as the European food-plant. "Elder" is not the German "Erle," but is applied to plants of the genus *Sambucus*. He undoubtedly meant "Alder" (botanical genus *Alnus*). Kaltenbach gives as the European food-plants of the *Cryptorhynchus*, *Rumex hydrolapathum*, *Salix* spp. and *Alnus* spp., while Ratzeburg gives both Willow and Alder.

Society News.

Brooklyn Entomological Society, Sept. 6th, 1887. 12 members present. Mr. Weeks read a newspaper article upon insects attracted to the electric light, which brought forth a great deal of interesting discussion and information from various members upon the subject.

The general testimony was that vast numbers of insects were attracted to these brilliant lights. That in many cases the dead insects form a bulk of quarts every night. These lights made by all odds the best of collecting places. Different persons had made arrangements with those who cleaned the lamps, and thus had been able not only to get a mass of common material, but very many rare and hitherto almost unique specimens. The Lepidoptera were apt to be worn by beating about the globes, but the Coleoptera were generally in good condition. Mr. Gade reported that in Fordham where formerly he had never failed to find good collecting, almost nothing was this year taken at "sugar" or about the gas lights owing the electric lights near by.

Oct. 4th, 1887.—15 members present. Mr. Herbert H. Smith was elected a member.

The Treasurers' report showed a favorable condition of the finances of the Society owing to the liberal donations of some of the members.

Mr. Neumoegen proposed, and the proposition was adopted, that the members of the Society donate to the Society some rare insects out of their personal collections to be auctioned off for the benefit of the Society on the evening of the meeting, Dec. 6th, the meeting previous to Christmas.

Mr. Weeks read a paper on *Conotrachelus lapathi* Linn., giving an account of the first appearance of the insect in the vicinity of New York. So far as he could learn, it was first taken by Mr. S. Lowell Elliot in 1882, in the Northern part of New York City.

Mr. Weeks also read a paper on the food plants of *Deilephila lineata* adding to the Portulacæ, Oenothera biennis.

Mr. Edwards was of the opinion the larvæ could be considered omnivorous. He had found them commonly on Fuchsia also on Lettuce, Amaranthus and the Chenopodiums generally.

Mr. Beutenmueller added Apple to the list.

Mr. Hulst, on the authority of Mr. G. W. Wright, spoke of the fact that the larvæ were very common in S. Cal., but the food plants were not given him. The larvæ, eaten raw, are there esteemed a great delicacy by the Mohave Indians.

Mr. Hulst read a paper upon certain *Pyralidæ*, in which he described as new 38 species, principally *Phycitidæ*.

Messrs. Hulst and Weeks each proposed Amendments to the Constitution, which under the rules were laid upon the table to be acted on at the next meeting.

ENTOMOLOGICA AMERICANA

VOL. III. BROOKLYN, DECEMBER, 1887. NO. 9.

EARLY STAGES OF SOME NORTH AMERICAN LEPIDOPTERA.

By Henry Edwards.

With a view to the publication at an early day of a "*Catalogue of the Described Transformations of North American Lepidoptera*," which I wish to make as complete as I can, I have prepared the present paper, and I take the opportunity now presented to me, of asking my fellow entomologists throughout the country to publish as quickly as possible, any descriptions they may have of eggs, larvæ or pupæ, so that the references to them may be made in my forthcoming work, to save as far as may be, their future issuance in the form of an Appendix. The Catalogue up to the end of the Sphingidæ is now ready for the printer, but will be kept back until the close of the year, so as to embrace descriptions which may be given in answer to this appeal.

RHOPHALOCERA.

Synchloe (Coatlantona) Janais, Drury. *Chrysalis.*

In form very much like the chrysalis of *Melitæa.* It is obtusely cylindrical, swollen about the head parts, and tapering abruptly at the 4th abdominal segment, those behind being somewhat bent downwards. The color is dull sordid white, with numerous black dots and dashes. There are dorsal and sub-dorsal rows of raised black points, two raised black points on the thorax, and between and behind them are two bars of black, placed like the sides of a triangle. The sides of the thorax and head are also conspicuously marked with black irregular blotches. On the wing-cases are several long distinct black streaks, and a row of black dots marks the course of the spiracles. Underside also strongly marked with black dashes and blots. The

cremaster is rough, with 4 small winged processes, and an elevated ridge in its centre, attached as usual by fine silken threads.

Length 15 mm. Width 5 mm.

Pieris occidentalis, Reakt. *Chrysalis.*

Form of *P. Rapæ* and *P. Protodice*, and much resembling the latter. Its color is cream white, the raised margin of thorax and abdominal segments edged with yellowish brown. Head produced into a short sharp beak as in other species of *Pieris*. On the dorsum are some small black shining points, and very fine irrorations of black are scattered over the whole surface. These are scarcely visible without a lens. On the wing-cases are 7 rows of black points, indicating the course of the veins. Black points also indicate the spiracles.

Length 20 mm. Width 6 mm.

From some specimens found in Sier. Nevada, Cal., Sept. 1884. The imagos emerged early in October.

Callidryas Philea, L. *Chrysalis.*

Color pale drab, darkest about the abdomen. The segments are marked with a series of waved fine lines, and are elevated in the middle to a sharp ridge. The centre of the body, i. e. at the junction of the thorax and abdomen is greatly depressed into a hollow. The thorax is shining, but bears a few roughened waved lines, most apparent anteriorly. The head is produced into a very long (12 mm.) beak, as in *Terias* and other species of this genus. This is smooth, subulate, roughened a little at the extremity, where it is dark brown in color. The wing-cases are enormously large, and very much extended above the abdomen. Looked at sideways, with the wings downward, the chrysalis bears a fancied resemblance to a hammock swung, bearing a human form. The veins of the wing are distinctly seen through the wing-cases. The anal segment is elevated on the margins, and the cremaster is rough, attached by a coarse, strong, silken web.

Length, incl. beak, 45 mm. Width, incl. wing-cases, 20 mm. Length of wing-case from base, 22 mm. Width of wing-case, 14 mm. Width of abdomen below wing-cases, 8 mm.

From specimens kindly given me by my friend Wm. Schaus, Esq., Jr.

Thecla halesus, Cram. *Chrysalis.*

Broad, short and stout, abruptly narrowing towards the two posterior segments. Color snuff-brown, irregularly blotched with black over the whole surface, particularly at the extremity of the wing-cases. The posterior segments bear a few short scattered hairs.

Length 18 mm. Width 6 mm.

Chrysophanus xanthoides, Bois. *Egg.*

Almost spherical, but slightly flattened at the base, cream white, delicately reticulated over the whole surface, the reticulations forming somewhat deep pits between.

From two specimens laid in my collecting box some years since in California.

Argynnis Bellona, Fab. *Chrysalis.*

Fawn color, with a few irregular darker lines. Thorax with 6 raised shining the posterior pair the largest. On each of the 3 middle abdominal segments

are also 3 raised points placed triangularly. The spaces between the points elevated into a ridge. Wing-cases traversed by several brown waved lines crossing each other, and giving a net-like appearance. The cast skin of the larva clings to the crema ter, and forms part of the attachment of the chrysalis.

Length 15 mm Width 5 mm.

Gonepteryx Clorinde, Godt. *Chrysalis.*

Cream white, the sides of the abdomen and the dorsum marked with a streak of pale chestnut brown. The head is continued into a short, awl-like beak, the extremity of which in the ♂ is black and bent upwards in a short hook, while in the ♀ it is swollen, roughened at the tip, and light chestnut brown in color. The whole surface is slightly wrinkled, especially on the anterior portion of the abdominal segments. The spiracles are yellowish. The thorax above is slightly raised into a hump. The larva transforms under a leaf, attaching its silken thread to the midrib. This is fixed around the centre of the wing-cases. The cremaster, which is slightly blotched with black, is attached also to the midrib of the leaf by a small elevated silken button.

Length 35 mm. Width 10 mm. Width over wing-cases 14 mm.

From several specimens sent me by Wm. Schaus, Esq., Jr. Though there is doubt as to this insect belonging to our fauna, I make no apology for introducing this description here.

Pamphila Ethlius, Cram. *Chrysalis.*

Color after exclusion pale buff, surface with a slight mealy covering. Form nearly cylindrical, tapering somewhat abruptly from the 4th abdominal segment, the anal segment being strongly pointed, triangular, margined, with a deep fovea in the centre, thus elevating the sides of this segment into sharp ridges. The surface of the abdominal segments is roughened by slightly raised reticulations, and in some specimens, on the 1st, 2nd and 3rd segments are some faint brown shades. The wing-cases are smooth—slightly glossy. In the ♂ chrysalis the spiracles are marked with black dots, in the ♀ they are concolorous with the rest of the body. The head bears a sharply pointed process, about 4 mm. in length, slightly curved upward, and roughened at the extremity.

Length 40 mm. Width 10 mm.

The larva curls itself up in a leaf (as in the case of *Eudamus Tityrus*) to which it is attached by a silken thread placed around the wing covers—the surface of the leaf bearing a thin silken web.—From many examples collected and raised by Wm. Schaus, Esq., Jr.

HETEROCERA.

Family **SPHINGIDÆ.**

Œllopus tantalus, L. *Pupa.*

In shape like that of *Hemais Thysbe*—almost cylindrical, very slightly sw about the middle, and abruptly narrowing at 5th abdominal segment. Color pi with the posterior margin of the abdominal segments chestnut brown, those of th 5th and 6th segments broadly so. Thorax almost smooth, with faint waved Anterior portion of abdominal segments a little roughened. Cremaster produce a short, sharp point.

Length 30 mm. Width 10 mm.

From a specimen from which the moth had been raised by Wm. Schaus, Esq., Jr.

Cautethia Grotei, Hy. Edwards. *Pupa.*

Same shape as *Hemaris*, cylindrical tapering gradually to the posterior end. Pale pitchy, shining. Head, thorax and wing-cases impunctate. Abdominal segments roughly and densely punctured on anterior half. Spiracles pitchy black. Cremaster pitchy black, rough at its base, carried out to a sharp point, which is bifurcate. The rough punctures of abdominal segments are continued on the lower side.

Length 25 mm. Width 8 mm.

From a specimen given to me by my friend Dr. Wittfeld, Indian River, Fla.

Amphonyx Antæus, Drury. *Pupa.*

Pitchy—the head, thorax and wing-cases lighter in color. Tongue-case about 40 mm. long, gracefully curved, and swollen very much at its extremity, which rests against the chest. It is roughly grooved over its whole surface, except the swollen tip, which is quite smooth. On its upper side is a double ridge, slightly raised, and when viewed sideways, the ridges above the grooves have the appearance of blunt teeth. The head is much narrower than the thorax, and is swollen between the eyes. Thorax rugosely wrinkled, at the base of the wings are roughened, elevated, serrate processes. The bases of the wing-cases are slightly swollen. The wing-shape is very clearly defined, and the cases are streaked slightly with darker brown along the course of the veins. Base of the abdomen has two roughened processes like those at the base of the wing-covers—but broader and larger each way. At the anterior edge of the abdominal segments are bands of similar roughened spaces extending transversely across the dorsal region nearly as far as the spiracles, which are black, with a deep narrow slit. The underside of the abdomen is smooth. Each segment above is marked also with transverse ridges. Cremaster black, obtusely pointed, ridged, rough.

Length from base of tongue-case 90 mm. Width across middle of abdomen 25 mm.

From several specimens from which the imagos were raised by Wm. Schaus, Esq., Jr.

Phlegethontius Rusticus, Cram. *Pupa.*

Very like that of *A. Antæus*, but differing in many important particulars. The tongue-case is proportionately much longer, alike in structure, but the grooves are deeper, and the serratures consequently longer and sharper. The abdominal segments want the curiously roughened spaces so remarkable in the preceeding species. In this they are roughly punctate in front, closely punctate over the rest of the surface. The anal segment is smooth, with a deep groove above, wrinkled beneath, while the cremaster is furnished with two small points at the sides. The wing-cases [illegible] thorax are concolorous with the abdomen, while the tongue-case is less curved [illegible] *A. Antæus.*

[illegible]gth 70 mm. Width 18 mm. Length of tongue-case 45 mm.

[illegible]rocampa tersa, L. *Pupa.*

[illegible]ylindrical, last two posterior segments, conically and abruptly smaller. Color [illegible]wn drab, with black markings. Head gradually tapering, eyes and base of [illegible]e slightly swollen, as are also the bases of the wing-covers. Abdominal segments

transversely wrinkled. There is a broad dorsal stripe of black, the spiracles are surrounded by black circles, the position of the tongue is marked by a black line, and the underside of the abdominal segments bears a broken black line, while irregular blotches of the same color mark the whole surface. The underside on each side of the tongue is dirty yellowish, as also is the portion of the abdomen above the edge of the wing-cases. Cremaster sharply pointed, the point black, shining.

Length 50 mm. Width 13 mm.

Philampelus Vitis, Drury. *Pupa.*

Pitchy black, posterior margin of abdominal segments broadly chestnut brown. Gradually tapering from the middle to both head and anal segment. Thorax moderately smooth, with well marked median channel. Anterior edges of abdominal segments coarsely and densely punctured, other parts transversely wrinkled. Wing-cases smooth, not showing the veins. Cremaster slightly constricted in the middle, ending in a sharp point.

Length 60 mm. Width 15 mm.

A. Koebele, Esq. Florida.

Pseudosphinx Tetrio, L. *Pupa.*

In shape like that of *Philampelus*. Pitchy black, shining. Head slightly swollen at the eyes. Thorax transversely wrinkled, with a slight dorsal channel. Covers of the tongue and legs much raised above the surface. Wing-cases longitudinally ridged above the veins. First 4 abdominal segments rugosely channeled, the remainder more smoothly channeled, with the anterior margin of each densely and coarsely punctured. Underside of the posterior abdominal segments quite smooth. Cremaster triangular, rough, ending in a sharp point.

Length 65 mm. Width 18 mm.

Jalapa, Mexico. Wm. Schaus, Esq., Jr.

Anceryx Edwardsii, Butler. *Larval stages.*

After 3rd moult.—Entirely pale sea-green, the head, as is usual in the group in their earlier stages, monstrously large. It is faintly punctured, and has a slight dorsal channel. Mouth parts white. Caudal horn rough, straight, very sharply pointed, yellowish at the tip. On the middle of the dorsum of 4th segment is a small black round dot. Abdominal legs sordid white.

Length 18 mm.

After 4th moult.—The larva now assumes its more mature form and color. It is rich reddish brown dorsally, pale fawn-color laterally. Head moderate in size, the same width as the second segment, yellowish fawn-color, with dashes of light brown running down each side of the front, and a triangular blotch of the same color above the mouth parts. 2nd segment fawn-color, with double dorsal band, pale brown, edged outwardly and divided by a darker line. On the sides are brown dashes, extending to the base of the legs. On the 3rd segment, which is slightly swollen, the band and lines are continued, and there is on the anterior half of this segment, a rich wine-red stain, enclosing 2 narrow transverse bars of rich brown. The black marks on the sides of the segment are larger and more distinct than in No. 2. The 4th segment is swollen, being nearly half as wide again as the rest of the body. The anterior half is velvety black, with a reddish tinge, and in the centre is a narrow circular ring of scarlet, enclosing in its centre a small light brown dot. Posterior half of the 4th segment fawn-color, covered each way by brown lines. The marks of the sides are here distinct blotches, the anterior series being the largest. The remaining segments

are rich chestnut brown, mottled with black spots, of which there is a distinct dorsal row. On the anterior portion of the subdorsal region is on each segment a cloud of white spots, almost lost in the ground color. Lateral region fawn-color, very slightly mottled with black, and most prominently so immediately above the abdominal legs, which are fawn-color, with a rich black velvety patch at the side of their middle segments. The thoracic feet are paler with black patches at their base. Candal horn dull fawn-color, slightly roughened. Underside fawn-color, with black ventral line, and many small black dashes. One of my specimens is paler in the ground color, but there is no difference in the arrangement of the markings.

Length 50 mm.

Mature larva.—In the single specimen of this stage before me, there has come a great change. The ground color is now greenish drab, with yellowish marks consisting of slightly roughened patches of that color over the body, enclosing here and there a few brownish dots. The red stain on 3rd segment has disappeared, and the black transverse band enclosing the circular ring is proportionately narrower and smaller. Spiracles brown.

Length 80 mm. Width 15 mm.

Pupa.—Pitchy, lighter across the abdominal segments and wing-covers. Head gradually smaller from its base, rounded very much in front, not swollen over the eye-cases. Its divisions are strongly marked, and it is rather rugosely wrinkled. The tongue and antennæ cases are distinctly marked. Wing-covers lighter brown with black streaks along the course of the veins. Thorax slightly raised, rugosely and irregularly wrinkled. Abdominal segments narrowly rugosely-punctate in front, transversely wrinkled posteriorly and marked with broken transverse band of black. Last 3 segments pitchy, obscuring the markings. Cremaster triangular, rough above and beneath.

Length 55 mm. Width 15 mm.

From a series admirably prepared by Dr. Wittfeld. Ind. Riv., Fla.

Anceryx Ello, L. *Larval stages and pupa.*

The Rev. W. J. Holland in Can. Entom., vol. 18, p. 103, has most carefully described the *mature* larva of this species. I add descriptions of the earlier stages and of the pupa.

After 3rd moult.—The general color of the larva is either pale sea-green, (green var.) or pale reddish brown, (brown var.). On the head and second segment the brown double line is very distinctly marked, especially in the green form, but on the 3rd segment it is nearly lost in the ground color. The round black velvet-like spot on 3rd segment is bordered more broadly behind with yellowish white, and on the sides of this segment are some white blotches standing out in strong contrast with the ground color. The lateral region is mottled with reddish, among which the white blotches appear. The dorsal region has the spots of the segments very small, but there is a faint line of distinct black dots at the anterior edge of each segment. The caudal horn is very long, rough, and smaller through its length than in the more mature stages. The thoracic feet are reddish brown, banded with a darker color, and the abdominal legs are also reddish brown, broadly banded outside with black.

Length 40 mm.

After 4th moult.—The dorsal markings become heavier and more distinct, the black dorsal spot also heavier, the caudal horn very much reduced in length, but

heavier and more obtuse. The anal plates are distinctly dotted with white, and the white blotches of the lateral region are much longer and more striking. These blotches of white do not appear in 3 specimens of the mature larva in my possession. After the fourth moult the caudal horn is bright red.

Length 55 mm.

Pupa.—Bright chestnut brown with black markings. The head has a central longitudinal blotch, two blotches on the side and two in front, black. The tongue and antennal cases are marked with black. The wing-covers are streaked with black between the veins. The thorax is black dorsally, with a band across the front, thus leaving a streak of bright chestnut at the sides and at collar. The abdominal segments are narrowly black at their posterior margin, and there is on each segment a double transverse interrupted black line. The two posterior segments are pitchy without lighter shades, and the cremaster is black, triangular, roughly punctate. Each of the abdominal segments is thickly punctate along the anterior margin.

Length 60 mm. Width 15 mm.

From a series prepared by Dr. Wittfeld. Ind. River, Fla.

Ellema coniferarum, Abb. Smith. *Pupa.*

Cylindrical, pale pitchy. Head, thorax and anterior margin of wing-covers rugosely punctate, as are also the fore margins of the abdominal segments. The 4 posterior abdominal segments are rugosely punctate nearly over their whole surface and are constricted at their junction. Cremaster ending in a sharp point.

Length 32 mm. Width 9 mm.

A. Koebele, Esq. Florida.

Family **ZYGÆNIDÆ.**

Scepsis Edwardsii, Grote. *Larva.*

Head, 2nd segment and anal plates, deep brown. Mouth parts pitchy. Rest of the body yellowish white, each segment bearing a series of 6 tubercles, coarsely spinose. Underside, feet and legs, honey-yellow.

Length 33 mm. (Probably somewhat stretched in blowing.)

An example sent to me by Dr. Wittfeld. Ind. River, Fla.

Family **BOMBYCIDÆ.**

Hemileuca Yavapai, Neum. *Larva.*

Body velvety black, beautifully irrorated with yellowish white dots. Head reddish brown, with deep channel on the crown and bearing numerous tawny hairs. 2nd segment with two wine-red tubercles in front, and on the anterior edge is a fringe of tubercles, bearing pencils of black hairs. The segments are divided by a transverse dull orange band, bearing a black bar, and there is a double dorsal interrupted whitish line, running the whole length of the body. All the segments from No. 2, bear each 6 tubercular processes crowned with a pencil of black spines. The underside is honey-yellow—the feet and abdominal legs red at the base, the other joints black.

Length 60 mm.

A specimen prepared by Mr. J. Doll, kindly given me by friend, B. Neumoegen, Esq.

Citheronia sepulchralis, G. & R. *Larva.*

Ground color, chestnut brown, head a little paler, shining, the division of the lobes indicated by a deep furrow. Mouth parts edged with black. Between 3rd and 4th, and 4th and 5th segments is a broad black, velvety, transverse band, extending underneath, but then less distinctly marked. The spiracles are also velvety black. On each segment are some waved blackish shades, more apparent laterally, and on each from 2 to 13 are 6 tubercular spines, which are jointed, thickened at their base, and bear geminate points, the dorsal series being always the longest. On segments 2, 3 and 4 these spines are very long, those on 3 and 4 being fully 10 mm. in length, and are covered with rough warty tubercles. On segment 12 is also a single long spine of the same length, which is directed abruptly backward, the others being slightly curved posteriorly. The anal plates are sub-triangular, rough, but shining. Underside marked as the upper, there being on each segment an angled black line, and some waved shades. The feet and abdominal legs are tipped with black.

Length 100 mm. Width in centre 16 mm.

A. Koebele, Esq. Florida.

Heterocampa unicolor, Pack. *Larva.*

Head small, obliquely truncate, very pale testaceous, with 2 rather broad oblique lilac-brown stripes in front, broadly edged with white. Body pale green, each segment covered with bright purple irrorations. Along the dorsum is a broad white double stripe, the inner edge streaked with yellow, the outer with purplish brown. The stripe widens gradually towards the anal segment, where it is minutely dotted with yellow and purple. The extremity of the anal segment is furnished with 2 filamentary processes, about 3 mm. long, yellowish white, with a purplish brown streak internally. There is an indication of a broken yellow sub-dorsal line. The spiracles are dull orange. Beneath wholly pale green.

Length 43 mm.

On Sycamore (*Acer Pseudo-plantanus* L.) Long Island. On August 2nd, the larva spun a very slight cocoon between two leaves drawn flat together, and the perfect insect emerged August 22nd.

Phragmatobia rubricosa, Harris. *Larva.*

After 3rd moult.—Body jet-black, shining. Head also jet-black. The hairs of the tubercles are very short, and evenly cut. Color bright chestnut, paler at the sides.

