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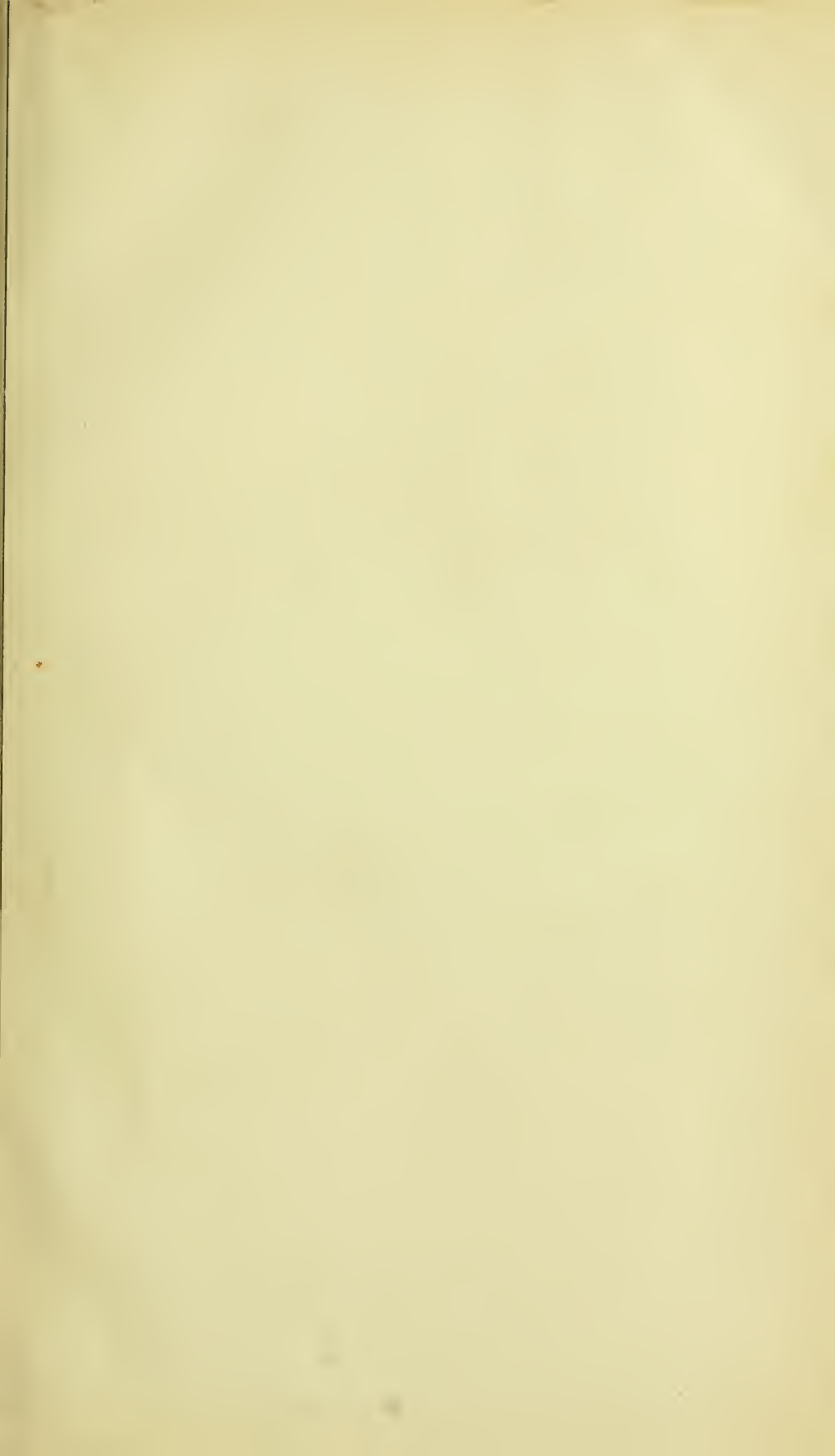
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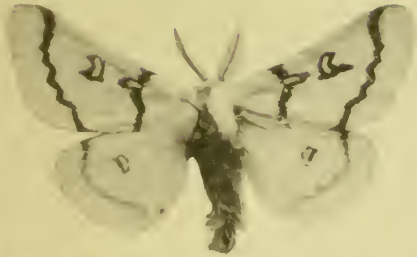
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JOURNAL
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Vol. I.

MARCH, 1893.

No. 1.

COMMON versus PROPER.

BY ANNIE TRUMBULL SLOSSON.

Entomologists differ now, as they have always differed, as to the advisability and practicability of having a popular and simple as well as a scientific and technical nomenclature in their own branch of natural history. I will not enter into the general question here, but simply relate a few incidents in my own experience as a collector which seem to bear upon the matter.

I have a collection of insects, principally Lepidoptera. In it are certain rare and interesting things, as some of you know. There are some types, several uniques, and many fine series, showing gradations, varieties, seasonal and climatic differences in certain species. All these insects, with very few exceptions, have been taken by myself personally, or by friends interested in adding to my treasures; for I do not acquire specimens by exchange or purchase. And I can safely say that my collection would be far smaller, infinitely less valuable and interesting, had I been one of those who confine themselves strictly to the use of scientific and polysyllabic appellations in speaking of my favorites. A few illustrations will show you what I mean. I spend a great deal of time among the northern hills of New England. I am there often in the spring time before the summer guests arrive, often in the quiet autumn days when tourists and boarders have gone to their city homes. At such times my only friends and companions are the villagers themselves. These are intelligent, appreciative people, but not what we call liberally educated. They know no Greek or Latin and could not easily learn even the dreadful mixture of tongues which passes for these languages in the nomenclature of entomology. But they possess, many of them,

keen powers of observation, a true love of nature and a bountiful stock of that patience and persistence which all fishermen, hunters and woodsmen so readily learn. So there is the material of which to make admirable collectors. But first they must be taught a few things; must be shown what I want and for what I do not care. How shall I do this? Shall I tell the simple souls that my desiderata are Lepidoptera, particularly the Heterocera, that I am just now especially interested in the Bombycidæ and the Notodontians? No, by so doing I should at once scare away my neophytes and lose all chance of making them useful to me. I dare not even ask them to capture "moths" for me. Few of them apply that term to anything but the devouring insects which eat their buffalo robes, their coonskin coats, the braided rugs upon their floors, their flowering plants or garden vegetables. Be the pest tineid, hemipter or coleopter, he is to the farmer in that north country a "moth;" even the potato-bug and the Buffalo beetle are "moths" in their vocabulary. But they know what "millers" are. So throwing science to the wind—temporarily—and casting aside all entomological traditions, I descend (ought I not to say rise?) to their level and boldly own myself a collector of millers. But a new difficulty arises, I do not want all millers. That is, I do not care to acquire all the specimens of one species to be found in that locality. So after a hundred or more of some common insect like *Spilosoma virginica* are brought me I go a step farther in my instructions and give orders that no more "white millers" are to be gathered. But I soon find that this again is too broad and embraces too much. One of my country boys throws aside as worthless a *Euchetes collaris*. Then I begin to show my pupils the more striking distinctions between the various white moths. Very soon they know them apart and have their own name for each, given because of some peculiarity of marking or habit which they themselves discover or to which I call their attention. Then *Spilosoma virginica* becomes the "common white miller," *Spilosoma prima* the "dirty-white miller," *Hyphantria textor*, the "littlest white miller." For *Leucarctia acraea* I give them Harris's old name of the "Saltmarsh miller," a term which is at once shortened and put into local dialect by my pupils and thus becomes the "ma'sh miller." Last summer when absent from the mountains I remembered the request made by an eminent entomologist then interested in examination of the scent organs of insects, that I would save him in alcohol specimens of *Leucarctia acraea*. So I wrote to one of my best collectors in the north

country, good, simple-hearted, enthusiastic Sim L. to attend to the matter for me. Now I did not ask him to capture and preserve specimens of *Leucartia acraea* Drury male. He would not have understood me, and I should not have obtained what I wanted, but I wrote: "Dear Sim, Catch me a lot of 'ma'sh millers,'" and Sim took the job and carried it to a successful conclusion. I shudder to think what Messrs. A. and B. and C. our well-known, sincere and earnest supporters of the doctrine that only scientific and authorized names should be applied to described species, would say should they hear some of our entomological talks in those northern regions. "What luck last night, Sim?" I ask some morning in July. "Dreffle poor, Mis' Slosson," says my honest friend; "everlastin' lot o' millers, but all on 'em common. Guess I took nigh on to a dozen browneys, more'n that o' blackeys, and a heap o' chestnuts. Never ketched a single nice thing but one drinker, and you've got plenty o' him. I see a modest miller an' struck at him, but he got away." "Want any niggers, Mis' Slosson?" calls out my little neighbor Billy B., his freckled face glowing with excitement and hope. "There's a bustin' lot on 'em round them posies in my backyard." And I know, as well as if I had seen them myself, that that day-flying, sunloving Zygænid, *Ctenucha virginica*, is sipping honey from Mrs. B.'s petunias.

Bumblebee moths, big-grays, little-reds, scallops, fattys, fussys, shutter-millers, bowlin' alley moths—these and many more are the unscientific, but suggestive names given to the Lepidoptera of the mountains, by my young collectors. And in other orders, there are shinin' bug, the mud beetle, big horns, prickly legs, sidewalk bug, humpy, straddly beetle, flat nose, dead-rat bug, etc., etc. In fact, we have a vocabulary of our own, I and my collectors, one we fully understand, and by means of which I secure many and fine specimens unattainable there by the use of more scientific terms. And the "Catalogue of described insects of northern New Hampshire, prepared by Sim L., Billy B. *et al.*," is just as valuable and important to me as are the lists of Grote, Henshaw, Scudder, Osten Sacken, Cresson and Uhler.

In Florida I use a different language. There the colored race take an eager interest in our collecting. To them my moths are no longer millers, but generally can'le flies, because, I suppose, of their flying to light of candle or lamp. "Want a can'le fly, missy?" cry the shrill voices of the dark-faced, bright-eyed little chaps, running on bare, brown feet to bring a big cossid or arctian. "Here, boss, here's a right smart heap o' can'le flies

roun' this light." Again, to some of this imaginative race, moths are "bats." I was once formally introduced by one of my ebony friends in Tampa, to a dusky companion, as "De missy what cotches bats." And I did not resent the title but owned the soft impeachment. On another occasion while I was watching a friend plying his net at an electric light in Jacksonville, I overheard one little darkey say to his mate: "Yer know what that gemman do'n over thar? He jes' cotchin' them poo' li'le can'le flies, put 'em in a bottle an' make camphire out 'n 'em." Deplorably ignorant you see of the first principles of entomology, knowing nothing of Hübnerian terms, the laws of priority, of Linnæus, Fabricius, Guenée, Say, and their respective claims to originality. In fact, they are utterly lacking in the knowledge of all these things about which you learned scientists love to wrangle. But they are sharp-eyed, nimble-footed, light-handed, and they capture many a rare, desirable insect, just as acceptable to me by their names of crawler, flopper, doodle-bug, snake-doctor or stick-in-the-mud as if bearing a two-tongued appellation in "linked sweetness long drawn out," and understood only by the favored few.

But it is not only in conversation with the simple and unlearned that I have found the use of popular names advisable if not absolutely necessary. You may not believe it, but there are actually some educated and accomplished men and women, scholars in various branches of art, science and literature quite removed from our particular field, who do not care to spend the rest of their days in acquiring a new language, or jargon. Such an one I have now in mind. He is an admirable collector and it is to him I owe many, very many of my rarest specimens. He is quite capable of committing to memory the scientific names of our entomological lists, but he has something else to do with his time and brains. So he gives the insects he finds, or looks for, names of his own coining. At this moment I can recall but a few. Such are Proteus for that inconstant and variable geometer, *Hyperetis amicaria*; the scalloped sphinx, for *Paonias excrucatus*, and glowing-eye for a large noctuid whose eyes shine in the darkness like rubies or garnets. He talks familiarly of the checkered moth (*Halisidota maculata*); the New York moth (*Orgyia leucostigma*); the grass moth (*Drasteria*); the falcon-moth (*Platypteryx*); in all of which titles you who are lepidopterists will see a certain appropriateness. Again he will catch at the real scientific name and falling into the natural error we entomologists so soon discard, that these names have always some legitimate meaning, or correct

derivation, he gives them a free translation, and we have the senator (*Anisota senatoria*); the twin (*Smerinthus geminatus*); the minister (*Datana ministra*). Or, twisting the correct name a bit he gives it thus a more familiar sound. So he always calls the pretty little sub-alpine geometer, *Baptria albovittata*, the Baptist. Shall I ever forget the look of perplexed horror on the face of a good old man of the Free Will Baptist persuasion, as he heard this enthusiastic but unconventional collector announce one day that he had caught a lot of ministers, bottled one senator and pinned three little Baptists! But I understand him perfectly, and we hold most satisfactory entomological conversation and correspondence. Thus I obtain from him, as I said before, by the means of this vocabulary of home-made names, rare and desirable insects which I should lose I am sure if I asked for them, or spoke of them only by the long, often meaningless terms which he has no patience or leisure to learn.

I draw no conclusions here, you see; I propound no well defined theory. I tell you some simple little incidents, only a few out of hundreds of similar ones in my experience.

In making your plans for popularizing entomology, for drawing into the study young and old, wise and unlearned, perhaps these illustrations of mine may not lack suggestiveness. And you may, perchance, consider the advisability of giving, as do the entomologists of England, Germany and other lands, a simple, popular name to each and every insect, as well as its more scientific titles. Why should we not, in time, have an Index Entomologicus, like that of Wood, where side by side, stand the two names, the easy and the difficult, the simple and the scientific?

AUCTION SALE OF INSECTS.

Recently an auction sale of insects was held at the residence of Mr. B. Neumoegen, for the benefit of the publication fund of the Journal of the New York Entomological Society. The material for this purpose was contributed by members. About one thousand Coleoptera and Lepidoptera were sold. The prices realized for some specimens was very encouraging. A single example of *Spilosoma prima* brought \$4.25; a pair of *Scirarctia echo* \$1.50; a specimen of *Gyascutus cuneatus*, \$1.25. Other species brought equally good prices, upon which we will report later.

ATTEMPT AT A NEW CLASSIFICATION OF THE BOMBYCINE MOTHS.

By A. S. PACKARD.

For several years past I have been engaged in studies on the life-histories of the members of this group, as well as on the venation and other characters of the adults; the result has been a considerable modification of the classification given in my earlier papers, and that of later authors. I am inclined to regard the Bombyces as a super-family divided into 13 or 14 families. We may begin with what seem to me to be the most generalized forms, those least modified by adaptation to changed surroundings, viz.: the *Notodontide*. These seem to have descended from forms more like the Noctubombyces or Bombycoidea (Thyatiridæ) than any other moths, being similar to them not only in larval, but in adult characters. We will not venture to say that the Notodontians have directly evolved from the Noctuidæ or Noctuina, but they are so similar to them as to be often mistaken for them, in all stages of development; and the Thyatiridæ and Bombyces may have had a common origin from some extinct Noctuid form.

FAMILY 1.—NOTODONTIDÆ.

In arranging the genera of *Notodontide*, which may be divided into perhaps 6 groups, one should begin first (1) with *Gluphisia*, as the simplest most unmodified form, most like the Noctuina. Then follows *Nadata* and *Lophodonta*. In these genera the larvæ are simple, greenish, with only longitudinal lines, not being ornamented with any spots or humps; the full-fed caterpillars differ but slightly from the freshly hatched young.

2. In *Datana*, the body is simple in shape, but with bright longitudinal bands, and with long hairs. This is succeeded by *Apatelodes*, with its densely hairy body, and its conspicuous pencils.

3. The next step in ornamentation, humps being added, is *Ichthyura*.

4. *Pheosia*, *Notodonta* and *Nerice*, with their allied genera *Edema*, *Dasytophia*, *Schizura*, (*Oedemasia*), *Hyparpax*, and *Janassa* form the typical humped group of the family.

5. This group is succeeded by a large American group represented by *Scirodonta* and *Heterocampa*.

H. marthesia with its long Cerura-like caudal appendages, connects this group, with—

6. The most specialized and modified genus of the family, represented by the species of *Cerura*.

FAMILY 2.—CERATOCAMPIDÆ.

It is not improbable that this family originated from the Notodontians or forms allied to them. It is divisible into two sub-families. The most generalized members of the family are *Dryocampa*, etc., and *Anisota*, the larva of the former being the more simply spined. *Sphingicampa* may be regarded as a transitional genus connecting *Dryocampa* and *Anisota*, with the third group comprising *Eacles* and *Citheronia*. The foregoing genera form a sub-family, which may be named the *Ceratocampinæ*.

The second sub-family we may call the *Agliinæ*, the sole genus being the European *Aglia*. In the venation of the wings *Aglia* shows a most unexpected resemblance to that of *Eacles imperialis*. It will be remembered that the larva of *Aglia* loses at its final molt its spines, and becomes much like a Saturnian of the *Telea* group. It thus connects the *Ceratocampidæ* with the *Saturniide*.

FAMILY 3.—SATURNIDÆ.

This is a highly modified, and probably quite recent group, whether we take into account the larvæ or the imagines. During the evolution of the group, probably from the Ceratocampidæ, the larvæ, as shown by their life-history, underwent a change in shape, from a rather long and slender form to a thick heavy larva. The moths also underwent a process of degeneration, as seen in the atrophy, total or partial, of the maxillæ, and in the loss of veins in their very large, but weak wings. This family also appears to be a closed type, viz.: none of the higher or more specialized Bombyces appears to have descended from it (unless possibly the Cochliopodidæ.)

The genus *Saturnia* (in its restricted sense), represented by the European *S. carpini* and its allies, and our Pacific Coast *S. mendocino* and *S. galbina*, is the most generalized one of the family. This family may be divided into two sub-families: 1. *Saturniinæ*, 2. *Attacinæ*.

The North American genera of *Attacinæ* may be arranged in the following order: *Platysamia*, *Callosamia*, *Samia*, (*S. cynthia*), *Telea*, *Actias*.

FAMILY 4.—HEMILEUCIDÆ.

At present both on account of its larval and adult characters I am disposed to consider the *Hemileucini* of Grote as most probably of family rank.

The North American genera are *Hyperchiria*, *Hemileuca* and *Pseudohazis*. The exact position of *Coloradia* we have not been able to establish for want of material.

FAMILY 5.—ENDROMIDÆ.

After a somewhat careful examination of the European *Endromis versicolora* I find that it has the head, palpi, and antennæ, as well as the hairy abdomen, much as in *Hemileuca maia*, but the median vein of both wings divides into four branches, and the sub-costal vein of the fore wings divides into five branches, as in *H. maia* and the other Hemileucidæ. The larva has a smooth, sphinx like-body, with oblique bars and a caudal horn. The family appears to form a branch of the Bombycine tree parallel to, but distinct from the Hemileucidæ, and stands above the latter, connecting this group and the Ceratocampidæ and Saturniidæ with the higher families of the Bombyces, in which there are four branches of the median vein, all the families already mentioned, with the Saturniidæ, agreeing with the Notodontidæ in having but three branches.

FAMILY 6.—BOMBYCIDÆ.

The type is *Bombyx mori*; it has three branches of the median vein in each pair of wings.

FAMILY 7.—PLATYPTERYCIDÆ.

In this group also the median vein of each pair of wings have but three branches.

FAMILY 8.—PSYCHIDÆ.

In this aberrant and highly modified group the number of branches of the median vein varies from three (*Perophora*) to four, the true Psychidæ. The group may be divided into two sub-families: the *Lacosominæ*, and the *Psychinæ*. As the females of the Lacosominæ are winged, like the males, they are evidently in this respect, as well as in the larval characters, less modified and more generalized Bombyces than the genuine Psychidæ, and they should for this reason be referred to a distinct sub-family of the group. The three last families form side-branches of the Bombycine phylum, and before passing to the remaining families we shall have to return again to the main trunk, to a point near where the Notodontian branch originated, to consider the next group.

FAMILY 9.—COCHLEOPODIDÆ (Limacodidæ.)

We now come to families in which the median vein of both wings throw off four branches or veinlets. From recent prolonged

studies on the larvæ, especially the freshly hatched ones, as well as the moths, I have been led to consider one of two alternatives. 1. Either the Cochliopodidæ have originated from the Saturniidæ or from forms allied to them; or, 2. Both the Saturniidæ and Cochliopodidæ have descended from a common stem-form, and this perhaps some Notodontian. At all events the systematic position (and in this connection I may say that the larval, pupal, and imaginal characters bear me out) of the group represented by *Limacodes* and its allies, is very near Saturniidæ, and not far from the Notodontidæ.

I am inclined to believe that the oldest, most generalized, living forms, though at the same time indeed the most highly specialized forms, are the tuberculated larvæ of *Empretia*, *Euclæa* and *Adoneta*, as they resemble the larvæ of Saturnians, and in some respects those of the Notodontians. On the other hand the nearly smooth slug-worms, when fully-grown without hairs or even tubercles, such as the larval *Limacodes* and *Heterogenæa*, which seem to be the most aberrant and modified, viz.: have become the most adapted to the peculiar mode of life emphasized by the term "slug-worm;" these being caterpillars which have lost by disuse their abdominal legs, the thoracic ones being greatly reduced in size; while by their sluggish disposition, their slug-like slow, gliding mode of progression, and by the peculiar coloration of the larvæ (viz: *Heterogenæa*, which mimics the red, swollen spots on the leaves of various trees), we have, as the result of gradual modification brought about by adaptation, perhaps the most strange and bizarre type of Lepidopterous larva in existence.

The succession of genera we should propose is as follows: *Empretia*, *Euclæa*, *Parasa*, *Adoneta*, *Phobctron*, *Monoleuca*, *Isa*, *Limacodes*, *Packardia*, *Lithacodia*, *Heterogenæa* (including *Tortricidia* and perhaps *Kronea*).

FAMILY 10.—LASIOCAMPIDÆ.

Quite contrary to my former opinions and prejudices this family instead of being placed at or near the bottom of the Bombyces, belongs much higher up in the series and should be associated with the Liparidæ rather than with the Ceratocampidæ and allied families; this view being based on a consideration of both larval and imaginal characters.

Beginning with *Clisiocampa*, *Artace*, and *Tolyte*, *Heteropacha* connects them with the most highly specialized genus, *Gastropacha*.

The tufted and very hairy larvæ lead to the *Liparidæ*.

FAMILY 11.—LAGOIDÆ.

We have already attempted to show that *Lagoa* is the type of a distinct family, intermediate between the Cochliopodidæ and the Liparidæ. (*Psyche*, July, 1892. p. 281).

FAMILY 12.—LIPARIDÆ.

Of this group *Carama* and *Artaxa* may be the more generalized forms, *Dasychira*, *Laria*, *Parorgyia* follow, the most modified and recent form being *Orgyia*, with its wingless females.*

FAMILY 13.—ARCTIDÆ.

The most generalized form appears to be *Halesidota*, with its tufted larva. The *Lithosiidæ* are certainly very difficult to separate from the Arctians, and after careful consideration of the head and wing characters, I do not feel sure that they should be treated as a separate family, but rather as a sub-family. The chief distinction is in the antennæ, those of the *Lithosiidæ* being simple. Whether *Nola* should be regarded as the type of a distinct family, or as a sub-family of *Lithosiidæ* is a matter for debate. Butler places *Lycomorpha* in the *Lithosiidæ*, but I regard it as a *Zygænid*.

FAMILY 14.—ZYGÆNIDÆ.

The next great group is the *Zygænidæ*. Whether it should be regarded as equivalent to the Bombyces as a whole, may well be a matter of doubt. Since some of the simpler forms intergrade with the Lithosians, I am inclined to think that the group is simply a family, and that it should perhaps be associated with the Lithosians and Arctians under the Bombyces, since the larvæ are spinners and hairy, with tufts or pencils of hairs.

At present I think the *Zygænidæ* should be divided into three sub-families. 1. and lowest, or most generalized, the *Syntomcinæ* (*Glaucopinæ*); 2. the *Zygæniidæ*; and 3. the *Dioplinæ*, our North American form being *Phryganidia*.

The *Zygænidæ* as thus circumscribed, are very distinct from the next family, and I am inclined after recent studies on the

* I have satisfied myself by a study of the venation, etc., that *Varina ornata* Neum. referred to this family in Smith's List, is a Noctuid. Prof. Smith has discovered that it is a synonym of *Acherdoa ferraria* Walk. (*See Can. Ent.* xxiv. June 1892, p. 135.) Prof. Smith, however, appears not to question its position among the Bombyces.

venation and head-characters to arrange the other higher moths in the following order:*

- Family *Agaristidæ*.
- “ *Castniidæ*.
- “ *Hepialidæ*.
- “ *Cossidæ*.
- “ *Thyrididæ*.
- “ *Ægeriidæ*.
- “ *Sphingidæ*.

The Hepialidæ and Cossidæ appear to be more nearly allied to the Sphingidæ than to the Bombyces, though originally they may have directly descended from the latter group. The two families are closely related.

The three families of Thyridæ, Ægeriidæ and Sphingidæ are closely related.

Finally, it is not improbable that all the moths mentioned in this paper, including also the Rhopalocera, have originated in various ways and at different times from the Bombyces, and perhaps all of them in the first place from the Notodontians; though the Sphingidæ may have evolved from the Ceratocampidæ, or Endromidæ. At present this may be a fairly good working theory to account for the relationship of these families, and at all events the Bombyces are with little doubt the most ancestral and generalized forms of the higher moths, as the Tineina are of Lepidoptera as a whole.

Specimens of *Datana major*, *D. palmii*, *D. contracta*, *D. angusii* and *D. integerrima* have been sent to Mr. C. Palm, from Arkansas, which is a new locality for these species.

A single example of *Harmonia morisonii* Hy. Edw. was taken by Mrs. Slosson at Watkins Glen, N. Y. Hitherto only known from Montana and Missouri.

* It is possible that the Agaristidæ and Castniidæ form a side branch, standing above the Sphinges, and next to the Hesperidæ, Megathymus being the connecting link.

NOTES ON MACROPS AND ANTHONOMUS.

By G. W. J. ANGELL.

Macrops schauppii, sp. nov. Oblong, moderately stout, rufopiceous; densely covered with yellowish and dark brown scales. Rostrum stout, subangulate at sides, about equal in length to thorax, narrowed at middle, dilated at tip; tricarinate, lateral margins sulcate, each sulcus bearing a row of stout bristle-like setæ. Surface rather sparsely covered with pale squamiform hairs, a dense patch of rounded, concave scales near base. Scrobes very deep, directed toward lower half of eyes. Head short, trapezoidal, moderately convex, densely clothed with pale filiform scales, with many larger rounded scales intermixed. Thorax about as wide as long, narrowed at base and apex, sides strongly arcuate, not indented, transversely impressed near apex; rather convex and covered with rounded scales, with many stout, erect setæ intermixed, a narrow median vitta and sides paler, enclosing a darker spot, lobes prominent. Elytra about one half wider than thorax, sides very slightly narrowed for three-fourths their length, then rather abruptly constricted and bisinuate, apex broadly rounded. Striae very strongly impressed, punctures large but not approximate, intervals subequal, convex, each bearing a row of stout, erect, bristle-like setæ; surface mottled with dirty brownish, glutinous appearing scales. Beneath rather sparsely scaled. Legs moderately robust, clothed with flattened scales and a few recumbent squamiform hairs. Anterior tarsi dilated. Last ventral with a large, concave impression occupying nearly the whole surface of segment. Length 4.5 mm.; .17 inch.

A single abraded specimen, evidently a male, collected by my friend Mr. F. G. Schaupp, in honor of whom I have named it. The distance of the scrobes, shape of the elytra, and strongly setigerous intervals would place the species in the *hirtellus* group of Dr. Dietz (Trans. Amer. Ent. Soc. Vol. xvi, page 45). It bears a most deceptive resemblance to *echinatus* Dietz, from which species it differs in its larger elytral punctures and sexual characters.

Macrops laramiensis, sp. nov. Oblong, piceous; antennæ rufopiceous, club darker. Beak slightly longer than thorax, rather slender, somewhat flattened; widest at base, gradually tapering and slightly compressed at tip. Rostrum not carinate; clothed with filiform, cupreus scales, intermixed with others having a pearly lustre, scales becoming more bristle-like at tip. Antennæ moderately stout, second joint of funicle slightly longer than first, but much more slender, scrobes directed toward superior margin of eyes, superocular sulcus deeply impressed. Head conical, densely clothed with cupreus and pearly scales; lobes moderate, anterior thoracic suture well-marked. Thorax subquadrate, rather convex, strongly narrowed and constricted anteriorly, sides arcuate, hind angles broadly rounded. Surface densely clothed with cuprocinereous and silvery white scales, the paler ones forming a narrow median vitta and a submarginal vitta on either side, the latter angulated at middle and then divergent toward the base. Thorax with a few large punctures, irregularly placed, and many recumbent hair-like scales.

Elytra about twice as long as wide, one-fourth wider than thorax, humeri broadly rounded; sides nearly parallel for two-thirds their length, then rather abruptly narrowed and broadly rounded to apex. Striae rather fine, moderately impressed, punctures approximate. Intervals broad, nearly flat, each bearing a series of fine setigerous punctures; setae short but bristle-like. Surface densely clothed with a mixture of cupreous, pearly and whitish scales, the paler ones forming a diagonal chevron on the fourth, fifth, sixth and seventh intervals. This paler band occupies rather more than the median third of the elytra, its anterior margin gradually diverging from suture toward the humeri where it forms a continuation of the marginal vitta of the thorax. A small ill-defined white patch, on the second and third intervals, slightly in front of chevron; scutellum large, subquadrate, covered with elongate, silvery-white scales. Ventral surface and legs sparsely clothed with pearly scales, which are more filiform than those of the elytra. Tibiae denticulate and setigerous along their inner margin. Anterior tarsi dilated. Last ventral unimpressed. Length 5.5mm.; .25 inch.

A unique specimen in my cabinet taken by Mr. H. F. Wickham, at Laramie, Wyoming, May 22d. Its sexual characters show it to be a male. This species is a member of the *Ulkei* group of Dr. Dietz and should be placed after *grypidioides* Dietz, from the latter it differs in its larger size, non-carinate beak and peculiar vestiture and markings. It is the largest *Macrops* known as yet from our fauna.

Anthonomus Dentoni, sp. nov. Elongate, subelliptic, uniform rufous, shining; sparsely clothed with pure white, recumbent squamiform hairs. Beak long, rather slender, shining, with large confluent punctures. Scrobes deep and straight; antennae slender, inserted about two-fifths from apex, funicle seven-jointed, first joint long and stout, second much more slender, slightly longer than third, third to seventh sub-equal, with many long bristling hairs, club elliptical, faintly annulate. Head subconical, shining, frontal fovea large and deep. Eyes dark rufopiceous, rather convex. Thorax slightly wider than long, rather strongly narrowed in front and constricted at apex, sides broadly rounded; surface coarsely punctured, each puncture bearing a whitish scale like recumbent hair, pubescence becoming more dense near side margins and forming ill-defined white vittae. Elytra oblong, slightly wider than thorax, nearly three times as long as wide, humeri rather prominent; sides feebly narrowed, and gradually rounded from near middle to apex. Surface deeply striate, punctures large and deep, approximate, intervals somewhat convex finely punctured and bearing short recumbent setae. The peculiar squamiform hairs become much more dense just before apical third, where they form a conspicuous band, widest near suture; humeri and scutellum with denser patches of similar white hairs, ventral surface sparsely and rather coarsely punctured with a few white hairs. Legs not very robust, coarsely but sparsely punctured, femora clavate, anterior femora with a large triangular tooth, median with tooth small but very acute, posterior femora unarmed. Tibiae slender, anterior curved near base, sinuate. Length 3 mm.; .12 inch.

The unique male in my cabinet was taken near Franktown, Nevada, some years ago by Mr. S. W. Denton whose name it

bears. It is evidently a member of the *nigrinus* group of Dr. Dietz (Trans. Amer. Ent. Soc. Vol. xviii, page 220) but is not closely related to any of the species there given. Remarkably distinct in coloration from any species known to me.

As a large portion of my material in Macrops and Anthonomini has recently passed through the hands of Dr. Dietz, our acknowledged authority in these groups, I am enabled to add somewhat to the recorded geographical distribution of certain species as given by him in his two monographs cited above. While in some instances I can only add to the recorded locality, a neighboring State, yet certain other species show a distribution hardly to be expected. The localities given by Dr. Dietz are in quotations.

Anthonomus hirsutus Bruner.—The type of this species (now in my cabinet) shows it to be very distinct from *scutellaris* Lec.

A. Bolteri Dietz.—Described from "New Mexico." I have a specimen labeled Cal. without more definite locality.

A. Morulus Lec.—"California." Also taken by Mr. Wickham, at Tacoma, Wash.

A. subguttatus Dietz.—"Florida, D. C." A specimen labeled Iowa received from Mr. Wickham.

A. consimilis Dietz.—"D. C." Also Penn. from same source as above.

A. nigrinus Say "D. C., N. C., La., Va." Ark. (Little Rock), Wickham.

A. albopilosus Dietz "N. Mex." Also Texas (Cypress Mills), Schaupp.

A. squamosus Lec.—"Ks., Col., N. Mex., Cal., Neb." Also Montana (Glendive), Wickham.

A. tectus Lec.—"Ariz., N. Mex., Col., Utah." Also Dak. (Bismark), Wickham.

A. hirtus Lec.—"Cal., Ariz., Utah," Dak. (Bismark), Wickham.

A. yacobinus Dietz.—"Colorado." Ariz. (Winslow), Wickham.

A. nanus Lec.—"Ariz., New Mex.," Cal. (Sta. Cruz), Ricksecker.

A. ligatus Dietz.—"Ariz." Also Iowa, (Wickham).

Pseudanthonomus validus Dietz.—"Neb., Col., Can., N. Mex." Also N. J. (Bergen Point), Mr. Wilhelm Julich.

Ps. sericetosus Dietz.—"Mich. (Detroit)." Also Neb. (Lincoln), Wickham.

Ps. facetus Dietz.—"Lincoln, Neb.," also Iowa, (Wickham.)

Ps. rufulus Dietz.—"D. C." N. J. (Orange Mts.), Angell.

- Orchestes niger* Horn.—“Ill., Mich. Penn.” Also S. Carolina, (Morrison), and Vanc. Is. (Victoria), Wickham.
- Euclyptus testaceus* Dietz.—Described from a unique female from “Buffalo, N. Y.” A number of specimens have been taken at Sandy Hook, N. J., by Mr. Julich.
- Macrops interpunctatulus* Dietz.—“Kans., Tex., Neb.” Also Mont. (Glendive), Wickham.
- Macrops Ulkei* Dietz.—“Dak., Tex., Wyo., N. B.” Also Neb., (McCook) and Mont. (Helena), Wickham.
- Macrops tenebrosus*, Dietz.—“Mont., Dak., Wyo.” Also Neb. (Lincoln), Wickham.
- Macrops montanus* Dietz.—“Ill., Kans., Nev., Dak., Mont.” Also Col. (Greely), Wickham.
- Macrops obscurellus* Dietz.—“Tex., D. C.” Also Mont. (Missoula), Wickham.
- Macrops vittaticollis* Dietz.—“Wyo., Neb.” A specimen labeled Utah received some years ago from the late Capt. R. H. Murdoch.

NOTES ON ONITICELLUS, SERV.

By G. W. J. ANGELL.

Oniticellus californicus Horn. This interesting species was described by Dr. Horn (Trans. Amer. Entom. Soc. Vol. x, page 118) from a unique pair in the cabinet of Mr. Henry Edwards. These specimens were obtained at the base of Mount Shasta, California. No further specimens of this species were captured until last season, when a few pairs were taken, by Mr. C. J. Weidt, in the desert region of south-western Utah. From him I have gathered the following interesting notes: The first specimen was found late in March hibernating under a stone near the Virgin River, but a most careful search failed to reveal other specimens at that time. Towards the end of April, a male and female were found in horse-dung and on the following days several more specimens were taken, some eighteen or twenty examples in all. Mr. Weidt informs me, that these insects seem to prefer the fresh droppings, that is when from two to three hours old, none being found on the mornings following, when the droppings had become quite dry. As this region contains but few

cattle and is certainly but little travelled, the query arises, as to where these insects find a sufficiency of their necessary food.

Oniticellus cubiensis *Duval*. Some years since I received a single specimen of this insect, from the late H. K. Morrison, collected by him in Key West, Florida. This species, common in the West Indies, has probably obtained a foot-hold in Southern Florida and should be added to our list. The specimen mentioned above is now in Dr. Horn's cabinet.

SOME INJURIOUS INSECTS OF THE ORCHARD AND GARDEN.

BY MARV TREAT, VINELAND, N. J.

Insects are everywhere and their food is almost everything that one can think of in the world. But those who try to grow fruits and flowers are more interested in the pernicious creatures that live in our orchards and gardens. In the orchard no part of a tree is exempt from the attacks of the numerous and various insects whose existence depends in a great measure upon our labor in making the trees grow to support them. We find them feeding upon the bark, others eating into the solid wood, and some live upon the leaves and twigs, which they devour entire, while others live upon the fruit and flowers, and dainty ones eat only the parenchyma, leaving the skeleton of the leaf intact, and still more tiny ones find ample room for homes between the epidermis of the leaf when they mine and make intricate roads in every direction. In the garden, also, are untold numbers feeding upon our small fruits and vegetables. The currant borer eats the pith of the stems of our currant bushes, while the currant worm strips the leaves from both gooseberry and currant bushes, and borers attack our blackberries and raspberries. In fact, everything that we attempt to grow is hedged about with foes. In this brief article I can mention only a few of the most destructive that come under my own observation in our home grounds.

Every few years particular kinds of insects will be very abundant, and then for a time partly subside. Just now we are having an unusual visitation of the round-headed apple tree borer. (*Saperda bicittata*.) It threatens to kill our trees in spite of all our

efforts to save them. It is not unusual to find from ten to a dozen of these borers in a single tree. Young trees have been completely girdled and killed. It has been said that this borer confines itself to the base of the tree, and occasionally in the crotch. Last summer and autumn we not only found them in the base and crotch, but many were at work in the trunk anywhere between the crotch and base, and in some instances we found them well up in the tree in the larger branches. The parent of this borer is quite a handsome beetle, about an inch in length, with two longitudinal white stripes alternating with three light-brown ones. But it is seldom seen in the day-time unless one knows its haunts and unearths it and brings it to the light.

The only natural enemies that I have observed trying to get these borers are the Downy woodpecker and the great Golden-winged woodpecker, and neither of these birds, as far as I have seen, have learned to work at the base of the tree where they are most abundant, but in the crotch or in a branch they will work until they get them. If frightened away they soon return. The Golden-winged builds its nest in our orchards if he can find a partly decayed tree, and becomes quite domesticated.

The apple-worm or codling moth (*Carpocapsa pomonella*) is one of the most destructive insects of the fruit. It is almost always present, but in the summer of 1891 for some reason there were none here, and we had beautiful smooth apples which kept until the following April, something heretofore almost unheard of in our locality. But we had only one year's respite; the past season they were with us as usual. The parent of the apple-worm is a small, brown moth, and it is double-brooded. The first brood cause the young apples to fall, and this thinning out of the superabundant fruit is an advantage rather than detriment. It is the second brood that works the immediate mischief, as now the apples are so far advanced that they do not fall, while the creature mines its way to the core, and many find their way out again and fall to the ground, when they almost invariably start for the trunk of the tree and conceal themselves beneath loose bits of bark, where they spin cocoons and remain in the larvæ state until spring, when they pass into the pupæ state and emerge as moths in early June.

A good many of these secreted worms are found and eaten by the Downy woodpecker and the Brown creeper, which are almost always in company, especially in the late autumn. The little creeper follows his larger companion closely, and often the woodpecker

breaks off bits of bark, leaving the cocoon and sometimes the worm fully exposed and passes on, and the creeper avails himself of his oversight. It looks almost as if the woodpecker purposely uncovered some of the worms for the creeper, as he leaves them fully in view, and goes on until he finds others which he will eat.

The tent caterpillar (*Clisiocampa americana*) is another annual visitant of our orchards, but these caterpillars are so easily managed that only the most careless fruit grower will allow them to mature.

Last season, as we were preparing for the annual raid upon these creatures, I noticed a Cuckoo was destroying one of the nests and filling its mouth with the young worms. The Cuckoo's nest was in one of the apple trees, so I stopped proceedings, and the pair of birds destroyed every nest.

The peach borer (*Egeria cxitiosa*) is ever present, but this is of minor importance compared with the black peach aphid. In a mild winter we sometimes find the twigs of a tree completely covered with these insects. Such a tree is soon thereafter killed with the yellows—not from their visible work on the limbs, but from their attacks on the roots. How and when they enter the ground I do not know from practical observation, but I have pulled up young trees in late summer when the leaves had turned yellow and found the roots almost covered with lice when none could be seen above ground.

Root-lice are much more destructive than those on the stems and leaves, both to herbaceous as well as to woody plants. Last summer I noticed a native *Ampelopsis* looked sick, and the leaves began to fall in August. Heretofore it had been a strong, vigorous grower. Carefully removing the earth from the long roots which run near the surface, I found clusters of dun-colored lice thickly scattered all along the rootlets, causing little galls. As the *Ampelopsis* is closely related to the grape, may not these lice be related to the grape *Phylloxera*, of which Professor Riley has given us the life history?

The most effectual remedy which I have found for these underground pests is some disagreeable compound that was sent to me for a trial on the rose-bug. It had no effect on this nuisance, and as the odor was so annoying I had the box carried off some distance from the house, where it remained three years. I think the donor called it sludge—the refuse of kerosene, but I should think it was the refuse of everything disagreeable. However, after three years banishment I came across it and found the vile

smell had greatly evaporated, and concluded to give it a trial on plant lice. I dissolved a quantity in water and sprinkled it over infested plants, and it acted like a charm, soon killing all the aphides without injuring the plants. I then tried it on root-lice, and a marked beneficial effect was evident. Drooping herbaceous plants soon revived. A small Botan plum tree was badly infested at the roots. I saturated the ground around it with the mixture, and very soon the tree put on a healthy look.

But of all the insects which we have to combat the rose-bug (*Macrodactylus subspinosus*) is the most formidable. It overwhelms us with its numbers. In favored localities where this insect is unknown, the statement of its ravages would seem improbable.

They make their appearance toward the last of May, and remain with us about six weeks, devouring foliage, flowers and fruit. By Decoration Day they are in full working order, and their devastations in our cemeteries is almost past belief. Not only are all the flowering shrubs and plants swept clean, but also the beautiful designs and emblems woven by loving hands are wholly devoured before the sun disappears. About this time they also attack the grape-blossoms, all of which they take except those protected with paper bags. After the grape-blossoms are eaten and the roses and most of the other garden flowers are consumed, they swarm over the fruit trees. The apple seems to be their first choice; after this plums, cherries and peaches. As far as I have observed they do not eat pears.

Were it not for their social habits scarcely any fruit would be left. They cluster thickly over an apple which the first one happens to alight upon, and soon there is a great ball of clinging insects around it which only the center ones can reach. At this stage the stem is often eaten, and the mass falls to the ground, when they disperse, and we see nothing is left of the apple but the core. When they start for flight they do not rise as high as the tree from which they fell, but gradually rise higher as they fly until each strikes some plant, shrub or tree on which it alights as a nucleus for another.

I saved plums on small trees by often shaking them, when the beetles would drop to the ground and pass on to other things.

The only way to kill them is either by crushing or drowning in kerosene oil. I keep several pails partly filled with water and a good supply of kerosene in each, and set them near the plants I wish to save. Many times during the day the plants are visited

and the beetles thrown into the liquid. When it becomes thick with the pests more oil is poured in until all are killed. The pails at first were carried some distance and the contents emptied on the ground, but we soon found the odor emanating from them was undesirable, and was obliged to bury the creatures.

Early in July the females begin to burrow into the ground to deposit their eggs, and soon after their day is over for the season, and we begin to take pleasure in our roses and other plants in the flower garden.



NOTES ON SOME NORTH AMERICAN MOTHS,

BY CHARLES PALM.

Sphinx cupressi *Bdr.* Plate 1, fig. 6.

The late Henry Edwards recorded the capture of two examples of this species, which were taken in Florida. One by Mrs. A. T. Slosson and the other by myself. Another specimen, a perfect male, has recently been sent to me by one of my correspondents from the same locality.

Arachnis zuni *Neum.* Plate 1, fig. 2.

Described from New Mexico. The type is in Mr. Neumoegen's collection.

Hyparpax venus *Neum.* Plate 1, fig. 4.

Described from Colorado. The types are in Mr. Neumoegen's collection.

Datana modesta *Beut.* Plate 1, fig. 7.

This species was described from a single male taken by me at Kissimmee, Orange County, Fla. A fine example of the female has since been sent to me from the same locality. It differs slightly from the male by being a little more distinctly marked; the transverse band and the discal patch being quite distinct. Another small spot is present a little before this patch. Otherwise same as male. Expanse 55 mm.

Cerura nivea *Neum.* Plate 1, fig. 8.

This was first described as a *Heterocampa* in the Canadian

Entomologist, Vol. xxiii, p. 124, from a single female, from Virgin River, South Utah, and has been redescribed as *Cerura meridionalis* by Mr. H. G. Dyar. (Psyche, Vol. vi, p. 291).

Parorgyia atrivenosa, n. sp. Plate 1, fig. 5.

Male.—Primaries grayish fuscous, with the veins marked with blackish-brown scales. The inner half of the wing is somewhat paler, with several dirty, white, irregular patches. On the apical third is a narrow, curved, blackish transverse band, which forms an angle before it reaches the inner margin. Before the outer margin is an irregular, grayish, patch-like band. Hind wing grayish fuscous, with an obsolete discal spot of a deeper color. Before the outer margin is a distinct broad band of a lighter color, running from a little below the apex, nearly to the anal angle.

Underside, dirty, grayish white, with a broad transverse smoky-gray band across the wings. Also a discal spot of the same color. Thorax and body, grayish fuscous. Expanse 25 mm.

Female.—Differs from the male by having the transverse band on the primaries almost obliterated. Band before the cilia on the secondaries indistinct. Otherwise same as male. Expanse 33 mm.

One male and one female. Hab. Red River region, Arkansas. Types Coll. Chas. Palm.

Euleucophæus hualapai *Neum.* Plate 1, fig. 3.

This insect was described from Arizona, and the type is in Mr. Neumoegen's collection.

Euleucophæus neumoegeni *Hy. Bidw.* Plate 1, fig. 1.

This beautiful insect has been omitted from our list. It was described from Prescott, Arizona, and the type is in Mr. Neumoegen's collection.

Catocala elda *Behr.*

Three specimens of this species were taken by Mr. C. J. Weidt in the Cascade Mountains, Br. Columbia. The insect is certainly nothing more than a dark form of *C. relicta*, and could only be placed as a variety. It was first described from Oregon. (Can. Ent. Vol. xix, p.199).



Several specimens of *Circolettix verruculatus*, have been taken by Mr. Wm. Davis on the out-cropping of modina sandstone near the top of the mountains, on the Pennsylvania side of the river, at Delaware Water Gap.

NOTES ON THE LIFE-HISTORIES OF SOME NOTODONTIDÆ.

By A. S. PACKARD.

PART I.

As a result of recent studies on the early larval stages of this group I have been led to consider it as on the whole the most generalized or ancestral of all the Bombyces. In their general, simple shape, their lack of tubercles, spines, stripes and spots, the freshly hatched larvæ of *Nadata*, *Gluphisia*, (and probably *Lophodonta*) seem like the nearest allies of the unknown ancestral form from which the group originated, and which was probably most closely related to the *Noctuina*, from which it seems not improbable that the *Bombyces* sprang. It is not improbable that the stem-form which gave rise to the *Noctuo-Bombyces*, may have also given origin to a series of some lost forms which served as connecting links between the *Noctuina* and *Bombycina*.

Heretofore our conceptions as to the true sequence of Notodontian genera have been based on somewhat arbitrary and erroneous considerations. It seems to us not unreasonable to place *Gluphisia*, *Nadata*, and *Lophodonta* at the base of the series, and to let the hairy genera *Datana* and *Apatelodes* follow; then would come *Ichthyura* which is both hairy and tubercled. These should be succeeded by *Notodonta* and its allies, *Nerice*, *Pheosia*, *Edema* and *Dasylophia*. These would lead up to the group represented by *Schizura*; *Hyparpax* and *Janassa* would connect the foregoing genera with *Heterocampa*; of the latter group of species, *H. marthesia* would seem to be an annectant form binding the foregoing genera with *Cerura*, which is perhaps the most modern and specialized genus of the family.

From some ancient forms resembling *Edemasia concinna*, with its remarkable tubercles and spines, or from *Pheosia* with its caudal horn, the genus *Dryocampa* may have sprung, this being the ancestor or founder of the next nearest related family *Ceratocampidæ*. That the *Notodontidæ* and *Saturniidæ* are closely related is also proved by the venation and other characters of the moths, as we shall hereafter hope to show.

***Ichthyura inclusa* Hübner.**

As the following account is based on living specimens, it may replace my description in the Proceedings of the Boston Soc. Nat.

Hist., Vol. xxiv, p. 515, which was in part based on alcoholic specimens.

The eggs of this species were received from Mr. W. N. Tallant, of Columbus, O. They were laid July 20th and the larvæ hatched Aug. 10th or 11th. It feeds at first socially on the aspen, eating out patches on the under surface of the leaf.

Egg.—Diameter about 0.6 mm. Hemispherical, rather high; the shell is thin, white (the egg is reddish just before the larvæ hatches). The shell under a Tolles $\frac{1}{2}$ inch objective is seen to be covered with minute polygonal cells which are tolerably distinct, with slightly thickened walls.

Larva, stage I.—(Hatched Aug. 10–11. Described two days after hatching, and also from alcoholic specimens of the same brood.) Length 3 mm. The body is rather long, cylindrical, head rounded, but little wider than the body at first before the latter becomes filled out after eating a few days, as later it is no wider than the body; it is shining jet black, and provided with scattered, long, stiff, tapering bristles. The prothoracic and suranal plates are shining brown-black. The former is moderately large, about three times as broad as long, irregularly trapezoidal, narrowing a little behind, and shows no signs of division into two halves; four hairs arise from the front, and four from the hinder edge. The piliferous warts on the thoracic as well as abdominal segments are more or less conical, and *none bear more than a single hair*. The 2d thoracic segment bears two minute median dorsal tubercles, one on each side of the median line of the body, and smaller than those on the third segment, while the next one on each side of the body is larger than the homologous ones on the 3d thoracic segment. The tubercles on the 2d and 3d thoracic segments are arranged across the segment in a straight line, four of them being visible on each side above. On the abdominal segments the four dorsal tubercles are arranged in a more or less curved line, the curve becoming more marked towards the end of the body, until on abdominal segment 8 the curve is almost semicircular. On the first abdominal segment the two median tubercles are *larger than any on the thoracic segment*, and are larger than the subdorsal and lateral ones on the segment in question, and are *decidedly larger than the homologous ones on the 2d to 7th abdominal segments*. The four dorsal tubercles on segments 2 to 7 are all of the same size, but *the two on the 8th segment are nearly as large as those on the 1st, and are about twice as large as those on the 7th abdominal segment*; on the 8th segment, however,

the subdorsal tubercles are nearly as large, but are narrower than the two in the middle. This segment is *slightly humped, and bears a brown spot surrounding the bases of the two twin tubercles, and a similar spot occurs on the 1st abdominal segment.* The four dorsal warts on segment 9 are arranged in a trapezoid, the two in front being one-half as large as the two behind. The upper subdorsal row of tubercles are partly connected by short lines or streaks, and between this and the next row of warts lower down is a broken fine brown line, which is, however, almost obsolete. A fine nearly obsolete (or is it incipient?) dorsal brown line.—In more advanced specimens the body is *plainly striped on each side with three interrupted dark reddish lines.* The piliferous tubercles or warts are dark brown, and give rise all over the body to but a *single hair.* A pair of especially large long hairs arises from the 2d thoracic and 9th abdominal segments. The hairs are long and slender, and though under a low power they appear to be tapering, under a $\frac{1}{5}$ objective they are seen to be docked or blunt at the end and some at least slightly but distinctly bulbous at the tip; they are also seen to be hollow and truly glandular, the end appears to be flattened, as seen sideways the hairs appear to taper. The hairs vary much in length, some being longer than the body is thick. An unusual, if not unique feature, exceptional among Bombycid larvæ in the first stage is the microscopic hirsuties clothing the body. Under a $\frac{1}{5}$ objective the microscopic hairs are very short, quite uniform in length, very dense, and taper to a point.

The suranal plate is distinct, blackish, nearly as long as broad, rounded triangular, and bears on the edge 8 piliferous warts of nearly equal size, besides two arising from the surface, a little in front of the middle. The spiracles are round and remarkably small.

The thoracic legs are black, and at the end near the claw are two tenant hairs which are long and large, curved backward and somewhat knife-shaped. The abdominal legs have a black chitinous scale on the outside above the planta. These are at first crotchets.

The general color of the body is deep straw-yellow with a greenish tinge and a waxy appearance or gloss on the skin, while the obscurely marked stripes are reddish.

Stage II.—Length 5–6 mm. Aug. 18–20. Now the generic and part of the specific characters are assumed, the species in this stage being easily distinguishable from the others of the genus.

The larvæ still feed socially on the under side of the leaves, in confinement hiding between the leaves in the breeding box.

The head is black, as wide as the body. The prothoracic shield is pitch-black, and now is *divided by a pale median line*. The body is bright yellowish-green. There are *three dorsal dark brown lines*, the median less broken than the others. The *three lateral lines are now distinct*, the middle one being one-half as wide as the others, the two others bearing the larger subdorsal and lateral tubercles respectively. The situation and relative proportion in size of the tubercles (which are dark) are as described in Stage I; the two large twin dorsal pairs on abdominal segments 1 and 8 are *larger, higher and more distinct than before, and each bears about four or five stiff, dark bristles of unequal size and length*. The suranal plate is blackish. The hairs are now slender, pale or dull whitish, tapering, and in general about as long as the body is thick. The legs as before, but the abdominal ones with a larger and rather more distinct squarish chitinous patch above the planta. (Described soon after moulting).

STAGE III.—(Described Aug. 29, immediately after moulting). Length, 12 mm. The head is now not so wide as the body, black. The prothoracic shield is distinctly divided. Body bright, glistening, yellowish-green, with three narrow dorsal black lines, the median one less broken than the others. These are succeeded by a broad diffuse subdorsal, almost double black stripe, on which a black piliferous wart is situated, one for each segment. Below is a similar wart—including broad line, and above and below this is a fine black-brown, somewhat broken line; the lower one is the spiracular line, the dark spiracles being minute and interrupting the line, so that *there are four instead of three lateral lines in this stage*; the additional line being the lowest or spiracular one.

The two large twin tubercles on the 1st and 8th abdominal segments arise from a common fleshy hump, that on the 8th segment being slightly the smaller of the two pairs. Each bear 6–7 black hairs. The hairs are in general sordid white, and are not so long as the body is thick. The suranal plate is large, black, and the anal legs are nearly all black on the sides.

Recapitulation. (Corrected from that published in Proc. Bost. Soc., xxiv. 517).

In stage I the two median dorsal tubercles on the 1st and 8th abdominal segments are larger than the homologous ones on the 2d to 7th abdominal segments, and each pair is situated on a brown raised ground.

The prothoracic shield is undivided; in stage II it begins to be divided, becoming separate in their last stages.

3. Toward the end of the stage the three lateral lines are indicated.

4. The hairs in stage I are glandular and slightly bulbous.

5. The tubercles in stage I all give rise to but a single hair.

6. The three dorsal dark reddish lines appear at the end of stage II.

7. The spiracular line appears in stage III.

Ichthyura vau *Fitch.*

The young larva was found feeding on the aspen at Brunswick, Me., and moulted Aug. 10-12, when it became 10 mm. in length.

Young larva in 3d stage.—Length, 10 mm. Head black. The body is on the sides and at the end livid dark brown. The warts and humps on the 1st thoracic, and 1st and 8th abdominal segments are of the same color, but the other piliferous dorsal warts are yellow. There are four parallel whitish-gray dorsal lines, or rather three dark, livid-brown, fine dorsal lines on a grayish-white field.

Last stage.—Length 25 mm. Head brown-black, flattened, as wide as the body; with gray hairs. The prothoracic plate is widely divided into two transversely oval brown-black plates. The body is marked with a broad, dorsal, ash-gray band, containing three vandyke-brown more or less broken lines. The sides of the body darker and containing two darker, irregular, broken lines. On the 1st thoracic segment are no dorsal yellow warts, but two on each side, the upper one in front of the spiracle, button-like, prominent. On the 2d and 3d thoracic segments are four yellow tubercles, forming a transverse series. On the 2d to 8th abdominal segments the yellow warts are arranged in a very low trapezoid, and the two anterior ones are minute. Those on the 9th segment form a curved line. The suranal plate is broad and rounded, speckled with black. There are no humps or specialized warts on the 1st and 8th abdominal segments, thus differing from the larva of *I. inclusa*. The thoracic legs are blackish; the abdominal and anal legs livid ash.

The larva differs decidedly from that of *I. inclusa*, though the moth is nearly allied.

Ichthyura albosigma *Fitch.*

The following description is drawn up from Mr. Bridgham's colored drawings of the three last stages, and an alcoholic specimen of the mature larva. It occurred on the poplar, July 9 to 13, those in the three last stages occurring at these dates. Other specimens were reared by Mr. Bridgham and the moths obtained from them.

Larva in stage III.—Length, 26 mm. Head as wide as the body, reddish. The body reddish on the sides, and green along the back, interrupted by a reddish patch on 1st and one on the 8th abdominal segments, each of which encloses a median tubercle. The green back encloses three parallel dark-green, indistinct, interrupted lines. There are two greenish tubercles on the side of the body, one above and the other below the spiracle.

Stage IV.—Length, 30 mm. The hair is still reddish, but the body has now lost its green shade on the back, which is pale, with three darker parallel dorsal lines. The two median tubercles are now as well developed as in the last stage. The side of the body is pale reddish, with dark lateral tubercles on the thoracic and 1st abdominal segments; those on the succeeding segments being yellowish, as on the abdominal legs, including the anal pair and suranal plate. The thoracic legs are pale.

Full-fed Larva.—Length, 30 mm. Head hardly as wide as the body, black, with a y-shaped, pale-brown line in front, formed of a median line extending down from the vertex to the apex of the clypeus, and then dividing so as to extend down on each side, ending before reaching the antennæ. The head is flattened and densely covered with grayish hairs. The three thoracic segments bear each six lateral rather large, yellowish warts, the lowest one the largest, each bearing about 6 or 7 hairs of unequal length. There is a high median finger-shaped, fleshy nutant black tubercle on the 1st abdominal segment, bearing numerous short, unequal hairs; it is rather high, finger-shaped, and bent over backwards. On the 8th segment is a shorter, smaller, paler one. *It is evidently of double origin*, its longest diameter being transverse to the body, and somewhat wedge-shaped; the end is somewhat swollen on each side, with a slight valley between the swellings, showing that it was originally formed of two separate tubercles, and this is also suggested by the fact that each swelling bears eight or ten short unequal hairs. The thoracic legs are black; the abdominal legs are dark, especially towards the planta.

Colors : (described from Bridgham's figure) Body straw-yellow, with three dorsal, more or less interrupted grayish or pearly pale-brown lines, and a broad lateral stripe, below which the tubercles are yellow-ochreous. The suranal plate is flattened, rounded in outline and hairy, with the surface rather rough and hairy. In my single alcoholic specimen there is no sign of a prothoracic shield or plate.

Although the imago of *I. vau* is very near that of *I. inclusa* in markings, the larva is very different, there being no median dorsal tubercle on the 1st abdominal segment. In the lack of these tubercles *I. strigosa* resembles *I. vau*. On the other hand, the larva of *I. albosigma*, in respect to the presence of the two dorsal abdominal tubercles approaches that of *I. inclusa*; these two species, then, as larvæ, belong to the same genus; while the two other species (*vau* and *strigosa*), as respects the larvæ, differ generically from *inclusa* and *albosigma*, though the moths are congeneric. It is evident that the larvæ of *vau* and *strigosa* are more generalized, since they lack the rather highly specialized dorsal tubercles, so prominent in the two other species of the genus. If we regarded the moths alone we might erroneously consider that *vau* and *inclusa* were both coeval, whereas *vau* must be a much older, more generalized form; hence, speculations on the phylogeny of Lepidoptera based on the imagines alone, may often be uncertain. (For a brief description of the larva of *I. strigosa*, see our Forest Insects, 453, and Bull. 13 Div. Ent. U. S. Dept. Agr. 30.)

The larva of our *I. albosigma* is closely allied in shape, and in the two dorsal abdominal dark tubercles to the European *I. reclusa*, except that the tubercles in the American species are much larger and more prominent.

A considerable number of the Beaver parasite, *Platyssylla castoris* have been distributed by Mr. G. Beyer, who obtained them by beating dried beaver skins, which were sent to him from Nebraska. A few specimens of the rare *Leptinus validus* were also found in the same manner.

Mr. G. D. Bradford and Mr. Wm. Schaus, both members of our Society, are at present on a collecting trip. The former went to Egypt last January and the latter recently went to Florida. No doubt, both will return with many rare and interesting species.

NEW SPECIES AND VARIETIES OF BOMBYCES.

By B. NEUMOEGEN AND HARRISON G. DYAR.

In advance of the revisionary work which we are preparing on the families of Lepidoptera classed as the Bombyces, we present the following descriptions of new forms. We do so to avoid as far as possible the production of synonyms.

Family **Lasiocampidæ**.

Genus **Hypopacha** n. gen.

Head rather small, sunken, eyes naked, palpi obscured by vestiture, which is hairy; antennæ moderately bipectinate, shorter in ♀, thorax moderate, abdomen square, hardly exc. eding hind wings.

Primaries trigonate, 1.4 times as long as broad (less than $1\frac{1}{2}$ times); costa straight nearly to apex, outer margin long, convex, gently rounding to internal angle.

Secondaries ovate, the costa concave, exterior margin very convex. Venation; fore wings: vein 1 close to margin; a sub-median fold; median vein 4 branched, 2 given off near base; 3 from median beyond middle of cell; 4 and 5 together from lower angle; cell closed by a weak concave vein; 6-8 on a stalk from apex of cell; 9-10 on a very long stalk from sub-costal just before end of cell, the furcation almost at apex of wing; 11 from sub-costal on cell about half the length of cell from base; 12 free.