Psyche confederata, Grote. *Larva and Pupa.*

Larva.—Head, 1st, 2nd and 3rd segments pitchy, the segments narrowed gradually towards the head. 4th segment yellowish with 2 pitchy triangular spots on each side. 5th whitish with 2 pitchy brown points. Rest of the body yellowish white, except the anal segment, which has a pitchy brown triangular patch above. Lower side same as the upper, with the tips of the feet all brownish. Body rather flattened, narrowed anteriorly and posteriorly.

Length 11 mm. Width 3 mm.

The inside of the case is very thickly lined with silk of white color.

Pupa.—Cylindrical, wholly pitch-brown, darkest about the head and wing-cases. Thoracic region much swollen. Head, antennæ and wings clearly visible through the skin. Abdominal rings very distinct, shining—the spaces between these dull and paler. On each segment are 4 or 5 slightly raised tubercles.

Length 8 mm.

Parasa fraterna, Gr. *Larva.*

Ovate elliptic in outline. Body chestnut brown, darker in front and at the sides, the margin of the dorsum elevated into a sharp ridge. On segments 3, 4 and 5 are two retractile tubercles, bearing bunches of sordid white spines, those of the third segment being much smaller than the others. The 10th and 12th segments are furnished with similar tubercles, those of the 12th being the smallest. The dorsal region is pale chestnut brown, with some indistinct waved streaks of a slightly darker shade. Head pitchy, mouth parts paler. The anal segment is produced into a long spine. The spiracles are dull yellowish, the underside also dull yellow, and the lower lateral region reddish yellow.

Length 15 mm. Width at 5th segment 5 mm.

Hyparpax aurora, Abb. Smith. *Larval stages.*

After 1st moult.—General color, yellowish brick red. Head constricted at junction of the 2nd segment, yellowish white, mottled with brick red. 2nd segment dull white, with double dorsal line, enclosing some small reddish blotches, and two small reddish piliferous tubercles. The posterior margin of this segment is darker than the anterior. 3rd segment bright yellow, with small piliferous tubercles of the same color. 4th segment raised in the centre, with small double piliferous hump. 5th with yellow blotch in centre, irregular in shape, spreading slightly on the side of dorsum. 6th, the yellow is here wider, with narrow red stripe. 7th, 8th, 9th, the red stripe becomes gradually wider, leaving the yellow only on the sides. 10th and 11th, the red stripe here narrows in front and widens behind, being elevated into rather a high hump in centre of the dorsum. The anal segments are elevated in repose, as is the manner of *Cerura*, the last segment being furnished with two rather short processes.

Length 12 mm.

After 2nd moult.—Head as before, but the markings a little darker, and more spread over the surface. 2nd, 3rd and 4th segments, as also the whole of the lateral region, are now pale yellowish green, the dorsal red mark being widest on 2nd and becoming obsolete on the 4th. On the 5th the hump is larger than before, and there are 4 piliferous tubercular spots, the anterior pair highest and largest. The red dorsal patch is very apparent on 5th, 6th and 7th, narrows on 8th, spreads again on 9th, 10th and 11th, being constricted on 10th. 12th and anal segment are pale yellow with reddish mottlings. The anal processes are also short, yellowish, mottled with yellowish. Whole body with small shining tubercular spots. Feet and legs reddish. The colors are somewhat confused, blending into each other, particularly on the lateral region.

Length 22 mm.

After 3rd moult.—The colors are now more clearly defined. 2nd and 3rd have the red coloring edged with bright yellow, and reduced to a mere point on the posterior edge. 4th segment wholly pale yellowish green. Lateral region also pale yellowish green. 5th segment produced into a hump, which bears anteriorly two rather high tubercles, the reddish color being broad posteriorly, and narrow anteriorly. 6th has the red a little constricted—2 tubercular spots yellow, rather large, and a smaller pair of the same color beside them. On 7th, the red patch is wide; on 8th, narrow; on 9th and 10th again widened, then narrow and almost obsolete at anal segment, which has 2 small processes, tipped with red. The whole of the red color on the dorsal region is broadly shaded with bright yellow, between it and the green

lateral stripe. Legs and whole of the underside yellowish, mottled with red. Spiracles yellow, edged with red.

Length 34 mm.

From a small brood raised on Oak by Miss E. Morton of New Windsor, N. Y. I regret that it was not in my power to observe the stages beyond those described, but I believe Miss Morton was so fortunate as to raise the larva to perfection.

Datana perspicua, G. & R. *Egg and larval stages.*

Egg.—Dull white, laid in small, compact irregular masses, united side by side. They are ovate, and when the larva emerges it does so by a large circular opening, eaten away by the larva, and occupying $\frac{1}{3}$ of the shell.

Young larva.—After exclusion from the egg. Head and anal segment black shining. 2nd segment also jet-black, rather raised centrally, shining in the centre of the dorsum only. Ground color dull yellowish, with two stripes dull red, the dorsal stripe double the width of the others. The lateral stripes are 3 in number on each side, those in the centre being the widest. The extreme lateral stripe immediately above the spiracles is slightly waved in its outline. Thoracic feet black, abdominal legs reddish brown.

Length, 4 days after exclusion, 9 mm.

After 1st moult.—The colors are now a little brighter. The black of the 2nd segment is reduced by the widening of the lateral stripes as is also that of the anal segment. The 12th segment has a small brown shining tubercle in the centre.

Length, (9 days), 18 mm.

After 2nd moult.—Head jet-black. 2nd segment brown-black in centre. The stripes are dull yellow, the spaces between being reddish brown, that on the dorsum much the widest. Spiracles jet-black. Underside brownish orange, base of all the legs with a reddish tinge. Legs, feet, anal segment, all jet-black, shining.

Length 26 mm.

After 3rd moult.—Head jet-black. 2nd segment chestnut brown, shading into blackish brown in the central region. The stripes are now all broad, and very bright sulphur yellow, giving the insect a brilliant appearance. Ventral stripe also very broad. Base of feet and legs bright orange, their tips jet-black.

Between this and the mature larva the stages were not observed.

Mature larva.—Head bright wine-red, shining, rather coarsely punctured. Upper mandibles pitchy black, lower wine-red. The 2nd segment is also red in the centre, the yellow lines faintly shown on the red ground color. The body is a deep chestnut red, varying in some individuals to a darker shade, almost black, or at least pitchy. The longitudinal lines are 11 in number, and are almost all of equal width. They are arranged 3 on each side subdorsally, 2 laterally and 1 ventrally. The spaces between them are widest on the dorsum and on the lateral region enclosing the spiracles, which are black. The color of these longitudinal lines is vivid lemon yellow, darker and brighter than in any other species, and the larva has a very gay and attractive appearance. In some examples the subdorsal yellow stripes are almost confluent. The stripes are thinly covered with red irrorations, from the base of which spring sordid white hairs. The feet and legs are reddish at their base, the extremities being pitchy black.

Length 60 mm.

Food plant, Stag-horn Sumach. (Rhus typhina L.)

Family **NOCTUIDÆ.**

Arsilonche albovenosa, Guen. *Larval stages.*

Young larva, (3 days).—Head small, black above, mouth parts pale. Ground color of body sordid white. Segments 2, 3, 5, 6, 9 and 10 bear small black warty tubercles on the dorsal region, and a smaller one on the sides, from which spring rather short black hairs. Nos. 4, 7 and 8 have a dull orange transverse band. Anal segment black. Underside sordid white. Feet dull black.

Length 4 mm.

After 1st moult.—Ground color sordid white, dorsal region dull chestnut brown, with the black tubercles very apparent, those of 5, 8 and 9 much larger than the rest, while those of the lateral region are arranged obliquely in pairs.

Length 6 mm.

Food plant, Polygonum. The subsequent stages were not observed.

Notes on some Coleoptera.

By M. L. Linell.

I have been led by my observations to believe that some *Carabidæ* do not hibernate in the imago state. I have never been able to find *Nebria pallipes* in early Spring, but on May 30th for a number of successive years I have found numbers of specimens, but all immature. In the month of June it becomes common.

* * *

I have also become convinced that *Silvanus planatus* is the female of *S. bidentatus*. I have taken the two together in numbers, and found one pair in copula, so that the evidence of their identity is at least very strong.

* * *

Last year, while collecting on Staten Island, I found on a tree stump a specimen of *Tomoxia bidentata*. Waiting about the place for some two hours, I succeeded in taking 16 specimens, all having alighted on the same stump.

This Summer I went for the purpose of getting the insect, to the same place, but a little earlier in the season. I found *Tomoxiæ* sitting on the same tree stump, but in every case they were *T. lineella*. They were very shy, and as I did not have my net with me, I was able to secure only one specimen. The same day I saw three specimens of *T. lineella* in my umbrella all flying away. But there was no sign anywhere of *T. bidentata*. I am quite of the opinion that *T. lineella* is the male of *T. bidentata*, and I am the more strongly inclined to this opinion, as it agrees with the general tendency of the family to greater development in the male of the maxillary palpi.

A Bee new to Entomologists.

On the morning of Oct. 16, 1887, a famous and popular clergyman, (and consequently not the Editor of this Journal), preached a sermon in which the following was spoken.

"A miracle of formation is the bee: five eyes, two tongues, the outer having a sheath of protecting hairs on all sides of its tiny body to brush up the particles of flowers, it flight so straight that all the world knows of the bee line. The honey comb is a palace such as no one but God could plan, and the honey bee construct; its cells sometimes a dormitory, and sometimes a storehouse, and sometimes a cemetery. These winged toilers first make eight strips of wax, and by their antennæ, which are to them hammer, and chisel, and square, and plumb line, shape them for use. Two and two these workers shape the wall. If an accident happen, they put up buttresses or extra beams, to remedy the damage. When about the year 1776 an insect, before unknown, in the night time attacked the bee hives all over Europe, and the men who owned them were in vain trying to plan something to keep out the invader that was the terror of the bee hives of the continent, it was found that everywhere the bees had arranged for their own protection and built before their honey combs an especial wall of wax with porthole through which the bees might go to and fro, but not large enough to admit the winged combatant called the Sphinx Atropos.

Do you know that the swarming of the bees is divinely directed? The mother bee starts for a new home, and because of this the other bees of the hive get into an excitement which raises the heat of the hive some four degrees, and they must die unless they leave their heated apartments."

The doctor in giving this description did not attach to the insect its scientific name, but I have no doubt Entomologists will see, from the description, that it is very distinct from any species at present known. Its habits are also, in many respects very peculiar. It is to be hoped the insect studied was not carelessly destroyed. A specimen would be a great acquisition for any Entomologist!

But come to think we are stupid! It must be the insect known as a "bee in the bonnet" to which the eloquent Doctor refered. Entomologists can be pardoned if they are ignorant of it, as it is of course a "rara *apis*" with them. We hope for the sake of Science the next time the Doctor has a specimen under observation he will capture it,—pin it, properly label it with name, (perhaps *Apis krankii*), and locality (probably *Caput inane*) and send it to some Entomological Society where it will be duly appreciated.

Geo. D. Hulst.

An unknown or forgotten illustration of North American SPHINGIDÆ.

By Dr. H. A. Hagen.

The library of the Entomological Department of the Museum received October 1887 some colored plates in 4to, as presented to Harvard College by Mr. Wm. Calverley, Barnegat, N. J. Of these plates 27 contained the figures of North American Sphingidæ and one Papilio Calverleyi. I had never seen the work, and was not able to find it quoted anywhere, so I applied for information to Mr. S H. Scudder and received the following answer: "I can only say, that I received the first five plates from W. H. Edwards in October 1861. I do not think any were ever published." Mr. Scudder does not know where his copy is, but he believes that it was not colored; the plate of the Papilio he has never seen. The plates figure 65 North American species and about half more from Cuba and were made about from 1861 to 1866. Some figures are very good, some others good, some not well done, principally on the last plates. I dot not know, why it was left unpublished.

The Sphingid plates have on top the inscription "North American Lepidoptera"; in the right upper corner Tab. I and II; then Plate III to XXVII. Below, the names of the figured species are given; in the left lower corner, published by J. W. Weidemeyer and S. Calverley, New York; beginning with Pl. III the name of W. H. Edwards is added. In the right lower corner, Ch. Walo lith. and prin., on Pl. I to XI and XIV, with the addition Drawn from Nat. on Pl. X and XI, Ch. Walo fecit Pl. XII, XIII, XV, XVI, XX, XXI; E. W. Robinson del., W. West imp. Pl. XVII to XIX; the Pl. XXII to XXVII are seemingly made by another artist; on Pl. XXIV with D. Wiest lith. Philada.

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1. 2.
3. 4.
5.

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Larva of Acidalia insularia, *Guen.*

By Geo. D. Hulst.

Length 20 to 27 mm. Head rounded, slightly indented at summit. Body cylindrical, slender; ground color of head and body the same, varying from yellow green, through orange to dark brown. A lighter dorsal and subdorsal line running from the mouth, over head, the whole length of the body. A broad lateral light colored line also running the whole length of head and body. Sides of body with a fleshy ridge included in the light line or band. The whole body with points of one or two very short fine hairs easily seen with a good lens. Beneath somewhat lighter than above. Legs 10, all the color of lateral line. Food plant, *Cassia chamæcrista.*

Pupa.—10 mm. in length, varying in color from light translucent green to violet brown. Nearly evenly conical, segments and wings hardly marked by indentings though evident by shading of color. Upper end

nearly squarely truncate with a sharp spine like protuberance on each side giving the pupa quite the appearance of the seeds of the common Beggar ticks (*Bidens frondosa*). These points are in all cases violet in color. On each side of the pupa edging the wing-cases is a light line edged in the green specimens with a shade of violet and in the darke specimens with dark violet. The pupa is fastened by the tail to slight button of silk, and is also girthed with a thread of silk abou the wing cases. Pupated, August 29th. The larva before spinning loosely covers the surface of the leaf or stem with silk, and the girth often shows individual strands running off to quite a distance, giving the idea that there is tendency towards a slight cocoon. The pupa is very active, wriggling in a lively manner when anything touches it.

Of the pupa Dr. Packard gives a description and figure Mon. Geom. p. 336, pl. 13, f. 32. In the description he speaks of the pupa as "flattened" which is not true of the 30 or 40 specimens before me. In the figure the ear-like projections are slightly shorter than in those before me. The imago, which is two-brooded, emerged Sept. 7th.

There is a very considerable interest attaching to this history as it bears upon the position that much discussed species *Euphanessa mendica* Walk. Walker, Herrich-Schaeffer, and Dr. Packard put it in the *Bombycidæ*. I discussed the matter in a paper before the Entomological Club of the A. A. A. S. (Entom. Am., Vol. II, p. 167), and there gave my reasons for believing it a true Geometer. The greatest aberrancy was in the shape of the pupa, and its habit of placing a girth of silk about the wing-cases. I had considered that the moth ought to be catalogued near *Ephyra*. The history of *A. insularia* strengthens my opinion that the insect is a true Geometer, and also that I was right in my idea of its place in the Catalogue. The form of the pupa of *A. insularia* very strongly resembles that of *E. mendica*, and its habit of making use of a girth is the same. I am indebted to A. C. Weeks, Esq., for the larvæ.

21 Eighth Street, Lowell, Mass. Aug. 24th, 1887.

Eds. Entomologica Americana.—Gentlemen :

I am open to criticism in saying "Ent. Am." Vol. III, p. 85, that there are *two* exceptions to Lieut. Casey's observation that the *tibiæ* are unarmed in *Stenus* when I only adduce one.

A pupa of *Anthonomus pusillus* has been discovered in the seed-vessels of *Helianthemum Canadense* since my notes were written, proving that the entire transformations take place within the seed vessels as I had supposed.

Respectfully, Frederick Blanchard.

Traces of Maternal Affection in Eutilia sinuata, *Fabr.*

By Mary E. Murtfeldt.

The *Membracinæ* is one of the most attractive groups of the *Homoptera* on account of the singularity of form and beauty of coloring displayed by the species composing it. Many of them are also extremely interesting in habit.

Among the smaller species indigenous to this section (Central Missouri) the one named above is one of the prettiest and most common. It breeds chiefly on the Ragweeds (*Ambrosia*) though it is occasionally found on other composite plants. The gregarious habit is common to many of the species, but, with the exception of the case I am about to instance, I have never found the parent insect remaining with her eggs or young.

Two years ago early in August I observed a female hovering over a cluster of her eggs. I plucked the leaf, expecting of course that this usually shy and active insect would jump off at the disturbance. But to my surprise she did not move, not even when I touched her with my finger. I carried her openly on the leaf into the house and up-stairs to my study, but with all the shaking about and brushing against my clothing she was not dislodged.

Wishing to examine the egg cluster more closely, I placed her in a small rearing jar into which I afterward put the leaf with the eggs. She immediately began crawling about over it until the eggs were found, when she stationed herself over them as before. The young hatched about two days later, and remained in a close cluster about the mother insect, who had now moved a little forward on the leaf with the instinct probably of giving them a better opportunity for feeding.

As the original leaf had now withered I put in a fresh one to which after some delay and scattering the insect migrated with her entire, large family.

The rearing jar did not seem to furnish an entirely congenial atmosphere to the young *Eutilias*, as a large number died in the first moult and scarcely a moiety reached the pupa state, but through all changes the mother remained with her young and although I would not assert that she made any demonstrations of affection, she certainly seemed to enjoy having them around her.

The family groups which I began to watch, out of doors, were not put to the inconvenience of changing from one leaf to another until after the pupa state was attained, when there was a disposition to migrate in small groups, the mother with part of her family remaining on the original

leaf until, when all had arrived at the perfect state, she could no longer be distinguished from her progeny.

I do not know that the immature stages of this insect have ever been described, and therefore subjoin a few notes concerning them.

I did not have the opportunity of watching the process of oviposition, and think it takes place mostly at night. The *modus operandi* would seem to be as follows:

The midrib of the leaf is always selected, on the under side of which the cuticle is ruptured by a series of punctures made probably with the beak. The eggs, to the number of fifty to seventy-five, are then crowded into the loose vegetable tissue in an oblique position. They are somewhat pear-shaped, the larger end being uppermost, and of a dingy white color varying to pale brown. As with the eggs of many other insects they seem to swell considerably before hatching. On escaping from the egg the young leaf-hoppers are rather more than 1 mm. in length, of a translucent, pale, greenish-yellow color, with the head and prothoracic region of a dark red-brown, a saddle-like spot of the same color across the middle of the body and another at the tip of the abdomen, which is always held in an upward curve. The form from a dorsal view is somewhat tad-pole like, except for the long, slender legs. The head in front is sparsely covered with hairs; the eyes are large, ruby-red, surrounded by a pale ring. The prothoracic joint is raised in front and there is a double row of hair-like papillæ extending along the dorsum. These larvæ grow quite rapidly and moult but twice previous to the change to pupæ. In the latter the dorsal prothoracic projections characteristic of the mature insect are clearly developed, but in a soft tissue which is notched finely on the upper edge. The arrangement and color of the spots do not vary much from those of the newly hatched larvæ. The period of growth from the egg to mature insect is about three weeks.

Kirkwood, Mo., Nov. 1887.

Life History of Euscirrhopterus Gloveri, *Grt.*

In the "Industrialist," a paper published by the State Agricultural College Kansas, under date of Oct. 1, 1887, Prof. E. A. Popenoe gives the life history of the above insect. The larva and pupa are described as follows:

"The egg may be found on the underside of the purslane leaf, singly or in clusters of two to five. It is a flattened hemisphere in form, about one-half millimeter in diameter, attached by its flat side to the leaf; and

under the magnifier is a beautiful object, being delicately sculptured with radiating grooves, and with dots in concentric lines. The young larva is hatched two or three days after the egg is laid, and at first is light greenish, or yellowish green, with darker shading across the middle of the body. The body is now thinly set with black hairs, arising from minute black points. Eight or nine days after hatching, the larva is full fed, having meanwhile moulted four times. It is now a smooth-bodied caterpillar, with the ground color, a light gray or dull white, marked with black dashes on the sides of each segment, and with shadings of salmon pink. The full-grown larvæ enter the ground for transformation, excavating for themselves in the surface soil, to the depth of two inches, a tubular burrow, the lining layer of which is rendered firm by the application of the juices from the caterpillar's mouth, and the opening closed by a thin layer of particles of soil united in the same manner. These cases may, with moderate care, be removed entire from the soil."

"The transformation to the pupal state is now effected. The insect in this state has the pointed oblong form and brown color of the pupa of moths in general, slight characteristics being found in the outlines of the apex of the head and tip of the abdomen. The exact duration of the pupal state was not observed. However, it may be said that the insect was underground about twelve days; at the end of this period appearing as a moth."

The moth also is described, but as that is comparatively well known we will not reproduce the description.

Prof. Popenoe says in addition to the descriptions: "Four broods of the insect have been traced the past summer, and some of the moths of the last brood are now flying. It is not certain, however, that they will generally leave the pupa before Spring; and further observation is needed to determine the manner of hibernation."

"The larva was seen at Manhattan in 1886, in moderate abundance, and the moth was bred that year. Previous to 1886, the writer has seen this moth only from the southwest, having collected numerous specimens at La Junta, Colorado, in 1881."

"Specimens are reported by collectors from Arizona and Texas, the species having been described from the last-named region by Grote and Robinson, in the transactions of the American Entomological Society, Vol. II, for 1868–69."

The article has good wood cut illustrations of the egg, the nearly emerged and the mature larva, the pupa and pupa case and also the imago.

Food - Plants of Lepidoptera.

By Wm. Beutenmueller.

[No. 7.]

(**LAGOA CRISPATA**, Pack.)

Rosaceæ.

Pyrus malus, Tourn. (Common Apple.)
Prunus Cerasus, Juss. (Common Garden Cherry.)
Prunus domestica, L. (Plum.)
Rubus villosus, Ait. (Blackberry.)
Rubus occidentalis, L. (Black Raspberry.)
Rubus cuneifolius, Pursh. (Sand Raspberry.)

Lauraceæ.

Sassafras officinale, Nees. (Sassafras.)
Lindera Benzoin, L. (Spice-bush.)

Platanaceæ.

Platanus occidentalis, L. (Sycamore.)
Platanus orientalis, L. (Oriental Plane.)

Cupuliferæ.

Quercus alba, L. (White Oak.)
Quercus macrocarpa, Michx. (Bur Oak.)
Quercus rubra, L. (Red Oak.)
Quercus coccinea, Wang. (Scarlet Oak.)
Quercus palustris, Du Roi. (Swamp or Pin Oak.)
Corylus americana, Walt. (American Hazel.)

Myricaceæ.

Myrica cerifera, L. (Bayberry or Wax Myrtle.)

Betulaceæ.

Betula alba, L. (White Birch.)
Betula var. populifolia, Spach.
Alnus serrulata, Ait. (Smooth Alder.)
Alnus incana, Willd. (Speckled or Hoary Alder.)

Salicaceæ.