Hind wings: two internal veins; 4 branched median, 2 from near middle of cell, 3 before end of cell, 4-5 on a stalk from lower angle of cell; cell closed by an angulated vein; 7 from sub-costal before end of cell; 8 from sub-costal about $\frac{1}{3}$ length of cell from base; a long spur from base of sub-costal into enlargement of costa at base.

Type **Cnethocampa grisea** *Neum.*

This genus is closely related to the European *Trichiura crategi* Linn., but differs from it in venation. Its nearest American ally is *Artace*, from which it differs in antennal structure.

Genus **Clisiocampa** *Curt.*

C. disstria *Hübner*.

The typical form is of a yellowish brown color, with two transverse brown bands on fore wings.

var. sylvatica *Harr.*

This name may be retained for the form in which the primaries are crossed by a deep brown band, filling up the space between the transverse lines.

var. thoracicoides n. var.

In this form the transverse lines are very obscure, the whole wing nearly uniform in color, densely irrorate with brown scales. Types 2 ♂♂ in Mr. Dyar's collection.

C. erosa *Stretch*.

The typical form is marked like *C. distria*.

var. sylvaticoides n. var.

Closely resembling the *var. sylvatica*. The primaries are dark in their shade of brown, the space between the transverse lines filled in with dark brown, but not always completely. Outside this band the ground color is paler for a short space.

Types 4 ♂♂ in Mr. Dyar's collection.

var. thoracica *Stretch*.

As proved by an examination of the type and by Professor Rivers' description of the larva, this name must be referred as a variety.

var. perversa n. var.

In this form, the space between the base of primaries and inner transverse line, the terminal space from outer band to margin and the outer half of secondaries is shaded over with brown of the color of the transverse lines, leaving the middle of primaries and base of secondaries of the normal yellowish color.

Type 1 ♀ in Mr. Dyar's collection.

C. incurva *Hy. Edw.*

♂ Chocolate brown scales (Ridgway's Nomenclature of colors Plate III, Fig. 13) heavily irrorate over a pale cream buff ground (Ridg. V, Fig. 11), almost entirely obscuring the surface, except in two arcuate pale transverse bands, dentate toward each other and defined by darker brown; but away from each other fading into the general shade. A faint trace of paler median band on secondaries.

♀ Darker in color than ♂, but of the same tint. The color is entirely chocolate brown, the lines pale cream buff, undulate, not bordered by a distinctly darker shade.

var. constrictina n. var.

♂ Fore wings pale cream buff, slightly dusted with chocolate scales, much as in *constricta*. The lines are dark chocolate brown, consisting of the borders of the pale lines of the normal form, diffused towards each other, obsolete connected over the median venules. Secondaries as in the typical form.

Type 1 ♂ in Mr. Neumoegen's collection.

C. fragilis *Stretch*.

In the typical ♂, the color is chocolate brown with two pale transverse bands on primaries.

var. lutescens n. var.

In one specimen, the light yellowish color of the inner transverse band occupies the whole basal space, while the outer band is broad, diffusely shaded outwardly. There is also a broad yellowish median band on secondaries. In the other specimen, the yellowish color is still more extensive. It covers the whole fore wing except two parallel brown bands which are connected by straight brown lines on the veins and a diffuse brown shade on the costal region. The pale band on secondaries extends farther toward outer margin and is more diffused.

Types 2 ♂♂ in Mr. Dyar's collection, received from Mr. C. A. Wiley, of Miles City, Montana.

var. perlutea n. var.

Fore wings entirely light yellowish (Ridgway's Nomenclature of Colors Plate V, Fig. 13—a little paler than the figure) no trace of lines, a few brown scales before margin, forming a darker cloud, but faint. Marks on the fringe obscured, but seen with lens to be nearly normal. Hind wings pale brown, a good deal paler than normal *fragilis*, but same color, the broad diffuse pale band present, but not contrasting on account of the paleness of wing. Body parts nearly as pale as fore wings, a little darker on thorax.

Type 1 ♂ in Mr. Neumoegen's collection, received from Mr. D. Bruce, from Colorado.

Family **Zeuzeridæ**.

Vein 1 a of primaries present, both wings with furcate false discal veins.

Vein 8 of secondaries united to the subcostal by a cross vein.

♂ antennæ pectinated basal half **Zeuzera**.

♂ antennæ pectinated to tip.

Sexes approximate in size **Trypanus**.

♂ smaller than ♀ and differently marked **Prionoxystus**.

Vein 8 of secondaries free from sub-costal from base.

Vein 11 of primaries from discal cell **Hypopta**.

Vein 11 of primaries from accessory cell **Cossula**.

Genus **Trypanus** *Ramb.* (*Cossus* *Fab.*).

T. perplexus n. sp.

Head, thorax, primaries and fringes silky gray, the latter with black shades at base; central part of thorax dusted with russet grains. Black collar line and

black edges to patagiæ. Black maculations of primaries minutely reticulate. Two prominent transverse lines, the inner line forking between vein 1 and inner margin, the outer line having two prominent forks, the upper one dividing between first sub-costal vein and costa, thus enclosing a sub-triangular space between centre of costa and apex; the lower one, of smaller dimensions, forking at angle.

Secondaries of a uniform light grayish, silken gloss. Abdomen of darker gray, especially near basal part, hairy, of silken gloss, and slender. Palpi and legs of the same color. Below as above, the reticulations of primaries and the transverse lines fainter, with whitish fringes along inner margin. Expanse of wings, 33 mm. Length of body 13 mm.

Habitat, Colorado. Type 1 ♂ in the collection of Mr. Neumoegen, received from Mr. D. Bruce, from Colorado. Another specimen, exactly like this one, was found by him at electric light, but in poor condition. We see no course but to describe this form. Walker described a ♀, as *C. populi* from Hudson's Bay. The description answers nearly in every point to *C. brucei*, French, but before Walker's type has been examined, nothing definite can be said about it. Perhaps *T. perplexus* may prove to be the ♂ of *C. populi*: but we leave this matter for future investigation.

Genus *Hypopta* Hübn.

H. edwardi n. sp.

Head and body white, grizzled with black scales; antennæ white on the shaft, the pectinations blackish. Fore wings white, irrorate with black scales, heaviest over the apical portion and part of wing below median vein and vein 2, less thick over the cell, where the white ground predominates. A faint, brownish, diffuse coloration in the interspaces between veins 2-5 at their bases. Fringe white, with a narrow brown terminal line. Hind wings brownish gray, from the heavy sprinkling of dark scales. Fringe as on fore wings. Below, the fore wings are blackish, shaded; the hind wings largely white. Expanse, 40 mm.

Type 1 ♂ in Mr. Neumoegen's collection.

H. ethela n. sp.

Head and body gray, black and white hairs mixed. Antennæ whitish on the shaft, pectinations blackish. Primaries blackish gray, the ground color white, but heavily irrorate throughout with black scales, most heavily at apex and outer margin. At the end of cell a small white spot, from which the irrorations are absent, and just below it an elongated black spot. A terminal black line. Fringe white, spotted with black at termination of nervules. Secondaries nearly black, especially centrally. Costal area much paler, as is also abdominal margin. Fringe spotted as on primaries. Both wings below blackish gray, paler along margins. Fringes spotted as above. Expanse, 28 mm.

Type 1 ♂ in Mr. Neumoegen's collection.

H. cornelia n. sp.

Body parts sordid white, shaft of antennæ white, pectinations blackish. Fore wings white, with a faint brownish tinge which becomes marked beyond the cell, predominantly in two obscure, parallel transverse lines, the outer of which is

subterminal; along the inner margin, occupying nearly all the space enclosed by vein 1a, except at base, is a patch composed of mixed brownish-black and pale ocherous scales. This patch is obscurely divided in a strigose manner by the white ground color. Fringes white, very faintly spotted with ocherous brown. Secondaries light gray, whitish at abdominal margin and fringe, showing faintly the markings of under side. Below, both wings are blackish gray, fading to white along the internal margin, but thickly covered with a series of little, blackish strigose patches, arranged indistinctly and without great regularity in about twelve transverse bands. Expanse, 27 mm.

Type 1 ♂ in Mr. Neumoegen's collection.

All three species from Colorado, collected by Mr. D. Bruce.

We take pleasure in dedicating these insects to Prof. Edward T. Owen, and to those whose memory is dear to him.

Synopsis of species.

Wings nearly uniform white, pectinations of antennæ brown—**manfredi.**

Wings more or less mottled or irrorate with dark shades—pectinations of antennæ blackish.

With black marks at end of median vein.

Black marks extending from origin of vein 2 to cross vein or further, fringes of secondaries almost entirely white **bertholdi.**

Black marks confined to origin of veins 3 and 4; fringes of secondaries distinctly black-spotted . . . **ethela.**

Without any black discal marks.

Wings largely marbled with pale brown, the white ground reduced to a series of confluent spots . . . **henrici.**

A brown spot only on middle of interior margin; size smaller **cornelia.**

Without any brown markings on fore wings; white, irrorate with black scales; size large . . . **edwardi.**

Genus **Cossula** Bailey.

We believe the following synonymy to be correct, though no structural characters are given by Dr. Strecker, and we have been obliged to rely on his description of the maculation.

C. basalis Walker.

1856—*Cossus basalis* WALKER, Cat. Brit. Mus. pt. VIII, 1523.

1891—*Cossula basalis* HY. EDWARDS, Ent. News, Vol. II, p. 72.

1892—*Cossula basalis* SMITH, Can. Ent. Vol. XXIV, p. 136.

Cymatophora magnifica STRECKER.

1876—*C. magnifica* STRECKER, Proc. Acad. Nat. Sc. Phil., p. 151.

1891—*Bombycia magnifica* SMITH, List Lep., No. 1467.

Cossula magnifica BAILEY.

1882—*C. magnifica* BAILEY, Papilio, Vol. II, p. 93.

1890—*C. magnifica* PACKARD, 5th Rep. U. S. Ent. Com., p. 59, pl. II figs. 1-3.

1891—*C. magnifica* HY. EDWARDS, Ent. News, Vol. II, p. 72. (*pr. syn. slossonii*).

Inguromorpha slossonii HY. EDWARDS.

1888—*I. slossonii* HY. EDWARDS, Ent. Amer. Vol. II, p. 183.

1891—*I. slossonii* HY. EDWARDS, Ent. News, Vol. II, 72, *pr. syn.*

Family **Saturniidae**.

Genus **Thauma** Hy. Edw.

Antennæ doubly bipectinated, the upper branch the shorter ; of ♀ serrate.

Primaries : Vein 1 free ; median vein three branched, cell closed, 5 from below apex of cell, 6-8 on a stalk from apex of cell ; 9-10 absent ; 11 from subcostal vein on the cell ; 12 from base of wing. Secondaries : One internal vein, median three branched, cell closed, 5 from cross vein very near apex of cell, 6-7 on a stalk from apex of cell, 8 from base of wing, arcuate, remote from subcostal vein,

This genus is related to *Ormiscodes*, Blanch, but differs in detail of venation.

In *Ormiscodes cinnamomea*, the type of the genus, vein 7 of primaries arises from a stalk ; otherwise the venation is practically the same.

The following is the synonymy of the North American species.

T. socialis Feisth.

1839—*Bombyx socialis* FEISTH, Mag. Zool. pl. 20 fig. 1.

1853—*Dirphia angulifera* WALKER, Cat. Brit. Mus. pt. VI, p. 1363.

1874—*Thauma ribis* HY. EDWARDS, Proc. Cal. Ac. Sc. Vol. V, p. 265.

Mr. Neumoegen has a ♂ specimen from Chili, and we have examined a ♀ specimen belonging to Mr. J. Doll, also from Chili. The latter has been kindly loaned to us by Mr. Doll and carefully compared with the typical specimen in the Edwards collection, now in the American Museum of Natural History.

Family **Notodontidae**.

Nadata gibbosa Sm. & Abb.

var. rubripennis n. var.

A form in which the ordinary buff shades of the fore wings are turned to red. The color is marked, and comes out most distinctly in the cell next to the white dots where it is "orpiment orange" (Ridg. pl. vi. fig. 1) or a very little duller in shade. The lines are reddish-brown, the dots large, white, rounded ; the apical space gray, exactly as in *gibbosa*, not red shaded, but contrasting

with the dark wing. Hind wings only very slightly reddish; hardly so at all.

Types $\frac{3}{5}$ in Mr. Neumoegen's collection. Caught by Mr. Bruce in Western Colorado.

Notodonta stragula Grote.

var. **manitou** n. var.

As in *stragula* in markings. The thoracic parts are a little paler. Fore wings pale ochre yellow except along costa, the costal half of median space, and the narrow terminal space, where they are gray with the tint of *stragula*, but paler. All the brown markings are as in *stragula* and the same color. The difference lies in the pale color of the region about internal margin, base, and sub-terminal line, which in *stragula* is only partly ochraceous being usually largely deep brown. Here the brown color is almost entirely confined to the marks, the ground color being pale ochraceous, and encroaching on the gray parts of the wing.

Type 1 $\frac{5}{5}$ in Mr. Neumoegen's collection, collected by Mr. Bruce in Denver, Colorado.

A NEW LITHOSID GENUS.

By B. NEUMOEGEN, NEW YORK.

Bruceia, nov. gen. Head small, eyes large. Palpi short and thin. Thorax moderate. Body long and slender, with slight anal tuft extending somewhat beyond wing. Antennae $\frac{7}{7}$ setose, nearly sub-serrate, simple. Primaries well drawn out, about $2\frac{1}{2}$ times as long as broad, slightly rounded at apices. Angle produced; inner margin somewhat concave at centre; 12 veins. Vein 1 free from base, slightly sinuate; vein 2 arises from beyond centre of median; vein 3 from lower angle of cell; 4 and 5 nearly contiguous at origin; cell closed; discal vein angulate inwards; vein 6 arises from cross-vein, a little below apex of cell; veins, 7, 8 and 9 from a stalk at apex; veins 10 and 11 arise independently from subcostal, 11 beyond centre of cell, 10 being intermediate; vein 12 free from base.

Secondaries nearly as broad as long, well rounded at anal angle. Two internal veins; veins 2, 3, 4 and 5 identical in position with those of primaries; 6 and 7 emanating from a stalk at upper angle of cell; vein 8 springs from a little before centre of subcostal. Legs long and slender; two pair of tibial spurs.

A near relative of *Hypoprepia* Hb., and probably *Hyaloscotes* Butl. I take great pleasure in dedicating this genus to Mr. D. Bruce, whose successful entomological work in Colorado for the last decade deserves general recognition.



Venation of *B. pulverina*, enlarged.

B. pulverina, nov. sp. Antennæ brown. Eyes black; head, thorax, body and legs light straw color. Primaries have the ground color, costa and fringes light yellow, but are densely powdered with brownish black, so that only a few yellow maculations are visible. These are a few subterminal, irregular blotches along margin, of subtriangular shape, pointed inwardly. Two large spots, one in centre and one at end of cell; basal dashes and tinges along centre of inner margin.

Secondaries of uniform light straw color, sub-diaphanous. Below, primaries suffused grayish black, with yellow grains along costa, and faint traces of the yellow maculations. Secondaries as above. Expanse of wings: 31-32 mm. Length of body: 5-6 mm.

Types σ^3 ♀. Coll. B. Neumoegen.

Habitat: Western Colorado. Caught by Mr. Bruce, who says that the insect has the same habits as the other Lithosians flying in that region. *Hypoprepia inculta* Hy. Edw., with which it flies in common, will, upon closer examination by Mr. Dyar and myself, probably be placed in the same genus.



ON THE FOOD-HABITS OF NORTH AMERICAN RHYNCHOPHORA.

BY WM. BEUTENMULLER.

I herewith beg leave to present the following paper on the Food-Habits of North American (except the Scolytidæ) in place of the one I published on the same subject in the Canadian Entomologist, Vol. XXII, pp. 200 and 258. I am under special obligation to Dr. John Hamilton for sending me his notes on this subject, for which he has my thanks.

Auletes cassandræ Lec.—Found by Messrs. Hubbard and Schwarz on *Cassandra calyculata*. (Rhyn. N. Am., p. 5). Beaten from *Myrica cerifera* (Bayberry) by Dr. Hamilton, at Brigantine Beach, N. J., also taken on Sweet-fern by Mr. J. D. Sherman.

Auletes ater Lec.—Taken on the leaves of the Sweet-fern in September, by Mr. J. D. Sherman, and also by Mr. Wm. Jülich. (Cat. Ins. N. J., p. 246).

Eugnamptus collaris Fab. and **E. angustatus** Hbst.—Both these species occur on the leaves of different kinds Hickories.

Eugnamptus striatus *Lec.*—Found on Scrub-Oak in Florida by Mr. Schwarz. (Proc. Am. Phil. Soc., Vol. xviii, p. 464).

Rhynchites bicolor *Fab.*—Lives on various kinds of Wild Roses.

Rhynchites æratus *Say.*—Taken on Willow by Dr. Packard. (5th Rep. U. S. Ent. Com., p. 599). *R. Cyanellus*, is also found on Willow. (Harrington, Can. Ent., Vol. xxiii, p. 21).

Rhynchites hirtus *Lec.*—Taken in July on the Rosin-weed, (*Silphium integrifolium*), cutting the stems. (Forbes, 5th Rep. Nox. Ins. Illinois, p. 75).

Pterocolus ovatus *Fab.*—Feeds on the leaves of Wild-Grape sprouts, according to Dr. J. Hamilton. I have beaten it from Live Oak trees in Florida. Also found on Oak by Mr. Julich. (Cat. Ins. N. J., p. 247).

Attelabus rhois *Boh.*—Lives on Oak and on Hazel (Hamilton). Rolls up the leaves of Alder. (Packard, 5 Rep. U. S. Ent. Com., p. 632). Taken on Oak, Basswood and doubtfully on Birch, by Mr. Harrington. (Can. Ent., Vol. xxiii, p. 21).

Attelabus bipustulatus *Fab.*—Lives on Oak, rolling up the leaves (Murtfeldt, Can. Ent., Vol. iv, p. 143). *A. analis* Ill. and *A. nigripes* Lec. also live on Oak. The latter species I have beaten from Live Oak at Kissimmee, Florida, in April. It also rolls up the leaves of Sumac (*Rhus glabra*) according to Prof. Popenoe (Trans. Kan. Ac. Sc., Vol. v, p. 38) and was observed by Mr. Geo. Hunt on the Walnut before the buds open (5th Rep. U. S. Ent. Com., p. 335).

Graphorhinus vadosus *Say.*—Feeds in the imago state on the leaves of clover. (Webster, Am. Nat., Vol. xvi, p. 746).

Anametis grisea *Horn.*—The larvæ live in stems of *Ambrosia trifida*, (Hamilton), and according to Dr. Riley under the bark of Apple and Pear. (Am. Nat. Vol., xvi, p. 916).

Op hryastes vittatus *Say.*—Is chiefly found on "Greasewood" as is also *O. sulcirostris* Say., and *O. latirostris* Lec. according to Mr. Wickham. (Ent. Am., Vol. v, p. 77).

Panscopus erinaceus *Say.*—Occurs on Wild Grape. (Schwarz) Bull. Brooklyn, Ent. Soc., Vol. vii, p. 84).

Diamimus subsericeus *Horn.*—Taken around the roots of Cotton-wood by Mr. Wickham. (Ent. Am., Vol. v, p. 78).

Rhigopsis effracta Lec.—Lives on the Yucca. (Leconte and Horn, Rhyn. N. Am., p. 37).

Agraphus bellicus Say.—Found on Golden-rod. (Jülich, Cat. Ins. N. J., p. 248).

Epicærus imbricatus Say.—According to Dr. Riley this species is injurious to the Apple and Cherry trees and Gooseberry bushes, by gnawing the twigs and fruit. It is also said to be found on Cabbage, Onion, Raddish, Watermelon, Cucumber, Beet, Squash and Potato Plants.

Exomias pellucidus Boh.—I have first taken this European beetle at Astoria, L. I., in 1884, and again on Staten Island in 1886. In Europe it is said to live on the Strawberry. (Ent. Am., Vol. v, p. 188).

Otiorhynchus sulcatus Fab.—This European species is destructive to a variety of horticultural plants. In the larval stage it attacks the roots of the Strawberry. *O. ovatus* Linn. also infects the roots of this plant.

Aragnomus griseus Horn.—Recorded by Dr. Riley as an enemy to Pear trees in Oregon. (Insect Life, Vol. 1, p. 16).

Phyxelis rigidus Say.—Is beaten abundantly from herbage in swampy places. (Hamilton).

Neoptochus adspersus Boh.—Found on Oak in Florida. (Schwarz, Proc. Am. Phil. Soc., Vol. xviii, p. 465).

Pachnæus distans Horn.—Found on Pine and Oak trees in Florida. (Schwarz, Proc. Am. Phil. Soc. Vol. xviii, p. 465). *P. opalus* Oliv. is injurious to the orange (Riley, Am. Nat., Vol. xvi, p. 916).

Tanymecus confertus Gyll.—Appears to be polyphagus, without preference to any particular plant. (Riley, Am. Nat., Vol. xvi, p. 916). The larva lives and hibernates in the stems of *Ambrosia trifida*, and without entering the ground becomes a beetle about June. (Hamilton).

Brachystylus acutus Say.—According to Dr. Riley is found on Persimmon. (Am. Nat., Vol. xvi, p. 916).

Aphrastus tæniatus Gyll.—Breeds abundantly in the roots of various coarse grasses, especially such growing in alluvial fields. (Dr. Hamilton).

Pandeletejus hiliaris *Hbst.*—Lives in the trunk of the White Oak. (Harris, *Ins. Inj. Veget.*, p. 70), also found on Beech trees by Mr. Chittenden.

Artipus floridanus *Horn.*—Is injurious to the Orange. (Riley, *Am. Nat.*, Vol. xvi, p. 916).

Aramigus tessellatus *Say.*—According to Prof. Popenoe infests the sweet-potato. (*Industrialist*, May 29, 1886).

Aramigus fulleri *Horn.*—Feeds on the root of Roses. (Riley, *Rep. U. S. Dept. Agricul.*, 1878).

Cyphomimus dorsalis *Horn.*—Beaten from budding Oak. (Popenoe, *Trans. Kans. Ac. Sc.*, Vol. v, p. 38). Found on *Prunus virginica* by Mr. Jülich. (*Cat. Ins. N. J.*, p. 249). Polyphagus, on bushes, beaten in multitudes from many species. Habits unknown. (Hamilton).

Scythropus elegans *Coup.*—Is found on Pine according to Mr. W. H. Harrington. (*Trans. Ottawa Field, Nat. Club*, Vol. I, p. 33). Mr. F. H. Chittenden also found this beetle on Pine (*P. strobus*) at Ithaca, N. Y.

Eudiagogus pulcher *Fah.* and **E. Rosenschældi** *Fah.*—Both feed on *Cassia occidentalis* and *C. obtusifolia*. The former species I have taken in large numbers at Enterprise, Florida in May.

Sitones lineellus *Gyll.*, **S. flavecsens** *Marsh.* and **S. hispidulus** *Germ.*—These three species are injurious to the Clover, living in the larval stage on the roots.

Ithycerus noveboracensis *Forst.*—Is found on White and Burr Oak. The larva bores in the tender twigs. I have also found the insect on hickory in its imago state. Mr. W. H. Harrington found it on Beech. (*Rep. Ent. Soc. Ont.*, p. 52). Dr. Hamilton writes me that he also found the beetle on cultivated Cherry, Pear and Apple trees.

Apion segnipes *Say.*—Found on Willow, especially when in flower. (Harrington, *Can. Ent.*, Vol. xvi, p. 117). Breeds in the seed of *Tephrosia virginica*. (Leconte, *Rhyn. N. Am.*, p. 411). Also found in the seeds of *Astragalus* by Say.

Apion herculanum *Smith.*—Occurs on the flowers of *Viburnum acerifolia*. (Hamilton, *Can. Ent.*, Vol. xx, p. 67). Found on *Cratægus* by Mr. Jülich. (*Cat. Ins.*, N. J., p. 250).

Apion rostrum Say.—Infests the seed-pods of Wild Indigo, (*Baptisia tinctoria*). Found on Sweet-fern by Mr. Jülich. (Cat. Ins. N. J., p. 250).

Apion nigrum Hbst.—Depredates the leaves of the Locust (*Robinia pseudacacia*).

Apion walshii Smith. (*A. languinosum* Walsh).—Was bred from the gall of *Cecidomyia strobiloides* on the Willow. (Walsh, Proc. Ent. Soc. Phil., Vol. vi, p. 269). Infests the catkins of Birch (*Betula nigra*), in the larval state. (Schwarz, Proc. Ent. Soc. Wash., Vol. 1, p. 11).

Apion fraternum Smith.—Was observed by Mr. Chittenden upon two species of *Lespedeza*.

Podapion gallicola Riley.—Makes a spherical or ovoid gall on Pine (*Pinus inops*), (Riley, Bull. Brooklyn, Ent. Soc., Vol. vi, p. 61). I have taken the galls of this insect in the vicinity of Washington, D. C. in June.

Phytonomus punctatus Fab.—Lives on the leaves of clover. I have also found it in abundance on Timothy Grass. *P. nigrirostris* Fab. also feeds on clover. *P. comptus* Say, lives on *Polygonum* and *P. eximius* on *Rumex* (Riley, Rep. Dept. Agricul. 1881-82, p. 171).

Lepyrus geminatus Say.—Common on Willow in the imago state. (Harrington, Can. Ent. Vol. xxiii, p. 23).

Listronotus latiusculus Boh.—Was found by Dr. C. M. Weed in all its stages in the stalks of *Sagittaria variabilis*. Mr. F. M. Chittenden found *L. tuberosus* Lec., *L. caudatus* Say, and *L. appendiculatus* Boh. while sweeping a small patch of aquatic plants composed entirely of *Sagittaria* and a species of *Carex*. *L. appendiculatus*, it is said, was found by Mr. Jülich breeding in the lower parts of the stems of some species of reed. *L. caudatus* and *L. nebulosus* Lec., occur together on *Sagittaria* according to Prof. Popenoe. (Trans. Kans. Ac. Sc., Vol. vi, p. 85). *L. teretirostris* Lec., is found in Reeds. *L. squamiger* Say. The larvæ live in the stems of *Sagittaria variabilis*. (Hamilton).

Macrops solutus Boh., and **M. sparsus** Say.—Both breed in the stems of *Sagittaria variabilis*.

Pissodes strobi Peck.—Is sometimes very destructive to the White Pine. The larva and imago were first described by Peck.

(Mass. Agricul. Reposit., Vol. iv, p. 205). *P. affinis* Rand., also occur on Pine.

Pachylobius picivorus Germ.—Found under Pine bark in Florida. (Schwarz, Proc. Am. Phil. Soc., Vol. xviii).

Hylobius pales Hbst.—Lives in Pine trees, beneath the bark, burrowing into and destroying the inner surface of the bark, and the tender newly formed wood often doing great damage to pine forests.

Hilipus squamosus Lec.—Occurs in the Southern States under Pine bark. Mr. Charles Dury informs me that the beetles bore in the budding shoots of Sassafras in Tennessee.

Lixus rubellus Rand.—Has been observed in considerable numbers clinging to the leaves and blossoms of *Polygonum amphibium* by Mr. F. M. Webster.

Lixus parvus Lec.—Is said by Dr. Riley to form galls on the stems of *Amelanchier*. (Proc. Ent. Soc. Wash., Vol. i, p. 33).

Lixus terminalis Lec.—Found on *Polygonum amphibium* (Popenoe Trans. Kans. Ac. Sc., Vol. v, p. 38). Bred from the stems of this plant by Prof. Forbes. (5th Rep. Nox. Ins. Illinois, p. 76).

Lixus concavus Say.—Has been observed by Glover, burrowing in the foot stalks of Rhubarb or Pie-plant. (Rep. Com. Agricul. 1865, p. 90). I have also found it on a species of *Rumex* and also producing a gall-like swelling on the stalk of the Thistle, from which plant I bred the insect. Mr. F. M. Webster bred it from Wild Sunflower (Ent. Am., Vol. v, p. 11).

Lixus macer Lec.—Dr. Riley reared this species from *Chenopodium hybridum*. Mr. Coquillett observed it ovipositing in Wild Sunflower, as also did Mr. Webster (Ent. Am., Vol. v, p. 11).

Cleonus calandroides Rand.—Lives in its earlier stages on the leaves of *Cakile americana*, as I am informed by Mr. A. Bolter, who found the species on this plant at Nantucket, Mass.

Dorytomus mucidus Say.—Breeds in the blossoms of Cotton wood and develops very rapidly, (Riley). *D. latiscollis* Lec. is found on Poplar. (Jülich, Cat. Ins. N. J., p. 252). *D. brevicollis* Lec. common on Willow (Popenoe, Trans. Kans. Ac. Sc., Vol. vi, p. 85). Beaten in abundance from Willow growing on the river shore. (Hamilton).

Demoris constrictus Say.—Found on Sunflower (*Helianthus*) by Prof. Popenoe. (Trans. Kans. Ac. Sc., Vol. v, p. 39).

Barytychius discoideus Lec.—Breeds in the flower heads of *Helenium tenuifolium*. (Schwarz, Bull. Brooklyn, Ent. Soc., Vol. VII, p. 84).

Barytychius amœnus Say.—Found on Rag-weed (*Ambrosia*) by Dr. Hamilton. (Can. Ent., Vol. XVIII, p. 114).

Smicronyx griseus Lec. and **S. tychoides** Lec.—Both occur on Rag-weed. (Hamilton, Can. Ent., Vol. XVIII, p. 114).

Tanysphyrus lemnae Fab.—Breeds in ponds on *Lemnae minor*, the leaves of which the beetle perforates with round holes. (Hamilton).

Anchodemus angustus Lec.—Has been found by Mr. Harrington eating the leaves of a species of *Sagittaria*. (Can. Ent., Vol. XVI, p. 118).

Strophosomus coryli Fab.—Has been found on Sweet Birch (*Betula lenta*) by Mr. Bailey. Also taken by Mr. Angell on this plant.

Lissorhoptrus simplex Say.—Lives on the roots of Rice. (Riley, Rep. Dept. Agricul., p. 130, 1881-82).

Otiodocephalus myrmex Hbst. and **O. chevrolatii** Horn.—Are beaten abundantly from Hickory, Grape, Hazel and other plants. (Hamilton). *O. dichrous* Lec. was found on dead Palmetto leaves in Florida and *O. myrmex* on Oak. (Schwarz, Proc. Am. Phil. Soc., Vol. XVIII, p. 465). *O. chevrolatii* occurs on Elm and Hickory according to Mr. Harrington. (Can. Ent. Vol. XVI, p. 118.) *O. levicollis* Horn, was bred by Dr. Riley from galls of a species of *Cynips* on Oak. According to Dr. Hamilton the beetle is abundant on Hickory.

Magdalis barbata Say.—Bred from dead Elm (*Ulmus Americana*) by Dr. Hamilton. Has been found ovipositing in fallen Hickory (*Hickoria amara*) by Mr. Harrington. (Ent. Am., Vol. 1, p. 18).

Magdalis olyra Hbst.—Bred from dead Hickory in multitudes by Dr. Hamilton. Also burrows under the bark of Oak.

Magdalis armicollis Say.—Inhabits the Elm. *M. pandura* Say was bred from the same plant and also from Hickory by Dr. Hamilton.

Magdalis alutacea *Lec.*—Probably bores in the terminal twigs of *Pinus inops*. (Riley, Bull. Brooklyn Ent. Soc., Vol. vi, p. 62).

Magdalis salicis *Horn.*—Bred from the wood of Chestnut by Mr. Chittenden. (5th Rep. U. S. Ent. Com., p. 342).

Magdalis lecontei *Horn.*—Found upon young Pines by Mr. Harrington (Can. Ent., Vol. xxiii, p. 24). Also taken on Pine by Mr. C. U. Clark.

Acalyptus carpini *Hbbs.*—Is found Willow when in bloom. (Harrington Can. Ent., xxiii, p. 25).

Coccotorus scutellaris *Lec.*—Attacks the fruit of the Plum.

Anthonomus elegans *Lec.*—Found on Scrub Oak in Florida. (Schwarz, Proc. Am. Phil. Soc., Vol. xviii).

Anthonomus quadrigibbus *Sqf.*—Punctures the fruit of the Apple and Pear. The larva lives in the heart of the fruit, and feeds around the core.

Anthonomus juniperinus *Sanb.*—Larva lives in *Podysoma*, a parasitic fungus on Juniper. (Sanborn, Proc. Bost. Soc. Nat. Hist., Vol. xii, p. 82).

(TO BE CONTINUED).

LOCAL ENTOMOLOGICAL NOTES.

Members of the New York Entomological Society and all others, are solicited to contribute to this column, their rare captures, local lists and other items of interest relating to the insect fauna of New York City and vicinity.

CATALOGUE OF THE BUTTERFLIES OF STATEN ISLAND, NEW YORK.

BY WILLIAM T. DAVIS.

Though the notes from which this catalogue have been compiled extend over a number of years, it must, nevertheless be considered as only partly complete. Every season has added something of interest in the past and no doubt a number of additions are yet to be made. Indeed the years do not resemble one another to a butterfly collector; his memory is checkered with unexpected visitations of particular species, and he goes afield ever expecting a surprise. Thus to Staten Island, 1886 brought a countless number of the orange colored *Terias nicippe*, and 1884 of *Pyramis cardui*. In all other respects 1884 was a remarkably poor butterfly year.

The fragrant button-bush (*Cephalanthus*) is a favorite with butterflies, and I have at times in late July, seen the species then flying, visiting the blossoms in great numbers. Probably no other single flower is so attractive to them.

There are at least six species on the Island that may be termed winter butterflies, or such as hibernate, and whose appearance may be expected on warm sunny days particularly in the late fall and early spring. These are the Camberwell Beauty (*Vanessa antiopa*), the Red Admiral (*Pyramis atalanta*), and the four species of *Grapta*.

Mr. Wm. Beutenmuller in his Catalogue of Lepidoptera found within Fifty Miles of New York City, published in the Annals of the N. Y. Academy of Sciences Vol. v, pp. 129-229 has given the food plants of the butterflies mentioned in this list, and I have simply added the times of appearance. A species that is to be seen on the wing through four full months, is no doubt double brooded.

NYMPHALIDÆ.

Satyrus alope *Fabr.*—Last days of June through July, when it becomes common, to August and the first days of September. They are seldom seen in the last named month.

Neonympha canthus *Bd-Lec.*—Last days of June through July and August to the first days of September.

Neonympha eurytris *Fabr.*—Last days of May through June and July to the first days of August. Common.

Limenitis ursula *Fabr.*—Occasional in May, a few in June, common in late July and throughout August, and a few in September. Much more common during the last few years than formerly. I have found the caterpillars leaving their hibernaculum on the first day of May.

Limenitis disippus *Godt.*—A few in June, more common in July and August, and scarcer again in September. On October 9th, 1887, a single specimen was seen.

Grapta interrogationis *Fabr.*—To be met with throughout the warm weather. Common.

Grapta comma *Harr.*—Less common than the above.

Grapta progne *Cram.*—Hibernated specimens in March and April, and fresh examples at mid-summer.

Grapta j-album *Bd-Loc.*—Hibernated specimens in early spring and fresh examples at mid-summer. It has been more common during the last few years. Since 1887 four specimens have been taken or seen on the Island, and one of them was found hanging to a gas fixture in a room on the 3rd of October.

Vanessa antiopa *Linn.*—Seen flying from March to November inclusive. The red seed clusters of the sumach are sometimes, in the spring, attractive perching places for the individuals that have awakened from their hibernation.

Vanessa milberti *Godt.*—One specimen taken near Silver Lake by Mr. Gustav Beyer in October 1886.

Pyrameis atalanta *Linn.*—From April to November inclusive. One specimen seen December 13th, 1891.

Pyrameis huntera *Fabr.*—May to November inclusive.

Pyrameis cardui *Linn.*—It has been taken on the Island in August, September and October. Usually not common, but plentiful in September 1884.

Junonia cœnia *Hüb.*—From June to November inclusive. Often very common on dusty roads.

Euptoieta claudia *Cram.*—I have only seen it on the Island in September and October, but it also occurs earlier in the season. Rare.

Argynnis idalia *Dru.*—Last days of June through July, August and first part of September.

Argynnis cybele *Fabr.*—June, July, August and September. The males appear in numbers in June a day or so before the females.

Argynnis aphrodite *Fabr.*—A single specimen taken on the 29th of June.

Argynnis myrina *Cram.*—May, June, July, August and September.

Argynnis bellona *Fabr.*—June, July and August. Much less common than the last species.

Phyciodes tharos *Dru.*—May to October inclusive.

Melitæa phæton *Dru.*—Formerly plentiful in Clove Valley. I have also taken it near Graniteville.

Danais archippus *Fabr.*—May to November inclusive. I have never found any hibernating. The first specimens of the year are females and the species does not become numerous before August. On the 29th of September 1889, I counted about a single plant of the New England aster fourteen of these butterflies whose terra cotta colors contrasted well with the purple flowers. Often they are quite common on the sea-shore and light on the sea-weed and other objects cast up by the waves. What may possibly be called a migration of this species was observed on the 27th of August 1885, when many Monarch butterflies were seen flying slowly westward along a road. The day before had been cold for an August one. Probably none of our butterflies fly higher than this, often almost among the swallows. It does not beat its wings always, but sails with them spread in somewhat the same way as a hawk.

Libythea bachmanni *Kirtl.*—Two seen on August 11th, 1888, about the *Celtis* trees at the old fort near Richmond village.

LYCÆNIDÆ.

Thecla humuli *Harr.*—May to September inclusive.

Thecla calanus *Hüb.* June and July.

Thecla smilacis *Bd-Lec.*—Taken by Chas. W. Leng at Watchogue, May 8th, 1881.

Thecla augustus *Kirby.*—April and May common at Watchogue; also occurs on other portions of the Island, particularly the sandy ones.

Thecla irus *Godt.*—May 16th, 1886 at Watchogue.

Thecla niphon *Hub.*—Common on May 8th, 1881, along a sandy road at Watchogue. None have been since taken.

Lycæna pseudargiolus *Bd-Lec.*—Including the seasonal forms, from April to September.

Lycæna comyntas *Godt.*—May to September inclusive.

Chrysophanus hypophlæas *Bdv. (americana)*—May to October inclusive.

Feniseca tarquinius *Fabr.*—Taken by A. C. Weeks, June 21st, 1885.

PAPILIONIDÆ.

Papilio ajax *Linn.*—A specimen was observed by Mr. Wm. Beutenmuller and myself on July 5th, 1886, near Bull's Head. Another individual was seen on June 30th, 1889, near Old Place.

Papilio philenor *Linn.*—May to September inclusive. A single fresh specimen was seen November 2nd, 1882. The caterpillars feed late into the fall and apparently many die of the cold.

Papilio asterias *Fabr.*—May to October inclusive.

Papilio troilus *Linn.*—May to September inclusive.

Papilio turnus *Linn.*—May to September inclusive.

Papilio cressphontes *Cram.*—August and September, 1882. None have been captured since.

Callidryas eubule *Linn.*—Not uncommon in September, particularly in the Moravian Cemetery, about Four Corners.

Colias philodice *Godt.*—April to November inclusive. A single specimen flying on Todt Hill, December 6th, 1891.

Terias nicippe *Cram.*—Appeared in June 1880 and was very common through the summer and fall. Its next occurrence was in the fall of 1891, when two males were taken.

Terias lisa *Bd-Lec.*—August, September and October.

Pieris protodice *Bdv.*—August and September. Taken in 1882, near where the St. George R. R. station now is. Also at Kreischerville.

Pieris rapæ *Linn.*—April to November inclusive.

Pieris oleracea *Bdv.*—Mr. Aug. R. Grote has written me: "I believe that I remember clearly that I took *P. oleracea* on Staten Island between 1856 and 1859." At present the occasional specimen does not attract attention among the similarly colored imported cabbage butterflies.

HESPERIDÆ.

Eudamus pylades *Scudd.*—June and July.

Eudamus bathyllus *S. & A.*—June and July.

Eudamus lycidas *S. & A.*—June and July. Found principally in the Clove Valley and on Ocean Terrace.

Eudamus tityrus *Fabr.*—May to September inclusive.

Nisoniades brizo *Bd-Lcc.*—April, May and June. On the more barren hills and sandy districts.

Nisoniades persius *Scudd.*—May and June.

Nisoniades juvenalis *Fabr.*—May to September inclusive.

Pholisora catullus *Fabr.*—May to August inclusive.

Pyrgus tessellata *Scudd.*—One specimen taken at Tottenville, September 29th, 1883.

Ancyloxypha numitor *Fabr.*—June, July, August and September.

Pamphila massasoit *Scudd.*—July and August. Plentiful near Bull's Head, 1891.

Pamphila zabulon *Bd-Lcc.*—May and June.

Pamphila sassacus *Harr.*—May and June.

Pamphila leonardus *Harr.*—Two specimens taken in September.

Pamphila otho *S. and A.*—June and July.

Pamphila peckius *Kirby.*—May to September inclusive.

Pamphila mystic *Scudd.*—June.

Pamphila cernes *Bd-Lcc.*—May to September inclusive.

Pamphila verna *Edw.*—June and July.

Pamphila metacomet *Harr.*—July.

Pamphila pontiac *Edw.*—July.



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TICKS IN THE EARS OF HORSES.

BY C. H. TYLER TOWNSEND.

Notwithstanding the recent valuable papers of Dr. Cooper Curtice (in Journ. Comp. Med. and Vet. Arch., July 1891—Jan. 1892, and in Bull. 24 Texas Agric. Exper. Station), and the timely and valuable classificatory paper of Dr. Geo. Marx, (Proc. Ent. Soc. Wash., Vol. 11, pp. 232-6) on ticks, I can find no mention of any species ever being found in the ears of mammals. In southern Mexico, and also western Texas, we have a tick which is, at least here, confined to the *ears* of horses and perhaps some other animals. They are never found outside on the body of the animal, but only within the ears and usually deep-seated. They are very abundant also, and the wonder is that there seems to be no record of this habit in a tick, and what is more that the tick itself is not readily determinable.

I am informed that ticks, perhaps not the present species, are found in the ears of horses, and also cattle, in the southern states, and as far north as Pennsylvania. It therefor seems strange that no mention should be made of this habit by writers on ticks. I have also been told of ticks that were found in the ears of dogs in northern Indiana, the tick being a species apparently either of *Ixodes*, or of *Dermacentor*.

In March, 1891, in Las Cruces, I took from the ears of a horse of the type commonly called bronco, a good number of ticks of all stages except the larva. These are of all sizes, from the egg (?) and white young ticks to the leaden blue older ones. But they all have eight legs, which indicates that they have all passed the larval stage.

I have spent much time in rather vainly trying to arrive at a

conclusion, satisfactory to myself, as to their generic position. After much study of Dr. Marx's classificatory paper above mentioned, I conclude that the chances are most in favor of their belonging to the genus *Argas*, in which case they may perhaps be the species described by Packard as *Argas americana*, of which I have no description. I am not at all sure of this generic conclusion, however, as the figure of *A. reflexus* (the dove tick) in the Standard Natural History shows the body produced anteriorly far over the head, and the palpi nearly twice as long as the rostrum. I therefore give the following description of the important characters of this tick, which is made wholly from the specimens above mentioned as taken in March, 1891, all of them being secured from the ears of the same animal, a small bronco. This animal had, shortly previous to that time, been brought in off the range near the foot of the Organ Mountains.

Description of adult.—Capitulum not apparent, minute, rudimentary, concealed within a circular oval hollow or cavity with raised edges, into which the mouth parts are sunken at base. This oval hollow which contains the capitulum, is situated well below the dorsal surface of the body, and at a considerable distance from the anterior edge of the body. The palpi are not excavated longitudinally on the inside, and are not approximated to the sides of the rostrum, except of course at the base. They are but slightly longer than the rostrum, 4-jointed, sub-cylindrical, a little more than three times as long as wide; the first three joints are nearly equal, and cylindrical, while the fourth is hardly as long as the third, not as stout, narrowing on apex, and probably not retractile. Rostrum can hardly be called either long or short, being about twice as long as its width at base. Eyes absent. Anterior border of body projected in a rounded angle (not in a beak-like prominence) immediately over the capitular hollow, the palpi and rostrum projecting forward sufficiently to be seen from above. Spiracle showing as a small round conical tubercle on side considerably dorsal of last pair of legs, and just anterior to middle of lateral constriction of body.

The body is coriaceous, leaden gray or bluish in color, with a creamy colored area on ventral surface near base of abdomen, and legs cream colored; full round, oval in outline from above, about half as thick as wide, and covered with little short spines which give way on posterior half or more to hairs. A little behind the middle the body is constricted at the sides. In alcoholic distended specimens the dorsum has two short longitudinal depressions ante-

rior to lateral constrictions, two posterior to same, and a short one in the middle between the four, or more or less elongated behind, between the posterior two. Legs 6-jointed, not including the very small terminal subjoint; each leg terminated by a pair of elongate, strongly hooked claws, borne on the subjoint. None of the legs with suckers. The sixth joint of legs bears on outer side before tip, a tubercular projection of the surface with hairs, the joint being suddenly narrowed at this tubercular eminence. This narrowed terminal portion of the sixth joint sometimes appears like an extra joint. Length 8 to 8.75 mm.; greatest anterior width 5 to 6 mm. Three alcoholic specimens. Color noted in life.

Fourth stage.—Differs only in integument being more filled out, lateral constrictions somewhat more pronounced, shape somewhat more elongate, oval excavation without raised edges, dorsal depressions absent, faint, or shallow. Spiracles same. Color nearly same, slightly lighter bluish. Length, 6.25 to 6.75 mm.; greatest anterior width, 4 to 4.25 mm. Three alcoholic specimens. Color noted in life.

Third stage.—Color bluish gray, more oval in shape, not swollen, body narrowed posteriorly, spines of anterior half more closely approximated both on dorsum and on venter, giving the surface a more spinose and prickly appearance; hairs of posterior body thicker. Mouth parts same, but less sunken, the oval hollow being less apparent, the palpi and rostrum more extended and more plainly seen from above. Three short longitudinal impressed lines on venter posterior to last pair of legs, the two outer lines diverging posteriorly from the median one. Spiracular tubercle hardly more prominent. Length, 3 to 4.5 mm.; greatest anterior width, 2.25 to 3 mm. Five alcoholic specimens. Color noted in life.

Second Stage.—Nearly shape of preceding stage, but smaller, and wholly whitish. While the above stages are all more or less coriaceous, the present one is almost fleshy. Mouth parts same, but not sunken, the capitulum exposed, at least the mouth ring visible, and palpi and rostrum entirely visible from above. Spines of anterior half of body above and below whitish, concolorous with body, posteriorly directed. On ventral surface, anterior to the three longitudinal lines and situated between the third pair of legs, is a pair of oblong spots, each marked by an elongate circlet of blackish dots, median posterior line being also defined by similar dots. A pair of exactly similar spots, each marked by a circlet of dots, on dorsum; and also a longitudinal median line, marked

with dots, almost exactly corresponding to the middle line on venter. Eight legs. Spiracles conical, rather more prominent, posteriorly inclined. Length (including rostrum), 3 mm.; greatest anterior width, 2 mm. Two alcoholic specimens. Color noted in life.

Egg (?).—This is apparently the egg. Whitish, pyriform in shape, slightly flattened, wider anteriorly, rounded posteriorly, perfectly smooth, with a median teat like anterior projection which represents the larval head and mouth parts. Length, 4 mm.; anterior width, 2.33 mm.; posterior width, 1 mm.; width at posterior two-thirds, 2 mm.; thickness, 1.75 mm.; length of head case, nearly 1 mm. One alcoholic specimen. Color noted in life.

Note.—The above stages are simply those represented in the material in hand. They are not necessarily the consecutive stages, representing consecutive moults, though it is quite probable that they are such, and are correctly numbered, omitting the first, or larval stage. The second stage above described is probably the first eight-legged or nymph stage. It may be well to note that immersion in alcohol for two years turned the third, fourth and adult stages to a reddish or dark brown. The second stage preserved its whitish appearance, except that it was turned slightly yellowish.

Horses infested with these ticks are given to repeated shaking of the head at irregular intervals, which sometimes dislodges the ticks. When badly infested, animals have been known to roll as well. The ticks can be extracted with a pair of forceps, the horse usually submitting quietly to the operation, but it is necessary to cast some animals before operating upon them. A mixture of twenty parts of sweet oil to one of laudanum is sometimes poured into the ear as a remedy, which is of doubtful efficacy. The sweet oil alone is probably about as effective. Fish oil would doubtless give good results. Kerosene should never be used, unless in emulsion. Pure, it has been known to cause temporary deafness. Train oil, sometimes called British oil, poured into the ear is quite highly recommended, and will doubtless prove very effective.

Dr. Wm. B. Lyon, of Las Cruces, informs me that he has on several occasions extracted this same tick from the ears of children in this neighborhood. He recommends a little chloroform or carbolic acid in sweet oil, or dusting of calomel into the ear for ticks infesting horses.

NEW NORTH AMERICAN ACULEATE
HYMENOPTERA.

By WM. J. FOX, Philadelphia, Pa.

Myrmosa parvula

♂.—Clypeus strongly convex medially, more or less depressed on the sides, its anterior margin emarginate in the middle; front and vertex with tolerably fine punctures, the former with an impressed line down the middle; antennæ short, stout, the flagellum of nearly the same thickness throughout the third joint of antenna shorter than the fourth; thorax coarsely and closely punctured; metathorax coarsely and closely granulated, with a strong furrow in the middle, extending from base to apex, interrupted at about its middle and strongest on upper surface; posterior coxæ, as in the other two species armed with a large tooth or spur at base, above; hind tibiæ and tarsi very feebly spinose; abdomen fusiform, finely punctured, the first segment much narrower than the second, gradually widened to the apex, the first and second segments, both above and beneath, separated by a wide fissure. Black; tips of mandibles reddish; head and thorax sparsely clothed with fuscous pubescence; the mandibles, clypeus, metathorax and abdomen with pale pubescence; wings hyaline strongly iridescent, nervures testaceous; second submarginal cell fully twice as large as the third, receiving the first recurrent nervure before its middle, the third submarginal receiving the second recurrent at about the middle. Length, 4 mm.

Southern Illinois (*Robertson*). The following table will aid in distinguishing the three North American species of *Myrmosa*, the males of which are only known.

Clypeus planate; head coarsely punctured; antennæ long, reaching about to the apex of scutellum; second submarginal cell triangular, the first and second transverse-cubital nervure meeting at the top; abdomen rather coarsely punctured, first segment of abdomen dentate beneath **unicolor** *Say*.

Clypeus strongly convex; first abdominal segment not dentate beneath; transverse-cubital veins widely separated above. Second submarginal cell more than twice longer than the third; metathorax without a depression at base; entirely black **parvula** n. sp.

Second submarginal not twice longer than the third; metathorax with a transverse depression at base; abdomen, except first segment, ferruginous **rufiventris** *Bl.*

Tachysphex apicalis

♀.—Medial portion of clypeus convex, with tolerably strong and close punctures, before its anterior which is slightly emarginate medially, there is a wide, transverse depression or furrow, extending from side to side and giving the anterior

margin a reflexed appearance, front and vertex more coarsely punctured than the clypeus; behind the insertion of each antenna, there is a strong depression which terminates angularly above; just above these depressions the face is slightly protuberant; front rather strongly furrowed medially, the furrow interrupted by the fore ocellus, then extending back on the occiput dividing in its course the swollen portion between the ocellus into two strong lobes or tubercles; space between the eyes at the vertex about equal to the length of the first two joints of the antennæ united; dorsulum depressed in the middle, anteriorly its punctuation sparser than that of the front; scutellum punctured likewise, not impressed; upper surface coarsely rugose or rugged, the metalpleuræ strongly and obliquely striated, the posterior face coarsely granulated, with a strong depression at base and with a strong, sinuous, transverse ridge at the top; four hind tibiæ and tarsi tolerably well armed with whitish spines; abdomen with exceedingly fine punctures, strongest on the second ventral segment; pygidium with a few scattered punctures, acute at tip, convex. Black, last dorsal segment red; front, face and clypeus with silvery pubescence; vertex and thorax more or less with short, fuscous pubescence; abdomen with sparse silvery pile; wings subhyaline, palest basally, iridescent; marginal cell obtuse at apex. Length, 9 mm.

♂.—Differs from the ♀ by the clypeus being not emarginate; the stronger punctuation of front and vertex; the shorter antennæ; the slightly impressed scutellum and more finely sculptured metathorax. Length 7 mm.

Southern Florida (*Robertson*). To the genus *Tachysphex* belong several of our species of *Larra*, prominent among them are *terminata*, *acuta* and *tarsata*. *T. apicalis* is related to the two first mentioned species but is at once distinguished by the sculpture of metathorax.

Priocnemis agenioides

♀.—Anterior margin of clypeus strongly rounded out; front convex, the face in the region of insertion of antennæ depressed, third joint of antenna very little, if anything, longer than the fourth space between the hind ocelli but little less than the distance between them and the nearest eye-margin; posterior margin of prothorax subangular; metathorax rather short, not impressed, but with a slight pit or fovea at the extreme base in the middle, four hind tibiæ strongly armed, especially the hind pair, which are serrate; longer spur of hind tibiæ more than one-third as long as the first joint of the hind tarsi; claws with a large tooth on inner margin; abdomen fusiform polished, the apex rather densely clothed with long, brownish hairs. Black, the head and thorax with a slight, greenish tinge; face, clypeus, sides of thorax and coxæ with silvery pile; wings subhyaline, their apical margins fuscous; second submarginal cell more than one-third wider beneath than at the top, its height is about equal to its width at the top; first recurrent nervure received by second submarginal cell, before the middle, the second is received by the third submarginal in about the middle, the marginal cell does not extend to the apex of the third submarginal. Length 7 mm.

Southern Illinois (*Robertson*). Related to *conicus*, *pomilius* and *germanus*. From the first mentioned it will be distinguished in the form of the clypeus; from *pomilius* in the color and by the pale

wings and from *germanus* by the pale wings, the form of prothorax margin and the shorter marginal cell.

Planiceps minor

♀.—Anterior margin of clypeus in the middle slightly incurved or subtruncate; space between hind ocelli greater than that between them and the nearest eye-margin, antennæ joints 3-7 about equal in length, all the flagellum joints more or less narrowed basally on under side, so that the flagellum has the appearance of being slightly serrate; the prothorax is longer than the dorsulum and scutellum combined, its posterior margin subtruncate; metathorax above faintly impressed down the middle; legs stout, the four hind tibiæ and tarsi strongly spinose; claws armed with a strong tooth within longer spur of hind tibiæ fully equal to half the length of the first hind tarsal joint; apical abdominal segments with a few long, black hairs. Black, the thorax with a strong, purplish reflection; fore wings dark-fuliginous, with a strong, purple reflection, which is not to be seen on the apical margins. Length, 8 mm.

Southern Florida (*Robertson*). Differs from its ally *P. niger* by its smaller size, the purple wings, and the much longer prothorax and hind tibial spur.

Planiceps dubius

♂.—Anterior margin of the clypeus rounded; antennæ short, stout, not reaching beyond the tegulæ, third joint about one-third shorter than the fourth, space between the eyes at the clypeus is a little greater than the length of the first, three joints of the antennæ united; posterior margin of prothorax angular, upper surface of metathorax with a longitudinal medial impressed line, the posterior face depressed; four hind tibiæ and tarsi strongly armed with spines; longer spur of the middle and hind tibiæ very nearly equal in length to the first joint of their respective tarsi; abdomen shorter than the thorax, more compressed than depressed. Black, the head and thorax more or less clothed with silvery pile, which is most dense on thorax beneath, upper surface of hind coxæ, the metathorax and the femora, the two first dorsal segments of the abdomen are also silvery when viewed in certain positions; wings hyaline basally, becoming gradually darker to the apex; first recurrent nervure received by the second submarginal cell between its base and middle. Length, 6.5 mm.

Southern Florida (*Robertson*). From *Pl. feralis* Cr., it is distinguished by its smaller size, angular prothorax, longer hind tibial spurs and darker wings; from *calcaratus* Fox it will be separated by the black tibial spurs, larger size and the shorter and more robust antennæ.

Cerceris Robertsonii

♀.—Middle part of clypeus with a short, flap-like, appressed lobe, which is indistinct when viewed from above, the anterior margin strongly crenulated; head coarsely punctured, the punctures strongest on cheeks and vertex, finest in depression behind antennæ and sparsest on face and clypeus; third antennal joint about

one-third longer than the fourth, the fourth joint is, if anything, very slightly longer than the fifth; thorax very coarsely punctured, the punctures sparsest on scutellum and deepest on metathorax; enclosed space on metanotum, with exception of base and laterally, smooth; tibiæ and tarsi strongly spinose, the hind tibiæ in addition very strongly serrated; punctuation of abdomen less coarse than that of the thorax, the posterior margins of dorsal segments 1-5 reflexed, the basal portion of segments 2-5 transverse depressed, so that when viewed from the side these segments are seen to be separated by a wide fissure; ventral segments sparsely punctured, transversely swollen in middle; pygidium elongate-ovate, its surface pustulate. Black, clypeus except anteriorly, sides of face, carina between antennæ, scape beneath, an elongate spot on mandibles, spot on summit of cheeks, line on prothorax above, interrupted medially, spot on tegulæ, two large spots on scutellum and dorsal abdominal segments 2-5, all yellow, that on second segment entire, on the others very widely emarginate anteriorly; first four or five joints of the flagellum beneath, the apical joint also, tegulæ in part and coxæ and femora more or less reddish, the tibiæ and tarsi and the hind trochanters generally yellow, the hind tarsi black; wings subhyaline, the apical margin with a fuscous band which also includes the marginal cell, stigma and adjoining nervures reddish; the head, thorax and first two abdominal segments are clothed with sparse, pale fuscous, long hair. Length, 12-13 mm.

♂.—Anterior margin of clypeus armed with three teeth, the middle one of which is most prominent; third joint of the antennæ distinctly less than one-third longer than the fourth, the last joint obliquely truncate; head and thorax punctured about like the female; the enclosed space on metanotum with strong radiating ridges; tibiæ and tarsi spinose but not so strongly as the female, the punctures of the abdomen stronger and sparser; pygidium with very large sparse punctures; colored like the ♀ except that the clypeus is entirely yellow, and the yellow on abdominal segments 3-5 is very narrow, slightly broader laterally; ventral segments 3-5 with a small, yellow spot on each side. Length, 10-11 mm.

Montana; Smithville, Southern Dakota (*J. T. Aldrich*); Southern Illinois (*Robertson*). Related to *clypeata* and *compacta* from both of which it will be distinguished by the form of the clypeal lobe in the female. The male will be distinguished from that of *clypeata* by the scutellum having two yellow spots and the shorter and stouter antennæ.



Mr. Wm. Schaus intends to illustrate those species of American Lepidoptera which have not been figured previously, and he is desirous of obtaining material not represented in his collection. The first part of his work, with three colored plates, has already appeared and treats on South American Zyganidæ and Bombycidæ.

NOTES ON THE LIFE-HISTORIES OF SOME
NOTODONTIDÆ.

BY A. S. PACKARD.

PART II.

Nadata gibbosa *Abbot and Smith.*

The eggs were received from Mr. H. Meeske, and hatched June 12. They were laid on the oak, and the larvæ were raised on the leaves of that tree. Compare also the description of the five stages by Miss Soule in *Psyche*, Vol. vi, p. 197.

Egg.—Described by Miss Soule (*Psyche* vi, 197). I still need specimens for examination under high powers of the microscope.

Larva, stage I.—Length 2.5 mm. The head is large, full and rounded, pale green, with a yellowish tinge like the body, only clearer, more amber-like; it is wider than the body, which is pale yellowish green. The body is smooth, without distinct piliferous tubercles, though there are scattered long, fine glandular hairs, which are ochreous-brown in color, arising from microscopic tubercles. These hairs under a $\frac{1}{2}$ inch objective at first appear to be simple tapering hairs, but after close observation are seen to be clear and slightly flattened and bifid at the tip. The body tapers regularly from the prothoracic segment to the end.

Stage II. (End of stage?)—Length 12 mm. June 20. The head is rounded, smooth, as wide as the body where it is thickest; yellowish green. The body is cylindrical, tapering decidedly toward the end; the segments are distinctly wrinkled above. The body is pale green, with two broad diffuse yellowish longitudinal bands, one on each side from the prothoracic segment to the end of the body. The hairs are minute, and, with the tubercles they arise from, not easily seen.

Stage III.—Length 13 mm. June 23. Of the same shape as before. The head is still much wider than the body; it is a little deeper green, but the color of the body differs from that of the previous stage in being whitish glaucous-green, since the body is covered with a soft whitish exudation or bloom, so as to obscure the lateral faint stripe.

Stage IV.—Length 18 mm. June 29. The head is very large, wider than the body and pea-green in color, while the body is more whitish, covered with a white bloom. The lateral pale, straw-yellow line is not very distinct. There is a faint, very narrow, vas-

cular median dorsal-line over the dorsal-vessel. The skin is wrinkled above, and flecked above and on the sides with white. *The suranal plate is well rounded and edged with straw-yellow.* The prothoracic segment is much wider than those behind, and the body tapers rapidly towards the end. The spiracles are ringed with light sienna-brown, rendering them rather conspicuous. The thoracic and abdominal legs are pale green.

Stage V.—Not described, but closely resembles the full-fed larva.

For a description and figure of the full-fed larva see Lintner, Ent. Contr., III, p. 150, and our Forest Insects, p. 154, Pl. XI, fig. 6, after Lintner; also Miss Soule (l. c.).

Summary.—1. The freshly hatched larva is in shape like the adult, only the head is larger in proportion, and the body is provided with bulbous glandular hairs. There are no lines nor white dots.

2. The two subdorsal yellowish longitudinal stripes probably appear at the end of the 2d stage.

3. In stage III, the whitish bloom appears.

4. In stage IV, the suranal plate is edged with yellow.

This is, next to *Gluphisia*, the simplest, least specialized Notodontian larva; more so than that of *Lophodonta*. The body is without tubercles or humps; the piliferous warts are minute and the simplest markings are colorational, *i.e.*, two yellowish subdorsal bands, with no spots. In the Notodontians the subdorsal lines are the first to appear, before the lateral ones. This is probably as near the primitive ancestor of the Notodontians as any known genus, unless *Gluphisia* be excepted; the larva of *Lophodonta* is nearly if not quite as simple in shape and ornamentation as that of *Nadata*.

Lophodonta angulosa *Abbot and Smith.*

A detailed description was published in Forest Insects, p. 154, comparisons being made with the larva of *Nadata gibbosa*; but in the following description some features are noted which do not appear in the published description.

It occurred at Brunswick, Me., September 8, on the oak, and at Providence, R. I., in September and early in October.