Populus tremuloides, Michx. (American Aspen.)
Populus grandidentata, Michx. (Large-toothed Aspen.)
Salix alba, L. (White Willow.)
Salix lucida, Muhl. (Shining Willow.)

Society Meetings.

Brooklyn Entomological Society.—November 1st, 1887. Thirteen members present.

Dr. Geo. Marx of Washington, D. C., and Herman Meeske were elected members.

The following amendments to the constitution, proposed at the last meeting of the Society, were adopted.

Art. II, Section 8, to read as follows: "The Executive Committee shall hold not less than one meeting each month, except during the months of July and August. Any member of the Committee absent from three consecutive meetings, without excuse satisfactory to the Committee, shall be understood thereby to have resigned his office, and at its option, the Committee shall have power to accept the resignation and to fill the vacancy."

Art. I, Section 9, to read as follows: "Members 6 months in arrears for dues, shall be debarred from all privileges of the Society, unless excused by a majority vote of those present at the next meeting. The Treasurer shall read at each meeting, as part of his report, a list of all members whose dues to date amount to the sum of three dollars or more, for the information of the Society."

Mr. Weeks read an interesting note on *Exomias pellucidus*, Boh., a beetle new to our Fauna. He had taken the beetle on Staten Island.

Mr. Beutenmueller reported that he had taken it also at Astoria, Long Island.

ENTOMOLOGICA AMERICANA

VOL. III. BROOKLYN, JANUARY, 1888. NO. 10.

New Genera and Species of North American Moths.

By Henry Edwards.

Family **HETEROGYNIDÆ**, H.-Sch.

Thia, new genus.

Size small. Thorax and abdomen rather stout, the latter extending for nearly half its length behind the posterior wings. Head imbedded deeply between the eyes, which are rather large. Palpi long, slightly bent downwards, the basal article longer than the other two, the apical short, pointed. Antennæ simple. Tibiæ and tarsi long, hind tibiæ with two long spines, the tarsi also furnished with short spines and the last joint sharply hooked. (The middle and anterior pair are broken in the specimen before me.) Wings short, the anterior pair only slightly longer than the posterior. The margins of both are very distinctly rounded. Fringes long. The wings are densely covered with scales, so that it is impossible to give the neuration accurately. There is, however, apparently no costal vein to the inferior wings, and the internal vein seems to be very short.

I have no doubt whatever of the close relationship of this singular form to the European genus *Atychia*, Latr., which has until recently wanted a permanent resting-place. It has been placed in the *Tortricidæ*, *Tineidæ*, and I think by one author in the *Lithosiidæ*, but it is now by common consent agreed to belong to H.-Schæffer's family *Heterogynidæ*, which comes in the system near to the *Ægeriadæ* and *Thyridæ*. My *Penthetria parvula* may also be placed into H.-Schæffer's family, so that the present species will be the second of the group now known in N. America. *Thia* is the Goddess of Light of the Greek Mythology.

Thia extranea, n. sp.

Head, thorax, abdomen above and below, and upper surface of primaries greenish black, with slight metallic lustre. Fringe slightly golden. Secondaries sub-diaphanous, with the fringe golden brown, with golden scales scattered over the surface. The

underside of primaries thickly, of secondaries thinly covered with golden scales. Proboscis honey-yellow. Antennæ long, black, simple.

Exp. wings, 15 mm. Length of body, 8 mm.

2 examples, taken by Mr. A. J. Bolter at Los Angeles, S. California, April, 1879, on flowers.

This species has a strong superficial resemblance to the ♀ of *A. appendiculata*, Esp.

Family **BOMBYCIDÆ.**

Halisidota significans, n. sp.

Ground color of primaries, sordid white, with three dentated bands of rich brown, through which run, along the course of the nervures, streaks of dull scarlet, giving the insect a very unusual and striking appearance. The scarlet color is very apparent on the costa, and there are also faint streaks of the same shade at the base. The exterior margin is also scarlet, with the fringe dull white. Secondaries semi-transparent, sordid white, with the abdominal margin buff. Underside with the same markings, but fainter. Thorax dull scarlet, streaked with sordid white. Abdomen, rusty brown. Exp. wings, 40 mm.

1 ♂. Las Vegas, N. Mexico. A. J. Bolter.

An entomological anecdote has to be related with reference to this species. I described this and *Seirarctia Bolteri* when in Chicago, 3 years ago, and soon afterwards Mr. Bolter sent colored drawings of both species to Mr. R. H. Stretch. On my return home, some weeks later, I received a letter from Mr. Stretch in which he says: "Your *Halisidota significans* is a synonym of Strecker's *H. ambigua.*" The manuscript of my paper was then in the printer's hands, but I at once sent to have the description stricken out. I was in time to get this done, but it turned out, when it was too late, that Mr. Stretch meant that my *Seirarctia Bolteri* was the synonym, and thus I redescribed one of Mr. Strecker's species, and left the new one, which I now publish, unrecorded. This is one of the most beautiful of all *Halisidotas* and resembles in its coloration some of the tropical forms. The unique type is in Mr. Bolter's collection. He was good enough however, to furnish me with an exquisite drawing of the insect.

Inguromorpha, new genus.

A genus closely allied to *Cossus*, and deemed by Mr. J. B. Smith, to whom I submitted the specimen for examination, to be identical with it. He points out the distinctions, however, and they are so marked and the insect so unlike the ordinary species of *Cossus* in coloration and markings, that I think it wise to separate it, which I do at least provisionally, under the above name. I am fortified in this course also, by the opinion of Dr. Packard, who has also seen the specimen, and who believes it to be a new genus.

The head is small, not more than one-third the width of thorax. Eyes very large. Palpi barely exceeding the head, with long hairs at their base, the terminal article small, and sharply pointed. Antennæ closely and deeply pectinated. Thorax densely tufted with short scale-like hairs. Abdomen cylindrical, dotted with short hairs. Feet and legs are covered with hair to the base of the tarsi, which are also sparsely clothed with hairs. Wings much narrower than usual in the genus *Cossus*, the secondaries being a little more than half the length of primaries. The median cell of both wings is divided, and there is an accessory cell on the primaries only. The internal vein of primaries is reduced to a mere fold, and there is a connecting vein between the costal and subcostal of secondaries. Otherwise, the neuration resembles that of *Cossus*.

Inguromorpha Slossoni, n. sp.

Pale gray. At base of primaries is a deep black transverse band, extending quite across the wing. At internal angle and apex are distinct black lines forming circles, the enclosed spaces being dotted with brownish black scales, and there are also several irregular black dashes on the rest of the wing. The secondaries are pale gray, with faint black reticulations. The under side has the markings repeated, but a little more faintly. Thorax and abdomen gray, with blackish mottling.

Exp. wings, 32 mm. Length of body, 15 mm.

From 1 ♂, taken at Jacksonville, Florida, at electric light, by Mrs. A. Trumbull Slosson, to whom I respectfully dedicate it. I have taken considerable pains to compare this singular species with the descriptions of those in our lists which are unknown to the general entomologist, and cannot make it to be anything but a new species. It is certainly not *C. nanus* of Strecker, as that is said to resemble *C. ligniperda*. It is not at all like the descriptions of Walker's *C. plagiatus* or *C. populi*, and differs also greatly in size, these two being each said to be 18 lines, or $2\frac{1}{3}$ inches in expanse, while the present species is only $1\frac{1}{3}$ inches. Lintner's *C. undosus* would appear, if perfect, to be of the same size as Walker's species. The markings too, are very different from either of them, the strange circular apical blotch, and the distinct black basal transverse line being strong characters. I shall endeavour at an early day to give a figure of this very interesting species.

Arctia Brucei, n. sp.

♂. Ground color of primaries brownish black. At the base is a rosy red patch, enclosing 3 black dashes. Costa for its entire length, a large triangular patch in the middle, an almost straight line from costa to internal margin, fringe and internal margin all rosy red. The line across the wing is slightly bent about its middle, and from it are two slight dashes, indicating the W mark common to the genus, but in this sex there is no trace of the mark beyond these faint lines. Secondaries wholly rosy red, with broken maculate marginal band. Head chestnut brown. Shaft of antennæ fawn color. Disc of thorax, upper side of abdomen, pectus, base of femora, and pectinations of antennæ brown. Collar, tibiæ, and abdomen beneath and at the sides, rosy red. Underside of wings marked as above, but more faintly.

♀. Similar to the ♂, but the red is brighter and the mark on the outer third of the wing more distinct. It is however, more like the letter X than W, and the

outer branch after touching the margin, turns again to the costa, which it reaches about 3 mm. from the apex. The spots on the margin of secondaries are smaller than in the ♂, and the abdomen is wholly ro-y red, except a blackish brown dorsal line. Exp. wings, 34 mm. Length of body, 15 mm.

From 6 examples, ♂, ♀, raised from larvæ found near Denver, Colorado, by Mr. D. Bruce, to whom I dedicate this beautiful species. The vestiture is very long, and the wings though gaily colored, are thinly clothed with scales, giving the insect a slightly transparent look. It has a remarkable resemblance to *Phragmatobia*, and but for the strongly pectinated antennæ of the ♂, I should not hesitate to place in that genus.

Arctia Franconia, n. var.

A form of *A. figurata*, Drury, in which the disc of the lower wings is bright golden yellow. The primaries are rich black—a rather broad band of cream color runs from the middle of base to near internal angle, where it forms the one side of the W like mark, which is here very distinct. A small sublunate cream colored dash in the cell. Internal margin narrowly cream color. Secondaries golden yellow on the disc, with very broad black marginal band extending around the costa, indented on its inner edge, and joined in middle of the costa to a large black discal spot. At extreme base are two black dashes. The extreme abdominal margin is yellow, and there are long dusky yellow hairs clothing this portion of the black band. Head in front, tegulæ, and sides of abdomen cream color. Palpi and antennæ black, as are also the disc of thorax and two spots on the collar. The coxæ are cream color, the tarsi black. The underside has the markings repeated.

Exp. wings, 32 mm. Length of body, 15 mm.

1 ♂. Taken at Franconia, White Mountains, N. H., by Mrs. A. T. Slosson.

Arctia remissa, n. sp. (?)

♀. Closely resembling *A. Yarrowi*, Stretch, of which it may be a variety. In the color and markings of the abdomen and legs it exactly agrees with Mr. Stretch's description (Zyg. Bombyc. N. Amer., p. 221), the difference being as follows; the markings of the primaries are buff, not lemon yellow, the secondaries are black only at the base, and a little way along the abdominal margin, there is a black waved central streak, and four submarginal black spots, the apical one very small. Next to this is a dentate line, then a large sublunate spot, and a linear one at the anal angle. Beneath the wings are both wholly suffused with orange red, the costa of primaries and the whole surface of the secondaries being clearly of that color, the markings of upper side being but faintly seen.

Exp. wings, 38 mm. *A. Yarrowi* is given as 1.75 inch.

1 ♀. Ungoa Bay, Hudson B. territory, Lucien M. Turner. The remarkable difference in locality, Mr. Stretch's type having been taken in Arizona, leads me to think that this may be a distinct species. The specimen from which my description is made, had evidently been put into its paper alive, as some eggs had been deposited. These were clear white, and very glossy shining like satin, flattened on the side of attachment. They had produced several larvæ, all of which were killed. These

were wholly black, with the hairs of the posterior segments longer than the rest, and tipped with white.

Apatela sancta, n. var.

Pure clean white, with all the markings reduced to mere spots or dashes. There is a very minute black dash at the base of primaries, hardly visible without a lens, three black spots on costa, one at basal third, the other two near together beyond the middle—one in middle of wing, and a faint one behind the cell. The submarginal line is indicated by three spots, one on internal margin, one near the middle of vein 3, and a smaller one near the apex, close to which are two very indistinct dots. The marginal line is composed of minute black dots, and there is also a black dot in the middle of the internal margin. Fringe clear glossy white. Secondaries silvery white, glossy, shining, the marginal line barely visible. Fringe clear white. Head, thorax, breast, palpi, outer side of coxæ, femora and tibiæ clear white, as is also the underside of abdomen. Shaft of antennæ white, pectinations black. Tarsi white, banded with black. Interior of legs blackish. Upperside of abdomen black, covered with long white hairs, and with white band, indicating the separation of the segments.

Exp. wings, 42 mm. Length of body, 20 mm.

1 ♂. White Mountains, N. H., Mrs. A. E. Slosson. I have for the present regarded this as a variation of *A. populi*, Riley, but it may prove to be a new species. I took an example of this form at St. John, N. Brunswick, in August 1886. It has at first sight a good deal of the appearance of the European *A. Leporina*. I may here remark that Mr. Grote is in error in supposing *A. populi* to be identical with *A. lepusculina*, Guen. I have now a very long series of both forms, and am confident that though closely allied, they are distinct species, *A. lepusculina* being much darker than its relative, the ground color of the wing being gray instead of white, with the black markings less distinct. In this respect it approaches *A. felina*, Grote, with which it is probably sometimes confounded.

Has the form of *Ecpantheria scribonia*, Stoll, found in Florida—and perhaps in other Southern States—received a name as a variety? I took last Spring, in Jacksonville, between thirty and forty of this species. The specimens were all fresh and unworn, save that the tips of primaries were invariably devoid of scales. Later, in reading Abbot's Insects of Georgia, I found a reference to a Southern form of *scribonia* as having "tips of primaries denuded." (I cannot quote literally, not having the book at hand.) I have never met with the ordinary form in Florida.

New York. ANNIE TRUMBULL SLOSSON.

Descriptions of three new Eucharids from Florida, with a Generic Table of the Eucharinæ.

By William H. Ashmead.

The discovery of three new Chalcids in Florida, in the subfamily *Eucharinæ*, belonging to genera not yet recognized in the United States, and the meagre table of this subfamily in Mr. Cresson's "Synopsis," has induced me to reproduce here Mr. W. F. Kirby's very excellent table, as published by him in his revision of this group; *vide* Jour. Linn. Soc., Vol. XX, (1886), p. 28.

In this timely paper, Mr. Kirby describes six new genera and recognizes in the subfamily no less than fifteen distinct genera, from all parts of the world, which he has rendered readily recognizable in his admirable table.

Of these, species in six of the genera are now already known from North America, viz.: *Eucharis*, Latreille, *Orasema*, Cameron, *Lophyrocera*, Cameron, *Kapala*, Cameron, *Thoracantha*. Latreille, and *Lirata*, Cameron.

No doubt, species in other of the genera will be recognized when our fauna is more thoroughly worked up.

Mr. Kirby says: "The *Eucharinæ* are large, strongly-sculptured, metallic-colored *Chalcididæ*; the abdomen always more or less petiolated, and is frequently raised and compressed, giving the insects some resemblance to the *Cynipidæ*. From the *Perilampinæ*, to which they have some resemblance, they may be distinguished by the longer petiole, the absence of the stigmatic nervule, &c."

Now, I can see no resemblance at all to the *Cynipidæ*, at least in any of the forms known to me; on the contrary to me they exhibit a much more remarkable resemblance to the *Evaniidæ*, and I believe that the Eucharid genus *Lophyrocera* connects the *Chalcididæ* with this family, through the peculiarly Evaniid genus *Hyptia*.

The following is the table alluded to above:

TABLE OF GENERA.

Scutellum bidentate ..... 3.
Scutellum not bidentate.
  Antennæ ramose in male..... 2.
  Antennæ simple in male.
    *Antennæ moniliform.
      Abdomen compressed, ascending.....G. 1. **Eucharis**, Latreille.
      Abdomen not compressed, nor ascending.

First joint of tarsi much thickened.....G. 3. **Tricoryna,** Kirby.
First joint of tarsi very long, but not thicker than the others.....
G. 4. **Metagea,** Kirby.

**Antennæ not moniliform.
Joints of antennæ long.....G. 5. **Psilogaster,** Blanch.
Joints of antennæ short.....G. 2. **Orasema,** Cameron.

2 Antennæ ramose in male.....G. 6. **Chalcura,** Kirby.
Antennæ biramose in male .....G. 7. **Rhipipallus,** Kirby.

3 Scutellum often as long as the abdomen..... ..... 4.
Scutellum of moderate size.
Antennæ simple in male.....G. 8. **Stilbula,** Spinola.
Antennæ ramose in male.
Metathorax unarmed .....G. 9. **Schizaspidia,** Westw.
Metathorax with a strong lateral projection.
†Metathoracic processes curving downwards.....
G. 11. **Lophyrocera,** Cameron.
††Metathoracic processes consisting of two diverging horizontal teeth.....
G. 10. **Tetramelia,** Kirby.

4 Scutellar processes covering the whole abdomen.
‡Scutellar processes very broad ..... G. 13. **Thoracantha,** Latreille.
‡‡Scutellar processes long, contiguous, and tapering to the extremity .....
G. 15. **Uromelia,** Kirby.
Scutellar processes long and slender, generally curving inwards towards the tips.
‖Third joint of the antennæ as long as all the rest together.....
G. 14. **Lirata,** Cameron.
‖‖Third joint of the antennæ not much longer than fourth .....
G. 12. **Kapala,** Cameron.

DESCRIPTIONS OF NEW SPECIES.

LOPHYROCERA, Cameron.

Lophyrocera floridana, n. sp.

♂. Length .15 inch. Brownish-yellow; thorax with some brownish blotches; legs and abdomen pale, honey-yellow. Head small, triangular, æneous black, coarsely fluted. Eyes and antennæ brown, the latter as long as the whole body, 13-jointed. The scutellum ends in two short, diverging horns, horns black. Metathorax with two prominent projections, one on each side. Abdomen compressed, triangular; the petiole long, slender, smooth, the length of the abdomen. Wings clear hyaline, veins pale, the stigma thickened, brown.

Hab.—Florida.

Described from one specimen captured in April.

ORASEMA, Cameron.

Orasema violacea, n. sp.

♂. Length .12 inch. Violaceous, except the tibiæ and tarsi, which are yellowish. The head and thorax, rugose, and there is a slight golden lustre on disks of mesonotum, parapsides, scapulæ, scutellum and pleuræ. The abdomen is shortly petiolated,

long triangulated, shaped somewhat as in some *Perilampi*. The antennæ are dark brown, the wings hyaline; stigma a mere dot.

Hab.—Florida.

Described from one specimen collected in May.

Orasema minuta, n. sp.

♂. Length .08 inch. Head and thorax golden with some slight bluish reflections. This species is much more finely rugose than *O. violacea*. The scutellum is very high, almost pyramidal, with the apex well rounded. The legs are pale yellowish, except a faint blotch on the middle of the femora. Abdomen æneous black. Wings hyaline.

Hab.—Florida.

Described from one specimen.

Exomias pellucidus, *Boh.*

By Archibald C. Weeks.

(Read before the Brooklyn Entomological Society, Nov. 1, 1887.)

In the Summer of 1886, while on a collecting excursion on Staten Island, I found what seemed to be an *Otiorhynchus* of a dark piceous color, about $\frac{1}{8}$ of an inch in length. The insect was found slowly crawling upon stone flagging, beneath some large Elm trees. The beetles were numerous, and seemed to emerge from the grass which lined the border of the flagging. I took a number, as did also Messrs. Dietz and Beutenmueller, who were accompanying me. As none of my friends were able to identify the beetle, I wrote to Dr. Horn asking for information, and at the same time sent him specimens. Dr. Horn was unable to recognize it as belonging to our Fauna, and sent specimens to Dr. Sharp of England, and M. Bedel of Paris. In due time he heard from the latter gentleman, and I have received the following note.

"I have just received a letter from M. L. Bedel of Paris who pronounces the little Otiorrhynchide to be *Exomias pellucidus*, Boh., a species very common in the environs of Paris at the base of the cultivated Fragraria (Strawberry.) He thinks it must have been introduced here.

Yours truly, Geo. H. Horn."

From the numbers of the insect seen on Staten Island, and from the fact, that it has since been taken by Mr. Beutenmueller at Astoria, L. I., I think we must believe it is well established in this vicinity and can be now properly credited as belonging to our Fauna.

As said above, the insects that were seen on Staten Island seemed to come from the grass. In the absence of knowledge of its habits, no observations were made as to the presence or absence of Strawberry plants in the vicinity

A Summer Trip to Southern California.

By Geo. D. Hulst.

It was my good fortune to be able to get away from professional duties during the last Summer. Starting from home I made my way without any but necessary stops till I reached Los Angeles, Calif. My entomological captures on the way were but few. A *Syneda*, which boarded the train in Arizona. A *Phycid*, new to Science, which I found on a R. R. lamp while we were stopping for breakfast at the Needles, but carried in my hat for a day, it lost its beauty. At the Needles a leguminous shrub was very attractive to butterflies, and on the Mohave Desert *Lycæna exilis* was very plentiful, flying in the hottest sunshine when the Thermometer ranged from 110 to 120 degrees in the shade.

My first chance to do any collecting was a single day (June 22,) at San Diego. Among other captures I took *Lycæna Battoides*, Behr., *L. Marina*, Reak., *Chrysophanus Hermes*, Edw., (a single specimen), *Lemonias Virgulti*, Edw., *L. australis*, Edw., *Chlorosea fasciolaria*, Guen., and *Thamnonoma Guenearia*, Pack.

The next opportunity I had was at San Bernardino, where I enjoyed the hospitality of Mr. W. G. Wright, who in every department of Science, but notably in Botany and Entomology has done faithful work. Mr. Wright used his horse and wagon, his purse, and himself, to make my visit pleasant, and took any amount of trouble to show me some rarities "in the flesh." First about San Bernardino we collected nearly full grown caterpillars of *Hemileuca Nevadensis*, Stretch. They were very common, feeding on Cottonwood and Willow. Then in a swampy place, where knee deep in mud and water I pursued them, he showed me the haunt of *Scepsis Wrightii*. The swamps of California are very different from Swamps in the East. There are no Ferns, and there is none of the prolific development of *Geometridæ* and *Microlepidoptera*. However, I managed to get a *Crambus* or two, and the rare and beautiful *Orobena octonalis*, Zell., hitherto taken, so far as I know, in Texas only.

Next, I was taken into the mountains to the Arrow Head Hot Springs Hotel. It was curious to note as we advanced how marked was the difference of the Lepidoptera of the plain, the foot hills, and the mountains. *Colias Eurytheme* held the plain; coming to a certain point Mr. Wright said: "Now you will see no more *Eurytheme* but *Barbara* takes its place," and so it was. And here too *C. Eurydice*, the most beautiful of our butterflies on the wing, and perhaps also when spread, was seen. Just above the beginning of mountain rise, *Melitæa Wrightii* was taken, having a narrow range of a few hundred feet of elevation. Up at the

Hotel I remained three days, taking among other things, *Pieris Beckerii*, Edw., *Colias Barbara*, H. Edw., *C. Hagenii*, Edw., *Melitæa Gabbii*, Behr, *M. Wrightii*, Edw., *Satyrus Paulus*, Edw., *Thecla Californica*, Edw., *T. adenostomatis*, H. Edw., and *Chrysophanus Gorgon*, Bois.