Full-fed Larva.—Length 40 mm. Resembling in its simple, smooth body, without tubercles or humps, the larva of *Nadata gibbosa*, but the head is smaller, and it has no such suranal plate, while the body is smooth not granulated. The head is nearly as

wide as the prothoracic segment, but not as wide as the body; it is full and rounded, though a little flattened above; it is deep pea-green, but concolorous with the body; on the vertex are four short, faint whitish lines (sometimes wanting), the inner two parallel, the outer somewhat diverging; each side of the clypeus is lined with whitish; on the side of the head is a pink line edged above with white and extending to the base of the antennæ. The mandibles are green at base with an orange-red line along the upper edge, the tips being black. There is a short, black line above at the base of the antennæ.

The body is noctuiform, tapering towards the anal legs, which are short and small, no larger than the other abdominal legs. The suranal plate is small, rounded at the end, not large and conspicuous as in *Nadata gibbosa*. The segments are not convex, but the sutures are distinct. A double median, whitish, somewhat broken line, sometimes faint, the two lines converging and forming a single one in the middle of the suranal plate, and slightly tinged with pink. A distinct lateral pink line begins on the side of the head and extends to the end of the body along the edge of the suranal plate; the line is somewhat finely bordered with brown, and is edged below with white. In one specimen along the sides of the body are two broken yellowish-white lines, the lower of the two more broken and yellowish than the upper one, and represented by two spots on each segment; it lies midway between the upper and the pink and yellow spiracular line.

The whole body is pea-green, or sometimes suffused with a roseate or pinkish tint; it is slightly darker below than along the back. The thoracic legs are greenish-amber, spotted externally with black. The abdominal legs are green like the body.

In some examples the lateral reddish spiracular line is not so distinct, while the white lower edge is nearly obsolete.

Datana integerrima G. & R.

This and the following descriptions of *Datana* larvæ, are rather more detailed than those given by other entomologists and refer to some features which have been overlooked.

The larva was received from Mr. James Angus, August 25. Feeds on butternut, walnut and hickory.

Larva, stage IV.—(Supplementing that of my paper in the Proceedings of the Boston Society of Natural History, Vol. xxiv. pp. 518 & 519).

Length 15 mm. Head shining black, as wide as the body.

The body of the usual cylindrical shape, rather slender, dark pitchy reddish brown all over. Prothoracic shield transversely oblong, not so square at the corners as in *D. perspicua*. There are four dull whitish rather obscure lines on each side, which are of nearly the same width and of exactly the same color; they are somewhat irregular on the edges, being somewhat broken and of the same distance apart. The lowest or infraspicular line is a little wider and more distinct than the others and extends along the lateral ridge. The body beneath is of the same color as above. The suranal plate is black, rounded; the anal legs are black at the tips. The middle abdominal legs are stained black above the plantæ, and the thoracic legs are black. The hairs are long and white; those on 1st thoracic segment, and 8th and 9th abdominal longer than those elsewhere; those on the prothoracic segment stand up and curl over the head, and two or three of them are as long as the three thoracic segments put together. The spiracles are black.

***Datana contracta* Walker.**

The larvæ were sent me by Mr. James Angus, and were received Sept. 1. It feeds on the walnut and will eat the ash or rose.

Full-grown larva.—Length, 30 mm. Head large, as broad as the body, entirely black, including the mouth-parts. 1st thoracic segment with a distinct gamboge-colored transversely oblong plate, with three indistinct blackish clouds on it. The body is jet-black, with four continuous whitish-yellow very distinct stripes on each side, and a fifth broken one between the bases of the legs, both thoracic and abdominal. The three upper stripes are equidistant, the upper or subdorsal one being slightly wider than the others. The 4th stripe is on the lateral ridge and is broader than the others and wavy. The width of the dorsal black stripe is like that of *D. perspicua*. There is a median ventral whitish yellow stripe which ends before reaching the anal legs. The thoracic legs are black, but gamboge-yellow at the enlarged fleshy base. The middle abdominal legs are gamboge-yellow, each with a large external black patch above the planta. The two subdorsal whitish yellow lines end before reaching the suranal plate, leaving a black space; the plate is also black, and the anal legs are wholly black above and beneath and on the sides. The head and body are clothed with long white hairs, much longer and thicker than in *D. perspicua*, and longer than the body is thick.

Datana perspicua G. & R.

The specimens described below were received Aug. 23, from Mr. James Angus, and so named by him.

Larva, stage III or IV?—Length, 17 mm. The head is black, not quite so wide as the body. A shining black chitinous transversely oblong prothoracic shield. The body is moderately hairy, the hairs reddish; it is deep straw or lemon-yellow, with eleven pitchy reddish lines: the median dorsal line is much broader than any of the others and broader than the spiracular line; of the two subdorsal lines, the upper is a little wider than the lower; the lowest or infraspiracular line is interrupted by the sutures; the two ventral lines of the same reddish color pass along at and including the base of the thoracic and abdominal legs. The suranal plate is small shining black. The anal legs are conical, black, except the reddish planta which is distinctly reversible, being seen at times to be retracted, though armed with hooks. The two paranal plates are dark at the end; the end of the body is constantly upheld. The thoracic subdominal legs are black.

Immediately after moulting one can see the fluids of the body under the neck; the head is cherry red, while the suranal plate, anal and other abdominal, and also the thoracic legs are pale carneous.

Stage V?—Length at first, 20 mm, becoming the next day 23–25 mm. Body as before, but the stripes are blackish red, there being no other change of importance. The suranal plate is a little larger than before.

Last stage.—Length, 40 mm. Head large, black, as wide as the body. Prothoracic shield dark reddish black.

The stripes are of the same relative width as in stage III, but have lost their red color, and are brown black, while the yellow of the body has a greenish tinge. There is no red at all on the prothoracic segment or on the legs or on any part of the body. The suranal plate is large and black, the black median dorsal line wider on the segment in front. *The hairs are now whitish and thicker than* in the previous stages.

Note.—When irritated it discharges a drop of green fluid, its partly digested food.

I notice that the hairs on the thoracic segments have at times an individual motion, and are jerked one way and another, as also the warts which give rise to them!

One pupated Sept. 20, and another a little later.

Datana ministra *Drury*.

It occurred at Providence, R. I., on the birch, Sept. 10-12. Figured in Forest Insects, Pl. IV, figs. 1, 2.

Stage next to last.—Length, 26 mm. Head black, as wide as the body. 1st thoracic segment black. The body is *yellow*, not greenish-yellow, as in the adult, and the stripes are *reddish-brown*, the color of brown roofing slate. Just before molting the 1st thoracic segment becomes gamboge-yellow on the plate, and straw-yellow around the edges. A broad dorsal reddish brown line fully twice as wide as the others. There are four lateral stripes all of the same width, the yellow spaces between them only a little more than one-half as wide as the brown bands; the 3d brown band includes the black spiracles. Thoracic feet black; suranal plate and anal legs black; middle abdominal legs dark, four of the legs pale livid reddish; plantæ pale. The hairs are minute, short, not apparent without a lens.

The head and thoracic segments often held bent over backwards, so that the thoracic feet stick up, while the tail is so bent up as to nearly meet the head.

Last stage.—Length, 30 mm. Head black. Body with *white, conspicuous hairs*, many of them one-third longer than the body is thick. The body is now *distinctly greenish-yellow*, and the prothoracic plate gamboge-yellow. The stripes are *black*, not reddish dark brown, as before. The 3d or spiracular band is *a little wider than before*, and continued on to the prothoracic segment, under the gamboge-yellow plate. Base of the legs and space around and between them *honey-yellow*, not dull reddish-yellow, as in the previous stage. Middle abdominal legs reddish-yellow, with a large black chitinous plate above the planta.

Datana angusii *G. & R.*

The specimens here described were received under the above name from Mr. James Angus, Sept. 4. I failed to note their length, but they were nearly if not quite full-grown.

Head black, including the mouth parts. The prothoracic shield is distinct, transversely oblong, black. Body black, with four narrow pale whitish-yellow stripes on each side. The two dorsal stripes are wide apart, leaving a broad dorsal median black stripe; the space between the 1st and 2d line is a little wider than between the 2d and 3d; the 4th line is slightly wider than the others, scalloped, and interrupted by the sutures between the segments. Beneath the lateral ridge along the base of the legs is

an irregular livid purplish stripe beginning on the 3d thoracic segment. *There are no hairs along the back and those along the side are unusually short and are pale grayish in color.* The body beneath is black, with a median livid pinkish line along the abdominal segments, widening between the abdominal legs, and ending on the 7th segment, the end of the body, including the anal legs, being black.

Notodonta stragula Grote.

This larva occurred on the aspen at Brunswick, Me., August 14. In the stage before that described and figured in my report; it feeds on the edge of the leaf.

Stage III?—Length 12 mm. Head large and broad, wider than the body, and flattened in front, narrowing towards the vertex, where it is slightly bilobed, and bearing a broad, straight, dark amber-brown band on each side, edged with pale whitish on the outside. The body is a rich purplish, becoming darker below and on the under side, *with no reddish tints such as occur in the next stage.* The nutant projection on the 2d abdominal segment is large and well developed and inclined backward, *while the 2d one is very small, much smaller than in the next stage,* being about one-third as large as the one in front. The dorsal hump on the 8th abdominal segment is conical, with a broad median lilac amber-brown band passing back on to the suranal plate, and forwards over the projection in front to the head. The sides of the humps are stained whitish and ochreous, with two short, wavy stains in front, one set on each side of the body. The thoracic legs are dark; the abdominal legs paler and nearly concolorous with the peculiar, velvety purple of the body, and somewhat darker. The piliferous warts are small, but pale and distinct. On the side of the prothoracic segment above the legs is a short, narrow, horizontal pale-yellow line.

For a description of the fully grown larva, see Proc. Bost. Soc. Nat. Hist., Vol. xxiv, p. 524, and for a description and figure of stage IV. see my report on Forest Insects, p. 563, Pl. v, fig. 1.

Pheosia rimosa Packard.

Mr. Dyar has described (Psyche, Vol. vi, p. 196) at length all the stages (five) of this species (*P. dimidiata* H.S.) from California, where it feeds on poplar and willow.

The eggs and freshly hatched young were observed on the under side of the leaves of the aspen, the 26th of July and 1st of

August. The female lays usually three eggs near together on a leaf. The larva does not appear to eat them up, as the eggs are found throughout the month, with simply the hole gnawed by the larva in making its exit. The young larva is solitary, and eats a patch on the under side of the leaf. The larva in the second and later stages were unusually frequent in Maine in 1890.

Egg.—Diameter 1.3 mm. Low hemispherical, about one-half as high as broad. Under a Tolles triplet the micropyle in the centre is distinctly seen, and the snow-white shell is distinctly though very finely pitted or granulated. Under a half-inch objective the markings are seen to be very peculiar, the surface not being divided into polygonal areas, but studded with microscopic beads, which form near the micropyle at the apex radiating series, and lower down lines of beads more or less parallel with the equatorial diameter. From 3 to 7 eggs are laid on a single leaf. Probably the moth flies from one plant to another, laying a few eggs at a time.

Freshly hatched larva, stage 1.—Described a few hours after hatching, before they began to feed. Length 3.5—4 mm. The head is rather large, shining black, smooth, and considerably wider than the body; not spherical in shape, but somewhat flattened and sub-cordate or bilobed, as the occiput is deeply indented. A large broad, but antero-posteriorly rather short black, mostly smooth prothoracic plate, with slight roughnesses near the front edge where the hairs take their origin; the hinder edge slightly indented on the median line. On each side of the plate is a lateral black piliferous wart. The 2d and 3d thoracic segments each with a pair of conspicuous, oval, black, flattened, piliferous warts, and two small, round ones on each side, the lower one being about one-half as large as the upper. Abdominal segments 1—6 each with four dorsal, piliferous, flattened black warts, the hinder ones a little farther apart than the anterior ones, but yet close to the latter. On segment 7 the four corresponding warts are arranged in a regular trapezoid, the two anterior ones being much nearer together than the two hinder ones. On the 8th segment is a single central dorsal black, oval, moderately prominent wart, which is twice as large as the largest on the 9th segment; it is transverse, bearing a bristle at each end, thus having plainly originated from what was once two separate warts. The latter segment bears 4 black warts, arranged in a regular trapezoid. The 9th and 10th segments are held up when the larva walks. The anal legs are black and a little smaller and shorter than the middle abdominal legs. The

black suranal plate is sub-triangular, being obtusely pointed in front; the surface is rough, bearing a rough, low tubercle in front on which are minute piliferous warts. The body is somewhat flattened, being broader than high, and of a peculiar, pale glaucous- or sea-green, the skin being polished like porcelain.

The hairs under a $\frac{1}{2}$ inch objective are seen to be slightly bulbous at the tip, and therefore glandular, but under a lower power appear to taper like ordinary setæ. In stage II. the hairs are also slightly bulbous, and clear at the tip.

At the end of stage I.—Length, 5–6 mm. The body is much longer than before, so that the tubercles are farther apart, and now the 8th segment has the dorsal wart surrounded by an amber-yellow spot rendering it more conspicuous, and also the lateral concolorous line has appeared; the same tint occurs on the base of the abdominal legs.

(Specimens described in part from life, Aug. 2). Length at the end of the stage, just before exuviation, 6 mm. The head is moderately large, in the single larva observed not so wide as the body, as it was about to moult, the prothoracic segment being greatly swollen. (In alcoholic specimens, the head and black piliferous tubercles of the larva in the next stage can be seen through!) The head is now black and slightly bilobed, and 1.5 mm. wide.

The prothoracic plate is rather broad, but quite short antero-posteriorly, with four piliferous warts on the front, and four on the hinder edge. The piliferous warts on the succeeding segments are large, distinct, black, and bear but a single hair. The tubercles on the 2d and 3d thoracic warts are arranged in a straight transverse row; the two dorsal ones are slightly larger than those on the 3d thoracic segment. On the abdominal segments the four dorsal tubercles are all the same size and arranged in a trapezoid, which becomes longer going backward to segment 7. On the 8th segment there is a *double large black tubercle* bearing two bristles, the tubercle is several times larger than any of the others, and is evidently the result of the coalescence of the homologues of the two dorsal warts occurring on the segments in front. The 9th segment with the four dorsal tubercles arranged in a square, with the lateral ones farther up on the back than the homologous ones in front, and in a sub-dorsal position. The suranal plate is black-brown, nearly three-fourths as long as broad, bearing six marginal and two dorsal median hairs. The thoracic

legs are black; the abdominal legs pale, with an external dark chitinous plate above the planta.

The general color of the body is glaucous-green, being of the same hue as the color of the under side of the aspen leaf on which it feeds. There is a brown dorsal spot on the 8th abdominal segment, on which the tubercle rests, while along the sides low down, at the base of the abdominal legs, and in corresponding places where the legs are wanting is a row of irregular reddish spots. The skin under a $\frac{1}{2}$ inch objective is seen to be studded with fine, dark, short, conical setae or granulations which are largest and thickest on the sides of and at the base of the middle abdominal legs. The hairs over the body are glandular, slightly bulbous, and about half as long as the body is thick.

The two tenant hairs on the thoracic feet are knife-shaped, somewhat as in *Ichthyura inclusa*. The plantae of the abdominal legs have a much larger number of crochets than usual in larvae of stage I, as there are 26 of them, forming a nearly complete but broken circle, and the crochets themselves are rather short and blunt.

Stage II.—Length, 8 mm. Moulded Aug. 3. The Pheosia characters are now declared, owing to the transformation of the dorsal tubercle on the 8th abdominal segment into a fleshy cone or low horn! The larva feeds on the edge of the hole which it eats out of the leaf, and at first sight may be mistaken for a saw-fly larva, owing to the dark reddish brown spots and band on the sides which resemble abdominal legs, and assimilate it in appearance to the edge of the hole, which turns dark after it has been eaten out by the caterpillar.

The prothoracic shield has now disappeared. The head slightly narrows above and is slightly bilobed, smooth and shining, a little wider than the body, which narrows a little towards the end; it is dark chesnut-brown on the sides, pale chesnut in front. The body is pale green above, still of the same hue as the under side of the leaf. The under side is peculiar in the thoracic and short, thick abdominal legs being dark livid brown; with a large chesnut-brown patch on the base of each, and on the 1st and 2d abdominal segments is a dark brown blotch where the base of the legs would be if they were present; farther along in the space between the 4th pair of legs and the anal legs is an irregular dark brown broad line extending along the side of the body to the sides of the anal legs. The latter are used in creeping, but but are about half as large as the middle ones.

The hump on the 8th abdominal segment is now *well developed, high, conical, and fleshy, slightly inclined backward*, dark at tip, and still bearing two bristles, though the dark chitinous spine is obsolete; the horn-like tubercle is half as high as the segment is thick. The body behind the "caudal horn" narrows rather rapidly to the end of the suranal plate, which is larger than before, but pale and of the same color as the body.

The anal legs are used, but are about half as large as the middle ones and with much fewer crochets, which are very numerous in the middle legs, *forming a nearly complete circle*. The piliferous warts in general are now very much smaller and paler than in stage I, being *green like the body*, and scarcely visible under a strong lens. The hairs are sparse, only one arising from a wart, and they are short and fine.

In this stage the sub-prothoracic eversible gland was observed in an alcoholic specimen. It forms a large transverse sack, (bleached white by the alcohol, and contrasting with the red skin of the side of the segment. It sends off two lateral siphon-like long and slender finger-shaped diverging tubes, out of which the spray is probably forced. Their ends do not reach to the sides and are not visible from them, but the gland is much as that of *Cerura* as figured by Poulton. (Trans. Ent. Soc. London, 1887, Pl. X, fig. 7).

Stage III.—Aug. 6. Length 11 mm. The head is now pale amber, but still dusky on the vertex, and it is also still wider than the body. On each side of the body is a faint whitish sub-dorsal line. The "caudal horn" is dark brown, now nearly as long as the 8th segment is thick vertically. The horn is slightly retractile in this stage, and the base is movable, being capable of withdrawal and extension and is distinctly nutant, the apex sometimes hanging over backwards. The sides of the body along the base of both the thoracic and abdominal legs are now dark reddish chocolate brown, being of the same color as the horn.

The lateral yellow line is well marked. The body beneath is pale green. The spiracles form a dark dot surrounded by pale greenish.

Stage IV.—Length 20 mm. Aug. 25. The body is now thicker than before. The head is distinctly bilobed, rounded, narrowing a little towards the vertex. The caudal horn is now larger, higher and more acute than in the preceding stage; it is freely elevated or allowed to fall over backwards, is soft and flexible, but very slightly retractile, and bears a few scattered

fine bristles. It has a blackish shade extending up from a point above the last spiracle to the apex, which is dark. The body is chocolate colored; the head redder, finely mottled with paler reddish. The suranal plate is well rounded behind, the surface roughened, with no piliferous warts, and this and the anal legs are more reddish than the body, being of a reddish pink hue. The spiracles are much larger than in stage III, and are blackish, surrounded by a broad, pale, flesh-colored ring. The middle abdominal legs have a shining chitinous black patch above the planta, there being no such patch on the anal legs. The thoracic legs are dark, pitchy amber.

For the last stage see my description in Proc. Boston Soc. Nat. Hist., Vol. xxiv, p. 523.

Recapitulation:—1. The median dorsal tubercle or incipient "horn" on the 8th abdominal segment is in stage I plainly seen to be double, the result of the coalescence and specialization of what were originally two dorsal warts. In stage II, this tubercle becomes a well developed, high, conical, fleshy horn.

2. The prothoracic plate of stage I disappears in stage II.

3. Appearance in stage II of the dark reddish brown spots and band on the sides of the body.

4. Appearance in stage III of traces of a whitish subdorsal line, while the lateral yellow line is well marked.

Ædemasia concinna *Abbot and Smith.*

The later stages of this caterpillar, beginning with the second, are described by me in the Proceedings of the Boston Society of Natural History, Vol. xxiv, 531. I found the eggs with the larvæ just hatching on the leaves of the willow at Brunswick, Maine, June 24. The eggs were in this case somewhat scattered, and few in number, and the larvæ did not feed gregariously. The larvæ continue to hatch till the early part of August in Maine, as Aug. 14. I found the larvæ in stage II, and also fully grown on the aspen.

Egg.—Diameter about 1 mm. Low hemispherical, the height being about half the diameter. The shell is thin, smooth, and under a triplet not seen to be pitted, but under a half-inch objective the surface is seen to be divided into regular, moderately large polygonal areas, with slightly raised but distinct edges.

Freshly hatched larva.—Length, 3 mm. Head large, globular, smooth and unarmed, a third wider than the body, deep dark, honey-yellow. The body is greenish-yellow above, cherry-reddish on the sides; the prothoracic dorsal tubercles are larger and

higher than those on the 2d and 3d thoracic segments, and connected by a chitinous band, becoming more distinct in stages II and III. The 1st and 8th abdominal segments are reddish, including the pair of dorsal tubercles which are of the same size. The end of the body is held up, much as in the fully grown larva, and I mistook it for a *Schizura* larva, until after it had molted, as the tubercles are conical in this stage as in freshly hatched *Schizura*.* In some individuals the greenish dorsal tubercles are dark at the tip. The glandular hairs are bulbous at the tips, and a few at each end are nearly one-half as long as the body.

Three days after, June 27, they became 5 mm. in length, the head now small and the larvæ were preparing to molt; and July 29-30, three cast their skins.

Stage II.—Length, 4-5 mm. at first. Now the body is like dark opaque varnish in hue. The head is dark reddish varnish or pitchy in hue, and decidedly narrows above, bearing two blunt knobs on the vertex; it is now wider than the body. The prothoracic shield is larger than before. The sides of the 2d and 3d thoracic segments are yellowish with reddish lines, and on the sides of the 7th abdominal segment is a pair of lobed bright straw-yellow spots converging behind, and lower down are three yellow tubercles tipped with brown. There is a similar single yellow tubercle on each side of the 9th segment. The prothoracic dorsal tubercles are somewhat smaller than those on the 1st abdominal segment, and the 8th pair are also a little smaller, but all the other dorsal tubercles are still large and conspicuous.

***Schizura ipomeæ* Doubleday.**

The following description of two larvæ found at Brunswick, Maine, on the red maple, Aug. 14, describes the peculiar mimicing coloration better than those hitherto published.

Full-grown larva.—Length, 28-30 mm. Wonderfully mimics a dull blood-red portion of a leaf which had been cut partly off and become somewhat twisted, so that the larva itself would easily be mistaken for such a part of a prominent terminal leaf. The deception was perfect, as I did not myself at first see it when within ten inches of my eyes, and on holding it before the eyes of an observing boy of thirteen he could not at first distinguish it as a caterpillar. The same leaf had blotches of dull red, and the flesh-red abdominal feet of the caterpillar clasped the concolorous red leaf-stalk. One larva was much deeper blood-red in color than the other, the latter having a more faded tint.

* (Edemasia is probably only a section of the Genus *Schizura*.)

The head is high and narrow, not so wide as the body, but wider than the 1st thoracic segment; it is pale livid purplish, darker down the front, with two parallel black-brown lines on each side, bordered with paler, and enclosing a clear pale purplish band. The clypeus, labrum, antennæ and region near the eyes are pale. A minute piliferous wart on each side of the vertex. The 1st thoracic segment is mottled with reddish, and pale flesh on the sides. A dorsal broad band, divided in the middle by a pale yellow line becomes one-half as wide behind on the 2d thoracic segment, and passes back to the horn on the 1st abdominal segment; the rest of the 2d and 3d thoracic segments are pea-green, a little paler than the upper side, and darker than the under side of a red-maple leaf, but on the whole very closely assimilated in tint to the color of the leaf.

The abdominal segments are in general faded, dull blood-red, due to fine, dark, flesh-red lines and mottlings on a pale carneous ground. On the first abdominal segment is a high nutant fleshy, soft dorsal tubercle which is inclined a little backward, but on being touched bends over downward near the back; the basal half is mottled and lined like the sides of the segment from which it rises, but above becomes bright, clear, blood-red, the end being deeply forked, each fork bearing a long black bristle. A median black line passes along the tubercle, becoming forked in front and behind at the base. Two large, high twin soft tubercles on the 5th segment are not quite so large as the two similar ones on the 8th segment, but are situated on a much larger hump; they are of the same blood-red hue as those on the 1st segment. The small dorsal tubercles on the 2d and 3d abdominal segments are minute and yellow; those on the 4th are partly blood-red. The anal legs are long and slender. On the back of the abdominal segments 1—4 is a porcelain white band, bordered with faint yellow, and divided by the sutures; the portion on the 1st segment behind the tubercle is triangular, that on the 4th round; they each contain three deep pink lines more or less broken and irregular. The v-shaped mark consists of a white oval (acute in front) spot on the 6th segment, and the two arms of the v are formed by two converging oval spots, with a yellowish white spot between the forks. The thoracic legs are pale flesh; the middle abdominal legs of the color of the leaf-stalk, while the anal legs are paler. Beneath the body is green on the three thoracic segments, this color being continued back as a narrow band to the 1st pair of abdominal legs; otherwise much as on the sides of the body.

Schizura leptinoides Grote.

The eggs were laid by a species of *Schizura* and sent by Miss Emily L. Morton, who is quite sure that it was *Schizura leptinoides*. They were laid June 3, at New Windsor, N. Y., they hatched June 12, all the others being out of the shell by noon of the next day. I did not carry it beyond the first stage, but have little doubt but that Miss Morton's identification of the moth was correct.

Eggs.—Transverse diameter 1 mm. of the same size and shape as those of *S. ipomœa*. Hemispherical, moderately high, and under a high Tolles lens seen to be very finely pitted; under a $\frac{1}{2}$ inch objective of Tolles the surface is seen to be divided into 5 and 6-sided areas, with a distinct raised edge; the surface smooth and more often without the bead, so common in eggs of *S. ipomœa*.

Towards and at the micropylar region the cells become longer, minuter and more crowded, and in this respect the egg seems to differ from those of *S. ipomœa*, in which the areas are more or less obsolete in the micropylar region.

Freshly hatched larva.—Length, 3 mm. The head is very large, nearly twice as wide as the body; deep honey yellow.

Prothoracic segment of the same tint as the head, but green behind. The rest of the body is pale yellowish green, with rather large honey-yellow warts. The 1st and 8th abdominal segments are deep cherry-red, while the sides of the 2d to 7th segments above the legs are the same color. On the 1st and 8th segments is a pair of dorsal cherry-red tubercles, those on the 1st somewhat larger than those on the 8th segment; those on segments 2 to 7 are small, of nearly uniform size, and concolorous with the greenish yellow segments. The end of the body, including the anal legs and the 9th and 10th segments, is upheld as usual in the genus. The thoracic and first four pairs of abdominal legs are dark. The anal legs smaller than those in front and are pale, being of the same color as the end of the body. The glandular hairs are distinctly seen to be bulbous at the tip, and long and unequal in length; the two longest ones, *i. e.* those on the prothoracic segment being about three times as long as the body is thick.

Compared with the larva of *S. ipomœa* of the same stage, the two dorsal warts on the prothoracic segment appear to be a little smaller. The glandular hairs seen under a $\frac{1}{2}$ inch objective, are of the same length, and general shape as in *S. ipomœa*, but do not appear to be quite so bulbous.

Within the egg the larva lies with the front of the head next

the top of the dome, so that the jaws are opposite the upper side, hence when it eats its way out of the shell, the more or less bean-shaped opening is on one side rather high up, near the summit.

Fully-fed larva.—In Maine, at Brunswick, the caterpillar occurred fully fed on the beech and also on the hornbeam, during the first week in September.

This species is of the color of a dry, sere leaf, with no green upon the body, and is thus readily separated from *S. ipomeæ*; besides the body is thicker; it bears a striking resemblance to a part of a dead leaf, and several leaves were noticed with portions partly cut off and somewhat curled up, to which the caterpillars bore a striking resemblance, both in shape and color.

It was observed that the high dorsal tubercle on the first abdominal segment is both nutant and slightly retractile, being invaginated when irritated.

The larvæ also occurred at Providence, R. I., through September on the chestnut.

It is also figured in Ms. by Major Leconte as living in Georgia.

For descriptions of stages II and III drawn up from alcoholic specimens, see my paper in Proc. Boston Soc. Nat. Hist., Vol. XXIV, p. 539, 1890.

Length, 25–30 mm. The body is compressed as usual. The head is somewhat notched above, large and high, compressed, clay-yellow, with two broad dark bands in front, which are made up of irregular wavy dark lines and spots. The labrum is carneau. A pair of minute piliferous tubercles on the back of the 3d thoracic segment. On the 1st abdominal is a large high fleshy cylindrical nutant tubercle of the same yellowish color as the body; it nods back and forth freely as the creature walks; it bears a pair of cylindrical chitinous piliferous tubercles with bases rather wide apart, and which are reddish black at base, and pale at the tips. On the 5th abdominal segment is a large broad fleshy hump, concolorous with the body, from which arise two low conical nutant fleshy tubercles, each bearing a low chitinous piliferous tubercle. (This hump with its tubercles are not developed in *S. unicornis*). The 8th abdominal segment is provided with a prominent narrow fleshy hump bearing two small piliferous warts. The anal legs are about one-half as thick as the middle abdominal legs.

The body is uniformly the color of pale unburnt or Philadelphia brick, or of the same tint as a sere, pale brown leaf, *with no green upon it*. There is a broad dorsal dark brown stripe along

the thoracic segments, which is continued upon the base of the head, which bears a broad triangular dark spot. Behind the 1st abdominal hump is a long triangular flesh-colored dorsal band; on the 3d abdominal segment is a shorter similar patch, while a similar carneous band on the 4th segment breaks up into three diverging stripes ending at the suture. The V-shaped dorsal spot on the 6th and 7th segments is faded pink edged with clay-yellow, and dark brown. Along the abdominal segments is a narrow dark supraspiracular line. The thoracic and abdominal legs are, like the body, pale, with reddish lines.

The apparent aim or rather the result of the action of the environment has been to produce a caterpillar whose shape and color represent a sere, brown, more or less twisted portion of a serrated leaf such as that of a beech, hornbeam and similar trees.

It differs from any other species known to me in lacking any green color on the thoracic or other segments of the body.

Hyparpax aurora *Abbot and Smith.*

The young were reared from eggs kindly sent me June 26, by Miss Emily L. Morton of New Windsor, N. Y.

Larva, stage 1.—Length, 2.5 mm. The head is very large and broad, about twice as wide as the rather slender body, and dull honey-yellow or chitinous in color; with a few long light hairs in front near the vertex. On the prothoracic segment are two rather large acute conical dorsal tubercles, of the same color as the head, and larger than those on the 1st or 8th abdominal segments, though all the dorsal tubercles on the body are unusually large, larger in proportion than in the 1st stage of *Schizura*; those on the 2d and 3d thoracic segments are well developed, but considerably smaller than those in front. Those on the 1st abdominal segment are situated close together, while those on the 1st thoracic segment are rather wide apart. The two on the 8th abdominal segment are not quite so large as those on the 1st abdominal segment. The glandular hairs arising from these tubercles and those on the side of the body are long, varying in length, and distinctly bulbous at the end, those on the thoracic and posterior thoracic segments being longer than those in the middle of the body, or in the allied genus *Schizura*.

The body above pale yellow, with a greenish tinge, the sides of the body being cherry-red. The 1st, 3d, and 8th abdominal segments are cherry-red all around including the tubercles, so that the body is thrice ringed with red. All the dorsal abdominal

tubercles are quite large, those on the 1st and 8th segments scarcely larger than those on the other segments. The end of the body is uplifted both when walking and at rest. All the abdominal legs are reddish, and the thoracic legs are dark.

Stage II.—Just molted, July, 1891. Evidently delayed in its growth. Length, 6 mm. Head moderately large, (now wider than the body, as the larva has not begun to feed); it narrows slightly above, and bears on the vertex *two piliferous warts which are somewhat larger than those below on the face*, of which there are five, rather large conical warts, arranged in two rows, each bearing a bulbous tipped glandular hair; the head is pale sere brown (burnt sienna), with six whitish spots arranged in two vertical rows. The clypeus and labrum are whitish. The 1st thoracic, 1st, 3d and 8th abdominal segments each bear two large high dorsal warts, which are dark at the tips; they are flanked by subdorsal and lateral warts which are but a little smaller; the dorsal ones in question are much larger and higher than those on the other segments, and the segments themselves are dull pale cherry red. Thoracic segments 2-3 and abdominal segments 2, 4, 7, 9 and 10, together with the tubercles, are bright yellow. The legs are all pale, though the anal ones are darker and redder. The glandular hairs are still bulbous in this stage, rather short and even; those on the 1st thoracic and 1st, 3d and 8th abdominal segments being longer than those elsewhere.

These hairs are seen under a $\frac{1}{2}$ inch objective to be unusually large, distinctly flattened at the end, which is broad and square the tips being flattened and transparent. In a few of the hairs the expanded tip appears to be ragged and broken, or toothed, and in one case deeply forked.

I have not yet seen the fully fed larva, and we need a detailed description of it, as compared with the final stage of *Schizura* and *Janassa*. A figure, by Miss Morton, of the final stage is to be found in *Forest Insects* Pl. III, figs. 6, 6a.

The descriptions of the following stages are drawn up from Mr. Bridgham's excellent colored figures, those of the two earlier stages having been compared with my descriptions and found to be accurate in form and color. His examples of stage I (from eggs I sent him) were drawn July 3-7, of stage II, July 12; of stage III, July 18, stage IV, July 23; stage V, and last, July 28.

Stage III.—Length, 20 mm. The head is somewhat angular, spotted with whitish *and the tubercles are larger than before*. The body has more of a lilac tint, and the tubercles which were yellow

in the previous stage are now *still deeper yellow, tinged with white rendering them more conspicuous*; a distinct lateral stigmatal line extends along 8th and 9th segments, and along the edge of the suranal plate. The end of the body is raised high up; *there is no green on the body.*

Stage IV.—Length, 25 mm. In the greater thickness, and shape of the body as well as the bright green color the larva of this stage closely resembles the caterpillar in its final stage. The head is now smoother, *the tubercles smaller*, and the dorsal tubercles on the three thoracic segments, as well as those on the 2d to 7th abdominal segments are smaller than before, *while those on the 1st and 8th abdominal segments are now larger than before, and very prominent.* The body is now of a *deep delicate pea-green, with a large reddish brown triangular patch extending from the prothoracic segment next to the head, and ending at the anterior base of the tubercles on the 1st abdominal segment. Behind the said tubercles a broad reddish brown patch extends to the large tubercles on the eighth segment, the band being edged with whitish yellow; from the rear of the tubercle a similar-colored band extends to the end of the suranal plate.* The under side of the body in front, and the middle abdominal legs are brownish.

Stage V.—Length, 35 mm. In shape and coloration just as in stage IV, but the head is a little darker, and *the back of the larva between the two great abdominal tubercles and also behind the last tubercles on 8th segment, is green, not reddish brown, and this area is edged with irregular reddish thread lines on a white field.* Also a lateral infrastigmatal line is present along the end of the body. In Miss Morton's figure of this larva copied in my *Forest Insects* (Pl. III; fig. 6, 6a.) the larva has the same style of coloration.

Heterocampa unicolor Pack.

The eggs were received from Mr. Tallant of Columbus, Ohio, Aug. 21, having been sent on the 18th, all hatching on the way.

Larva, stage I.—Freshly hatched larva. Length including the tails (stemapoda) 6–7 mm. The head is almost as wide as the body, somewhat heart-shaped, bilobed, dark chestnut, paler along the middle. The body is long and slender, especially elongated behind the 8th abdominal segment. The prothoracic segment in all the examples is full, as if it were about to molt, though it seems too soon after hatching. The prothoracic segment bears two diverging, rather thick appendages, which are cylindrical and rounded at tip; the segment at base and behind pale reddish, and cherry-red

above; the appendages are cherry-red at base, paler above, but towards the end on the distal two-thirds blackish. In front are two reddish parallel stripes. The body is pale beneath, above pale greenish yellow, the 3d and 7th abdominal segments cherry-red, including the sides, low down, of the 6th segment. From the 1st thoracic to the end of the body are three parallel lateral, linear, reddish lines, the lowermost being obsolete posteriorly. The 8th abdominal segment is convex above, but not humped. The suranal plate is small, narrow, but distinct, rough on the surface and dark, almost blackish. Behind, at the base of the tails are two piliferous warts; the tails themselves are as long as the three last segments (8-10) taken together, and are of uniform thickness, ringed with dark red, sparsely setiferous, with two or three hairs at the end; they each end in a cylindrical swollen flagellum at each end, somewhat barrel-shaped, with a deep red ring in the middle, the end being clear and transparent. All over the body the piliferous warts and hairs are minute.

It rests with the body curved around so that the head nearly touches the tails, the last three segments and tails being held up in the air, or extended and then gracefully thrown into the air.

ANOTHER LEAF-MINER OF POPULUS.

By C. H. TYLER TOWNSEND.

In the picturesque little cañon called Cañada Alamosa, which runs several miles northwest from the town of the same name, in Sierra County, N. Mex., and opens out on the plain at Ojo, Caliente, there grows a species of cottonwood with a narrow and smaller leaf than that of *P. fremontei*. The latter is the only species found in the bottom lands of the Rio Grande in the southern part of New Mexico. This narrower leafed species is *P. angustifolia*. It also grows in the region of the Mimbres river, in Grant County, N. Mex., or a species very like it, and seems to inhabit valleys of streams in the somewhat higher region to the west of the Rio Grande valley.

Trees of this species in the Cañada Alamosa were found, June 17, 1892, to be infested with a small leaf-miner, much smaller than the leaf-miner of *P. fremontei* described from the Mesilla valley of the Rio Grande (*Zoe*, Vol. III, pp. 234-236, Oct. 1892), which by the way is a sawfly and not a tineid as at first suggested. The mine,

also, of this miner of *P. angustifolia* is on the underside of the leaf, and is not visible from the upper side, this leaf-miner may also be a tenthredinid, or on the other hand it may be a tineid.

Description of miner.—Length, 4 to 5 mm. Color white, with a line of blackish spots, occupying central portion of segments 4 to 12 ventrally, and 6 to 12 dorsally. Fleshy, head slightly corneous; each segment with several quite long bristly hairs, four to six or more dorsally. Head subangularly produced laterally, somewhat tapered anteriorly, wider posteriorly. Eyes represented by four black dot-like tubercles, three being nearly in a row parallel with lateral edge of head, and the other outside of and slightly posterior to the first or anterior one. Jaws rather strong, subquadrate, nearly as wide at base as long, a little narrower at tip, with three or four teeth on apical terminal edge. Antennæ small, conical, apparently 2-jointed, basal joint stouter. Maxillæ not definitely made out, but apparently 2-jointed with 2-jointed palpi. Three thoracic segments widest, one-half wider than head; segments 5 to 10 nearly equal in width, narrower than thoracic segments; 11 to 13 still narrower. All the segments nearly same length. Three pairs of well developed, 4-jointed thoracic legs; three basal joints about same length and basal one hardly thicker than following two, fourth very small.

Described from two specimens. A third specimen, which is apparently at a moulting stage, shows none of the black dorsal and ventral spots. Cañada Alamosa, June 17.

NOTE ON A NEW ANTLION ALLIED TO MYRMELEON BLANDUS (*HAGÉN*).

BY C. H. TYLER TOWNSEND.

On April 9, 1892, a few hours before sundown, while driving toward Las Cruces over the mesa from Organ, there were noticed for several miles hundreds of a neuropterous insect flying about the shrubs, particularly of *Ephedra nevadense*, which grew numerously on this part of the mesa. They were first noticed at a point about five miles to the east of Las Cruces, being on the lower sandy portion of the mesa. They occurred in companies, in small numbers, and even singly. The weather was clear, sunny, and quite warm, and had been so all day. There was not much wind.

Specimens of the insects were caught on the Ephedra bushes, and on being sent to Philadelphia, were reported with a query as *Myrmeleon blandus* Hagen.

Upon careful comparison, however, with Hagen's description of *M. blandus*, given in his Synopsis of Neuroptera, p. 235, I am convinced that it is quite distinct from it. Neither does it belong to any other of the 25 species of *Myrmeleon* described in that work. It differs as follows from Hagen's description of *M. blandus*:

Myrmeleon, n. sp. Length, from head to tip of wing, 20 mm. Pale yellowish, varied with blackish or brownish. The last joint of the palpi is fuscous or blackish, and so are the other joints more or less. No trifold black spot between the antennæ; instead there is at base of each antenna, anteriorly and a little inwardly, an elongate somewhat crescentic blackish spot, the two converging posteriorly between the antennæ but not coalescing. The vertex (or rather the front) bears a blackish marking anteriorly on the median portion; immediately behind and more or less coalescent with this is a narrow transverse blackish marking; posterior to the latter is a heavier transverse blackish marking broadly interrupted in the middle, and immediately behind the inner end of each lateral section of this is a blackish spot more or less coalescent with it, and posteriorly elongated in one specimen. The antennæ are almost entirely blackish, very narrowly and almost unnoticeably annulated with yellowish. The median pair of prothoracic stripes is exteriorly excised at anterior end, as described for *M. blandus*; the lateral stripes are shorter than the median, and below each lateral stripe there is another narrower blackish one, all the above on proscutum, with a short blackish one still lower on ventral aspect posteriorly. Mesoscutum with blackish lines and markings, and six small round black spots, two spots on each side just inside base of anterior wings, and two on posterior median sclerite. Abdomen is clothed with blackish hairs, appearing whitish in some lights; color is blackish, with about nine yellowish transverse spots on tergum more or less interrupted in middle, not including two narrow less noticeable bands on base of abdomen; the third, and less broadly the fifth, sometimes also narrowly the seventh, of these yellowish spots are continued uninterruptedly on venter, which is otherwise blackish, but for two basal bands which also show ventrally. The third, fifth, and seventh yellowish spots just mentioned mark the posterior margins of consecutive abdominal segments. The next to the last abdominal segment bears also a pair of faint yellowish median spots. Femora are brownish, shading into yellowish; tibiæ yellowish, more or less distinctly twice banded with brownish. Wing veins yellow and black interrupted.

Described from two specimens. *M. blandus* was described from the Pecos river, in western Texas. Since writing the foregoing, I notice that Mr. Nathan Banks refers *M. blandus* to the genus *Brachynemurus* Hagen. (See Trans. Am. Ent. Soc., Vol. XIX, p. 361). If this reference is sustained, the present species should be referred to that genus.

A NYCTERIBID FROM A NEW MEXICO BAT.

By C. H. TYLER TOWNSEND.

The following Nycteribid was taken from the breast of a bat caught in Las Cruces, N. Mex., Oct. 5, 1891. It proves to belong to the genus *Nycteribia* in the restricted sense.

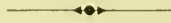
Osten Sacken says, in the 1878 edition of his catalogue, that no North American species of *Nycteribia* had up to that time been described, but that the Museum of Comparative Zoology in Cambridge possessed a specimen of this genus from California. Since 1878, Mr. Bigot has described a species from Mexico, which he called *N. mexicana* (Ann. Soc. Ent. Fr. 1885, p. 245). I am unaware that any other North American species has been described. The present form is distinct from Mr. Bigot's species, and may be recognized by the following description. The species of bat upon which it was found has been determined by Dr. C. Hart Merriam as *Antrozous fallidus*. Dr. Merriam writes that the type of this bat "came from El Paso, Texas, whence the species ranges west to California."

Nycteribia antrozoi n. sp.

Brownish yellow, legs paler; claws black, bristles reddish brown. Whole body, both ventrally and dorsally, and legs more or less covered with short bristle hairs, also some longer bristles. Head thrown back, the distal oral region bearing a group of short hairs and two long ones. The pair of long hairs appears to arise from the palpi, one from each palpus, and they are hardly three times as long as the longest of the other hairs on the oral margin. Thorax broad; its ventral aspect wide, flat, abruptly sloped off posteriorly, very evenly rounded anteriorly, with a longitudinal median suture; a lateral diagonal suture running posteriorly outward at an angle of 45 degrees from the median suture, starting from latter a short distance from anterior margin. Abdomen broad at base, tapering to a rather truncate apex, composed apparently of four segments, the anal segment much the longest and rather triangular in shape. Dorsum of next to last segment quite circular on hind border; the posterior border of each segment fringed with short bristles, the second and third segments also with some stronger and longer marginal bristles approaching macrochætæ on each side of middle. Last segment with three or four marginal bristles of equal length on each side, but without any longer bristles, the longest shorter than the bristles on margin of third segment. Ventral aspect of abdomen different from dorsal; a compact even transverse row of short strong posteriorly appressed black spines at base of venter; segments two and three with marginal bristles, but not long ones. There is an anal pair of elongate chitinous bristly appendages, which are bent forward beneath the abdomen to which they are closely appressed, extending beyond posterior margin of third segment, tapering to tips which are black. Legs of about equal length; the

femora clothed with short bristly hairs, those on tibiæ stronger and longer, the tibiæ also each with four to six stronger long bristles or macrochætæ. Tarsi almost bare, with only short hairs on upper edge, slightly bowed but strongly curved or bent outward just before tip, the latter with some short bristles; claws 2-toothed. Length 1.6 mm.; width of thorax, 1 mm.

Described from one specimen. This species differs from *N. mexicana* Big. as follows: It does not possess the two elongate bristles at end of abdomen, the anterior femora are not bare above, and the intermediate and posterior femora do not possess a preapical bristle or macrochæta.



ON THE FOOD-HABITS OF NORTH AMERICAN RHYNCHOPHORA.

By WM. BEUTENMULLER.

Continued from page 43.

***Anthonomus suturalis* Lec.**—Attacks the Cranberry, laying its eggs in the bud, and the larva living inside the fruit.

***Anthonomus sycophanta* Walsh.**—Was bred by the late B. D. Walsh from the gall of a saw-fly on Willow.

***Anthonomus musculus* Say.**—Is destructive to the Strawberry. Taken on Huckleberry by Dr. Hamilton.

***Anthonomus pusillus* Lec.**—Lives in the seeds of the Frost-weed (*Helianthemum canadense*). (Blanchard, Ent. Am., Vol. III, p. 87).

***Anthonomus gularis* Lec.**—Oviposits in the flowers of *Cassia marylandica*. (Schwarz, Bull. Brooklyn, Ent. Soc., Vol. VII, p. 84).

***Anthonomus flavicornis* Boh.**—Was found by Mr. Schwarz, inquilinous in a globular acarid gall on the leaves of *Solanum elæagnifolia*.

***Anthonomus decipiens* Lec.**—Beaten abundantly from Thorn (*Cratægus*), by Dr. Hamilton.

***Anthonomus cratægi* Walsh.**—Beaten from Wild Cherry, etc. (Dr. Hamilton).

***Anthonomus incipiens* Dietz.**—Beaten in multitudes from Laurel (*Kalmia angustifolia*) just out of bloom. (Dr. Hamilton).

***Anthonomus profundus* Lec.**—Develops within the fruit of Thorn (*Cratægus Crus-galli*); the imago appearing in July.

(Schwarz, Proc. Ent. Soc., Wash., Vol., p. 232). *A. mixtus* Lec., is abundant on the same plant according to Dr. Hamilton.

Anthonomus corvulus Lec.—Is found upon the flowers of Dogwood (*Cornus*) in May. (Harrington, Can. Ent., Vol. xxiii, p. 24).

Orchestes niger Horn and **O. subhirtus** Horn.—Both found on Willow when in bloom. (Harrington, Can. Ent., Vol. xvi, p. 119). *O. pallicornis* Say, *O. rufipes* and *O. ephippiatus*, also occur on Willow. *O. betuleti* Horn, is found on Birch (*Betula nigra*). (Schwarz, Proc. Ent. Soc., Wash., Vol. 1, p. 11).

Elleschus ephippiatus Say.—Was bred by Mr. Walsh from the gall of *Cecidomyia brassicoides* found on Willow.

Elleschus bipunctatus Linn.—Beaten from a small upland Willow, and also from Poplar (*Populus tremuloides*) by Dr. Hamilton.

Macrorhoptus estriatus Lec.—Breeds in the seeds of *Callirhoe involucrata*. (Popenoe, Trans. Kans. Ac. Sc. Vol. v, p. 39).

Piazorhinus pictus Lec., and **P. scutellaris** Say.—Beaten from Oak, etc., (Hamilton). The latter species was also found on Hickory by Mr. Harrington (Can. Ent., Vol. xxiii, p. 25).

Thysanocnemis fraxini Lec.—Collected on Ash trees by Mr. Pettit in Canada. (Leconte, Rhyn. N. Am., p. 214).

Plocetes ulmi Lec.—Found on Elm by Dr. Riley. (Leconte, Rhyn. N. Am., p. 214).

Cionus scrophulariæ Linn.—Attacks the fruit of the Plum, feeding in the kernel. In Europe it is said to be found on *Scrophularia* and *Verbascum*.

Miarus hispidulus Lec.—Has been observed to breed in seed capsules of *Lobelia inflata*. (Blanchard, Ent. Am., Vol. ii., p. 87).

Gymnetron teter Fabr.—Found in abundance on the stalks of the Mullen (*Verbascum thapsus*). The larva lives in the seed pod.

Notolomus bicolor Lec. and **N. basalis** Lec.—Found on Palmetto blossoms, etc. *N. Myricæ* Lec, occurs on a species of Myrtle in Florida. (Schwarz, Proc. Am. Phil. Soc., Vol. xviii, p. 466).

Læmosaccus plagiatus *Fab.*—Is found on Oak (Leconte, Rhyn. N. Am., p. 223). Also beaten from Oak by Dr. Hamilton.

Conotrachelus similis *Boh.*—The imago appear in numbers on *Bumelia lanuginosa*, when the tree is in bloom. (Schwarz, Proc. Ent. Soc. Wash. Vol. 1, p. 232).

Conotrachelus ventralis *Lec.*—Found exclusively on *Persca carolinensis* and have strong evidence that the larva is inquiline in the galls of a Psyllid, *Trioza magnolie*. (Schwarz, Proc. Ent. Soc. Wash., Vol. 1, p. 233).

Conotrachelus posticatus *Boh.*—Has been observed to live within Homopterous (*Phylloxera*) galls, by Mr. Schwarz (Proc. Ent. Soc. Wash., Vol. 1, p. 233). Dr. Hamilton informs me that he raised this species from the fruit of Thorn (*Cratægus*).

Conotrachelus elegans *Say.*—Dr. Packard, observed this insect laying its eggs in the partly rolled up leaves of the Pig-nut Hickory and cutting off the leaves during the process. (5th, Rep. U. S. Ent. Com., p. 316). Beaten from Hickory, in the leaves of which the larvæ live. (Hamilton).

Conotrachelus nivosus *Lec.*—Abundant on *Euphorbia corralata*. (Popenoe Trans. Kans. Ac. Sc., Vol. v, p. 39).

Conotrachelus retentus *Say.*—Beaten from Red Oak sprouts by Dr. Hamilton.

Conotrachelus cratægi *Walsh.*—Lives in the fruit of *Cratægus* as well as that of the Plum.

Conotrachelus nenuphar *Hbst.*—Is destructive to the Apple, Apricot, Cherry, Peach, Pear and Quince. The larvæ live in the fruit.

Conotrachelus anaglypticus *Say.*—According to Say, breeds in the fruit of the Walnut (Leconte, Edit., Vol. 1, p. 283). *C. juglandis* *Lec.*, also inhabits Walnuts.

Rhyssomatus lineaticollis *Say.* Infests the seed-pods of the milk-weed.

Chalcodermus æneus *Boh.*—Infests the seed-pods of a species of *Dolichos*.

Pseudomus sedentarius *Say.*—Found on dead vines in Florida. (Schwarz, Proc. Am. Phil. Soc., Vol. xviii, p. 466).

Tyloderma fragariæ *Riley*.—Lives on the Strawberry, excavating the crown and roots of the plant. (Riley).

Tyloderma foveolatum *Say*.—Bores in the stems of Evening Primrose (*Oenothera biennis*). Also bred from *Epilobium* by Dr. C. M. Weed.

Cryptorhynchus parochus *Hbst.*—Lives under the bark of Butternut. (Schaupp, Bull. Brooklyn Ent. Soc., Vol. iv, p. 35).

Cryptorhynchus lapathi *Linn.*—Found on Willow and Alder. The larvæ live in the trunks and stems of these plants.

Cryptorhynchus ferratus *Say*.—Can be obtained from Oak, Chestnut, and various other trees. In Florida it infests the branches of *Persea carolinensis* and is never met with on Oak. (Schwarz, Proc. Ent. Soc. Wash., Vol. 1, p. 233).

Cryptorhynchus brachialis *Lec.*—Breeds in the twigs of *Bumelia lanuginosa*. (Schwarz).

Cryptorhynchus tristis *Lec.*—Develops under the bark of Oak (*Q. coccinea*). The beetle feeds on the leaves, but is strictly nocturnal, hiding during day time in the ground at the base of the tree. (Schwarz, Proc. Ent. Soc. Wash., Vol. 1, p. 233).

Cryptorhynchus fallax *Lec.*—Bred from Hickory limbs, dead two years. September. (Hamilton).

Cryptorhynchus helvus *Lec.*—Found on dead vines in Florida. (Schwarz, Proc. Am. Phil. Soc., Vol. xviii, p. 466).

Cryptorhynchus obliquus *Say*.—Breeds in Hickory branches. (Schwarz, Proc. Ent. Soc. Wash., Vol. 1, p. 233).

Cryptorhynchus bisignatus *Say*.—Found by Dr. Packard on the leaves of the Oak. (5th, Rep. U. S. Ent. Com., p. 204). Also found on a chestnut log by Mr. Chittenden.

Copturus binotatus *Lec.*—Is said by Mr. Schwarz to be confined to the Honey-locust. (Proc. Ent. Soc. Wash., Vol. 1, p. 233.) Dr. Hamilton writes me that it is rare on Oak. *C. quercus* also occurs on Oak.

Acoptus suturalis *Lec.*—Taken in copulation on Hickory stumps. (Harrington, Can. Ent., Vol. xxiii, p. 25). Infests the branches of the Hornbeam (*Carpinus*). (Schwarz, Insect Life, Vol. iii, p. 87). Also lives in dead wood of Beech trees (Chittenden).

Craponius inæqualis Say.—Is injurious to the Grape, stinging the fruit and sometimes destroying the whole bunch.

Cæliodes acephalus Say.—Lives on *Polygonum*, especially on *P. hydropiper*. (Hamilton).

Cæliodes flavicaudis Boh.—According to Mr. Chittenden, occurs in abundance on the common nettle. (*Urtica dioica*).

Tachygonus lecontei Gyll.—Is found on the leaves of young Oaks, as observed by Mr. Zimmermann. *T. centralis* Lec., is found in Colorado on *Rhus aromaticum*. (Leconte, Rhyn. N. Am. p. 266).

Pelenomus sulcicollis Fabr.—Beaten abundantly from *Polygonum* in low grounds by Dr. Hamilton.

Rhinoncus pyrrophus Lec.—A pair of these little beetles were taken by Mr. F. H. Chittenden *in coitu* on a common species of Dock (*Rumex*), and being confined in a small vial with a part of a Dock leaf consumed it almost entirely within a week. The species has also been observed by Mr. M. L. Linell on a species of *Rumex* in June. Dr. J. Hamilton informs me that it lives abundantly on *Polygonum*. Prof. Popenoe also records it as also living on this plant. (Trans. Kans. Ac. Sc., Vol. v, p. 39). *R. longulus* Lec., according to Dr. Hamilton, is very abundant on *Polygonum*, eating round holes in the leaves.

Ceutorhynchus napi Gyll.—Was bred from the stalks of Wild Pepper-grass by Miss Mary Murtfeldt, who also described the earlier stages of this species. (Rep. Dept. Agricult., 1888, p. 136).

Ceutorhynchus cyanipennis Germ.—According to Mr. Jülich this species is said to be found on Grass. (Ent. Am., Vol. v, p. 57). In Europe it lives in the roots of Cabbage.

Ceutorhynchus assimilis Payk.—Infests the Radish. *C. rape* Gyll. Lives on the Rape and *C. septentrionalis* Gyll. is found on the Mustard (*Sisymbrium officinale*).

Baris interstitialis Say.—Found on flowers of Thistle in Florida (Schwarz, Proc. Am. Phil. Soc., Vol. xviii, p. 467.) Found on Yarrow by Mr. Jülich. (Cat. Ins., N. J., p. 262).

Baris confinis Lec.—Bred from the stems of a species of *Bidens* by Dr. C. M. Weed.

Trichobaris trinotata Say.—Bores in the stalk of the Potato, causing the stem to wilt.

Pseudobaris farcta Lec.—Found on *Salvia pitcheri*. (Popenoe, Trans. Kan. Ac. Sc., Vol. v, p. 39).

Pseudobaris nigrina Say.—Found on Golden-rod. (Jülich, Cat. Ins. N. J., p. 262).

Phytobius velatus Beck.—Lives in the larval state on maritime plants, coming ashore in the mature stage to hibernate.

Onychobaris rugicollis Lec. Found on Milk-weed. (Jülich, Cat. Ins. N. J., p. 262).

Aulobaris ibis Lec.—Taken on the blossoms of Thistle by Mr. C. Dury.

Ampelogypter sesostris Lec.—Makes a gall on the Grape-vine, as also does *A. ater* Lec. (Riley, Bull. Brooklyn Ent. Soc. Vol. vi, p. 61). *A. ater* was bred from the stems of *Ampelopsis* by Dr. Hamilton.

Madarus undulatus Say.—Bred from the stem of *Ampelopsis* by Dr. Hamilton.

Pachybaris porosus Lec.—Found exclusively on Palmetto blossoms in Florida. (Schwarz, Proc. Am. Phil. Soc. Vol. xviii, p. 467).

Centrinus scutellum-album Say.—I have found this beetle in abundance on the flower head of the Daisy.

Centrinus picumnus Hbst.—Infests the stems of the Bottle-grass. (*Setaria glauca*). (Webster, Insect Life, Vol. i, p. 374).

Centrinus lineicollis Lec.—The beetle feeds in June and July on the flowers of *Ceanothus americanus*. (Hamilton).

Centrinus prolixus Lec.—Occurs in the imago state upon Sedges and aquatic plants. (Harrington, Can. Ent., Vol. xxiii, p. 26).

Centrinus rectirostris Lec.—May be found in wet places on Club-rush (*Scirpus eriophorum*), in the stems of which the larva lives. (Harrington, Can. Ent., Vol. xxiii, p. 25). Also taken by Mr. C. Tunison and myself on this plant.

Euchætes echidna Lec.—The beetle has been found running on dead Beech trees near Cincinnati, O., by Mr. C. Dury.

Plocamus hispidulus Lec.—Breeds in the dead branches of

the common Locust, infested with *Agrius* larvæ. (Schwarz, Proc. Ent. Soc. Wash., Vol. 1, p. 233).

Balaninus quercus Horn, **B. nasicus** Say, and **B. uniformis** Lec.—Were bred from different kinds of acorns. *B. obtusus* Blanch, inhabits Hazel-nuts. *B. caryæ* Horn, lives in hickory-nuts. *B. proboscideus* and *B. rectus* were bred from chestnuts. The latter species also inhabits acorns. (Hamilton, Can. Ent., Vol. xxii, pp. 1-6).

Cylas formicarius Fab.—Bores in the roots of the Sweet-potato in Florida. (Comstock, Rep. Dept. Agricul. 1879, p. 250).

Eupsalis minuta Dr.—Bores under the bark of Chestnut Oak and Maple.

Sphenophorus.—The different species of this genus as far as known, infest the roots or lower parts of the stems of various wild and cultivated *Graminaceous* plants in their earlier stages. (See Forbes, 5th, Rep. Nox. Ins. Illinois, pp. 58-74).

Rhodobænus tredecimpunctatus Ill.—I have found this insect on Evening Primrose. Mr. F. M. Webster found it burrowing in the pith of the common garden Sunflower. (Insect Life, Vol. 1, p. 382). Also found on *Vernonia* by Prof. Popenoe. (Trans. Kans. Ac. Sc., Vol. v, p. 39).

Rhynchophorus cruentatus Fab.—Lives in the lower parts of the trunk and roots of the Palmetto. I have taken over a hundred individuals at Enterprise Florida, in May. The beetles were caught boring in the soft pulpy substance in the trunk of a young and freshly cut Palmetto tree. *R. palmarum* L. also lives in the Palmetto.

Cactophagus validus Lec.—Has been found exclusively under decaying *Opuntia* leaves, the larva no doubt living within the leaves or roots of the same plant. (Insect Life, Vol. 1, p. 199).

Calandra oryzae Linn. and **C. granaria** Linn.—Both these depredate upon stored wheat, rice, corn and other grains. *Calandra remotepunctata* Gyll., lives in grain in storage in multitudes, it is often called *C. granaria*, which rarely occurs in North America (Hamilton).

Yuccaborus and **Scyphophorus**.—Both these genera infest plants of the genus *Yucca*. (Insect Life, Vol. 1, p. 199).

Dryotribus, **Gonototus**, **Macrancylus** and **Elassoptes**.

These genera are strictly maritime, and live in larva and imago states in old boards and roots, etc., washed up on the beach (Insect Life, Vol. 1, p. 199).

Himatium conicum Lec.—Breeds within the bark of the Tulip-tree. (Schwarz, Proc. Ent. Soc. Wash., Vol. 1, p. 233). *H. errans* Lec., is inquilinous in the galleries of *Tomicus cacographus* under bark of yellow Pine. (Schwarz, Bull. Brooklyn Ent. Soc., Vol. VII, p. 84).

Cossonus corticola Say, **C. piniphilus**, **C. concinnus**, and **C. crenatus**.—Live under the bark of Pine trees. *C. platidea*, breeds abundantly under the bark of Butternut (Hamilton). Has also been found under bark of a partly decayed Poplar tree by Mr. Harrington. (Ent. Am., Vol. 1, p. 19).

Allomimus, **Caulophilus**, **Amaurorhinus** and **Rhyncholus**.—These genera live under bark of dead and decaying wood of deciduous or coniferous trees. (Insect Life, Vol. 1, p. 198).

Dryophthorus corticalis Say.—Was found by Mr. J. D. Sherman under bark of Pine. (*Pinus rigida*).

Stenomimus pallidus Boh.—Breeds in wounded places on living Hickory trees. (Hamilton).

Phlæophagus apionides Horn.—Lives in the trunks of Wild Cherry (*Prunus serotina*) and Ash. *P. minor* Horn, was found on Birch, Willow, and Elm by Mr. Chittenden; also taken on Ash by Mr. Jülich, who found the European *P. spadix* in water-soaked drift wood at the sea-shore of Long Island.