Another day I was taken up a canyon almost to the summit of the mountains. Here along a little stream I took 8 *C. Eurydice*, Bois., in one throw of the net, and 7 in another, all perfect but one! Here, well up the gorge *P. Eurymedon*, Bois., and *Zolicaon*, Bois., flew. Here along the stream we took *Limenitis Lorquinii*, Bois., *Heterochroa Californica*, Butl., *Thecla Grunus*, Bois., *T. iroides*, Bois., and *Copæodes Wrightii*, Edw., and near the summit on a projecting "bench" I saw *Argynnis Semiramis*, Edw., though I was unable to "box" it. It is the only *Argynnis* found there.

One thing surprised me, and that was the rarity of all Heterocera. "Sugaring" brought nothing, and light little more. Mr. Wright said this was in accord with all his experience. He never had the least success with "sugar," and the brilliant electric lights brought very little to them. Only one *Sphinx* was taken, *Deilephila lineata*, Fabr., which is very common. Its larva, eaten from the hand, just suits the fastidious taste of the Mohave Indians.

Leaving the Paradise of San Bernardino my next stopping place was Prescott, Arizona. Here, as in the main in Arizona, my visit was entomologically a disappointment. The people had gone into cattle raising, till at last they had overstocked the country. The cattle were dying by tens of thousands for lack of food. Grasses of every sort were as closely cropped as possible, and all shrubbery was stripped, not only of leaves, but of tender twigs as well. There was nothing for larvæ to live upon, save the few trees, mostly Pine. So from Prescott I went up into the mountains, where the country was too rough for herding cattle, and where there was absolute wildness, unbroken for many miles save by a single road. Here I remained for 12 days in a miner's hut, flourishing on a fare of Bacon, Coffee and "Arizona Strawberries," in other words Red Beans. Here I found *Papilio Daunus*, Bois., ovipositing on *Populus*. Here I took *Terias Mexicana*, Bois., *Neonympha Henshawii*, Edw., and *rubricata*, Edw. Also quite commonly *Thecla apama*, Edw., with *Lycæna Marina*, Reak., and our old friend *Pseudargiolus*. But my best capture was *Argynnis Nausica*, Edw., which seemed to be quite common though very local in the bottom of the canyons at the head waters of the Hassayampa River. As a White Violet was common there, its food plant is undoubtedly the same as that of its congenors in the East. The flight of the insect was rapid and the catching of it difficult, owing to the very rugged character of its

habitat. At the extreme summit of Mount Union, the highest point of this part of the Territory, I took two specimens of *Papilio Bairdii*, Edw., and saw it no where else.

Of all the Butterflies I saw, *Eudamus Tityrus*, Fab., was the most abundant. It fed on *Robinia Neo-Mexicana*. *Lycæna Pseudargiolus*, B.-L., and *Lemonias Nais*, Edw., were also abundant. The Coliads were rare. I took but two *Eurytheme*, and saw one specimen of a yellow one which I could not capture. From what I saw of their flight, I feel pretty certain that Aspen and Willow are the food plants of *Heterochroa Californica*, Butl., *Limenitis Lorquinii*, Bois., *L. Weidermeyerii*, Edw., *L. Ursula*, (which was found in the variety *Arizonensis*, Edw., only), and *Vanessa Californica*, Bois., as well as of *Papilio Daunus*, Bois.

As in California Heterocera were extremely scarce. "Sugaring" gave no insects whatever, and light was scarcely better. I did not see a single *Catocala* where Mr. Doll found hundreds.

The time of my visit was probably the worst time of the year, except Winter, for collecting Lepidoptera. It was just at the end of the dry season, and no rain having fallen for several months, the earth was hard and vegetation parched. The rainy season begins from July 1st to July 15th, and continues generally about a month. The early months of the year, say in April and May, ought to be good, but probably August and September are better.

As it was however, I took 77 species of Butterflies in all, in very little more than two weeks collecting.

In Coleoptera I did very little collecting, but from what I did obtain am certain that either in Southern California or Arizona one might have done very well indeed at the time of my visit.

Larva of Hemileuca Nevadensis.

By Geo. D. Hulst.

The larvæ were found full grown at San Bernardino, S. California, during the last week in June, on both Willow and Cottonwood, apparently to some extent favoring the former food plant. Mr. Doll has informed me he found the larvæ in the Big Chino Valley, Arizona, where only Cottonwoods were found.

The full grown larva is from $2\frac{1}{2}$ to $3\frac{1}{2}$ inches in length. The head is dark reddish brown, slightly conical in shape, with a slight furrow on

summit. The body is cylindrical in shape, largest at the posterior middle, and tapering in both directions, though less posteriorly than anteriorly. It is generally of a dull clay green color, varying to nearly clay white, and to yellowish green. This ground color is much taken up by broken and irregular blackish bands. One, dorsal, is narrow and generally continuous; another, subdorsal, is broader and broken; a third, supra-stigmatal, is still broader and still more broken, being composed of irregular short lines or striations. The portions of the ground color showing, are generally more or less oval in shape. The stigmata are clay white, oval, annulated with black. Beneath blackish, with many oval shaped spots of clay white. Prolegs black, ventral dull reddish, hairy, feet black. On each of the first five segments of the body and on the ninth and tenth are 8 spinous processes; the sixth, seventh and eight have 6, and the eleventh has 5. These are arranged in rows, as subdorsal, lateral and substigmatal; where the two extra processes exist, they are supra-pedal, and where one, it is dorsal. The supra-pedal, substigmatal, and lateral spinous processes consist of a number of small spines about the base of a single larger and black spine. Those about the base are black at bottom, whitish yellow towards apex, black at apex. The subdorsal processes on the first segment are like those already described. On all the other segments, except the second and eleventh, the subdorsal spinous processes consist of one main spine with many small spinules growing out of it except towards the apex. The spinules are yellow, the central spine is black. The processes on the second and eleventh are a compound of both the other forms.

The larvæ were very common at San Bernardino, in many cases denuding the trees. As has been said Mr. Doll found them in Central Arizona. In Eastern Arizona and Western New Mexico, along the A. T. and Santa Fé R. R., in many places the Cottonwoods were entirely denuded of leaves by some insect, very likely the larva of this species.

The larvæ pupated in Arizona the first week of July, and being brought to Brooklyn the imagines emerged about the middle of November.

Mr. Grote in his Catalogue, 1882, puts this insect as a variety of *Hemileuca Maia*, Dru., which it seems to be. Mr. Stretch in his description notes some differences in the color of patagiæ, and the markings of the fore wings. But I have seen many *H. Maia* from Texas which showed the patagiæ of the color of the typical *H. Nevadensis*, and which varied very much in the color of the wings—some being almost immaculate black, and others having the white band almost covering the wing, and this too in the same sex. But in Texas as I believe in the East and

North the food plant is Oak only, while in California, Nevada and Arizona the food plants are Willow and Poplar, and while Oak is in many places common, I am not aware, that the larva has in those places ever been found feeding upon it.

The larva of *H. Nevadensis* was originally described by Mr. Henry Edwards (Proc. Cal. Acad. Sci. Apl. 19, 1875). These described above do not differ very materially from those described by him, and yet in some respects they seem to vary. He found the food plant to be Willow.

Larva of Chlorosea bistriaria, *Pack.*

By Geo. D. Hulst.

Head rounded, somewhat furrowed between the eyes. Color clay green, with scattered dark flecks. All parts heavily rugose. Body considerably swollen just behind the head, then the segments continuing nearly of the same size to the last. Ground color of the whole, a dirty clay white; somewhat russet anteriorly on dorsum, with dusky, irregular and broken markings below. The segments are distinctly separated from each other, and each one is very rugose and as well ridged and tubercled. First there is on each a raised ridge on each side of the dorsal line, not very distinctly marked with a small tubercle and hair point, on the anterior portion of each segment. Then a supra-lateral ridge of tubercles, one on each segment, angular, and somewhat extended backward, much after the ordinary pattern of the larvæ of *Aplodes*. Each of these tubercles is surmounted at the point by a smaller cylindrical tubercle, somewhat spiny haired on sides, and with a single prominent spine on the summit. Laterally there are two oblique ridges on each segment. The spiracles are marked by black points. The prolegs are dusky in color, the ventral are of the color of the body. Food plant, the flowers of Golden Rod, (Solidago).

The larvæ has a peculiar method of progression, which I have noticed in a few other Caterpillars. As it reaches forward to advance it moves the forward part of the body with a trembling palsy like motion, bobbing the head at the same time from side to side.

The larva has at the same time a very remarkable habit. After eating the scales of the involucre of the flowers, it places the flowers upon the spines which surmount the body on each side of the dorsum. These soon drying, become distended, and thus the larvæ is thoroughly hidden, as it absolutely resembles the ripening flower heads, for about all that is visible is composed of them. Mr. Bruce, to whom I am indebted for the

larvæ, writes me : "I watched one yesterday fix the flower-buds on his spines. He carefully bit the stalk in two, and then took the flower between the pair of front legs, sat up like a squirrel and nibbled all the outer green covering, and then turned his head around and placed the bud on the spine, pressing it down and turning it half round several times until it was well fixed, and then, seeming to be tired, took a good long rest."

He says the larvæ grew very slowly, and it is likely in view of the time taken for larval development that the insect is single brooded. Those that I received were seemingly not full grown, when no longer the flowers of the Golden rod could be found to feed them ; and I am uncertain whether they pass the winter in the larval or pupal state.

Capturing Carabus serratus.

By A. C. Weeks.

The capture of this handsome *Carib* like that of its relatives of the genus *Cychrus* is rapidly becoming more infrequent in the vicinity of the City of New York. A specimen hibernating under a stone is occasionally taken in the Autumn or early Spring, but otherwise except by rare chance is not I believe often met with. Yet this beetle is in my opinion not so extraordinarily rare and familiarity with the life history and habits in the case of this as of other beetles previously considered rare will supply the collector with abundant specimens.

The species of this genus are chiefly nocturnal and the one in question absolutely so. The single brood attains maturity in August and the beetles emerge from their places of concealment and frequent the roots of large trees in localities somewhat moist and comparatively free from underbrush, searching there for food. They likely find enough of this for they are both carnivorous and vegetarian and when unable to intercept some unfortunate caterpillar on its way to or from its lunch the beetle will gorge itself with sap or other sweet juices. This latter fact can be made use of to obtain them in numbers. In sugaring after the manner of Lepidopterists brush the syrup to the roots of the trees where the beetles can readily find and follow its trail. Their fondness for the liquid makes them indifferent to danger and indeed seems to stupify them and they are easily captured.

All the species of *Carabus* found in this vicinity can be readily and plentifully taken in this manner.

"A Revision of the Genera Acrolophus, *Poey*, and Anaphora, *Clem.* By The Right Honorable Lord Walsingham, M. A., F. L. S., F. Z. S., &c."

By C. F. Fernald, Amherst, Mass.

The above is the title of a very interesting and useful paper which his lordship published in the Transactions of the Entomological Society of London, and a copy of which he had the kindness to send me.

These insects have been in a complete muddle in the collections and minds of our entomologists, and we owe a debt of gratitude to Lord Walsingham for this timely and carefully prepared paper.

It contains descriptions of thirty-five species (eighteen of which are from the United States) and thirteen genera, forming a group which his lordship raises to the rank of a subfamily with the name *Anaphorinæ*, and places under the "*Tineidæ.*"

The introduction of three pages is followed by the following:

TABULATION OF THE GENERA OF ANAPHORINÆ.

A. Palpi erect or slightly recurved.

a. Apical vein of fore wing forked.

I. Palpi erect ..... **Eulepiste**, Wlsm.

II. Palpi appressed to the head ..... **Neolophus**, Wlsm.

b. Apical vein of fore wing not forked.

I. Antennæ bipectinate ..... **Ankistrophorus**,* Wlsm.

II. Antennæ simple or serrated towards the apex.

1. Tarsal joints of hind legs strongly fringed above ..... **Thysanoskelis**, Wlsm.

2. Tarsal joints of hind legs not strongly fringed above.

AA. Palpi erect, with distinct separate tufts on each joint ..... **Ortholophus**, Wlsm.

BB. Palpi slightly recurved, uniformly hirsute throughout ..... **Pseudanaphora**, Wlsm.

B. Palpi strongly recurved.

a. Antennæ bipectinate ..... **Felderia**, Wlsm.

b. Antennæ serrated throughout.

I. Apical vein forked ..... **Cænogenes**, Wlsm.

II. Apical vein not forked ..... **Anaphora**, Clem.

* Lord Walsingham having found that *Ankistrophorus* is preoccupied, has since substituted the name *Homonymus* for it.

c. Antennæ simple, compressed, or slightly serrated ot the ends.

I. Apical vein forked.

1. Head with crest erect..... .....**Urbara,** Wlk.
2. Head without erect crest.....**Hypoclopus,** Wlsm.

II. Apical vein not forked.

1. Palpi roughly clothed throughout..... **Acrolophus,** Poey.
2. Palpi not roughly clothed throughout .....**Stoeberhinus,** Butl.

The paper includes two plates with colored illustrations of eight species, and numerous structural details, among which the genitalia of the males are prominent. The adoption of characters taken from the genitalia, in classification is undoubtedly a move in the right direciion. These characters have proved of great assistance to me in the study of the *Tortricidæ* as well as to others in other families of the Lepidoptera.

A Wicked Worm.

This has been discovered in Germany, and is playing havoc among the rails. An article on the subject is going the rounds in Iron trade and mining papers, and as, possibly some of our readers have discovered it in their localities we quote from the *Mining Scientific Press* of August 20th, 1887. "The existence has just been discovered of a detestable microbe (*sic*) which feeds upon iron with as much gluttony as the *Phylloxera* upon the vine. Some time ago the greatest consternation existed among the engineers employed on the railway at Hagen by the accidents occuring always at the same place, proving that some terrible defect must exist either in the material or the construction of the rails. The German Government directed an inquiry to be made. and a commission of surveillance to be found for the purpose of maintaining constant watch on the spot where the accidents had occured. It was not however, until after six months had elapsed that the discovery was made. One of the employees had observed that the surface of the rails appeared to be corroded, as if by acid, to the extent of 100 yards. The rail was taken up and broken, and it was perceived that it was literally hollowed out by a thin gray worm, to which the qualification of *'railovorous'* was assigned, and by which name it is to be classed in Natural history. The worm is said to be two centimeters in length, and of the size of the prong of a silver fork in circumference. It is of a light gray color, and on the head carries two little glands filled with a corrosive secretion, which is ejected every ten minutes upon the iron. This liquid renders the iron soft and spongy, and of the color of rust, and it is then greedily devoured by the insect." "There is no exaggeration," says the official report of the

calamity, "in the assertion that this creature, for its size, is one of the most voracious kind, for it has devoured 36 kilograms of rails in a fortnight!" ! ! !

It occurs to us however, that this must be a close ally of the "Cannon worm," a still more detestable animal, which, once upon a time attacked the guns of a Russian fort so viciously that they one and all burst when the attempt was made to fire them. J. B. S.

On Bolina fascicularis, (Hübn.) Guenée.

By H. B. Möschler,
Kronförstchen, near Bautzen.

It does not seem to be generally known that Guenée in describing this species in his "Noctuélites" III, p. 63, No. 1398, has made a very considerable mistake. The Author cites under this species, fig. 443, 444, of Hübner's "Zuträge zur Sammlung exotischer Schmetterlinge," but these figures show the two sides of *Melipotis* (*Ædia*, Hb., *Bolina*, Guen.) *fasciolaris*, Hb. To increase the confusion, Guenée also describes this latter species, (l. c., p. 69, No. 1412), and cites the same figures of Hübner's book! It is of course evident that there must be a mistake, as it is impossible that the same figures could show two species as different as *fasciolaris* and *fascicularis* must be, if Guenée's descriptions are correct. The reader will no doubt now be not a little surprised when I tell him that Hübner never published a species of *Bolina* named *fascicularis* but only *fasciolaris* to which belong the figures of his "Zuträge." The species described by Guenée as *fascicularis* does not exist at all, but Guenée has mixed up two species in his description, viz: *fasciolaris*, Hb., and the North American species well known as *Melipotis ochreipennis*, Harvey. He describes the fore wings of the latter, and the hind wings of the former species; besides he attributes to it the hairy brush of the middle tibiæ which shows the male of *fasciolaris*. He also does not state exactly the fatherland of both species, as he says *fascicularis* occurs in the "Antilles," *fasciolaris* in "Brazil and Honduras."

It is very difficult to believe so famous an author as Guenée could make so great a mistake, but there is no doubt he has made it; and those who compare Guenée's descriptions of these two species, must, I am sure, agree with me.

It seems that American as well as European Authors, even those most prominent, consider that the species occuring in the United States, and published by Harvey as *ochreipennis* is *fascicularis*, Guen., as I have

always received Harvey's species thus named. I sent colored drawings of this species as well as of the true *fasciolaris*, Hb., to Mr. J. B. Smith, and this author confirmed the opinion that *fascicularis* is synonomous with *ochreipennis*, which latter however likely belongs as a variety to *nigrescens*. Grt. & Rob.

Of course the name *fascicularis*, Guen., although published before *ochreipennis* or *nigrescens*, cannot stand, as there exists no species agreeing with the description of it given by Guenée, and Hübner never published a species under the name.

With regard to *Bolina lunearis*. Guen., a species nearly allied to *fasciolaris*, Hb., I am not convinced it is a good species, but am of the opinion that it is the female of *fasciolaris*. The differences between the two are the clay yellowish color of the head, thorax, and basal half of the fore wings of *lunearis*, while the color of these parts in *fasciolaris* is dark brown; besides the yellow band running through the basal half of *fasciolaris* is wanting in *lunearis*. But all these differences may be sexual as the sexes of *ochreipennis* show similar variation. The size of the wings, the disposition of the ornamentation of the fore wings, the color of the outer half, and of the hind wings, as well as of the underside, exactly correspond in *lunearis* with *fasciolaris*. There is also a small white angular line upon the head between the antennæ, and this, as it is found so far as I know in no other species of the genus, is, I think, of importance in establishing their identity.

I have never seen a male of *lunearis*, nor a female of *fasciolaris*; and moreover these two species occur in the same localities: for instance, I have received them from Porto Rico, and I saw only females of *lunearis*, and males of *fasciolaris* in the large collection of my friend Dr. Staudinger. Guenée himself was not convinced that *lunearis* was a good species. It would be of very great interest to me to hear of any Lepidopterist who has both sexes of one or the other of these species.

The fatherland of *fasciolaris*, Hb., is the West Indies, Columbia and Brazil; that of *lunearis*, Guen,, so far as I know from Guenée, and personally, is Cuba, Porto Rico, and Brazil. I do not doubt but this species will be found everywhere where *fasciolaris* is found to occur.

Ochreipennis is found only in the United States. Mr. J. B. Smith writes me that he has never seen a true North American specimen of *fasciolaris*, Hb. This species must therefore be stricken from the lists of North American Lepidoptera.

Walker in his "List" cites *fascicularis* (Hb.) Guen., with *fasciolaris*, Hb., as he did not recognize the mistake made by Guenée.

Society Meetings.

Brooklyn Entomological Society. Dec. 6, 1887. Fifteen members present. John B. Angelmann, of Newark, N. J., was elected a member of the Society.

Messrs. Graef and Hulst were appointed a Committee to see the proper authorities to ascertain if the Society could obtain the use of rooms for meetings in the Hoagland addition to the Long Island Medical College.

As arranged at last meeting an auction sale of presented insects was held and with only a part of these sold the sum of $47.49 was realized.

Ent. Soc. Washington. Nov. 3, 1887. Mr. Schwarz read a paper on the Insects living on *Uniola paniculata*, as observed by him at Cape Florida and near Lake Worth in Southern Florida. The Insects are on *Oxacis* and *Hymenorus densus* feeding on the ears of the plant; a *Phlœothrips* living between the blades; the common chinch bug, which occurs in this Southern latitude only in the brachypterous form, and develops some peculiar habits; *Collops nigriceps*, which, in the imago state frequently feeds on the pollen; *Mordellistena splendens* which develops within the stems of the grass, and finally a *Hemiptychus* which in the larva state lives in the stems vacated by the *Mordellistena*. A full series of specimens illustrating the life history of *Mordellistena splendens* was exhibited and explained. Mr. Schwarz also spoke on the periodical abundance of mosquitoes on the shores of Biscayne Bay, whenever the regular trade wind ceases to blow. At such times there is a curious correlation in the increase of the numbers of mosquitoes on the one hand, and of certain species of dragon flies on the other. Mr. Schwarz finally called attention to a peculiar habit noted by him in *Danais Berenice* which congregated in great numbers on stones which had been heated by fire.

Mr. Smith exhibited a specimen of *Cicindela Belfragei* which shows a peculiar abnormity in the shape of an acute tubercle on the left side of the prothorax. Mr. Smith further called attention to some modifications of tarsal structure among the *Arctiidæ*. He finds that some genera, as *Ecpantheria* and *Leucarctia* have the claws cleft to the base. Others, as *Phragmatobia* and *Parrharctia* have them dentate at the tip, while in *Spilosoma* and *Antarctia* there is a distinct long tooth at the middle of the claw. The claws are not always alike on all feet, and where there is any difference the fore tarsal claws are the ones that are modified. What systematic value this structure has, is yet uncertain. There are two distinct series indicated in this family by the venation, by the position of vein 10. In one series it arises from the subcostal before the end of the cell, in the other it arises from a stalk with 7, 8 and 9.

Dec. 8, 1887. Dr. Marx read a paper on the Morphology of the *Scorpionidæ*, illustrating the same by a series of carefully prepared drawings of the various structural details. Mr. Schwarz made a series of smaller communications, with exhibitions of specimens. He showed specimens of the insects referred to by Mr. Smith in his paper on "Ants Nests and their Inhabitants" (Amer. Nat. 1886, p. 686) viz: *Tapinoma sessile*, an unnamed Heteropterous larva, an undescribed *Anthicus* and the two species of *Teinopophus*, which, all occuring under the same conditions and at the same place, exhibit a rather remarkable resemblance in general appearance. The galleries made by *Pityophthorus minutissimus* under bark of Red Oak branches were exhibited, and Mr. Schwarz pointed out that these galleries closely resemble those of *P. querciperda*, exhibited at a former meeting. The galleries all seem to be the work of the parent beetle, and the larva probably do not make any galleries of their own. Mr. Schwarz also exhibited specimens of *Otidocephalus Poeyi*, Chevr., from Southern Florida, and

called attention to the remarkable character of the species, briefly mentioned by Gyllenhal. This consists of a large fovea on the upper side of the beak, which Suffrian entirely misinterprets and considers an abnormity. The fact is that this spoon-shaped fovea is a secondary male character not recurring in any other described species of the genus. Mr. Schwarz also exhibited larvæ, pupæ and imagines of *Bonvouloiria*, recently found by him at Biscayne Bay, Fla., and described the life history of the insect and more particularly the first appearance of the snow-white efflorescence with which the thorax and a spot on the elytra of the imago is covered. Mr. Schwarz finally pointed out that Dr. Harris in his account of the Pear-blight *Tomicus (Phlœotribus limnaris)* apparently mixed two species, the forms he mentions as living under Elm bark being in all probability *Hylesinus opaculus*.