Wollastonia quercicola Boh.—Lives in decaying wood of Cottonwood. (Knaus, Bull. Brooklyn, Ent. Soc., Vol. VII, p. 150).

Stenoscelis brevis Boh.—Has been taken from old Maple and Poplar stumps by Mr. Harrington. (Ent. Am., Vol. 1, p. 19).

Rhyncholus brunneus Mann.—Has been found in wood of Wild Cherry (*Prunus serotina*) by Mr. F. H. Chittenden. *R. angularis* Lec., was found under the bark of Willow. (Leconte, Proc. Ac. Nat. Sc. Phil., 1858, p. 81).

Eurymycter fasciatus Oliv.—Found on fungus growing on dead Beech trees by Mr. C. Dury.

Hormiscus saltator Lec.—Taken on dead branches of Osage-orange by Mr. C. Dury. *Eusphyrus walshii* Lec., also occurs on the dead branches of Osage-orange.

Phœnicobius chamæropis Lec.—Common on fresh cut Palmetto leaves in Florida. (Schwarz, Proc. Am. Phil. Soc., Vol. xviii, p. 469).

Piezocorynus dispar Gyll. and **P. mixtus** Lec.—Both feed in the imago state on fungus growing on the trunks of dead Beech trees. Have been taken in abundance by Mr. C. Dury near Cincinnati, Ohio.

Anthrribus cornutus Say.—Has been found in the imago state on the Honey-locust by Mr. C. Dury. It was raised from the stems of the Tamarix by Prof. E. A. Popenoe. (Bull. Agri. Exp. St. Kans. No. 3, 1888, p. 35).

Aræocerus fasciculatus De G.—Raised from the seed-pods of a large yellow flowering shrub belonging to the *Mimosaceæ*.

Choragus sayi Lec.—Found by Mr. Schwarz in the twigs of dead Beech trees, which were infested with fungus growth. (Bull. Brooklyn Ent. Soc., Vol. vii, p. 85).

Cratoparis lunatus Fabr.—Lives in fungus found on dead Oak trees.

Brachytarsus limbatus Say.—Was raised by Mr. Schwarz, from the flower heads of *Helenium tenuifolium*. He also obtained from the same plant *B. vestitus* Lec.

Brachytarsus variegatus Say.—Breeds in smut of Corn. (Schwarz, Bull. Brooklyn Ent. Soc., Vol. vii, p. 85).

Brachytarsus tomentosus Say.—Was found on Rag-weed (*Ambrosia*) by Dr. J. Hamilton. (Can. Ent., Vol. xviii, p. 114). Also taken on the same plant by Mr. J. D. Sherman.

Euxenus piceus Lec.—Found on dry Palmetto leaves in Florida, by Mr. Schwarz. (Bull. Brooklyn, Ent. Soc., Vol. vii, p. 85).



LOCAL ENTOMOLOGICAL NOTES.

Members of the New York Entomological Society and all others, are solicited to contribute to this column, their rare captures, local lists and other items of interest relating to the insect fauna of New York City and vicinity.

SOME NOTES ON THE RAVAGES OF THE WHITE ANT.

(*TERMES FLAVIPES*).

LOUIS H. JOUTEL.

The rapid increase, within a few years of the white ants (*Termes flavipes*) in the city of New York and especially Harlem which is now overrun with them, makes the fact of their present and future injury a very serious one, especially as their habits and lives while underground are so very little known, it having always been supposed that there was but one queen in each colony, while the fact is that their number varies in different colonies, having found as many as nine and another time fourteen laying and fertile queens living together in the same cell or gallery, this being I believe the first record of queens being found.

They, like many other insects are injurious or beneficial according to circumstances; when keeping to the woods which is their natural home, they do only good as living generally in dead and decaying wood, they help, with hosts of other insects, to clear the ground for a new growth; but, when they get in a city and begin to make sawdust of our homes, it is time to call a halt and try to find means to destroy them.

My observations as to the injury they do extends over a period of many years, and while somewhat limited as to area (having mostly taken place at or near my home) have been very thorough. The fact that they always work under cover helps to protect them and hides the mischief they do until too late to prevent it, and when discovered is generally attributed to some other cause.

A few examples of their ravages in my house will help to give you a general idea of the immense amount of damage and injury they are capable of doing in a city like ours, amounting to many thousands of dollars in the course of only one year.

When I moved into my present house, I found the frame work of the cellar windows all eaten away, only a thin shell composed of the paint and a few fibres of wood remaining, they had also begun to eat the sash when accidentally discovered. From

outside appearances the sash and frame were as substantial as when new, no trace of their ravages being visible.

Last year, having occasion to change the staging in my greenhouse, I found the posts measuring four inch square, and which were set on bricks to prevent the Termites from getting at them, were entirely hollowed in the middle leaving only a thin shell of wood on the outside, they had entered the bottom of the post by making a passage between the two bricks on which the post were set.

It is impossible in my garden to put a stake, board, posts, or wood of any kind, in or on the ground without having it eaten away by the Termites in the course of the summer, and those of my neighbors who have plank walks are obliged to renew them annually.

A frame house next door was sagging so much that the owner had to have it underpinned and raised with stone, it being found that the beams resting on the ground were rotten and "eaten by worms," but I believe that they were devoured by the white ants which annually swarmed in countless myriads from the structure.

I also observed last year in a cellar in the vicinity, the tunnels of the ants running in all directions along the walls, and ceilings, and the posts supporting the centre girder entirely honey-combed by them, and I have no doubt if they had been left at work another year or two, serious damage to the building would have resulted.

On three several occasions I have seen them issuing by millions during the swarming season from the cellars of several frame houses on Third Avenue, where, although I have not had the opportunity to examine their ravages, I have no doubt that they were considerable, as the buildings have settled so much that they have been repaired several times.

It is not alone to dead wood, whether sound or decaying, that they confine their operations, living plants and shrubs are just as liable to their attacks, and some kinds seem to be preferred to the decaying wood which is their natural food, such are geraniums of which they are very fond, eating everything but the outer skin and leaves which they leave intact. I had over twenty (20) standard geraniums from two to three feet high destroyed by them in one summer, as well as the stakes which supported them, red currants are also liable to their attacks, besides various other shrubs and plants, while the roots of grasses also serve them as articles of food.

NOTE ON THE CAPTURE OF BROTIS VULNERARIA.

BY RODRIGUES OTTOLENGUI.

It may be of interest for me to record the capture of the geometrid moth *Brotis vulneraria*. I captured a single male specimen in Prospect Park, Brooklyn, last July, and have just had it identified.

This insect was taken in Florida and named *floridensis* by Holland, the type being now in the collection of Dr. Hulst. As it is rather common in Mexico the discovery of a single specimen in Florida scarcely gave it a place in our list. Later, however, its capture was reported in Buffalo, and in Smith's check list Mr. Hulst has given it a place, adopting Hübner's nomenclature however, of which Holland's *floridensis* is undoubtedly a synonym. My capture emphasizes the correctness of including it in our list, although I believe thus far only males have been taken here.

It is rather a handsome insect, chocolate brown in color, except that an orange colored triangular blotch appears about the middle of the upper margin of the primaries. It expands one and five eighths inches.



LIST OF THE COLEOPTERA OF NORTH
EASTERN AMERICA,

WITH SPECIAL REFERENCE TO THE FAUNA OF NEW
YORK CITY AND VICINITY.

BY CHARLES W. LENG AND WM. BEUTENMULLER

In advance of a Hand-book of Coleoptera found in North Eastern America, the preparation of which is contemplated, we herewith desire to give a list of the species, as far as known to occur in the region just specified, with the hope that all interested in this undertaking, will inform us of any corrections and additions that they may be able to make, in order to have the list as complete as possible. The present list comprises the species found near New York, compiled from the MS. lists of Messrs. M. L. Linell, C. H. Roberts, J. B. Smith, C. W. Leng, Wm. T. Davis, O. Dietz, Wm. Beutenmuller and others; also the species named in the Cincinnati list of Mr. Charles Dury; the Buffalo list

of Messrs. Reinecke and Zesch; the New Jersey list of Prof. J. B. Smith; the Canadian lists of W. H. Harrington; J. Petit and W. Couper; also the species credited to the N. E. States and Canada in the synopses of Horn, Leconte, Crotch, Schaupp, Blanchard, Dietz, Smith, Jayne and Leng.

The territory included, of which a map will be published later, includes Canada, Nova Scotia, New Brunswick, Labrador, Newfoundland, Greenland, the New England States, the Middle States, Maryland, Delaware, Ohio, Indiana and Illinois; in short the country lying east of the Mississippi River and north of D. C., W. Va. and Kentucky. We have occasionally omitted a species said to be found on the southern limits of this territory, regarding it as a wanderer from our southern fauna.

CICINDELIDÆ.

CICINDELA *Linn.*

All the species of *Cicindela* are found running in the sunlight, usually in sandy fields or on the shores of ocean or rivers. A few species frequent sunny spots or roads in the woods and occasionally conceal themselves during the day under bark or among grass roots.

C. unipunctata *Fabr.*—N. Y., N. J., Pa., (also Mo., Ga.) Very rare near New York City, only a few examples have ever been taken; a single specimen was taken in Bronx Park last year, by Mr. C. Schaeffer—June.

C. longilabris *Say.*—N. Hampshire, Can., Nova Scotia, and northward, (also Colorado).

var. perviridis *Schp.*—Newfoundland (also Cal., Or., Utah).

C. scutellaris *var. rugifrons* *Dej.*—N. Y., Mass., R. I., Md. Occurs at Jamaica, L. I., and in Westchester Co. Not common. June and September.

var. modesta *Dej.*—N. Y., N. J., Pa. This species is double brooded in this vicinity. It is abundant but confined to a few scattered localities e. g. Greenville, N. J., Marion, N. J., Watchogue, S. I., and Richmond Valley, S. I. April, June, Sept., October.

C. sexguttata *Fab.*—N. E. Amer. Abundant and widely distributed. Common in this vicinity and frequents woods.

var. patruela *Dej.*—N. E. Amer. Occurs at Peekskill, N. Y., in woodpaths. Collected by J. D. Sherman. June, Sept.

var. consentanea *Dej.*—N. Y., N. J., Pa. (also Nebr.). Rare.

C. purpurea *Oliv.*—N. E. Amer. Probably double brooded; abundant in pastures and grass-grown roads in early spring and again in September.

var. limbalis *Klug.*—N. E. Amer. Less frequently in the same situations.

var. spreta *Lec.*—Maine.

var. splendida *Hentz.*—N. Y., (also Tex., Ks., Neb., N. C.). (Schaupp Synopsis).

C. formosa *var. generosa* *Dej.*—N. Y., N. J., Pa., Mass., Illinois west to Col. and Mo. In this vicinity it occurs with *C. modesta* but spreads over wider territory; is more abundant and occurs all summer long. May—Sept.

C. ancocisconensis *Harr.*—Buffalo, N. Y., Pa., N. J., Ill., N. H., Mass. Taken at Caldwell, N. J., by Mr. Crane.

C. vulgaris *Say.*—N. E. Amer. On sandy roads; widely distributed but not common near N. Y. June—Sept.

C. repanda *Dej.*—N. E. Amer. Everywhere one of the most common species we have. April—Oct.

var. 12—guttata *Dej.*—N. E. Amer. With the type but quite rare.

C. hirticollis *Say.*—N. E. Amer. Occurs on sea-shore and lake-shores; in this vicinity it does not appear until June. June—Sept.

C. punctulata *Oliv.*—N. E. Amer. Common on dry clay roads or city streets. June—Sept.

C. dorsalis *Say.*—N. Y., N. J. Found on the open sea-shore only; does not appear until July and is found to September.

C. marginata *Fabr.*—N. J., N. Y., Mass. Occurs on damp mud-flats near the sea-coast. Not rare but local.

C. cuprascens *Lea.*—Ohio (Dury).

C. puritana *Horn.*—N. H., Mass., N. Y. Does not occur in this vicinity.

C. macra *Lea.*—Illinois and west to Mo. and Kan.

C. lepida *Dej.*—N. Y., N. J. and westward. In this vicinity it occurs on the sandy hills at Rockaway Beach, Coney Island and Long Beach, L. I., and on a sandy patch at Jamesburg, N. J. July.

C. rufiventris *Dej.*—Ohio (O. Dietz). (Also D. C., Va., W. Va., Md., to Ky. and Ala.).

C. Hentzii *Dej.*—Mass.

C. tortuosa *Dej.*—N. J. and southward. Mr. Chas. Liebeck has taken this species at Atlantic City, N. J.

C. marginipennis *Dej.*—N. Y., Pa. Occurs on river banks at Callicoon, N. Y. July.

C. abdominalis *Fabr.*—N. J. and southward. Occurs rarely in the pine wood in southern New Jersey.

CARABIDÆ.

OMOPHRON *Latr.*

These species live in wet sand at the borders of brooks and ponds; by pouring water over the bank they are dislodged and captured.

O. labiatum *Fabr.*—Rare in the Middle, more common in the Southern States. In this vicinity it occurs at Coney Island and Rockaway Beach, L. I.

O. robustum *Horn.*—Nova Scotia and Cincinnati, Ohio, where it is plentiful on the banks of the Ohio (Dury), also found in Michigan.

O. americanum *Dej.*—N. E. Amer. The common species in this vicinity. Found on Staten Island, Long Island, Westchester Co., and New Jersey.

O. tessellatum *Say.*—N. E. Amer. In this vicinity it has been found at Coney Island.

CYCHRUS *Fabr.*

These species and the Carabidæ that follow are found under stones, logs and rubbish, preferring moist situations. A few which will be mentioned have other habits. The species of *Cychnus* live on snails.

C. nitidicollis *Chev.*—Hud. Bay Terr. to W. Va.; not found near New York.

- var. Brevoorti* Lec.—Maine, Canada. Not found near New York City.
C. stenostomus Weber.—N. Y., N. J., N. C., Pa., Mich.
var. Lecontei Dej.—N. E. Amer. Not rare in New York.
var. bicarinatus Lec.—N. E. Amer. Very rare. Not found near New York City.
C. canadensis Chaud.—Can. to Md. Not found near New York City.
C. elevatus Fabr.—Middle States to Colorado. Rare.
var. heros Harr.—Staten Island, N. Y., N. J., Ohio. Very rare.
var. unicolor Oliv.—Occurs with the type.
C. viduus Dej.—N. Y., N. J., Pa., Va., Indiana. In this vicinity it has been captured at Lake Hopatcong and Fort Lee, N. J., Vonkers and Mosholu, N. Y.
C. Ridingsii Bland.—Pa., W. Va. Not found near New York City.
C. Andrewsii Harr.—Pa., N. C., Va., W. Va., Ohio. Not found near New York City.

NOMARETUS Lec.

Live in mountainous districts, feeding on snails; rare everywhere.

- N. bilobus* Say.—Lake Superior. Ohio, (also Mo.).
N. imperfectus Horn.—Pa., N. C.
N. fissicollis Lec.—Illinois, (also Kan.).

CARABUS Linn.

- C. Chamissonis* Fisch.—White Mts., N. Hamp., Labrador, Greenland and Alaska.
C. sylvosus Say.—Can., N. Y., N. J., south to Texas. Rare in this vicinity.
C. serratus Say.—N. E. Amer. Not common in this vicinity.
C. limbatus Say.—N. E. Amer. Not rare in this vicinity.
C. vinctus Fabr.—N. E. Amer. Abundant in this neighborhood, especially along the Palisades, N. J.
C. nemoralis Muls.—Maine. A European species now abundant. (Harbeck.)

CALOSOMA Web.

- C. externum* Say.—N. E. Amer. Rare in the vicinity of New York.
C. Wilcoxii Lec.—Can., Atlantic States and westward. Rare in this vicinity, more common in the west.
C. frigidum Kby.—Northern States and Canada. Not found in this vicinity.
C. Sayi Dej.—Eastern and Southern States and westward.
C. triste Lec.—Central States. Not found here.
C. obsoletum Say.—Central States. Not found here.
C. calidum Fabr.—N. E. Amer. Abundant.
C. scrutator Fabr.—N. E. Amer. Abundant. Very common at the electric lights in June about New York.

ELAPHRUS Fabr.

Occur on mudflats, running in the sunshine.

- E. Clarivillei* Kby.—Canada, N. Y. and Westward. Not found in this vicinity. March—May.
E. olivaceus Lec.—N. Y. (Catskills).

E. cicatricosus *Lec.*—Canada. In this vicinity it has been taken at Steinway, L. I., by Mr. Julich.

E. fuliginosus *Say.*—Can., N. Y. and westward. Taken at Snake Hill, N. J., by Mr. M. Linell.

E. riparius *Linu.*—Calif., Alaska, Europe. Said to be found in the vicinity of New York City, by Mr. Wm. Julich.

E. ruscarius.—N. E. Amer. Our common species. May—June.

BLETHUSA *Bon.*

B. Julii *Lec.*—Nova Scotia. Lives during the summer near rain pools.

B. quadricollis *Hald.*—Canada, Buffalo, N. Y., N. J. Rare. Found in similar situations as the preceding species.

B. multipunctata *Linu.*—North. U. S.

NOTIOPHILUS *Dum.*

Live in damp sunny places under chips, leaves, etc.; especially at the base of trees.

N. æneus *Hbst.*—Northern U. S. Not rare in this vicinity.

N. semistriatus *Say.*—Canada, N. Hampshire, Cal.

N. sibiricus *Mets.*—Canada and Northern U. S. to Siberia. Ohio (O. Dietz). Not rare on Long Island, N. Y., also found at Newark, N. J. (Smith).

N. Hardyi *Putz.*—Newfoundland to New York. Rare at Silver Lake, Staten Island (Leng). Westchester Co. (W. B.)

NEBRIA *Latr.*

Live under stones near brooks and rivers.

N. suturalis *Lec.*—Lake Superior to New Hamp.

N. Sahlbergi *Fisch.*—Alaska to Oregon and New Hampshire, Labrador.

N. pallipes *Say.*—N. E. Amer. Abundant near Passaic, N. J., Staten Island, and along the Bronx river, N. Y.

N. Eschscholtzii *Men.*—Or., Cal. Found at Buffalo, N. Y.

PASIMACHUS *Bon.*

Found under stones, logs and cow-dropping in dry sandy places.

P. sublævis *Beauv.*—New York southward and westward. In this vicinity it is found at Coney Island, Reckaway Beach, L. I., Sandy Hook, N. J., and various other sandy districts in New Jersey. July—Sept. Frequent.

P. depressus *Fabr.*—New York to Illinois and southward. Not found in the vicinity of New York City.

P. punctulatus *Hald.*—N. Y. to La. and Ill. Found at Egg Harbor by Mr. Liebeck (Smith).

P. elongatus *Lec.*—N. J. westward and southward. Ohio (Dury).

SCARITES *Fabr.*

Common in ploughed fields; mimics the rigidity of death when captured.

S. subterraneus *Fabr.*—N. E. Amer. Common in this vicinity.

var. substriatus *Hald.*—Western and Southern States. N. J. (Smith), Ohio (Dury), Wisconsin (O. Dietz).

DYSCHIRIUS *Bon.*

Live in wet sandy places, where they dig holes; they may be dislodged by pouring water over their burrows or may be readily captured towards evening when they leave their hiding places.

- D. *æneolus* *Lec.*—Can., N. Y. City (Jülich), (also Col., Cal., Br. Col.).
- D. *globulosus* *Say.*—N. E. Amer. Common under stones in wet meadows.
- D. *longulus* *Lec.*—Can., Ohio. Not taken in this vicinity.
- D. *hæmorrhoidalis* *Dej.*—Ohio, (also Kans.).
- D. *brevispinus* *Lec.*—Mich., Ohio.
- D. *sphæricollis* *Say.*—N. E. Amer. Common at Coney Island, Rockaway and Long Beach, L. I.
- D. *erythrocerus* *Lec.*—N. Y., Ohio. Common at Coney Island, Rockaway and Long Beach, L. I.
- D. *sellatus* *Lec.*—N. Y., N. J., (also Mo.). Common at Coney Island, Rockaway and Long Beach, L. I.
- D. *pallipennis* *Say.*—N. Y., N. J. Not common at Coney Island and Long Beach, L. I.
- D. *hispidus* *Lec.*—Canada (Harrington).
- D. *nigripes* *Lec.*—Ottawa, Can. (Harrington).
- D. *filiformis* *Lec.*—N. Y., N. J. Under boards on damp sand at Coney Island (Leng).
- D. *pumilus* *Dej.*—N. Y. to Fla. Coney Island and Rockaway Beach, L. I.
- D. *setosus* *Lec.*—N. Y. Found in the vicinity of N. Y., by Mr. M. Linell.
- D. *terminatus* *Lec.*—Atlantic City (Liebeck, Wenzel). Described from Cal.
- D. *truncatus* *Lec.*—Ill., (also Mo.).

CLIVINA *Latr.*

Like *Dyschirius*, these species affect very damp situations.

- C. *dentipes* *Dej.*—N. Y., south and westward.
- C. *impressifrons* *Lec.*—N. Y., N. J., Pa., Ohio, (also Kans.). Not found in this vicinity.
- C. *rubicunda* *Lec.*—N. J. to Ia. Not found in this vicinity.
- C. *rufa* *Lec.*—Ill. to Ia. Not found in this vicinity.
- C. *collaris* *Hbst.*—Europe, Mass., Ohio. Not found in this vicinity.
- C. *americana* *Dej.*—N. E. Amer. Not rare in this vicinity. May and Sept.
- C. *striatopunctata* *Dej.*—N. Y. to Ia. Found at Brigantine Beach, N. J.
- C. *ferrea* *Lec.*—N. J. to Tex. Not found in this vicinity.
- C. *convexa* *Lec.*—N. J. to Tex. Found at Atlantic City, N. J.
- C. *bipustulata* *Fabr.*—N. Y. to Fla., Ind., (also Mo.). Found on Staten Island (Davis) and New York City at light (W. B.). Not common.
- C. *cordata* *Putz.*—Buffalo, N. Y., Can. Not found in this vicinity.
- C. *pallida* *Say.*—Can.
- C. *postica* *Lec.*—Ohio.

(TO BE CONTINUED).

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A PRELIMINARY REVISION OF THE BOMBYCES OF AMERICA NORTH OF MEXICO.

By B. NEUMOEGEN AND HARRISON G. DYAR.

In the present revision, we have in view, for the first object, the correction of the synonymy of species. We have also given synopses of the families, genera and species of the North American Bombyces, including all described from this region except certain ones which we cannot determine from the published descriptions, but which are listed at the end of this paper. Certain other species which we have not been able to examine and of which we have found no published account of structure, are given at the end of their respective families.

We have not altered the limits of the superfamily Bombyces as it has generally been understood; but we do not attempt to define this group. The characteristics of the several families are too diverse to allow of a comprehensive definition which would exclude all of the other divisions of the moths. We have adopted the families substantially as they stand in Prof. Smith's list; but the serial arrangement of both families and genera is arbitrary, as we follow the order of the synoptic tables. Descriptions of families, subfamilies and genera are omitted to save space; but the salient points of difference can be inferred from the synopses.

Under the name Euechromiidae we include the Syntomidae and Ctenuchidae of Prof. Smith's list. We find the character relied upon to separate them to be inconstant. The Agaristidae represent an approach to the Noctuidae in venation as well as in the characters of egg and larva. The Pyromorphidae are unchanged, except that we have transferred a series of species to *Triplocris* which were wrongly described under *Lycomorpha*. Under the

Lagoidæ we include *Lagoa* and its allies, and also *Dalcerides*, which differs in many respects, probably representing another family. We find *Phryganidia* to be a true Dioptid. We have separated the Lacosomidæ from the Psychidæ and also from the Drepanulidæ, believing that the absence of the frenulum sufficiently distinguishes them from both; while the different wing shape and venation and the occurrence of winged females further separate them from the Psychidæ, which they so much resemble in the habits of the larvæ. We have not restricted the Saturniidæ to the narrow limits proposed by Prof. Smith; but follow Mr. Kirby in this instance. The "Bombycidæ" of the list are included under the Lasiocampidæ and we recognize two subfamilies. Of the genera under "Heterogynidæ," *Penthtria* is a Lithosian; *Thia* is unknown to us, but may belong to the Microlepidoptera, where we also refer *Octa*. Following Mr. Kirby, we have not separated the Nycteolidæ* from the Lithosiidæ.

We hope the present revision will be of service in the determination of the North American species of Bombyces, and may save laborious reference to scattered publications. With this object in view, we have included brief descriptions of all the species, which appear here together for the first time. For full descriptions we must refer to the original papers.

We are indebted to Mr. W. F. Kirby for his valuable "Catalogue of Lepidoptera Heterocera" upon which we have relied to a great extent, except in the matter of synonymy of species. We are also indebted to Prof. J. B. Smith for friendly criticism and to Mr. E. L. Graef, Mr. Wm. Beutenmuller, Mr. S. Henshaw, Mrs. A. T. Slosson and Dr. A. S. Packard for the opportunity to examine certain specimens.

Local forms, breeding true to type, but differing to no great extent from the ground form, are classed as races, whether connected by intergrading forms in the intermediate territory or not. Since the difference between a local race and local species may be a matter of degree only, the forms are placed according to our present judgment and may be differently classed by other authors. We recognize seasonally dimorphic forms in a few instances. All the varieties referred to by us are supposed to inhabit the same territory as the typical form and not to breed true to type. We have not considered aberrations as distinct from varieties.

* *Earias obliquata* Hy. Edw. has been wrongly referred to this genus. The moth appears to be a Pyralid allied to *Epipaschia*.

The name of an author in brackets following a description, indicates that we have not seen the form described in nature; but have compiled the description from that of the author named.

Preoccupied names are marked thus:— ||

Class : **Insecta** ; Order : **Lepidoptera** ; Suborder : **Lepidoptera-
Heterocera** ; Superfamily : **Bombyces**.

Synopsis of Families.

Secondaries with a frenulum.

Vein 1 (internal) of primaries free, unbranched.

Median vein of primaries 4-branched, rarely only 2-or 3-branched from the absence of some of the median venules.

Primaries with one internal vein.

Vein 8 of secondaries wanting (present in one genus) **Euchromiidaë.**

Vein 8 of secondaries arising from the subcostal at, or beyond one third the length of cell from base (absent in 4 genera).

Ocelli absent **Lithosiidaë.**

Ocelli present **Arctiidaë.**

Vein 8 of secondaries arising from, or near base of wing.

Median vein of secondaries 3-branched **Agaristidaë.**

Median vein of secondaries 4-branched.

Secondaries with two internal veins.

Thorax slender, in width less than $\frac{1}{6}$ the length of fore wing **Pericopidaë.**

Thorax robust, more than $\frac{1}{6}$ of fore wing **Liparidaë.**

Secondaries with one internal vein **Drepanulidaë.**

Primaries with two internal veins.

Vein 8 of secondaries absent **Pyromorphidaë.**

Vein 8 present.

Antennæ of ♂ pectinated for the basal two thirds, or simple **Limacodidaë.**

Antennæ of ♂ pectinated to the tip **Lagoidaë.**

Median vein of primaries 3-branched.

Vein 8 of secondaries straight; veins 3 and 4 stalked **Dioptidaë.**

Vein 8 of secondaries sinuate; veins 3 and 4 not stalked.

Wings entire or excavated below apex; vein 8 of secondaries free **Notodontidaë.**

Robust; forewings roundedly subfalcate; vein 8 united to the subcostal by a cross-vein **Bombycidaë.**

Vein 1 of primaries sinuate and branched **Psychidaë.**

Secondaries without frenulum.

Secondaries unlike primaries and with less than 12 veins.

Primaries with one internal vein.

Median vein 3-branched, vein 2 arising about middle of cell.

Antennæ of ♂ pectinated to the tip.

Size medium; antennæ singly bipectinated; secondaries with one internal vein **Lacosomidaë.**

- Size large to very large; antennae frequently doubly bipectinated; secondaries with one or two internal veins . . . **Saturniidae.**
- Antennae of ♂ doubly bipectinated for two thirds their length **Ceratocampidae.**
- Median vein 4-branched; vein 2 from near base of wing **Lasiocampidae.**
- Primaries with two internal, and furcate discal veins **Cossidae.**
- Secondaries like primaries, 12-veined **Hepialidae.**



Family EUCHROMIID.E.

Synopsis of genera.

- Median vein of secondaries 2-branched.
 - Accessory cell present **Phylloecia.**
 - No accessory cell.
 - Wings opaquely scaled **Syntomeida.**
 - Wings hyaline **Cosmosoma.**
- Median vein of secondaries 3-branched **Lycomorpha.**
- Median vein of secondaries 4-branched.
 - Vein 8 of secondaries absent.
 - Wings largely hyaline **Didasys.**
 - Wings opaquely scaled.
 - Secondaries elongate, pointed at apex **Scepsis.**
 - Secondaries rounded, outer margin slightly concave.
 - Vein 10 of primaries absent.
 - Veins 9 and 10 absent, 7—8 stalked **Philoros.**
 - Vein 10 only absent, 7—9 stalked **Dahana.**
 - Primaries, 12-veined **Ctenucha.**
 - Vein 8 of secondaries present **Pygoctenucha.**

Genus **Phylloecia** *Guerin.*

1844—GUERIN, Icon. R. anim. 504.
Callicorus GROTE.
 1867—GROTE, Proc. Ent. Soc., Phil., VI, 182.

P. texana *Grote.*

1867—GROTE, Proc. Ent. Soc., Phil., Vol. VI, p. 184.

Wings much elongated, legs, especially hind pair, very long, tufted on tibia and banded with ocherous. Antennæ black, ocherous at tip. Abdomen blue black, banded narrowly with ocherous. Vertex and front of head, center of collar and patagia and four tetragonal spots on thorax, also ocherous.

Wings blackish brown, immaculate above, the costal portion of secondaries below, light ocherous. At base of abdomen above, and on the side near the base is a silvery patch. Expanse, 35 mm.

Habitat, Texas to Honduras.

Genus *Syntomeida* Harris.

1839—HARRIS, Amer. Journ. Sc., Vol. XXXVI, p. 310.

Hippola WALKER.

1854—WALKER, Cat. Brit. Mus., I, p. 222.

Synopsis of Species.

Abdomen blue with dark red tip **epilais.**

Abdomen banded with fulvous and black **ipomoeæ.**

S. epilais Walker.

1854—WALKER, Cat. Brit. Mus., I, p. 227.

Black, with a blue green reflection, last two joints of abdomen dark vermilion. Two round silvery white spots at base of abdomen above, and two more lateral, centrally. On fore wings a white spot at base, one in center of and end of cell, one or two between the median venules, and a large one in submedian interspace. On secondaries, a white discal spot. Expanse, 45 mm.

Habitat, Florida, Mexico, Honduras.

S. ipomoeæ, Harris.

1839—HARRIS, Amer. Journ. Sc., Vol. XXXVI, p. 316.

ferox WALKER.

1854—WALKER, Cat. Brit. Mus. pt. 1, p. 223.

euterpe Herrich—Schäffer.

1856—HERRICH—SCHAEFFER, Ausser. Schmett., f. 430.

Collar, anterior part of patagia, centre of thorax and abdomen (except five black bands) fulvous: antennæ, legs and wings black. On primaries a pair of somewhat diffuse yellow spots in interspaces between veins 3-4 and 4-5, and one or two very faint ones in the interspaces above, forming an oblique band directed to distal third of costa. At base of secondaries a white hyaline patch divided by the internal vein. Expanse, 40 mm.

Habitat, Southern States.

Genus *Cosmosoma* Hübner.