Mr. Howard read a paper entitled "A misconception regarding the Leconte edition of Say." The title page of this edition reads "The complete writings of Thomas Say on the Entomology of North America," but finding several papers not included in this edition Mr. Howard concludes from a paragraph in the preface that the editor simply intended to bring together the *descriptive* papers of Say and that the title page is therefore very misleading and the cause of a very general misconception on the part of Entomologists, as to the scope of the work.

Mr. Smith gave some notes on his experience with Museum pests. *Psocids* he finds come universally into boxes however tight, and are readily controlled by Naphthaline. The *Dermestids*, *Anthrenus* and *Megatoma* are not affected by Naphthaline to the extent of preventing growth and transformation. It acts however as a repellant to the parent, and seems to check development of the young larva. Boxes of similar nature in similar situations always showed infection more commonly where no Naphthaline was used, while boxes with cones were as a rule free, or with a very slight infection only. Tight boxes with Naphthaline cones remained free while the cones lasted, and some time after showed young larva where it was almost impossible that the infection should come from the outside. The common pest in Washington is *Anthrenus varius*. A lot of boxes received from North Carolina proved invested with *Attagenus* larva; those developed were killed, and the boxes were supplied with cones—for over a year no larvæ developed. After the cones had evaporated, they were not immediately replaced, and in a short time when the boxes were again examined it was found that a very general development of small larvæ—evidently only a very short time from the egg had taken place. As *Attagenus* is not common in the Museum and as no other boxes were similarly infested, he concludes that the Naphthaline prevented the development. Other instances were mentioned showing that the eggs of these beetles may under some circumstances remain undeveloped and sound for an indefinite time. He also finds bi-sulphide of carbon a positive destroyer of the insects in all forms save the egg. It will not however reach larvæ in large beetles like *Copris* or moths like the *Attaci*. Boxes exposed to the light are less affected than others. He also exhibited some cocoons of a *Microgaster* found parasitic on *Anthrenus*, and noted several other features in the history of the beetles, among which he mentioned that in the warmed rooms of the Museum the insects breed continually, all stages being found at all seasons.

A Correction.

On page 160 Mr. Howard corrects Mr. Jülich for his use of the word Elder in his Article page 123. The mistake was an error in Proof reading. The word is Alder in his manuscript.

ENTOMOLOGICA AMERICANA

VOL. III. BROOKLYN, FEBRUARY, 1888. NO. 11.

Address of Mr. G. W. J. Angell, the Retiring President of the Brooklyn Entomological Society.

"MR. PRESIDENT AND GENTLEMEN:

The precedent, established by my predecessors in office, calls for an address from me, on retiring from the presidential chair. As a preface to the few remarks I have the honor to lay before you to-night, I would thank you all for the hearty support and encouragement, which have made my official duties a pleasure, not a burden. To preside over a body, composed of so many different minds, such widely varying ideas, can be no easy task. Some laws are necessary; too many, but become a burden, and simply serve to clog the wheels in the very work they are framed to aid. I have tried to steer midway, between the rocks of rigid discipline and the hidden dangers of too great license. The past year has had its full share of cares and discouragements. At times we have been face to face with financial struggles it seemed hopeless to grapple with: yet you have bravely put your shoulders to the wheel and the threatened dangers disappeared. These trying ordeals are safely passed, all clouds of petty strife have faded, and, now to-night we meet together with one thought, one aim; the love and advancement of our cherished Goddess, Science. Once more we stand on the threshold of a new year, with little to regret, much to congratulate ourselves upon. To-night I lay aside the duties of official life with mingled feelings of gratitude and regret; yet the mantle of authority has fallen on more worthy shoulders, an abler hand is at the helm; my loss has been your gain."

On the Position of the Genus Pleocoma, *Lec.*, in the Lamellicorn System.

By Dr. Gerstaeker.

It is sufficiently well known that those related forms termed families, as well in the Insects as in the other divisions of animal life, range themselves in larger, more sharply defined groups; sometimes easily, and sometimes only with the greatest difficulty. The latter occurs naturally where all the members of a large group have essentially the same food and life habits, while the former is more usual when differences in habit bring about modifications of structure, which afford characters valuable in systematic classification. In the Coleoptera for instance, the *Lamellicornia* would be classed among those, which, sharply defined as they are from others, would admit of a much more ready and satisfactory division into naturally defined groups, than in say the families of the *Elateridæ*, *Buprestidæ*, or even the *Carabidæ*, *Melasomidæ* and *Cerambycidæ*. While in the latter group the case can readily occur—in fact has repeatedly occurred—that a newly discovered genus offers so many and so variously combined characters, that the exact position and relationship will be differently determined according as the student values the often very obscure and subordinate structural characters, such doubts scarcely exist at all in a family like the Lamellicorns, or at least confine themselves to such isolated genera which as for instance *Pantodinus* and *Euchirus* are so near to the border line between two nearly related groups, that they might with almost equal justice be referred to either. When therefore the case does exceptionally occur, that in such a family a newly discovered genus is, by an able and careful student, entirely misapprehended as to its relationships, the reason is clearly to be sought in the fact that in such a type the subordinate or habital peculiarities predominate and obscure and crowd out of view the essential characters to such an extent that they are entirely overlooked.

The extraordinary genus *Pleocoma*, described by Leconte in 1856, became known to me in 1866 in a single example in the collection of the Berliner Entomologische Museum, and aroused in me, even at that time, the gravest doubts as to the correctness of the position assigned to it by Leconte as a near relative of the *Geotrypini*; but I was unable at that time to oppose that view from the examination of a single specimen which also lacked the antennæ—so highly important in classification. I might have done so successfully in 1872 or '73 when a second, perfect example of *Pleocoma fimbriata* came into the possession of the Berliner Museum from the well known Californian traveler Alphons Forrer, but was pre-

vented by other work from a careful study of the specimens. At the present time, as I have also another specimen of the same species from the Greifswald Zoological Museum and three specimens from the rich collection of my friend C. A. Dohrn, and as I was thus able to make not only comparisons of superficial characters but also of those not visible in situ, I hesitate no longer in endeavoring to prove what I had long suspected—that the genus belongs to an entirely different group, remote from the *Geoptrypidæ*.

Leconte himself since 1856, when he first described the genus, has several times referred to the systematic position and relationships of this genus. While he at first considered it as related to the *Dynastini* he afterward changed his views so that he considered it as holding a middle position between that group and the *Geotrypini* and finally came to the conclusion that it was the representative of a new group, nearly allied to the *Geotrypini* and which he termed *Pleocomini*.

That he still adheres to this view seems to appear from the "Index to the Coleoptera described by John L. Leconte" (Tr. Am. Ent. Soc., IX, p. 197–272) revised by Leconte himself and therefore authoritive, because in this publication the genus *Pleocoma* is (p. 233) still in the same place, between *Geotrypes* and *Nigacus*, that it occupied in Leconte's Catalogue of the Coleoptera of North America (1863). Let us however follow Leconte a little more closely in his notes and opinions on this genus during the past nineteen years.

In his "Notice of three genera of Scarabidæ found in the United States" (Proc. Ac. N. Sc. Phil. VIII, 1856, p. 24) after an enumeration of the characters which seemed to him important and peculiar to the genus *Pleocoma*, he says as to its relationship:—"A very remarkable insect apparently belonging to the *Dynastidæ*, but differing from all the described genera of that tribe by the eleven-jointed antennæ having a four-jointed club; the seventh joint might almost be considered as belonging to the club, but is only half the length of the four following. The very long hairs fringing the body give a strong resemblance in appearance to *Syrichthus*. The anterior tibiæ are somewhat as in *Athyreus ferrugineus* and other Geotrupides, but the teeth are more unequal; the anteocular lateral horns are also seen in that species; the eyes are very large, and contract the mouth so much beneath that the maxillæ and mandibles are invisible, or have been destroyed by insects; the thick hair also prevents me from seeing the form of the mentum. The form of the prosternum is the same as in *Athyreus*; the anterior femora are very densely clothed with hair on the anterior surface. The anterior and posterior tarsi are unfortunately destroyed; the middle tarsi are exactly as in *Athyreus*. Doubt must therefore be entertained whether this species should be placed with

the Dynastidæ or Geotrypidæ; the form of the antennæ is equally repugnant to each, while the irregular puncturing of the elytra finds no parallel in the latter tribe."

The only species there described, *Pleocoma fimbriata*, was known to its author only in a single, very imperfect example received from California through Haldeman. He adds that according to Motschulsky there were examples of this species in the Museum at St. Petersburg, also from California, and that Motschulsky considers it as closely allied to the Geotrypid genus *Ceratophyus*, Fisch.

In the "Report of Explorations and Surveys for a railroad route from the Mississippi River to the Pacific Ocean" Vol. XII, (Entomological Report, page 40, pl. I, fig. 13 and 13a) Leconte gives another diagnosis of *Pleocoma fimbriata* based on the same specimen from which the original description was made, but in a foot note gives another characterization of the genus differing in important particulars from that previously given, and based, not on that specimen, but on others since received, and differing also in their smaller size. While in the original description the club is said to be *four*-jointed, it is now said to be *seven*-jointed, the entire number—eleven—remaining the same. The mandibles and maxillæ are said to be "*invisæ, minutæ.*" To this altered generic diagnosis, Leconte adds that these, newly received, perfect examples of this peculiar genus, of which he could then make only a hasty examination, had not given him more definite information in reference to its relationships. Although the antennæ being eleven-jointed agree with those of the *Geotrypidæ* yet their structure is entirely different as well from those of the *Geotrypidæ* as from the more allied groups, and the smallness of the mouth parts seems to indicate a new group between the *Geotrypidæ* and the *Coprini.* The differences between the first specimen and those later received, in size, structure of antennæ, punctuation and clothing of thorax &c., he is inclined to consider as sexual. Referring to the original, large specimen, described in the text, he says—contradicting the foot note—"As the oral organs and abdomen are destroyed, I cannot tell whether the genus belongs to the *Dynastides* or *Geotrupides*; in either case the four-jointed antennal club is equally remarkable. The affinities, so far as I can understand them, seem to be rather with *Geotrupes.*"

A further notice of this genus appears in 1859. In his "Catalogue of the Coleoptera of Fort Tejon, California," (Pr. Ac. N. Sc., Phil., XI, p. 71) Leconte gives a detailed description of the mouth parts of this insect from a specimen found in the stomach of a bird, and adds the following remark:—"It will thus be seen that combined with the 11-jointed antennæ with polyphyllous club, the characters above detailed are abundantly sufficient to establish this genus as a new group, related to

Geotrupidæ and *Copridæ*, with, however, strong tendency towards the Dynastide group of *Scarab. pleurosticti.*"

This new group is characterized under the name *Pleocomini* in 1861 (Classification of the Coleoptera of North America, p. 123 and 128) and in the "List of the Coleoptera of North America," published in 1863, at p. 37 is placed among the *Scarabæidæ laparosticti* between the groups "*Geotrupini*" and "*Acanthocerini.*"* At last, in 1874, (Note on the genus Pleocoma, Lec., in Tr. Am. Ent. Soc. V, p. 81–84) Leconte gives a resume of his statements made in his earlier publications on the genus mentions the two species, *Pleocoma staff*, and *hirticollis*, described in 1870 by Schaufuss (Nunquam otiosus II, p. 50) and now first makes known, what is of the highest importance, the true female of the genus. This is considerably larger than the male, oval and strongly convex, furnished with elytra but without wings, with stronger legs, and short tarsi, not more than one-third the length of the tibiæ. The prolongation of the head is short and broad, not emarginate nor bifurcate, the frontal horn is short, the thorax closely punctured, and not indented; the antennæ are much smaller with smaller, rounded club. Before proceeding to a description of the four species known to him (*P. fimbriata* ♂, *Behrensii* ♂ ♀, *hirticollis* ♂ ♀, and *Edwardsii* ♂) Leconte mentions having received a larva from Mr. Behrens, found deep in the earth, and described and figured by Osten-Sacken in an appendix to this paper (Description of the larva of Pleocoma, Lec., by Baron R. Osten-Sacken). Of this larva Leconte says that it justifies the erection of a special group for this genus and that its characters fully confirm the opinion already expressed regarding the relations of the genus.

At all events from these five publications of Leconte it sufficiently appears that the systematic position of the genus caused him in the earlier years a considerable amount of thought. Only after he had during five years undergone considerable changes of opinion did he arrive at a definite, and afterward repeatedly confirmed conclusion. The, at first, "apparently Dynasti-form" genus changed to him next to a middle thing between the *Dynastini* and *Geotrypini*, then to the representative of a special group to be placed between the *Coprini* and *Geotrypini*, and still later the *Dynastini* and *Coprini* are dropped altogether, and the special group *Pleocomini* figures among the *Scarabæidæ laparosticti* between the *Geotrypini* and *Trogini.*

To the latter conclusion, which seems to have become fixed with Leconte, it is obvious that only the following train of thought can have led him :—The *Geotrypini* are the only known Lamellicornes possessing eleven jointed antennæ; therefore this genus *Pleocoma* which also possesses

* The same position is retained in the 2nd Ed. of the "Classification" 1883.—J.B.S.

eleven-jointed antennæ, is, despite the difference in the form of these antennæ most closely allied to them. Now as the *Geotrypini* are laparosticti Lamellicornes I consider myself justified in placing this genus which also has but eleven antennal joints in this division. That this placing was due only to reasoning by analogy, extraordinary as it may seem, is forced upon one by the fact that he nowhere speaks of having examined the abdomen for the position of the stigmata, and positively mentions that the specimen first described by him had had the abdomen destroyed.

But what, actually, is the structure of this abdomen? Undoubtedly, in view of the many characters contradicting the relationship with the *Geotrypini*, an answer to this question was of primary importance, because, pro- or con, decisive. I, therefore, with the growing conviction that *Pleocoma* had nothing in common with the *Geotrypini*, but despite the eleven-jointed antennæ, could belong only to the *Melolonthini*, did not hesitate a moment about obtaining certainty by an examination of the carefully removed abdomen of one of my specimens. This examination proved positively, what I fully expected, that the large spiracles of the second and third, and the smaller ones belonging to the fourth and fifth abdominal segments, had, in *Pleocoma*, *precisely the same situation as in Melolontha*, i. e. on the superior portion of the ventral segments, and not on the membrane connecting the corneous dorsal and ventral plates as in *Geotrypes* and *Copris*.

From this it appears at once that *Pleocoma* does not belong to the *Scarabæidæ laparosticti* at all, and that the relationship assumed by Leconte to exist between this genus and the *Geotrypini* and *Coprini* as at first stated, or the *Geotrypini* and *Trogini*, as finally stated, was entirely without base. Certainly he would have been much nearer right in the conviction at first forced upon him, of its relation to the *Dynastini* as, agreeing with them, this insect is at least a *pleurostict*. But that, even disregarding the entirely different situation of the spiracles, *Pleocoma* shows no real relationship to the *Geotrypini* but only a certain habitual agreement with some of them, and an agreement in unimportant details with others is fully demonstrated by an examination of all really important characters.

As to the habitus of *Pleocoma*, it is not to be denied that it reminds one of the females *Ceratophyus*, Fish.; but of all the Geotrypid forms it reminds one of that only. As Leconte himself says a closer comparison is at once opposed by the entirely different sculpture of the elytra, and in this respect the resemblance to *Syrichthus* would be vastly more obvious. Further, as regards the agreement of the prosternum with that of *Athyreus* prominently mentioned by Leconte, I am utterly unable to discover any such; in *Athyreus* it forms an inflated trigonate or heart shaped plate, and at this point in *Pleocoma* there is only a small,

depressed margin before the coxæ. With much more justice than to the prosternum, Leconte might have referred to the very obvious similarity which exists between *Athyreus* and particularly *Balbocerus* on the one side, and *Pleocoma* on the other, in the large size, great convexity, smoothness, and brightness of the eyes, though this is as little decisive, systematically, as the similarity mentioned by Leconte between the two genera in the form of the anterior tibia and middle tarsi, for this can be equalled in a still more striking manner in another group of the Lamellicorns (*Melolonthidæ*).

Under no circumstances can these analogies, so far as they really exist, weigh against the fundamental differences, which two of the most important structures—the antennæ and mouth parts—show at a glance to exist between the *Geotrypini* and *Pleocoma*, and with perfect right did Leconte insist that on these characters it was impossible to unite *Pleocoma* with that Coprophagus group. The antennæ have nothing in common except the number of joints, eleven. With all the variations in form of club offered by the Geotrypid genera, it is yet constantly three-jointed, and always sharply limited from the funicle or stem, while in *Pleocoma* it varies from four to seven joints in the species and runs gradually into the funicle or stem—a peculiarity which, omitting the *Lucanini* and *Passalini*, is found only in the *Melolonthidæ* among the *Scarabæids*. In like way the mouth parts are diametrically opposed in structure: in the *Geotrypini* a large, transverse, horizontal labrum, broad, free, prominent mandibles, well developed, in comparison with the palpi large maxillæ, the inner lobe appearing furcate owing to a deep incision, and finally a large, also transversely developed mentum (compare Klug, Ueber die Gattungen Athyreus und Balboceras, Taf. II, Fig. I bis IVa, b); in *Pleocoma* on the contrary a very small, rather long, deflexed labrum, entirely rudimentary, concealed mandibles, small maxillæ, reaching scarcely to the end of the first palpal joint, the inner not split, and a very small, oblong mentum.

When therefore the genus *Pleocoma* neither in the position of the stigmata, nor in any other important structural character agrees with the *Geotrypini*, but is to be ranged with the Scarabæidæ pleurosticti; the next question would be, whether it is, in this group, entitled to take rank as a distinct tribe (Pleocomini). This question also is to be answered by a decided negative, because those very characters used by Leconte to separate the genus from the *Geotrypini* are identical with characteristic peculiarities of some of the *Melolonthidæ*. By the structure of the antennæ alone *Pleocoma* is at once excluded from every other group of pleurosticti Lamellicornes (*Dynastini*, *Melitophila* and *Rutelini*) because in all those the club is distinctly three-jointed, and sharply defined against

the stem or funicle. Even those undeniable habitual analogies which the genus has with the *Dynastini* in color, sculpture of elytra, prolongation of front, horned head, indented thorax, &c., cannot obtain against this decisive character; though it was these very points, which are not usual in the *Melolonthidæ*, which prevented the recognition of the genus as a member of that group and led to its association with entirely heterogenous forms.

In fact *Pleocoma* does not only not lack any of the characteristics of a *Melolonthid* antennæ, but even possesses all the peculiarities in the most prominent form. To be sure, against this, the number of joints, eleven, might be urged, as all hitherto known genera possess only 8-, 9-, or 10-jointed antennæ. But in view of the already known variability in number of antennal joints the further increase by one could be the less surprising, as eleven is evidently the original and normal number, and the decrease to 10, 9 and 8 can be considered only an departure from the normal structure, although it is one which among the Lamellicorns is widespread. At all events the *Pleocoma* antennæ show—if we ignore one of the short joints of the funicle which at any rate vary in number—entirely the structure of a *Melolontha*, *Rhopæa*, *Macrophylla*, or *Elaphocera* antennæ: not only in the comparative difference in size of club, between ♂ and ♀, but also in the more intimate connection between the funicle and club, by a gradual enlargement and unilateral broadening. Further, in this, that the joints modified into the lamellate club vary—*Rhopæa* to seven, five and three, *Macrophylla* five and three, *Pleocoma* seven and four—in different species of the same genus; and that as in *Melolontha*, *Anoxia*, *Rhopæa*, *Rhizotragus*, *Lachnodera* et al, the lamellate joints are clothed at the edges—the first and last also at its free surface—with stiff bristles. All these are peculiarities, which, partly by themselves, partly in their combination, are characteristic of the Melolonthid antenna.

Now as the situation of the stigmata in combination with the proved antennal structure, places *Pleocoma* primarily among the *Melolonthidæ*, so do other of its characters, as the structure of the mouth, the attenuated tarsi, the dense woolly clothing of the breast, and the free, not connate, ventral segments, point with entire certainty to the particular systematic position which is to be occupied by this genus. By all these characters *Pleocoma* is referred to the group denominated *Leptopodidæ* by Burmeister, and more particularly to that part of it named *Pachypodidæ* by Erichson. The more comprehensive *Leptopodidæ* which equal the *Tanyproctini* and *Pachypodidæ* of Erichson are characterized by Burmeister precisely by the slender tarsi and free ventral segments, and form in fact an equally natural as well defined group. Within this group appear two modifications in structure of mouth parts: on the one hand normally developed as in

Leontochæta, *Macrophylla*, *Tanyproctus* and allies; on the other all parts except palpi aborted as in the *Pachypodidæ*. Such aborted mouth parts which agree in all essentials with those of the *Pachypodidæ*, exist, as I have satisfied myself by examination, in *Pleocoma*. They agree indeed with those of *Elaphocera* and *Pachypus* so closely that one might feel inclined to refer the figures of the mouth parts of those two genera given by Erichson (Entomographieen, Taf. I, Fig. a–c und g–i) to those of *Pleocoma*. Especially is it the small, stumpy, triangular mandibles, and the entirely rudimentary lobes of the maxillæ which *Pleocoma* has in common with *Pachypus* and *Elaphocera*, while nowhere else, in the entire family of the Lamellicornes, rich as it is in forms do we find its equal. But also by an entire series of other agreements or at least similarities do we find the close relationship of *Pleocoma* with *Pachypus* and *Elaphocera* entirely confirmed. With *Pachypus*, *Pleocoma* has in common the concave depression of the anterior part of prothorax, and the untoothed, simple, pointed claws of tarsi; with *Elaphocera* the relative size, the great convexity and polish of the eyes, and the close fringing of side margin and felt like fringing of hind margin of pronotum. Despite the simple tarsal claws, and the indented prothorax, *Pleocoma* is much nearer to *Elaphocera*; for it has in common the short, transversely developed, equally outlined pronotum, the not dilated tibia, not shortened and broadened femora, the elytra not narrowing posteriorly, and the brilliant polish of the upper side—all this in the male. But particularly in the female, which offer precisely the same dissimilarities from the males—the greater convexity, complete elytra, but lacking wings, thicker legs with shortened tarsi, shortened antennal club, yet having the same number of joints &c., are *Pleocoma* and *Elaphocera* closely allied.

The acquaintance with the female in itself, ought, in my view, to have demonstrated to Leconte the Melolonthid nature of the genus.

That, with all its agreements with the two above mentioned Pachypodid genera, *Pleocoma* yet has several peculiarities foreign to the others in their entirety, cannot be denied. Yet even in this, it is not singular in the *Pachypodidæ* but simply enlarges the circle of aberrant unique forms: as indeed *Pachypus* and *Elaphocera* themselves are, in both sexes, as different as can be in habitus. As particular generic peculiarities of *Pleocoma*, beside the eleven-jointed antennæ with the club varying in number of joints in the species, might be viewed, on the one hand the well developed horn of the head, especially in the male; on the other hand the strikingly dense and long woolly clothing of the breast, which reminds one of *Leontochæta*, *Lachnodera*, *Anoxia* et al; and lastly also various peculiarities in the form and clothing of legs. Primarily in the tarsi, there is, while equally slender, an essential difference from *Pachypus*

in the proportion of the joints. While in the latter genus the fifth joint is but little longer than each of three preceeding joints, and is somewhat shorter than the first, it attains in *Pleocoma* double the length of the fourth. The tarsal joints are here also not only furnished at tip with stiff bristles but are also furnished throughout with bunches of much longer and finer hair.

After having in the preceeding disproved all the grounds brought forward by Leconte to justify his placing *Pleocoma* with the *Geotrypini*, by proving its Melolonthid character—in the imago state—, it remains to examine the remark of the author that the larva described by Baron von Osten-Sacken "fully confirms" the placing of the genus between the *Geotrypini* and *Trogini*. That the "Pleocoma-larva" made known by Osten-Sacken belongs to the Scarabæidæ laparosticti, admits indeed of no doubt, for it possesses the divided maxillary lobes, insisted on by both Erichson (Naturgesch. d. Insect. Deutschl., p. 716) and Schiodte, (Naturh. Tidskrift 3 Raek., IX p. 253) as characteristic of this division. But on this proof of a laparostict Lamellicorn larva, are in fact all of Von Osten-Sacken's statements in reference to its relationship to be confined; what goes beyond, the imagined near relationship to the larvæ of the *Geotrypini* and *Trogini* may be easily proved erroneous. But must not the above proved Melolonthid nature of the imago, fail, by the fact that the larva decidedly contradicts the structure of a pleurostict Scarabeid? If the latter were really the case, doubtless! But how is it proved that the larva described by Von Osten-Sacken is really that of *Pleocoma*? Certainly not through the statement of Leconte, that he received from Mr. Behrens a larva—undoubtedly Lamellicorn—found deep in the ground, alone! And nowhere is there furnished any proof of its relation to *Pleocoma*, which, as in California the most various Lamellicorn larva must live in the earth, seems absolutely necessary. The disproportionate length alone—50 mm., or rather greater than the full grown larva of *Melolontha vulgaris*—given by Osten-Sacken would seem sufficient to give rise to the gravest doubts as to its relationship to *Pleocoma*. The doubts must necessarily lead to a direct negative to the above question, if it is proveable that from the description and figures of Osten-Sacken the larva baselessly referred to *Pleocoma* cannot belong anywhere but to a group already well known in its early stages—i. e. the *Lucanidæ*. I maintain therefore shortly and positively that the larva can have no possible connection with *Pleocoma*.

That the remarks of Osten-Sacken, added to his description, in reference to the relation of this larva to those of other known Lamellicorns, are particularly inclined to invite confidence, can hardly be maintained. To compare a 50 mm. long larva with *Geotrypini* and *Trogini* is strange

to begin with; but to place it as even closely related to the *Geotrypini* proves entire ignorance of the larva of the latter. To be sure Osten-Sacken refers only to a table by Chapuis and Candèze in their Catalogue des larves des Coléoptères, p. 115, in which the characters of the laparostict Lamellicorn larvæ are analyzed. Strangely enough, this table contains the entirely false statement that the segments of the Geotrypid larvæ are furnished with transverse foldings, which is not the case; while in the same table the Lucanid larva which have these folds or wrinkles, are declared to be without them. As little as Frish, Mulsant and Erichson mention such wrinkles or folds, so little does Schiodte (Band IX, Taf. XVI) in the unsurpassed figures given by him. So in this direction it is impossible to speak of any relation between the smooth ringed Geotrypid larva, and the wrinkled, so called *Pleocoma* larva. The Trogid larvæ—which are still further removed by their size from this "Pleocoma larva"—seem, according to Chapuis and Candèze figures to have such wrinkles, but they seem to extend the full length of the larva, while in Osten-Sacken's figure they do not exist on the two enlarged end segments (in *Trox* these segments are narrow and tapering). In addition it appears however that this newly discovered larva does not agree with that of *Trox*, either in the structure of the mouth parts, nor yet in that of the antennæ: especially the latter, which by their greatly elongated basal joint prove typically different. In view of these mistaken remarks of Osten-Sacken as to the relationship with the *Geotrypini* and *Trogini*, it seems doubly strange that in his search after the nearest allies of the supposed *Pleocoma* larva, he failed to hit on just that group of laparostict Lamellicorns which their size and structure most indicated—i. e. the *Lucanidæ*. And that it belongs to a member of this family, an examination of the mouth parts and antennæ leaves hardly doubtful. Only in the Lucanid larvæ, among all the laparostict or even pleurostict Lamellicornes heretofore known, do we find the characteristic slender three-jointed antenna, on which the first joint is especially noticeable from its great length, which is so well shown in the figure of the so called *Pleocoma* larva. That this, in my opinion, only possible view, can be in any way contradicted by the statement that this larva was found deep underground—while as is well known Lucanid larva live in decaying wood—I cannot admit, in view of the fact that no details in reference to the finding of the larva are given.

Note by Translator. - This paper from the Stettiner Ent. Zeitschrift for 1883, pp. 436- 450 has not attracted the attention it deserved from American students. Dr. Horn urged its publication long since, although he disagrees with the views of Dr. Gerstaecker. In the Classification and in Henshaw's recent list the genus still retains its old place. Mr. Ricksecker's notices of one of the species have added something to our knowledge of its history and others of our Pacific Cast friends should be able to complete the work by finding the real larva of some of the species of the genus.

J. B. Smith.

Pleocoma Fimbriata, *Lec.*

By L. E. Ricksecker.
Santa Rosa, Cal.

A year ago I gave to the readers of "Ent. Amer." some notes regarding the habits of this interesting species, and hoped to be able to observe them more fully this year, but owing to my absence from home, I was prevented from doing so. However, as I had some boys watching the field, the recurrence of the brood, in great numbers, was observed by them, and under circumstances exactly similar to those recorded last year. Our October rain,—which generally falls during the first half of that month, and is of sufficient volume to soak the soil six inches or more in depth, and thus set at liberty the *Pleocoma* imprisoned by the hard baked crust during the Summer months,—failed altogether this year. We had a slight shower in September but not enough to penetrate to the required depth, although I heard of *Pleocoma* being seen, after this rain, further up the coast, showing that where sufficient rain fell the beetles were ready to emerge. Our first rain fell November 5th, and the boys report finding a few *Pleocoma*, but there was not enough rain to soak the earth thoroughly and consequently the beetles were scarce. On Nov. 28th there came a storm lasting about a week and immediately the whole brood emerged, the air being full of the black, flying males. Of the apterous females, large and brown in color, five fine specimens were secured.

Southern Form of E. scribonia, *Stoll.*

By Annie Trumball Slosson.

Ecpantheria denudata, n. var.

I feel assured from further examination of the form of *scribonia* referred to in previous note (Ent. Am., Jan., '88), and by the opinion of other Entomologists, that it deserves to be made a variety.

I venture, therefore, to give it provisionally the above name. In Smith's Abbott, Vol. II, p. 137, I find a description and figure of typical form under the name *Phalæna oculatissima.* An additional note says: "There is a smaller Phalæna in North America, nearly allied to this in the marking of its upper wings; but all the wings in that are naked and pellucid towards their tips, and the back almost entirely yellow. Fabricius seems by the English Museums to have confounded these two species." In my specimens there is no more yellow on abdomen than in the ordinary form. In fact, I see no deviation from type, except in the invariably pellucid and denuded tips of both anterior and posterior wings. I know nothing as yet of the larva, but shall endeavor to investigate the subject more thoroughly this coming Spring.

New Species of Geometridæ. (No. 4.)

By Geo. D. Hulst.

Heterolocha? Snoviaria, sp. nov.

Expands 28 mm. Head, thorax and abdomen ocher, the abdomen slightly lighter than the other parts. Antennæ smoky ocher. Fore wings deep ocher, loosely and somewhat irregularly dusted with dark brown specks. A dark fuscous, almost black line, rather irregularly scalloped, beginning on costa just within apex and reaching the inner margin two-thirds out from base; the points of the scallops are turned outward, and each one has in its sinus a white space forming thus a broken white line. The dark scalloped line is distinct on outer edge, indistinct on inner, and fades gradually into the ground color. Discal point fine, black. Fringe whitish with indistinct smoky spaces between the veins. Hind wings white, with a faint ocher tinge, immaculate. Beneath much as above, but with surface smoother, more indistinct, the outer space on fore wings lighter, the inner more fuscous.

1 ♂, N. Mex. The insect was received by me from Prof. F. H. Snow of the University of Kansas in whose honor I give it its specific name. He stated that it was not a unique, but I am not aware how many other specimens he may have.

Eois parvularia, sp. nov.

Expands 12 mm. Head, thorax and abdomen dull fuscous brown. Wings clay white overlaid with fuscous. A faint basal cross line, a more decided cross line on the outer space, beginning three-fourths out upon the costa and reaching the inner margin two thirds out. This line is slightly bent, strongly wavy. This is followed by a band of even width of a color somewhat darker than the general color of the wing. Discal points faint. Hind wings small with the lines and bands of the fore wings continued. Beneath as above, with the outer band a little more marked.

1 ♂, 2 ♀♀, Texas.

Eois ? scintillularia.

Expands 10 mm. Head dusky ferruginous. Thorax and abdomen dark smoky ocher, the abdomen with indistinct darker annulations. Fore wings brownish, overlaid with dove color to just beyond black discal point where the color terminates in a faint ferruginous line running parallel with outer margin; another faint submarginal line of the same color. Space beyond the first line yellowish, somewhat clouded. Hind wings reddish brown at base, slightly washed with dove color, reaching to discal spot, which is dark indistinct; the rest of the wing yellowish with a curved bright narrow line just beyond discal point, and a broad line or narrow band of the same color in submarginal space parallel with outer margin. Beneath the same general markings repeated in fuscous and light ocher.

1 ♂, Fla. Presented to me by Mr. Wm. Beutenmüller. This insect is probably the smallest of all our Geometers. It is decidedly pretty and peculiar. I place it provisionally in *Eois*, although it is generically distinct from anything I know.

Cleora punctomacularia, sp. nov.

Expands 40 mm. All the parts of an even smoky blue gray or dove color. Fore wings with a hardly determinate inner line with its position however marked by the black short streak on each vein. Discal spot black subquadrate, somewhat diffuse; an outer row of black points on veins nearly parallel with outer margin. A marginal line of black points. Hind wings with an outer curved row of black points, a broken black marginal line. Beneath gray with a russet shading on fore wings anteriorly.

2 ♂♂, 2 ♀♀, Cal., Vancouver Is. This species was, I think, known to Dr. Packard, but was probably regarded as a varietal form of *C. nigrovenaria.* I have no doubt however of its specific distinctness as the direction, as well as the location of the indicated lines do not at all agree with those of *C. nigrovenaria*, Pack.

Cleora atrifasciata, sp. var.

Expands 43 mm. Palpi blackish; front light ochreous; collar fuscous; thorax smoky ocher; abdomen ocher, somewhat fuscous, with fuscous dash on dorsum on each segment. Wings light ocher, edged brokenly with dark brown along costa. At the middle a broad black band reaching across wing; inner edge irregularly waved, somewhat bent inwardly; outer edge waved, strongly bent outwardly at middle; a fuscous spot along costa near apex; a broken black marginal line. Hind wings with less of an ocher shading than front wings; an intramedian cross line, blackish, obsolete anteriorly, bent at middle outwardly, the whole wing dusted more or less with fuscous, especially within the median line. A marginal line of black points. Discal point faint. Beneath light ocher, discal point prominent. Black band of fore wings indistinct clouded fuscous.

1 ♀, Cal. I am quite of the opinion that this may be an aberration of some known species, probably of *C. unbrosaria*, Pack., or *C. venaria*, Grt.

Boarmia furfuraria, sp. nov.

Expands 42 mm. Head and thorax gray. Abdomen fuscous. Wings all light gray overlaid with striations and washings of fuscous, the washings shaping themselves into an indistinct outer scalloped band; faint indications of a bent median band shown by undecided blackish points. Discal spots black, distinct on hind wings, a marginal line of black points on all wings. Beneath very white gray, almost white, the forewings somewhat washed with fuscous.

3 ♂♂, Col.

Boarmia atrolinearia, sp. nov.

Expands 35 to 38 mm. Palpi black, third segment white; front white. Antennæ black above, gray beneath; thorax gray with black edge in front; collar light gray; abdomen black and gray, banded on anterior segments, gray with black spots on dorsum on posterior segments. Wings light to dark gray. Basal line rounded, geminate. Middle field lighter than other parts, median line faint, running through discal spot, which is oval; outer line distinct, black, wavy dentate, not much bent or angulated; outer field with reddish shade. Hind wings with faint almost obsolete median line. Outer line scalloped, some angulated at middle, outer field with faint

waves of white and gray. Beneath dirty gray ; a median line on all wings of distinct black points. Discal spot on fore wings black, rather large.

1 ♂, 1 ♀, Ky. Nearest to *B. pampinaria.*

Boarmia fuliginaria, sp. nov.

Expands 35 mm. The whole insect above and below is of a dark smoky brown color. On all wings the black discal spots show faintly, and on the fore wing, just beyond disk, are three lengthened black spots faintly showing at base of veins 2, 3, and 4. Hind wings with faint indeterminate black points near center of wing. Beneath unicolorous, a little less dull smoky than above.

1 ♂, Ill. This may possibly be a case of melanism, but if so I am unable to tell to which one of our common species this referred peculiar form should be.

Boarmia Fernaldaria, sp. nov.

Expands 40 mm. Ground color uniformly a light gray formed of a white base, overlaid with fuscous scales. Body brown, or gray and dark gray ringed. Base of wing, brown, with an olivaceous tint, lines as in *B. crepuscularia.* Beyond third line is a broad band of even width across the wing, brown or olivaceous in color. Beneath, almost white, the brown band faintly showing through.

2 ♂♂, 1 ♀, Me. Named in honor of Mrs. C. H. Fernald of Amherst, Mass., to whom I owe my first specimen of this insect, and to whom I am grateful for other favors. The insect in its lines approaches very near to *B. crepuscularia,* but the band is very distinctive. It may possibly be an aberration or variety of that species.

Boarmia floridaria, sp. nov.

Expands 17 mm. Head, thorax, wings and abdomen, smoky blue-gray. Three fine black lines cross the fore wings, all of them being bent and wavy. The basal is strongly bent out near costa and inward near inner margin ; the second, which includes the discal spot, has a sharp bend at middle ; the outer has two sharp bends outwardly near middle. These lines are nearly equidistant from each other and subparallel. Hinds wings with the two outer lines continued both bent, wavy, dentate. Beneath, even smoky gray.

1 ♂, 1 ♀, Fla.

Boarmia Wrightiaria, sp. nov.

Expands 28 mm. Head, thorax and abdomen, light clear gray. Wings unevenly gray ; lines of fore wings very oblique, the outer with a large bend inwardly near inner margin ; both discal and outer lines geminate ; basal line wanting ; discal spot black ; a submarginal blackish line edged outwardly with whitish. Hind wings with faint parallel median and submarginal shadings ; discal spots black. Fore wings with inner angle rounded and outer margin very oblique. Hind wings very much rounded with a notch at end of vein 5. Antennæ longer than usual, heavily pectinated almost to end. Beneath even dark fuscous with black discal points.

4 ♂♂. Taken at San Bernardino, Calif. Named in honor of Mr. W. G. Wright who has helped very much to give a knowledge of the insects of S. California and to whom I am under obligation for many favors. The insect looks much like a *Lepiodes.*

Boarmia? plumogeraria, sp. nov.

Expands 44 mm. Palpi very short, these with head and thorax dark gray. Antennæ half the length of the fore wing, very lengthily and evenly pectinated to the end. Fore wings dark gray; a dark basal and median line both broad and rounded inwardly, and both very faint; outer line more distinct, narrow, wavy, straight, nearly parallel with outer margin, passing just beyond black discal spot; a submarginal line broad, quite faint; marginal line black. Hind wings slightly lighter than the fore wings, a broad median line passing through black discal spot, and a broad submarginal line. Beneath, nearly as above, but less determinate.

1 ♂, Cal. I saw specimens also in the collection of Mr. W. G. Wright of San Bernardino, Cal. The insect is not a typical *Boarmia*, and is easily known by its plumose antennæ in which it surpasses any other American Geometer.

Tephrosia Texanaria, sp. nov.

Expands 24 mm. Head parts dark fuscous to gray. Thorax, abdomen and wings olivaceous gray. Fore wings with three lines, the basal even rounded, the medium fainter discal, the outer clear distinct, fine, waved and curved just beyond disk; three black spots on costa at end of veins; the outer line is edged outwardly with light gray, and this is followed by a reddish band; a submarginal waved whitish line and a row of black marginal points. Hind wings correspond with the fore wings, the lines and colors continuing, except that the basal line is wanting. Beneath, in markings much as above, but smoother, less distinct, and without any reddish.

8 ♂♂, 6 ♀♀, Texas.

Tephrosia fautaria, sp. nov.

Expands 30 to 32 mm. Head and thorax reddish ochreous; abdomen ocher, fore wings light ocher to reddish ocher, loosely striated with blackish. Hind wings lighter. All wings with an outer line of black points parallel with outer margin, one point on each vein; discal spots black; a marginal row of black points on all wings. Beneath as above or with black points obsolete.

4 ♂♂, 2 ♀♀, Calif.

Tephrosia celataria, sp. nov.

Expands 32 mm. Palpi ochreous fuscous. Head, antennæ and thorax, fuscous gray. Abdomen ocher, somewhat fuscous on anterior segments. Fore wings gray, finely powdered and striated with black; discal point small, black; marginal line of black points. Hind wings light gray, finely but not heavily peppered and striated with black; discal spot black, small; marginal line of black points. Beneath, even smoky gray, somewhat darker along costa.

2 ♂♂, Havilah, Calif.

Tephrosia carnearia, sp. nov.

Expands 26 to 30 mm. Head and thorax reddish ocher; abdomen the same or ocher. Fore wings rounded, broad, reddish ocher to maroon reddish, most decided on the middle and outer fields; an indistinct fuscous band, extra basally, another extra discally; an apical submarginal fuscous clouding; discal spots black, small. Hind wings ocher with some fine blackish striations, especially outwardly; outer and anal marginal spaces reddish; a row of black spots on margin.

Beneath, ocher, somewhat dusted with black, costal margin reddish; discal spots black, small. ♀ larger, with more of a violet shading, and this not so distinct.

2 ♂♂, 2 ♀♀, Calif.

Tephrosia Nevadaria, sp. nov.

Expands 30 mm. Head and thorax bright ochreous; abdomen ochreous fuscous. Antennæ much more finely pectinated than is usual. Fore wings even ochreous fuscous to outer line; inner lines wanting, outer line broad, band-like, even, parallel with outer margin; beyond this line an ochreous space, then to margin fuscous; discal spot black, distinct. Hind wings light gray, finely striated with ocher fuscous; discal spot distinct; a marginal row of black points on all wings. Beneath as above with all wings lighter, except along costal and outer margins of fore wings.

1 ♂, Sierra Nevada Mountains, Calif.

Hemerophila Packardaria, sp. nov.

Expands 31 mm. All the parts generally of a dark fuscous color, formed by a light fuscous ground, generally but sparmmosely covered with black atoms. Discal point of fore wings white, annulated with black; lines two, both very oblique, the inner median, faint, the outer extra discal, distinct, rounded out at middle, reaching costa just within apex, and inner margin at middle, edged outwardly with a light line; a faint submarginal light line; marginal line of black points; fringe interlined. Hind wings unevenly scalloped on outer edge, with discal point black or inclosing white point; a black median line, distinct, subparallel with outer margin slightly angulated and edged outwardly with white. A light, rather faint submarginal line; margin black; fringes interlined. Beneath, nearly even dark fuscous; discal points whitish annulated.

4 ♂♂, Calif. Named in honor of Dr. A. S. Packard, who, more than any other, has advanced our knowledge of the *Geometridæ* of N. A., and to whom I make grateful acknowledgment of assistance.

Semiothisa cæsiaria, sp. nov.

Expands 22 mm. Uniformly even squammose gray. Fore wings with three lines; the basal and median heavy, black, diffuse, approximate, parallel; the median includes the discal point, which is white annulate with black; the third line is fine, faint, sometimes obsolete, with a large sinus on anterior half. Three black spots on costa at ends of lines. Hind wings with first two wings continued, but fainter or subobsolete. Beneath, nearly even loose gray.

2 ♂♂, 2 ♀♀, Eastern U. S. I have often had this insect sent me, and have with much suspicion looked upon it as a form of *S. ocellinata*, Guen. The shape of the wings is however different, as well as the position and direction of lines. It is also a stouter though a smaller insect. I have often found it at rest on the trunks of Willows, and have little doubt, that tree is the food plant of the larva.

Aspilates unicoloraria, var. nov.

I give this name to a variation of *A. desperaria*, which seems to be quite prevalent in Colorado. The insect is of the same general color as *desperaria*, but the lines are obsolete, and the whole surface of the wings is of a loose striated fuscous color laid upon light gray.

The American Species of Callimorpha.

By Geo. D. Hulst.

We have received from its author a very interesting and valuable paper, published in the Proceedings of the United States Nat'l Museum, entitled "The North American Species of Callimorpha, by J. B. Smith."

At about the time this was published, a paper appeared in the Can. Entomologist, Vol. XIX, No. 10, entitled "The North American Callimorphas, by H. H. Lyman, M. A.", and in the same periodical, Vol. XIX, No. 12, Mr. Smith has made a statement based upon the article of Mr. Lyman.

Both authors have given much study to the subject and the examination of Mr. Smith into the bibliography and structure of the species seems to be exhaustive. Both had abundant material at hand, and from different sections of the country. Mr. Lyman had the additional advantage of an examination of the British Museum collection. We might expect much to interest and instruct and we are not disappointed.

The conclusions of these two gentlemen very nearly agree, but they differ very widely from the ideas which have prevailed in the past, and which are probably now held by the majority of Entomologists.

Mr. Grote in his Catalogue, 1882, gives the current opinion in grouping all our forms of *Callimorpha* under 3 species. Mr. Smith makes 9 species, Mr. Lyman 8!

The Doctors indeed do not agree with each other in conclusion, but they agree that all the rest of us have been very far away from the truth. Their disagreement is on the right of *Vestalis*, Pack., to be called a good species. An examination of Dr. Packard's type will probably bring agreement on this point between them. The species as Mr. Smith finally tabulates them, are: 1, *Clymene*, Brown, (interrupto-marginata, Beau.); 2, *Colona*, Hb., (Clymene, Esp., preoccupied); 3, *lactata*, Smith; 4, *Leconti*, Bd.; var. *militaris*, Harr.; 5, *contigua*, Walk.; 6, *suffusa*, Smith; 7, *confusa*, Lyman; 8, *fulvicosta*, Clem.; 9, *vestalis*, Pack.

We are glad the octosyllabic *interrupto-marginata* is to drop from our lists and labels. The conclusions of these gentlemen both of ability, and practically verifying each other we receive, but with a sort of Gallileo consciousness we shake our heads, and say, "there are not so many species after all."

We call attention to the fact that our correspondent C. H. T. Townsend has followed in the footsteps of many other good Entomologists, and has gone to Washington, D. C. His address is no longer Constantine, Mich., but War Dep't, Adj. Gen. Office, Washington, D. C.

Deilephila lineata, *Fab.*

A note was made in an article entitled "A Summer Trip to Southern California" concerning the fact that the Mohave Indians feed on the raw larvæ of *Deilephila lineata*. Mr. W. G. Wright, from whom we received our information, has since sent us an article written by him, and published in the "Overland Monthly Magazine" Sept. 1884. In that article are some remarks bearing on the subjeet, so interesting, that we print them. He calls attention in the letter that we misrepresented him in saying the larvæ were eaten *raw*; and we cheerfully admit the mistake of our memory and insert the correction. What he saw is given in the story of a trip in the desert. "In an hour we come to the caterpillar pasture. The sand is dotted with mats and patches of procumbent plants, much resembling in flower the common garden verbena, *Abronia umbellata*, *A. viscosa*, on which vast armies of caterpillars—the larvæ of *D. lineata*—are feeding; they are huge worms three and four inches long. Another smaller army of Indians—bucks, squaws, and papooses—are out gathering them as though they were huckleberries, for use as food. The Indians do not notice us, but go on with their gathering. Seizing a fat worm, they pull off its head, and by a dexterous jerk the viscera are ejected, and the wriggling carcass is put into a small basket or bag, or strung upon strings and hung upon the arm or about the neck, till occasion is found to put them into a large receptacle. I got three of these gathering baskets. One is funnel-shaped, holding a quart or two; another is like a large, flat saucer, and the third is similar, but with a deep rim. At night these Indians carry their prey home, where they have a great feast. Indians from a long distance come to these worm feasts, and it is a time of great rejoicing among them. I asked one of the young man if these worms made good food; he replied, "Yes, very good indeed, in *stew*." Of another old fellow we asked where these worms all came from, and he replied: "From the good God." The larvæ that are not consumed at the time (and they eat incredible quantities), are put upon ground previously heated by a fire, and thoroughly dried, when they are packed away whole, or pulverized into a meal." G. D. H.

Notes on the Larvæ of Arctia Brucei, *Hy. Edwards.*

By David Bruce, Brockport, N. Y.

I first met with this moth above timber in the Snowy Range, Park Co., Colorado, July 7th ('87)—altitude 12,500 ft. It was sitting on a rock and was a fine female. In the course of the day she laid eggs. A few days after this I caught a perfect male as it was flying briskly in the sunshine. This was at least 13,000 ft. elevation. *Arctia Quensellii* was not

uncommon at the same time and place, also flying by day. From the eggs mentioned, I bred 6 perfect imagos. A pair of these also mated and gave me a small brood of eggs. The larvæ from these are now hybernating about one-third grown. The eggs were waxen yellow and rather large for such an insect. They hatched in 10 days. The larvæ were black at first, but became more hoary at each moult. When full grown they appear to have a broad dorsal line of light gray hairs, then a black line along the sides, and a gray line along the spiracles—in reality, they are covered with tufts of bustly hairs like the rest of the genus; these hairs are very black, but on the upper side of the top row of tufts are a few pure white hairs in each tuft—and the row on each side thus meeting on the back of the larva, form the apparently gray dorsal line. The same effect is repeated with the lower rows of tufts, forming the gray line about the legs. The head, feet, and the rest of the hairs or spines are black. They fed on Polygonum and Plantago and were extremely sluggish at all times. They fed for 27 days and emerged from pupa 14 days after. In the 8 examples I have seen, scarcely any variation either in color or markings occured.

Society News.

Brooklyn Entomological Society.—Regular Monthly Meeting held Jan. 3d. 16 members present. The following were elected Officers for the year 1888:

Pres., Ed. L. Graef; *Vice Pres.*, Ottomar Dietz; *Treas.*, Chris. H. Roberts; *Rec. Sec.*, A. C. Weeks; *Cor. Sec.*, G. W. J. Angell; *Librarian*, Rich. F. Pearsall; *Curators*, M. L. Linell, (Coleoptera), Wm. Beutenmüller, (Lepidoptera), A. C. Weeks, (Other Orders); *Executive Committee*, Gustav Beyer, F. H. Chittenden, Charles Palm, Rich. F. Pearsall, A. C. Weeks; *Publication Committee*, the Editors ex-officio, G. W. J. Angell, Wm. Beutenmüller, Hy. Edwards, B. Neumoegen.

The retiring President, Mr. G. W. J. Angell, read an address which was ordered to be printed in Ento. Am.

The Treasurer gave his report for the year, showing receipts $584.75 with disbursements $574.54. There is a large amount yet owing the Society, enough to pay all obligations and leave a handsome surplus.

The Librarian and Chief Curator also reported. The latter called attention to the very excellent collection of local Coleoptera in the Cabinet of the Society.

Mr. Graef reported that he had seen Dr. Hoagland and that the Society had been granted the use of rooms free of rent in the Hoagland Laboratory. The building would probably be completed so we could move in for our March Meeting.

Mr. Hulst proposed to make the next volume of Ento. Am. of 9 numbers only, subscribers to be charged $1.50 for that volume; the object in view which he considered very important was to have the volumes correspond with the year, and after this short volume the volumes would continue of 12 numbers corresponding to the months of the year and beginning with January. The proposition was referred to Publication Committee to report at next meeting.

There was an auction sale of specimens donated by members and $17.85 was realized.

ENTOMOLOGICA AMERICANA

VOL. III. BROOKLYN, MARCH, 1888. NO. 12.

Catalogue of Species of the Higher Families of the North American HETEROCERA, described since Grote's "New Check List" (1872), with those omitted from that publication.

By Henry Edwards.

In my studies of late years among the Bombycidæ and allied groups belonging to our fauna, I have very frequently come upon names of species, given by early authors, to which I could find no reference in any of our catalogues, or the works accessible to me, and I adopted the plan of making a card list of these for my personal use. This system enabled me to clear up many doubts and perplexities, and I have deemed that the results of my labors might prove acceptable to my entomological friends. The results I hope soon to publish under the title of "Popular Talks about the Higher Heterocera of North America," but I find it an absolute necessity before doing so, that a full list of all our species described up to this time, should be before me, and I therefore offer the present catalogue as a contribution in that direction. It may possibly be objected, that I have introduced into my list names long consigned to oblivion, but I think it best (as they are but few) that their real meaning should be made known, and that they should find their proper place in synonymy. Among them are some of Walker's species, and if the publication of them in this list will induce Mr. Butler, Mr. Kirby, or Mr. Grote, to enlighten us upon them, their mention now will not have been made in vain. I allude more especially to species described and quoted by Walker in the "British Museum Catalogues," and to those mentioned

by Boisduval in "Species General" and "Lepidoptera de la Californie." It is possible that not a few of these may exist with a wrong locality attached to the specimens, as shown by Mr. R. H. Stretch (Can. Entom.) with regard to *Dystauxes mediastina*, Hübner, and by Mr. Grote, (Ann. Lyc. N. York), with reference to one of Boisduval's species of *Thyris*, and to *Sph. Strobi*. If this be so, however, it is well that we should know it, in order that conflicting opinions regarding such species may be set at rest. On the other hand, it is probable that a few of the species mentioned may yet await re-discovery by our entomologists, and that they are fully entitled to a position in our lists.

I may here state e. g. that *Sph. lycopersici*, Bois., is the Californian form of *Phlegethontius Carolina*, L., and that it is a heavier insect, much lighter in coloration, and in every way entitled to at least a varietal name. But on this, and such subjects, I desire to speak more fully later on, and I will not therefore anticipate. Mr. Grote's admirable "Check List" has been of immense service to all lepidopterists, and considering the great amount of labor involved, it is remarkably complete. But it is to be regretted, that though Mr. Grote did not desire to cumber his work with too great an attention to synonymy, he should have omitted some names of older authors which would have lightened the labors of the student. It was hardly possible in a list of the character to which we allude, that some omissions should not occur. These I have endeavored as far as possible to repair, and I hope that very few species (if any) accredited to North America, have been passed over by me. The present catalogue contains 13 genera new to our fauna. It enumerates 247 species and varieties of which 151 have been published since Grote's list—47 were omitted by Mr. Grote, and 49 bear the names of older authors, and are among the doubts waiting to be cleared away. I desire however to state that among Mr. Grote's omissions in the *Ægeriadæ*, I am responsible for 11 species, thus reducing those left out of the "Check List" to 36—a very small number indeed, when we take into account the volumes to be searched and the references to be made. The present catalogue commences with the *Sphingidæ* and ends with the *Hepialidæ*. I have in some cases altered the names of the families and subfamilies, using those which are most popular, but have endeavored to follow closely the sequence of the genera as given by Mr. Grote, removing the genus *Gnophæla* however, to what is now conceded to be its proper position, viz: near to the *Arctiidæ*. The references have been made with care, and I have in all cases added the year in which the species is described. As nothing human is perfect, I shall be greatly indebted to any of my friends if they will point out errors, and offer suggestions, should an appendix to this catalogue be called for.

Fam. SPHINGIDÆ.

Lepisesia, Gr.

Ulalume, *Strecker.* Lepid. Rhopal. Heteroc., p. 135, pl. 15. 1877.

Hemaris, Dalm.

Metathetis, *Butler.* Revis. Sphingidæ, p. 519. 1876.
Etolus, *Bois.* Spec. Gener. Sphingidæ, p. 370. 1874.
Pyramus, *Bois.* " p. 372. 1874.
Grotei, *Butler.* Ann. Mag. N. History, (= axillaris, Gr.). 1874.

Pseudosphinx, Burmeister,

Tetrio, *L.* See *Hy. Edwards,* Can. Entom., vol. 20, p. 20. 1888.

Philampelus, Harris.

Typhon, *Klug.* See *Hy. Edwards,* Can. Entom., vol. 20, p. 14. 1888.

Smerinthus, Latr.

Populicola, *Bois.* Spec. Gener. Sphingidæ, p. 22. 1874.
Imperator, *Strecker.* Lepid. Rhop. Heteroc., p. 125, pl. 14. 1877.
Pavoninus, *Bois.* Spec. Gener. Sphingidæ, p. 37 (= excæcatus). 1874.
Astarte, *Strecker.* Proc. Acad. N. Sc. Philad., p. 283. 1884.

Ceratomia, Harris.

Ulmi, *Leconte* in lit. See *Bois.*, Spec. Gener. Sphingidæ, p. 53. 1874.

Macrosila, Walk.

Collaris, *Walker.* Cat. B. M. Heterocera, p. 201. 1856.

Protoparce, Burmeister.

Dalica, *Kirby.* Trans. Entom. Soc. London, p. 243. 1877.

Sphinx, L.

Strobi, *Bois.* Lepid. de la Californ., p. 67, 1869.
Lycopersici, *Bois.* Spec. Gener. Sphingidæ, p. 71. 1874.
Andromedæ, *Bois.* " p. 89. 1874.
Insolita, *Lintner.* Papilio, vol. 4, p. 145. 1884.
Separatus, *Neumoegen.* Papilio, vol. 1, p. 92. 1881.
Saniptri, *Strecker.* Lepid. Rhop. Heteroc., p. 118, pl. 13. 1876.
Coloradus, *J. B. Smith.* Entom. Amer., vol. 3, p. 153. 1887.

Fam. ÆGERIIDÆ.

Melittia, Hubn.

Flavitibia, *Walker,* see *Bois.* Spec. Gener. Sphingidæ, p. 479. 1874.
Ceto (var.) *Westwood.* See *Walker,* Cat. B. M. Heteroc., p. 66. 1856.

Sciapteron, Staud.

Præcedens, *Hy. Edwards.* Papilio, vol. 3, p. 155. 1883.

Fatua, Hy. Edw.

Palmii, *Hy. Edwards.* Can. Entom., vol. 19, p. 145. 1887.

Saunina (sic) Walker.

Uroceripennis, *Bois.* Spec. Gener. Sphingidæ, p. 465. 1874.

Ægeria, Fabr., **Sesia**, Fabr., &c.

Asilipennis, *Bois.* Spec. Gener. Sphingidæ, p. 391. 1874.
Mellinipennis, *Leconte* in lit., *Bois.* Spec. Gen. Sphing., p. 402. 1874.
Xiphiæformis, *Bois.* Spec. Gener. Sphingidæ, p. 409. 1874.
Bibionipennis, *Bois.* " p. 421. 1874.
Tipuliformis (var.) *Linn.* see *Walk.* Cat. B. M. Heteroc., p. 30. 1856.
Chrysidipennis, *Bois.* Lep. Californ., p. 64. 1869.
Nomadæpennis, *Bois.* " p. 63. 1869.
Præstans, *Hy. Edwards.* Papilio, vol. 2, p. 98. 1882.
Quercis, " " p. 98. 1882.
Prosopis, " " p. 99. 1882.
Candescens, " " p. 123. 1882.
Bolteri, " " vol. 3, p. 155. 1883.
Æmula, " " p. 155. 1883.

Pyrrhotænia, Grote.

Behrensii, *Hy. Edwards.* Papilio, vol. 2, p. 123. 1882.
Wittfeldii, " " vol. 3, p. 156. 1883.
Subærea, " " p. 156. 1883.
Animosa, " " p. 156. 1883.
Elda, " Entom. Amer., vol. 1, p. 49. 1885.

Fam. THYRIDÆ.

Thyris, Illiger.

Fenestrina, *Ochsenheimer*, see *Bois.* Sp. Gen. Sphingid., p. 488. 1874.
Vitrina, *Bois.* Mongr. Zygenides, p. 19, pl. 1. 1829.

(These two are doubtful N. A. species. See Grote, Ann. Lyc. N. Hist.)

Platythyris, G. & R.

Granulata, *Neumoegen* Papilio, vol. 3, p. 137. 1883
Floridana, *Hulst.* Entom. Amer., vol. 2, p. 182. 1886.

Sagalassa, Walker.

Perspicua, *Walker.* Cat. B. M. Heterocera, p. 7. 1856.

(This genus is said by Mr. A. G. Butler to belong to the Micro-Lepidoptera.)

Fam. HETEROGYNIDÆ.

Thia, Hy. Edwards.

Extranea, *Hy. Edwards.* Entom. Amer., vol. 3, p. 181. 1887.

Fam. ZYGÆNIDÆ.

Alypia, Hubn.

Matuta, *Hy. Edwards.* Papilio, vol. 3, p. 33. 1883.
Wittfeldii, *Hy. Edwards.* " p. 34. 1883.
Similis, var. conjuncta, *Hy. Edwards.* Papilio, vol. 3, p. 34. 1883.
Octomaculata, var. Hudsonica, *Hy. Edw.* Papilio, vol. 4, p. 43. 1884.
Gracilenta, *Graef.* Entom. Amer., vol. 3, p. 41. 1887.

Alypiodes, Grote.

Flavilinguis, *Grote.* Trans. Kansas Acad. Sc., vol. 8, p. 46. 1883.

Pseudalypia, Hy. Edwards.

Crotchii, var. Atrata, *Hy. Edwards.* Papilio, vol. 4, p. 14. 1884.

Phægarista, Bois. (Fenaria, Gr.)

Sevorsa, *Grote.* Papilio, vol. 2, p. 132. 1882.

Dahana, Gr.

Atripennis, *Grote.* Can. Entom., vol. 7, p. 175.

Euchromia, Hubn. = **Syntomeida,** Harris.

Ferox, *Walker.* Cat. B. Museum, vol. 1, p. 223. 1856.
Epilais, *Walker.* See *Hy. Edwards* in Can. Entom., vol. 20, p. 14. 1888.

Scepsis, Walker.

Wrightii, *Stretch.* Entom. Amer., vol. 1, p. 101. 1885.
Gravis, *Hy. Edwards.* Entom. Amer., vol. 2, p. 8. 1886.
Fulvicollis, var. pallens, *Hy. Edw.* Entom. Amer., vol. 2, p. 8. 1886.

Ctenucha, Kirby.

Corvina, *Bois.* Lepid. Calif., p. 71. 1869.

Pygoctenucha, Grote.

Funerea, *Grote.* Trans. Kansas Acad. Sc., vol. 8, p. 46. 1883.

Harrisina, Packard.

Australis, *Stretch.* Entom. Amer., vol. 1, p. 102. 1885.
Metallica, *Stretch.* " p. 102. 1885.
Nigrina, *Graef.* " vol. 3, p. 41. 1887.

Triprocris, Grote.

Martenii, *French.* Papilio, vol. 3, p. 191. 1883.

Lycomorpha, Harris.

Rata, *Hy. Edwards.* Papilio. vol. 2, p. 124. 1882.
Latercula, *Hy. Edwards.* " p. 124. 1882.
Coccinea, *Hy. Edwards.* Entom. Amer., vol. 2, p. 9. 1886.

Cydosia, Westwood.

Nobilitella, *Cramer.* Pap. Exot., pl. 264.

Œta, Grote.

Aurea, *Fitch.* 3rd Report Ins. N. Y., p. 168. 1856.

— BOMBYCES. —

Fam. NYCTEOLIDÆ, H.-Sch.

Earias, H.-Sch.

Obliquata, *Hy. Edwards.* Entom. Amer., vol. 2, p. 9. 1886.

Sarrothripa, Curtis.

Columbiana, *Hy Edwards.* Proc. Cal. Ac. Sc. 1873.
Lintneriana, *Speyer.* Entom. Zeitschr. Stettin, p. 170. 1874.

Subfamily LITHOSIIDÆ, H.-Sch.

Nola, Leach.

Anfracta, *Hy. Edwards.* Papilio, vol. 1, p. 12. 1881.
Hyemalis, *Stretch.* Entom. Amer., vol. 1, p. 102. 1885.
Minna, *Butler.* Ann. Mag. N. Hist., p. 315. 1881.

Hyaloscotes, Butler.

Fumosa, *Butler.* Ann. Mag. N. Hist., p. 314. 1881.

Hypoprepia, Hubn.

Plumbea, *Hy. Edwards.* Entom. Amer., vol. 2, p. 9. 1886.

Cisthene, Walker.

Plumbea, *Stretch.* Entom. Amer., vol. 1, p. 102. 1885.
Lactea, *Stretch.* " p. 103. 1885.

Eulithosia, Hy. Edwards.

Composita, *Hy. Edwards.* Papilio, vol. 4, p. 44. 1884.
Thoracica, *Hy. Edwards.* " p. 44. 1884.

Lithosia, Fab.

Rubropicta, *Packard.* Entom. Amer., vol. 3, p. 52. 1887.

Eustixia, Hubn.

Pupula, *Hubner.* Samml. Exotisch. Schmetterlinge, 224, pl. 206.
Igninix, *Walker.* Cat. B. Museum, pl. 2, p. 527. 1854.
Subfervens, *Walker.* " p. 528. 1854.

(The following species is said by Walker to occur in North America. I believe it to be unknown to American entomologists.)

Comacla simplex, *Walker.* Cat. B. Museum, p. 1679.

Subfamily PERICOPIDÆ.

Gnophæla, Walker.

Discreta, *Stretch.* Lepid. Wheeler Exp., vol. 5, p. 802. 1875.
Arizonæ, *French.* Papilio, vol. 4, p. 20, (= Discreta). 1884.

Melanchroia, Hubn.

Geometroides, *Walker.* See *Hy. Edw.*, Ent. Am., vol. 2, p. 9. 1886.
Cephise, *Cramer.* See *Hy. Edw.*, " p. 9. 1886.
Inconstans, *Walker.* See *Stretch*, Lepid. Wheeler Exp., vol. 5, p. 802. 1875.

Daritis, Walker.

Thetis, var. Howardi. *Hy. Edwards.* Ent. Am., vol. 2, p. 165. 1886.

Subfamily ARCTIIDÆ.

Crocota, Hubn.

Belfragei, *Stretch.* Entom. Amer., vol. 1, p. 103. 1885.
Costata, *Stretch.* " p. 103. 1885.
Obscura, *Stretch.* " p. 103. 1885.
Diminutiva, *Graef.* " vol. 3, p. 42. 1887.
Opelloides, *Graef.* " p. 42. 1887.
Intermedia, *Graef.* " p. 42. 1887.

Cerathosia, J. B. Smith.

Tricolor, *J. B. Smith.* Entom. Amer., vol. 3, p. 79. 1887.

Callimorpha, Latr.

Reversa, *Stretch.* Entom. Amer., vol. 1, p. 104. 1885.
Lactata, *J. B. Smith.* " vol. 3, p. 25. 1887.
Suffusa, *J. B. Smith.* " p. 25. 1887.
Confusa, *Lyman.* Canad. Entom., vol. 19, p. 185. 1887.

Euprepia, Germar.

Caja, var. Utahensis, *Hy. Edwards.* Ent. Am., vol. 2, p. 166. 1886.

Arctia, Schrank.

Excelsa, *Neumoegen.* Papilio, vol. 3, p. 70. 1883.
Incorrupta, var. ochracea, *Neumoegen.* Papilio, vol. 3, p. 71. 1883.
Incorrupta, var. Mormonia, *Neumoegen.* Ent. Am., vol. 1, p. 93. 1885.
Approximata, *Stretch.* Entom. Amer., vol. 1, p. 104. 1885.
Obliterata, *Stretch.* " p. 105. 1885.
Elongata, *Stretch.* " p. 105. 1885.
Phyllira, var. lugubris, *Hulst.* " vol. 2, p. 182. 1886.
Cervinoides, *Strecker.* Proc. Acad. N. Sc. Philad., p. 151. 1881.
Doris, *Bois.* Lepid. Calif., p. 77. 1869.
Nerea, *Bois.* " p. 77. 1869.
Sciurus, *Bois.* " p. 79. 1869.

Oithona, *Strecker.* Rhop. et Heteroc., p. 131. 1877.
Simplicior, *Butler.* Ann. Mag. N. Hist., p. 311. 1881.
Phalerata, var. incompleta, *Butler.* Ann. Mag. N. Hist., p. 311. 1881.
Franconia (var.), *Hy. Edwards.* Entom. Amer., vol. 3, p. 184. 1887.
Brucei, *Hy. Edwards.* " p. 183. 1887.
Remissa, *Hy. Edwards.* " p. 184. 1887.

Leptarctia, Stretch.

Stretchii, *Butler.* Ann. Mag. N. Hist., p. 312. 1881.
Boisduvalii, *Butler.* " p. 313. 1881.
Latifasciata, *Butler.* " p. 313. 1881.
Fulvofasciata, *Butler.* " p. 313. 1881.
Californiæ, *Butler.* " p. 313. 1881.

Nemeophila, Stephens.

Californiæ, *Walker.* Bat. B. Museum, pl. 3, p. 625. 1856.
Geddesii, *Neumoegen.* Papilio, vol. 3, p. 137. 1883.
Selwynii, *Hy. Edwards.* Can. Entom., vol. 17, p 65. 1885.

Seirarctia, Packard.

Bolteri, *Hy. Edwards.* Papilio, vol. 3, p. 121. 1884.

Phragmatobia, Stephens.

Fuliginosa, *Linn.* See *Bois.*, Lepid. Calif., p. 28. 1869.
Assimilans, *Walker.* Cat. B. Museum, pl. 3, p. 630. 1856.

Antarctia, Stephens.

Walsinghami, *Butler.* Ann. Mag. N. Hist., p. 311. 1881.

Spilosoma, Stephens.

Congrua, *Walker.* Cat. B. Museum, Heteroc., p. 669.
Nigroflavæ, *Graef.* Entom. Amer., vol. 3, p. 43. 1887.
Niobe, *Strecker.* Proc. Acad. N. Sc. Philad., p. 284. 1884.
Antigone, *Strecker.* Ruffner's Expl. Dep't Missouri, p. 1860. 1878.

Euchætes, Harris.

Pudens, *Hy. Edwards.* Papilio, vol. 2, p. 125. 1882.
Zonalis, *Grote.* " p. 131. 1882.
Vivida, *Grote.* " p. 131. 1882.
Perlevis, *Grote.* " p. 131. 1882.
Yosemite, *Hy. Edwards.* " vol. 3, p. 146. 1883.
Immaculata, *Graef.* Entom. Amer., vol. 3, p. 42. 1887.
Scepsiformis, *Graef.* " p. 43. 1887.
Murina, *Stretch.* " vol. 1, p. 106. 1885.
Bolteri, *Stretch.* " p. 106. 1885.

Vanessodes, G. & R.

Fuscipes, *Grote.* Can. Entom., vol. 15, p. 86. 1883.

Ecpantheria, Hubn.

Aulea, *Hubn.* See *Bois.*, Lepid. Calif., p. 78. 1869.
Sennetii, *Lintner.* Papilio, vol. 4, p. 147. 1884.
Cœca, *Strecker.* Proc. Acad. N. Sc. Philad., p. 283. 1884.
Denudata, var., *A. T. Slosson* Entom. Amer., vol. 3, p. 212. 1888.

Euerythra, Harvey.

Trimaculata, *J. B. Smith.* Entom. Amer., vol. 3, p. 17. 1887.

Nelphe, H.-Sch.

Carolina, *Hy. Edwards.* Entom. Amer., vol. 2, p. 166. 1886.

Halisidota, Hubn.

Mixta, *Neumoegen.* Papilio, vol. 2, p. 133. 1882.
Minima, *Neumoegen.* " vol. 3, p. 138. 1883.
Scapularis, *Stretch.* Entom. Amer., vol. 1, p. 107. 1885.
Laqueata, *Hy. Edwards.* " vol. 2, p. 166. 1886.
Significans, *Hy. Edwards.* " vol. 3, p. 182. 1888.
Cinnamomea, *Bois.* Lepid. Calif. (Phægoptera), p. 80. 1869.

Euhalisidota, Grote.

Pura, *Neumoegen.* Papilio, vol. 2, p. 133. 1882.

(The 4 following species of Arctiidæ are given by Walker in Catalogue of B. Museum, as N. American.)

Apantesis radians, *Walker.* Pt. 2, p. 632.
Cycnia dubia, *Barnston.* Pt. 2, p. 682.
" tenera, *Hubner.* Addenda, p. 1699.
" budea, *Hubner.* Add., p. 1781.

Subfamily LIPARIDÆ.

Orgyia, Ochsenheimer.

Leucographa, *Walker.* Cat. B. Museum, Addenda, p. 1724. 1856.
Antiqua, *Linn.* See *Walker*, Cat. B. Museum, Pt. 3, p. 784. 1856.

Cnethocampa, Stephens.

Grisea, *Neumoegen.* Papilio, vol. 2, p. 134. 1882.

Subfamily COCHLIIDÆ.

Euclea, Hubn.

Elliotii, *Pearsall,* Entom. Amer., vol. 2, p. 209. 1886.

Lithacodes, Packard.

Laticlavia, *Clemens.* See *Hy. Edwards,* Ent. Am., vol. 2, p. 9. 1886.
Græfii, *Packard.* Entom. Amer., vol. 3, p. 52. 1887.

Limacodes, Latr.

Parallela, *Hy. Edwards.* Entom. Amer., vol. 2, p. 10. 1886.
Beutenmuelleri, *Hy. Edwards.* Can. Entom., vol. 19, p. 145. 1887.

Monoleuca, G. & R.

Obliqua, *Hy. Edwards.* Entom. Amer., vol. 2, p. 10. 1886.

Varina, Neumoegen.

Ornata, *Neumoegen.* Papilio, vol. 4, p. 94. 1884.

Subfamily PSYCHIDÆ.

Psyche, Ochsenheimer.

Carbonaria, *Packard.* Entom. Amer., vol. 3, p. 51. 1887.

Pseudopsyche, Hy. Edwards.

Exigua, *Hy. Edwards.* Papilio, vol. 2, p. 125. 1882.

Subfamily NOTODONTIDÆ.

Ichthyura, Hubn.

Apicalis, *Barnston.* See *Walker*, Cat. B. Mus., Pt. 4, p. 1058. 1856.
Incarcerata, *Bois.* Lepid. Calif., p. 86. 1869.
Inornata, *Neumoegen.* Papilio, vol. 2, p. 134. 1882.
Brucei, *Hy. Edwards.* Entom. Amer., vol. 1, p. 17. 1885.
Luculenta, *Hy. Edwards.* " vol. 2, p. 10. 1886.
Jocosa, *Hy. Edwards.* " p. 10. 1886.
Astoriæ, *Hy. Edwards.* " p. 10. 1886.
Bifiria, *Hy. Edwards.* " p. 167. 1886.

Apatelodes, Packard.

Indistincta, *Hy. Edwards.* Entom. Amer., vol. 2, p. 13. 1886.
Torrefacta, var. Floridana, *Hy. Edw.* Ent. Am., vol. 2, p. 13. 1886.

Datana, Walker.

Robusta, *Strecker.* Rhopal. et Heteroc., p. 131. 1877.
Drexelii, *Hy. Edwards.* Papilio, vol. 4, p. 24. 1884.

Nadata, Walker.

Doubledayi, var. Oregonensis, *Butler.* Ann. Mag. N. Hist., p. 317. 1881.
Behrensii, *Hy. Edwards.* Entom. Amer., vol. 1, p. 49. 1885.

Gluphisia, Boisduval.

Septentrionis, *Walker.* Cat. B. Museum, Pt. 4, p. 1038. 1856.
Crenata, *Esper.* See *Bois.*, Lepid. Calif., p. 87. 1869.
Tearlei, *Hy. Edwards.* Entom. Amer., vol. 2, p. 11. 1886.
Wrightii, *Hy. Edwards.* " p. 11. 1886.
Ridenda, *Hy. Edwards.* " p. 11. 1886.
Rupta, *Hy. Edwards.* " p. 11. 1886.
Albofascia, *Hy. Edwards.* " p. 12. 1886.
Formosa, *Hy. Edwards.* " p. 12. 1886.
Severa, *Hy. Edwards.* " p. 167. 1886.

Lophopteryx, Stephens.

Elegans, *Strecker.* Proc. Acad. N. Sc. Philad., p. 285. 1884.

Notodonta, Ochsenheimer.

Notaria, *Hy. Edwards.* Entom. Amer., vol. 1, p. 17. 1885.

Lophodonta, Packard.

Plumosa, *Hy. Edwards.* Entom. Amer., vol. 2, p. 14. 1886.

Pheosia, Hubn.

Portlandia, *Hy. Edwards.* Entom. Amer., vol. 2, p. 168. 1886.

Edema, Walker.

Producta, *Walker.* Cat. B. Museum, Pt. 4, p. 1031. 1856.

Œdemasia, Packard.

Perangulata, *Hy. Edwards.* Papilio, vol. 2, p. 125. 1882.

Janassa, Walker.

Coloradensis, *Hy. Edwards.* Entom. Amer., vol. 1, p. 17. 1885.

Heterocampa, Doubleday.

Lunata, *Hy. Edwards.* Papilio, vol. 4, p. 44. 1884.
Superba, *Hy. Edwards.* " p. 121. 1884.

Cerura, Schranck.

Bifida, *Stephens.* See *Walker,* Cat. B. Museum, Pt. 4, p. 984. 1856.
Scolopendrina, *Bois.* Lepid. Calif., p. 86. 1869.
Bicuspis, *Borkhausen.* See *Butler.* Ann. Mag. N. Hist., p. 317. 1881.
Albicoma, *Strecker.* Proc. Acad. N. Sc. Philad., p. 285. 1884.

Cecrita, Walker.

Albiplaga, *Walker.* Cat. B. Museum, Pt. 7, p. 1748. 1856.

Subfamily DREPANULIDÆ.

Drepana, Fabr.

Fasciata, *Stephens.* See *Walker,* Cat. B. Mus., Pt. 4, p. 1163. 1856.

Prionia, Hubn.

Lacertula, *Linn.* See *Hy. Edw.* Can. Entom., vol. 19, p. 146. 1887.

Subfamily SATURNIDÆ.

Sericaria, Blanchard.

Mori, *Linn.* and authors. Silkworm-moth (domesticated.)

Telea, Hubn.

Paphia, *Linn.* See *Kirby,* Trans. Ent. Soc. Lond., p. 34. 1877.
Polyphemus, var. oculea, *Neumoegen.* Papilio, vol. 3, p. 71. 1883.

Attacus, Linnæus.

Cinctus, *Tepper.* Bull. Brooklyn Ent. Soc., vol. 5, p. 65. 1883.

Platysamia, Grote.

Polyommata, *Tepper.* Bull. Brooklyn Ent. Soc., vol. 5, p. 66. 1883.

Euleucophæus, Packard.

Hualapai, *Neumoegen.* Papilio, vol. 3, p. 138. 1883.

Hemileuca, Walker.

Electra, *W. G. Wright.* Papilio, vol. 4, p. 19. 1884.
Maia, var. Lucina, *Hy. Edwards.* Ent. Am., vol. 2, p. 14. 1886.

Hyperchiria, Hubn.

Zephyrea, *Grote.* Can. Entom., vol. 14, p. 215. 1882.

Subfamily CERATOCAMPIDÆ.

Citheronia, Hubn.

Infernalis, *Strecker.* Papilio, vol. 4, p. 73. 1884.

Sphingicampa, Walsh.

Bicolor, var. immaculata, *H. S. Jewett.* Papilio, vol. 2, p. [illegible] 1882.
Bicolor, var. Suprema, *Neumoegen.* Ent. Am., vol. 1, p. 94. 1885.

Subfamily BOMBYCIDÆ.

Gastropacha, O[illegible]senheimer.

Occidentis, *Walker.* Cat. B. Museum, Pt. 4, p. 1392. 1856.

Gloveria, Packard.

Arizonensis, *Packard.* ♂ *Hy. Edwards,* Papilio, vol. 4, p. 107. 1884.
Gargamelle, *Strecker.* Proc. Acad. N. Sc. Philad. (as Lasiocampa). p. 286. 1884.

Clisiocampa, Curtis.

Incurva, *Hy. Edwards.* Papilio, vol. 2, p. 125. 1882.

Artace, Walker.

Albicans, *Walker.* Cat. B. Museum, Pt. 4, p. 1492. 1856.

Subfamily COSSIDÆ.

Hypopta, Hubn.

Henrici, *Grote.* Papilio, vol. 2, p. 131. 1882.
Manfredi, *Grote.* " vol. 3, p. 139. 1883.

Cossus, Fabr.

Nanus, *Strecker.* Proc. Acad. N. Sc. Philad., p. 151. 1876.
Mucidus, *Hy. Edwards.* Papilio, vol. 2, p. 126. 1882.

Inguromorpha, Hy. Edwards.

Slossoni, *Hy. Edwards.* Entom. Amer., vol. 3, p. 183. 1888.

Zeuzera, Latr.

Pyrina, *Fabricius.* See *Walker,* Cat. B. Mus., Pt. 7, p. 1530. 1856.
Æsculi, *Linnæus.* See *Jacob Doll,* Papilio, vol. 2, p. 20. 1882.

Subfamily HEPIALIDÆ.

Hepialus, Fabr.

Carnus, *Esper.* See *Walker.* Cat. B. Museum, Pt. 7, p. 1552. 1856.
Sangaris, *Strecker.* Rhop. et Heteroc., p. 136. 1877.
Confusus, *Hy. Edwards.* Papilio, vol. 4, p. 122. 1884.
McGlashani, *Hy. Edwards.* Entom. Amer., vol. 2, p. 14. 1886.
Furcatus, *Grote.* Can. Entom., vol. 15, p. 30. 1883.

Pleocoma, *Lec.*, its systematic position and indication of new species.

By George H. Horn, M. D.

The article on *Pleocoma* by Dr. Gerstaecker, published in the Stettiner Zeitung for 1883, has been well known to me, not only in the original but also in the translation prepared by Mr. John B. Smith.

The volume containing the article did not reach me until the early part of 1884, at a time when I was busily occupied with other matters, to which were superadded the unfinished scientific affairs of our lamented Leconte.

The opportunity having occured for presenting to the English speaking public the translation above referred to I have carefully studied all the material accessible to me and prepared necessary dissections and drawings which will in due time appear in the Transactions of the American Entomological Society.

At present I propose to give in brief the results of my studies, so that Gerstaecker's article and my own may be read almost together.

As Dr. Gerstaecker gives a resumé of the articles written by Leconte I will not recapitulate. It is true as Gerstaecker states that Leconte modified his views somewhat from the first description to 1861, from which time there has been no change. This, however, is but the evolution of opinion based on the gradual arrival of better material. That Leconte came so near the truth in his first essay with such a wretched specimen is one of the best evidences of his clear insight.

When specimens with the necessary parts came and were studied, the characters fundamentally important in classification were observed and we see in the "Classification" of 1861 that *Pleocoma* takes its place among the Laparostict Lamellicorns, and the tribe instituted to receive it placed near the *Geotrupini*.

The "Classification" of 1883 appeared with *Pleocoma* in the same position and the space devoted to it much greater, from the more numerous details. Had Dr. Gerstaecker seen this volume he might have used a little more precaution before commiting himself to an opinion, or rather making the positive statement, so often repeated in his article as to have no doubt as to his full meaning.

The question involved in the controversy is one of fact—is *Pleocoma* a Pleurostict or Laparostict Lamellicorn? Dr. Gerstaecker asserts that he has examined the stigmata and finds them exactly as in *Melolontha*,

that is Pleurostict. On the other hand I assert that the stigmata are all on the connecting membrane and therefore Laparostict. To arrive at this determination with absolute certainty, I have removed the abdomen, divided it into two parts longitudinally; after having removed the entire contents of the abdomen the segments have been spread upon a piece of glass, permitting one to see the structure absolutely.

The larva described by Osten-Sacken as that of *Pleocoma* had been looked upon as very doubtful by me and I so expressed myself to Dr. Leconte. On reading the almost exhaustive arguments of Gerstaecker *against* its being the true larva I became convinced that the larva is *really the larva of Pleocoma.* "It is," says Gerstaecker, "an undoubted Laparostict larva" and there is no other Lamellicorn of that series in California requiring so large a larva.

Gerstaecker's mistake regarding the stigmata of the imago probably arose from the fact that the upper inflexed portions of the ventral plates are translucent and permit the stigmata to be indistinctly seen through their walls and thus appear Pleurostict.

The systematic positions of all the ambiguous genera in our fauna were very carefully discussed by the authors of the second edition of the "Classification," and while some may be still open to discussion, *Pleocoma* is not.

As a result of a study of the species of *Pleocoma,* the following table has been prepared:

Third joint of antennæ shorter and narrower than the first, the club with but four long lamellæ.

Seventh joint of antennæ merely transverse, not prolonged in a process; hairs of underside black ..... **Rickseckeri,*** Horn.

Seventh joint prolonged in a process, one-third as long as the following joint; hairs of underside yellow ..... **fimbriata,** Lec.

Seventh joint prolonged in a process, two-thirds as long as the following joint; hairs beneath yellow ..... **Behrensii,** Lec.

Third joint of antennæ nearly as long and as stout as the first joint.

Thorax regularly convex in front, with at most a slight depression.

Punctures of thorax fine, not greatly coarser in front, surface not hairy..... **conjungens,*** Horn.

Punctures of thorax relatively coarse, very conspicuously coarser, denser and deeper in front, the surface with semi-erect hairs ..... **hirticollis,** Schauf.

Thorax retuse in front, that is, suddenly declivous, with a broad depression posteriorly behind a transverse, obtuse ridge; surface finely punctured, not hairy; geminate striæ of elytra deep and coarsely punctured.

Hind angles of thorax distinct but obtuse; fourth joint of antennæ very little prolonged internally... ..... **Ulkei,*** Horn.

* These species are for the first time named.

Hind angles of thorax very broadly rounded ; fourth joint of antennæ prolonged in a process, fully half as long as the following joint.....**Staff,** Schauf.

With the exception of *Ulkei*, which is from Utah, all the species are from California. The females of three are known to me. In the more extensive paper which I have prepared fuller descriptions will be given together with such figures of details as may be needed to arrive at a correct understanding of the systematic position of *Pleocoma*.

WILLIAM W. HILL.

At Elizabethtown, Essex County, N. Y., on January 28th, 1888, died William W. Hill of Albany, N. Y. This news will sadden all who in any way have known Mr. Hill during his life time, and among Entomologists there are few who do not know him or his work.

Mr. Hill was born September 19th, 1833, at Pittsfield, Mass., but removed to Albany early in life, and entered the business house of Nathaniel Wright, dealer in saddler's hardware, at the age of fifteen. At the age of twenty he became a partner in the firm of Nathaniel Wright & Co., and on the death of the senior member of the firm the business was continued under the firm name of Woodward & Hill, of which firm he remained an active member up to the time of his death.

On April 9th, 1855, he married Miss Jane Woodward of Albany who survives him. He also leaves surviving him three sons and one daughter. Mr. Hill had a common school education ; but continued his studies after entering business and was an exceedingly well informed man and agreeable companion. Always fond of outdoor life and an admirer of nature, he was an ardent fisherman and of late years spent a part of each Summer in the North Woods or in the Adirondacks—combining this sport with his study of nature.

For many years he was more especially interested in Botany and made large collections of plants. In 1875 he became more especially interested in Insects, and collected persistently, carefully and systematically—with what success all Lepidopterists know. Though more particularly a Lepidopterist he collected also in other orders, to obtain a representation of local species. With Messrs. Bailey, Lintner and Meske he made excursions in the vicinity of Albany and finally Centre was hit upon, as an extraordinarily productive locality and here collecting was carried on with such vim and persistency that the place became known as "Butterfly station." Enormous quantities of "sugar" were prepared and used, and thousands of moths paid the penalty. During his visits to the Adirondacks Mr. Hill not only sugared persistently, but every

available room was lit up and windows were left open to attract the unwary night-flyers. In an unexplored field like the Adirondacks the result was most gratifying, and many previously unknown forms were discovered—the types of which are all in his collection. With such a quantity of material, exchanging was very productive and the collection rapidly increased. It was his boast that he never bought an Insect, yet the collection contains rarities from all sources, the products of exchanges. He was extremely systematic in the arrangement and care of his collection, every species bearing a number—or rather two numbers—one sex an even, the other an odd number. Every species was registered, and the duplicates were all noted, so that it was only necessary to refer to the proper book and the exact number of specimens on hand was at once apparent. In addition to this he was very careful in labelling his Insects, every specimen containing the exact locality, date of capture and whether at light or at sugar. The collection is therefore valuable, not only as an accumulation of material, but as an accumulation of facts, of great value in fixing dates, distribution and number of broods. The work required for all this was of course enormous, and can be appreciated only by those who have attempted anything similar.

Mr. Hill was not a describer, his only contributions to the literature being in the line of faunal lists in which dates and localities were carefully noted;—but though not a writer, he was a careful observer, and his intention was, when a sufficient material was accumulated to study some of the Heterocerous families systematically. This intention was unhappily prostrated by his untimely death. In September last he began to break down, and his physicians decided that the trouble was consumption. His death was quite unexpected and an autopsy revealed a cancer on the lungs as the true ailment. His death is a positive loss to Entomology, removing from our midst an active worker whom it will be difficult to replace. For the reasons stated his collection is peculiarly valuable, and it is to be hoped that it will not be lost. No testamentary disposition was made, but his expressed wish was that it should be disposed of in its entirety. The National Museum would be an excellent and appropriate place for it.

Mr. Hill was President of the Albany Fly-Casters Association; Chairman of the Ex. Com. of the Eastern N. Y. Fish and Game Protective Association; Life-member of the Albany Young Men's Association; Member of the Albany Institute; of the Old Guard, Albany Zouave Cadets; Masters Lodge F. & A. M., and a vestryman of St. Paul's Episcopal Church. None of his children have inherited his taste for Entomology.

J. B. Smith.

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GENERAL INDEX.

ERRORS AND CORRECTIONS.

Page 35, for A. G. Butler, L. L. S., L. Z. S., read A. G. Butler, F. R. S., F. Z. S.

" 107, bottom line, for trusts read thrusts.

" 120, line 11, for wither read whiter.,

" 134, line 11, for **gemmatilla** read **gematella**.

" 136, line 2 from bottom, for **minutularia** read **minutulella**.

" 153, line 15, for Capada read Chapada.

" 177, line 1 and elsewhere in article for Eutilia read Entilia.

" 198. All through Mr. Moeschler's article for *lunearis* read *cunearis*.

" 218, for Gallileo read Galileo.

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