1824?—HÜBNER, Samml. Ex. Schmett., II.

Aristodaema, Wallengren.

1858—WALLENGREN, Vet. Akad. Förhandl., Vol. XV, p. 159.

C. auge Linnaeus.

1767—LINNAEUS, Syst. Nat., I, p. 807.

omphale Hübner.

1824?—HÜBNER, Samml. Ex Schmett., II.

Body and legs vermilion, head, end of abdomen and a dorsal

band, blue black. Wings hyaline with the veins, discal spot and border black, the border broadest at the apex. Expanse, 35 mm.

Habitat, Florida to Panama, Antilles.

Genus **Lycomorpha** *Harris*.

1839—HARRIS, Amer. Journ. Sc., Vol. XXXVI, p. 317.

Anatolmis Packard.

1864—PACKARD, Proc. Essex Inst., Vol. IV, p. 46.

Synopsis of Species.

Thorax black centrally.

Bases of wings bright ochre yellow **pholus**.

Bases of wings pinkish ochreous *race* **miniata**.

Thorax red.

Black border of primaries broad at internal angle **coccinea**.

Black border of primaries narrow **grotei**.

Black border of primaries broad throughout **fulgens**.

L. pholus *Drury*.

1773—DRURY, Ill. Ex. Ent., Vol. II, pl. 28, fig. 3.

race miniata *Pack.*

1872—PACKARD, Rep. Peab. Acad. Sc., Vol. IV, p. 84.

Black: patagia, basal half of primaries and basal third of secondaries ochre yellow. The yellow on primaries indents the black along the median vein. Expanse, 25–30 mm.

Habitat, Atlantic States.

The race *miniata* has the bases of wings pinkish ochraceous, more reddish on secondaries. The pinkish part occupies about the basal half of primaries, being slightly more extensive than in *pholus*.

Habitat, California.

L. coccinea *Hy. Edwards*.

1886—HY. EDWARDS, Ent. Amer., Vol. II, p. 9.

Head, thorax and bases of wings bright red, border of wings and abdomen brownish black. The red extends to near apex on costa, but scarcely beyond middle on internal margin, being indented by the black opposite cell and submedian fold. Less than one half of secondaries red, outline twice indented. Expanse, 20 mm.

Habitat, Arizona.

L. grotei, *Packard.*

1864—PACKARD, Proc. Essex Inst., Vol. IV, p. 47.

palmerii PACKARD.

1872—PACKARD, Rep. Peab. Acad. Sc., Vol. IV, p. 84.

Deep red or slightly orange tinted. Head, abdomen, a very narrow outer border of primaries and a broad outer border of secondaries, black. The border of secondaries is variable in width. Expanse, 30 mm.

Habitat, Rocky Mountain region to Arizona.

L. fulgens *Hv. Edwards.*

1881—Hv. EDWARDS, Papilio, Vol. I, p. 116.

Larger than *L. grotei*, the wings broader; the black border along the outer margin of primaries is one fifth the length of wing. Secondaries black, with a red costal ray from the base.

Habitat, Arizona, Mexico.

Genus **Didasys** *Grote.*

1875—GROTE, Can. Ent., Vol. VII, p. 174.

D. belæ *Grote.*

1875—GROTE, Can. Ent., Vol. VII, p. 174.

Head, collar and abdomen red, the latter with dorsal black spots, black banded below. Thorax black with six narrow pale buff stripes. Wings hyaline with black veins, and black borders, which on primaries enclose a row of six orange inter-venular spots. A large orange discal spot bordered with black: extreme base of wing red. Secondaries with a black discal spot, confluent with the border. Antennæ, palpi and abdominal brushes of ♂ black. Expanse, 30 mm.

Habitat, Florida.

Genus **Scepsis** *Walker.*

1854—WALKER, Cat. Brit. Mus., pt. II, p. 285.

Synopsis of Species.

- Fore wings pale slate gray **edwardsii.**
- Fore wings black or brown.
- Top of head black.
- Collar pale, whitish **wrightii.**
- Collar orange *var.* **gravis.**
- Yellow of collar extending on to head.
- Primaries brownish black.
- Collar orange **fulvicollis.**
- Collar pale *var.* **pallens.**
- Primaries brown, slightly blackish **packardii.**

S. edwardsii Grote.

1881—GROTE, Papilio, Vol. I, p. 4.

Smooth pale slate gray, costa whitish, collar and palpi orange; abdomen shiny blue black, gray at base; secondaries sub-hyaline, with smoky black outer border and costa. Expanse, 35 mm.

Habitat, Florida.

S. wrightii Stretch.

1885—STRETCH, Ent. Amer., Vol. I, p. 101.

var. gravis Hy. Edwards.

1886—HY. EDWARDS, Ent. Amer., Vol. II, p. 8.

Black, abdomen with a bluish reflection, collar very pale yellow. Primaries dark brown, secondaries subdiaphanous centrally. The variety *gravis* has the collar dark yellow. Expanse, 30 mm.

Habitat, California.

S. fulvicollis, Hübner.

1806—HÜBNER, Samml. Ex. Schmett.

semiaphana Harris.

1839—HARRIS, Amer. Journ. Sc., Vol. XXXVI, p. 318.

race pallens Hy. Edwards.

1886—HY. EDWARDS, Ent. Amer., Vol. II, p. 8.

Primaries brownish black, secondaries diaphanous centrally. Abdomen blue black; collar, vertex of head and underside of patagia orange ochraceous. Expanse, 35 mm.

Habitat, Atlantic States.

The race *pallens* has the orange parts pale yellow. Expanse, 35 mm.

Habitat, Rocky Mountain region.

S. packardii Grote.

1865—GROTE, Proc. Ent. Soc. Phila., Vol. IV, p. 318.

matthewi Hy. Edwards.

1874—HY. EDWARDS, Proc. Cal. Acad., Vol. V, p. 184.

Differs from *fulvicollis* in having the fore wings pale brown with only a slight tinge of black. Expanse, 40 mm.

Habitat, Pacific Northwest.

Genus **Philoros** Walker.

1854—WALKER, Cat. Brit. Mus. pt. II, p. 283.

P. venosa Walker.

1854—WALKER, Cat. Brit. Mus. pt. II, p. 284.

Black, body parts shining blue, vertex of head bright red. Inner border of patagia, costa, a streak on vein 6, another on median vein from base, furcate and extending on to veins 3 and 4, and another on vein 1, all other yellow. Fringes of both wings white except centrally, where they are black. Expanse, 35 mm.

Habitat, Texas to Venezuela.

Genus **Dahana** Grote.

1875—GROTE, Can. Ent., Vol. VII, p. 175.

D. atripennis Grote.

1875—GROTE, Can. Ent., Vol. VII, p. 175.

Primaries brown black, secondaries blue black, terminal half of abdomen red, edges of collar and a spot at anal angle of primaries yellow. Expanse, 30 mm.

Habitat, Florida.

Genus **Ctenucha** Kirby.

1837—KIRBY, Faun. Bor. Amer., Vol. IV, p. 305.

Comsoyrium Blanchard.

1852—BLANCHARD, Gay, Hist. Chile, Zool., Vol. VII, p. 67.

Euctenucha Grote.

1873—GROTE, Bull. Buff. Soc., Vol. I, p. 33.

Synopsis of Species.

- Thorax black, immaculate **virginica.**
- Patagia lined with yellow or red.
- Some of veins of primaries colored.
- These veins outlined in yellow **cressonana.**
- These veins outlined in red **sanguinaria.**
- Veins black.
- Primaries black.
- Costal edge of primaries black.
- Head and patagia red **rubroscapus.**
- Head and patagia yellow *var.* **ochroscapus.**
- Costal edge of primaries narrowly white.
- Head and patagia red **multifaria.**
- Head and patagia yellow *var.* **luteoscapus.**
- Primaries brown or blackish brown **brunnea.**

C. virginica Charpentier.

1830—CHARPENTIER, Esper. Exot. Schmett., Vol. II, Suppl. t. 2 figs. 3, 4.

latreillana Kirby.

1837—KIRBY, Faun. Bor. Amer. Vol. IV, p. 305.

Black, primaries brown black ; head and front part of patagia and chest orange ochraceous. Expanse, 40 mm.

Habitat, Atlantic States.

C. cressonana Grote.

1863—GROTE, Proc. Ent. Soc. Phila., Vol. II, p. 64.

Marked exactly like *Phyloros venosa* except that the linings are very pale yellow and the fringe is entirely white. Size, shape and structure of Ctenucha, with long pectinations to ♂ antennæ. Expanse, 46 mm.

Habitat, Colorado.

C. sanguinaria Strecker.

1878—STRECKER, Rept. Surv. Dept. Mo. (Ruffner.) app. S.S. p. 1858.

Blue black; vertex of head, prothorax laterally; inner edge of patagia and markings on the veins as in *P. venosa*, scarlet. Expanse, 45 mm. (?)

Habitat, Colorado. [Strecker.]

C. rubroscapus Ménètriès.

1857—MENETRIES, Cat. Lep. Pet., Vol. II, p. 142.

twalsinghami Hy. Edwards.

1873—HY. EDWARDS, Proc. Cal. Acad. Sc., Vol. V, p. 112.

var. **ochroscapus** Grote & Robinson.

1868—GROTE & ROBINSON, Trans. Am. Ent. Soc., Vol. I, p. 330.

corvina Boisduval.

1869—BOISDUVAL, Ann. Soc. Ent. Belg., Vol. XII, p. 71.

Black, body blue black, apices of all four wings white on the fringe. Head and inner half of patagia bright red or yellow (*var. ochroscapus*). Expanse, 35 mm.

Habitat, California.

C. multifaria Walker.

1854—WALKER, Cat. Brit. Mus., pt. II, p. 479.

var. **luteoscapus** Neumoegen & Dyar.

Black, body blue black; costal edge of primaries and all fringes white except at anal angle. Head and inner part of patagia orange red to ocher yellow. (*var. luteoscapus*).

Habitat, California.

C. brunnea, Stretch.

1872—STRETCH, Zyg. and Bomb. of N. A., p. 30.

Fore wings brown with black veins and white costa; apices and internal angle of fringes of both wings white. Otherwise blue black; head, base of palpi, side of collar and inner part of patagia, red.

Habitat, California.

Genus *Pygoctenucha* Grote.

1883—GROTE, Trans. Kansas Acad. Sc., Vol. VIII, p. 46.

Synopsis of Species.

Collar red, size large.

Fringe of fore wings white **harrisii.**

Fringe black.

Last two segments of abdomen red **terminalis.**

Last five segments red **robinsonii.**

Collar ocher, black centrally; size small **funerea.**

P. harrisii *Boisduval.*

1869—BOISDUVAL, Ann. Ent. Soc. Belg., Vol. XII, p. 72.

Bronzy black, the fringe of fore wings white. Abdomen blue black. Collar and last two segments of abdomen red.

Habitat, California (Boisduval).

P. terminalis *Walker.*

1854—WALKER, Cat. Brit. Mus., pt. II, p. 478.

pyrrhousa Hulst.

1881—HULST, Bull. Brook. Ent. Soc., Vol. III, p. 77.

votiva Hy. Edwards.

1884—HY. EDWARDS, Papilio, Vol. IV, p. 13.

Black, with blue reflection, especially on abdomen. Collar, front of patagia, and last two segments of abdomen bright red. Expanse, 32 mm.

Habitat, Colorado to Mexico.

P. robinsonii *Boisduval.*

1869—BOISDUVAL, Ann. Ent. Soc. Belg., Vol. XII, p. 72.

Bronzy black, head, fore part of thorax and the five last abdominal segments carmine red.

Habitat, California. [Boisduval].

P. funerea *Grote.*

1883—GROTE, Trans. Kansas Acad. Sc., Vol. VIII, p. 46.

Black, with hardly any blue reflection, immaculate. Sides of collar, and tip of abdomen dark ocher yellow. Expanse, 28 mm.

Habitat, New Mexico.

The following species, unknown to us, probably belongs to the Euchromiidae.

Erruca pertyi *Herrich—Schaeffer.*

1854—HERRICH—SCHAEFFER, Ausserer, Schmett, fig. 240.

Black; head with two white spots; abdomen with four yellow basal spots and two lateral, interrupted white bands. Wings transparent, very narrowly margined with black.

Habitat, Georgia.

Family LITHOSIIDÆ.

Synopsis of subfamilies and genera.

Wings narrow, elongate, accessory cell usually absent	Lithosiinæ.
Median vein of primaries 2-branched	Crambidia.
Median vein 3-branched, veins 3 and 4 stalked	Lithosia.
Median vein 4-branched.	
Ten veins on primaries.	
Wings rather elongate and produced at apices.	
Antennæ of ♂ finely bipectinate	Nola.
Antennæ simple, ciliate	Lebena.
Wings shorter, more rectangular	Argyrophyes.
Twelve veins on primaries.	
Vein 7-9 on a stalk.	
Median vein of secondaries 3-branched.	
Color red and lead color; vein 10 midway between vein 11 and apex of cell	Hypoprepia.
Color black; vein 10 nearer to apex than to vein 11	Tantura.
Median vein of secondaries 4-branched.	
Antennæ of ♂ bipectinate	Pagara.
Antennæ setose, subserrate	Bruceia.
	Hyaloscotes.
Antennæ simple, ciliate.	
Wings long, more than twice as long as broad	Cisthene.
Wings broad, twice as long as broad	Clemensia.
Veins 6-7 from apex of cell; veins 8-10 on a stalk	Nycteola.
Wings broad, trigonate, thinly scaled; accessory cell present	Eudulinæ.
	Eudule.

Subfamily **Lithosiinæ.**

Genus **Crambidia** Packard

1864—PACKARD, Proc. Ent. Soc., Phila., Vol. III, p. 99.

Synopsis of Species.

Wings brownish	pallida.
Wings white.	
Head yellow	cephalica.
Head white, concolorous	casta.

C. pallida Packard.

1864—PACKARD, Proc. Ent. Soc., Phila., Vol. III, p. 99.

Uniform drab, abdomen and internal part of secondaries paler. Veins of fore wings broadly and distinctly lined with a pale shade. Expanse, 20 mm.

Habitat, Northern Atlantic States.

C. cephalica Grote & Robinson.

1870—GROTE & ROBINSON, Trans. Am. Ent. Soc., Vol. III, p. 176.

White throughout, the vertex of head ochre yellow. Under side and costal half of secondaries above more or less pale cinereous.

Habitat, Colorado to Arizona.

C. casta Sanborn.

1869—SANBORN, Packard's Guide Study Ins., p. 284.

caudata Hy. Edwards.

1874—HY. EDWARDS, Proc. Cal. Acad. Sc., Vol. V, p. 185.

Differs from *cephalica* in having the head also white.

Habitat, Mountains of New York, Colorado and the Pacific Northwest.

Genus **Lithosia** Fabricius.

1798—FABRICIUS, Ent. Syst. Suppl., p. 459.

L. bicolor Grote.

1864—GROTE, Proc. Ent. Soc., Phila., Vol. III, p. 74.

argillacea Packard.

1864—PACKARD, Proc. Ent. Soc. Phila., Vol. III, p. 98.

Dark slate gray, collar, costa of primaries and tip of abdomen ochraceous. Expanse, 25 mm.

Habitat, Northern New York, Canada, and New England to Pacific Northwest.¹

Genus **Nola** Leach.

1815—LEACH, Edinb. Encycl., Vol. IX, p. 135.

Roeselia Hübner.

1872?—HÜBNER, Verz. bek. Schmett., p. 397.

¹ *Synopsis of Species.*

- Primaries without any distinct tufts **minuscula.**
- Primaries tufted in the cell.
 - Gray, with one tuft **hyemalis.**
 - White, with three tufts **sorghiella.**

N. minuscula Zeller.

1872—ZELLER, Verh. Zool.-Bot. Ges. Wien, Vol. XXII, p. 455.

fuscula Grote.

1881—GROTE, Papilio, Vol. I, p. 76.

Pale gray with three blackish lines, transverse anterior, transverse posterior and subterminal, the latter waved. A dark cloud at end of cell; markings rather indistinct. A row of minute terminal dots. Secondaries whitish. Expanse, 16 mm.

Habitat, Colorado and Texas to Southern California.

N. hyemalis *Stretch.*

1885—STRETCH, Ent. Amer., Vol. 1, p. 102.

Very pale grayish. A dark brown streak at base of costa and three indistinct transverse lines made up of dots. Transverse anterior line oblique, straight, with a distinct brown dot near costa, made up of tufted scales.

Secondaries very pale, shaded with darker tints at apex. Expanse, 20 mm. [Stretch.]

Habitat, California, Arizona.

N. sorghiella *Riley.*

1882—RILEY, Rep. Ins., 1882, p. 188, pl. 11, fig. 1.

Silvery white, with three equidistant tufts near costa of primaries. These tufts, an arcuate shade towards outer margin and a spot below cell, yellowish brown; costa and a shade along outer margin, deeper brown. Expanse, 10 mm.

Habitat, Southern States [Riley].

Genus **Lebena** *Walker.*

1866—WALKER, Cat. Brit. Mus., Vol. XXXV, p. 1901.

Synopsis of Species.

- Fore wings white with black bands **melanopa.**
- Fore wings gray.
 - Costa of primaries with conspicuous dark spots.
 - Three blackish brown costal spots **trinotata.**
 - Two black spots **minna.**
 - Costa not distinctly spotted.
 - Wing gray with normal black lines **ovilla.**
 - Wing olive brown with white shades **anfracta.**

L. melanopa *Zeller.*

1872—ZELLER, Verh. Zool.-bot. Ges., Wien, Vol. XXII, p. 458.

White; costa of primaries and a median transverse band black. Outer margin lead gray with black terminal dashes. Secondaries blackish. Expanse, 19 mm.

Habitat, Atlantic States to Texas.

L. trinotata *Walker.*

1866—WALKER, Cat. Brit. Mus., Vol. XXXV, p. 192.

sexmaculata Grote.

1877—GROTE, Can. Ent., Vol. IX, p. 235.

Silvery gray; trans.-ant., trans.-post. and subterminal lines dark brown, waved, often indistinct. At base of costa a dark

brown dash; another at trans.-ant. line widening into the cell; a third on costa centrally, large, triangular. Secondaries very pale gray. Expanse, 20 mm.

Habitat, Atlantic States.

L. minna *Butler*.

1881—BUTLER, *Ann. Mag. Nat. Hist.*, (5) Vol. VIII, p. 315.

Silvery gray; a black-brown dash at base of costa; a black spot at basal third; a larger rhomboidal jet black spot in the cell and an oblique series of four blackish dots from this to inner margin; a black dot at end of cell and trans.-post. and subterminal lines of blackish spots, the latter waved. Expanse, 24 mm.

Habitat, California [Butler].

L. ovilla *Grote*.

1875—GROTE, *Can. Ent. Vol. VII*, p. 221.

Grayish white; trans.-ant. and trans.-post. lines black, the latter denticulate, followed by a pure white shade. A similar shade in place of the subterminal line. Hind wings dusty white. Expanse, 16 mm.

Habitat, Northern Atlantic States [Grote].

L. anfracta *Hy. Edwards*.

1881—HY. EDWARDS, *Papilio*, Vol. I, p. 12.

Primaries olive brown with white shades. Trans.-ant. and trans.-post. lines whitish, shaded with grayish on the edges, each enclosing a darker line. Trans.-post. line outwardly arcuate opposite the cell, terminating in a white blotch; before apex, four more white blotches. Margin broadly silvery white, succeeded by a pale olivaceous space inwardly. A row of terminal brown dots. Expanse, 20 mm.

Habitat, Sierra Nevada of California [Edwards].

Genus **Argyrophyes** *Grote*.

1873—GROTE, *Bull. Buff. Soc. Nat. Hist.*, p. 175.

Synopsis of Species.

A broad median blackish band on primaries	pustulata.
No distinct median band	cilicoides.

A. pustulata *Walker*.

1865—WALKER, *Cat. Brit. Mus.*, Vol. XXXIII, p. 795.

nigrofasciata Zeller.

1872—ZELLER, *Verh. Zool.-bot. Ges. Wien*, Vol. XXII, p. 454.

obaurata Morrison.

1874—MORRISON, *Proc. Bost. Soc. N. H.*, Vol. XVII, p. 154.

White; costa at base and a broad median band blackish brown, the latter with metallic scales and narrowly divided below median vein into rounded patches. A curved smoky subterminal line. A dark terminal shade. Secondaries smoky brown outwardly. Expanse, 17 mm.

Habitat, Northern Atlantic States.

A. cilicoides *Grote*.

1873—GROTE, Bull. Buff. Soc. Nat. Hist., Vol. I, p. 175.

Chalk white; on outer half of wing the terminal portion of median space is shaded with smoky, enclosing a raised blotch of black metallic scales at end of cell; a curved smoky subterminal line. Secondaries white, with a smoky shading at margin. Expanse, 16 mm. [Grote].

Habitat, Atlantic States.

Genus **Hypoprepia** *Hübner*.

1825—HÜBNER, Zutr. ex Schmett, Vol. III, p. 21.

Synopsis of Species.

Ground color of primaries entirely red.

Hind wings with broad lead colored border **miniata.**

This border lacking var. **subornata.**

Ground color partly yellow, partly red.

Lead colored border on primaries moderate, border of hinds wings narrow **fucosa.**

Lead color predominating, border of secondaries broad . . . var. **plumbea.**

Ground color entirely yellowish **cadaverosa.**

Fore wing nearly entirely gray, thinly scaled **inculta.**

H. miniata *Kirby*.

1857—KIRBY, Richardson's Faun. Bor. Amer., Vol. IV, p. 305.

vittata Harris.

1841—HARRIS, Rep. Ins. Mass., p. 241.

var. **subornata** *Neumoegen & Dyar*.

1893—NEUMOEGEN & DYAR, Can. Ent., Vol. XXV, p. 124.

Red; antennæ black. A broad stripe near costa, another from base to internal angle, and a short one from end of median vein to outer margin, as well as the fringe, dark lead color. A broad border on secondaries, occupying half the wing, also lead color but sometimes absent (var. *subornata*). Abdomen frequently more or less lead color centrally. Expanse, 30-40 mm.

Habitat, North Atlantic States westward.

H. fucosa *Hübner*.

- 1825—HÜBNER, Zutr. Ex Schmett, pp. 471, 472.
tricolor Fitch.
1856—FITCH, Rep. Ins. N. Y., Vol. III, p. 135.

var. plumbea *Hy. Edwards*.

- 1886—HY. EDWARDS, Ent. Amer., Vol. II, p. 9.

Yellow, the body parts, outer third of primaries tinged with red: marked as in *miniata*. Secondaries pink, with an outer narrow lead colored border, which occasionally becomes wide. (*var. plumbea*.) Expanse, 20–30 mm.

Habitat, Northern Atlantic States westward.

H. cadaverosa *Strecker*.

- 1878—STRECKER, Proc. Davenport Acad. Sc., Vol. II, p. 270.

Ocherous, marked with lead color as in *miniata*, but the border of secondaries narrower and sometimes absent.

Habitat, Colorado.

H. inculta *Hy. Edwards*.

- 1882—HY. EDWARDS, Papilio, Vol. II, p. 13.

Grayish lead color, the wings thinly scaled, secondaries sub-diaphanous, pale pink, with outer and costal border of gray not sharply defined. Expanse, 25–30 mm.

Habitat, Colorado.

Genus **Tantura** *Kirby*.

- 1892—KIRBY, Cat. Lep. Het., Vol. I, p. 86.
1893—NEUMÖGGEN & DYAR, Ent. News, Vol. IV, p. 139.
— *Penthetria* *Hy. Edwards*.
1881—HY. EDWARDS, Papilio, Vol. I, p. 80.

T. majuscula *Hy. Edwards*.

- 1881—HY. EDWARDS, Papilio, Vol. I, p. 80.

Black throughout, the tip of abdomen ocherous. Primaries deep black, secondaries less so, uniform and not translucent. Expanse, 28 mm.

Habitat, Arizona.

Genus **Pagara** *Walker*.

- 1856—WALKER, Cat. Brit. Mus., pt. VII, p. 1678.
Comacla Walker.
1864—WALKER, Cat. Brit. Mus., Vol. XXXI, p. 276.
1892—KIRBY, Cat. Lep. Heb. Vol. I, p. 362.
Vanessodes Grote and Robinson.
1871—GROTE & ROBINSON, Trans. Ent. Am. Soc., Vol. III, p. 176.
1892—SMITH, Can. Ent., Vol. XXIV, p. 134.

Synopsis of Species.

Wings translucent, uniform pale mouse gray: **simplex.**
More opaque with irrorations and discal dot **fuscipes.**

P. simplex *Walker.*

1856—WALKER, Cat. Brit. Mus., pt. VII, p. 1679.

murina Walker.

1864—WALKER, Cat. Brit. Mus., pt. XXXI, p. 276.

clarus Grote and Robinson.

1871—GROTE & ROBINSON, Trans. Am. Ent. Soc., Vol. III, p. 176.

Pale mouse gray, collar and abdomen tinged with ochereous. Wings uniform in tint, translucent, darker toward apices. Antennæ dark. Expanse, 22 mm.

Habitat, Montana.

P. fuscipes *Grote.*

1883—GROTE, Can. Ent., Vol. XI, p. 86.

Apices of wings squarer than in *simplex*. Uniform gray, blackish scales on a mouse gray ground, with obscure discal dot; central area of wings translucent, opaque toward apices. Expanse, 22 mm.

Habitat, Arizona.

Genus **Bruceia** *Neumoegen.*

1893—NEUMOEGEN, Journ. N. Y. Ent. Soc., Vol. I, p. 36.

B. pulverina *Neumoegen.*

1893—NEUMOEGEN, Journ. N. Y. Ent. Soc., Vol. I, p. 36.

Blackish gray with pale ochereous white spots on primaries very diffuse and ill defined, consisting of one in cell and at end of cell, a shade on centre of internal margin, and an irregular terminal border. Secondaries sordid white, very faintly ochereous. Expanse, 35 mm.

Habitat, Colorado.

Genus **Hyaloscotes** *Butler.*

1881—BUTLER, Ann. Mag. Nat. Hist., (5) Vol. VIII, p. 314.

H. fumosa *Butler.*

1881—BUTLER, Ann. Mag. Nat. Hist., (5) Vol. VIII, p. 314.

Semitransparent, smoky gray, with darker marginal line, veins and fringes. Body blackish, clothed with long whitish hairs; legs pale grayish brown. Expanse, 27–31 mm.

Habitat, Mt. Shasta, California. [Butler].

Genus *Cisthene* Walker.

- 1854—WALKER, Cat. Brit. Mus., II, p. 533.
Byssophaga Behr.
- 1872—BEHR, in Stretch, Zyg. and Bomb. N. A., I, p. 49.
Pyralidia Felder.
- 1874—FELDER, Reise der Novara, Lep. IV, pl. 106, fig. 23.

Synopsis of species.

- Bright colored species with pink and yellow.
 - A pale stripe on internal margin of primaries; apices of secondaries usually slightly covered by lead color.
 - Complete transverse yellowish band on primaries **unifascia.**
 - The band narrowed centrally var. **tenuifascia.**
 - A pale stripe near internal margin; apices of secondaries well covered with lead color.
 - A yellow mark at middle of costa **subjecta.**
 - This mark absent var. **plumbea.**
- Dull colored species with no pink.
 - Secondaries nearly unicolorous, smoky.
 - Secondaries dirty white **faustinula.**
 - Secondaries smoky gray var. **fusca.**
 - Secondaries yellowish with the apical fourth dark gray **nexa.**

C. unifascia Grote & Robinson.

1863—GROTE & ROBINSON, Trans. Am. Ent. Soc., Vol. II, p. 175.

var. **tenuifascia** Harvey.

1875—HARVEY, Bull. Buff. Soc., Vol. III, p. 4.

Primaries slate gray with a transverse band on outer third and a longitudinal one along basal two thirds of internal margin, pale yellow. Band varies in width. Abdomen and secondaries pink, with tip of latter, or a rather broad outer border, lead color, but costal edge pink. Thorax lead color or partly or wholly yellow. Expanse, 14—15 mm.

Habitat, Southern Atlantic States from New York to Texas.

C. subjecta Walker.

1854—WALKER, Cat. Brit. Mus., Vol. II, p. 534.
packardii Grote.

1863—GROTE, Proc. Ent. Soc. Phila., Vol. II, p. 31.

var. **plumbea** Stretch.

1885—STRETCH, Ent. Amer., Vol. I, p. 102.

Primaries lead colored with a spot on costa near apex, or without this spot. Near internal margin a yellowish band from base to near internal angle, dilated at the tip and sometimes

abbreviated. Secondaries pink, the lead colored border extending over the apex and along the costa to base. Expanse, 17 mm.

Habitat, New York to Texas.

C. faustinula *Boisduval*.

1868—BOISDUVAL, Ann. Soc. Ent. Belg., Vol. XII, p. 73.

var. fusca *Stretch*.

1872—STRETCH, Zyg. and Bomb. of N. A., Vol. 1, p. 49.

Dark gray, a broad paler band on primaries, concolorous with secondaries, slightly yellowish, or pale gray (*var. fusca*). Expanse, 30 mm.

Habitat, California.

C. nexa *Boisduval*.

1868—BOISDUVAL, Ann. Ent. Soc. Belg., Vol. XII, p. 74.

grisea Packard.

1872—PACKARD, Rep. Peab. Acad. Sc., Vol. IV, p. 84.

deserta Felder.

1874—FELDER, Reise Novara Lep., IV, pl. 106, fig. 23.

Dark gray. A whitish transverse band on primaries not reaching costa, with intended edges, and narrowly bordered with black. Secondaries sordid yellowish, apex dark gray. Expanse, 21 mm.

Habitat, California.

Genus **Clemensia** *Packard*.

1864—PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 100.

Uxia Walker.

1866—WALKER, Cat. Brit. Mus., XXXV, p. 1897.

Repa Walker.

1886—WALKER, Cat. Brit. Mus., XXXV, p. 1895.

C. albata *Packard*.

1864—PACKARD Proc. Ent. Soc. Phil., Vol. III, p. 101.

albida Walker.

1866—WALKER, Cat. Brit. Mus., XXXV, p. 1897.

cana Walker.

1866—WALKER, Cat. Brit. Mus., XXXV, p. 1895.

irrorata Hy. Edwards.

1874—HY. EDWARDS, Proc. Cal. Acad. Sc., Vol. V, p. 185.

var. umbrata *Packard*.

1872—PACKARD, Rep. Peab. Acad. Sc., Vol. IV, p. 85.

White, more or less irrorate with black scales, and slightly clouded with brown, forming sometimes a broad median shade

(var. *umbrata*). A transverse anterior, median, transverse posterior and terminal lines of black spots, often faint or largely absent. A black discal dot, below which near internal margin appears a brown cloud, containing one or two black dots: secondaries white, or clouded with brown with a more or less distinct row of terminal brown dashes. Expanse, 20 mm.

Habitat, North America and Mexico.

(Genus *Nycteola* Hübner.

1810?—HÜBNER, Tentamen, p. 2.

Sarothipus Curtis.

1824—CURTIS, Brit. Ent., Vol. I, fol. 29.

Avia Hübner.

1827?—HÜBNER, Verz. bek. Schmett, p. 395.

N. revayana Scopoli.

1772—SCOPOLI, Ann. Nat. Hist., Vol. V, p. 116, n. 130.

race *lintnerana* Speyer.

1875—SPEYER, Stett. Ent. Zeit, Vol. XXXV, p. 170.

race *columbiana* Hy. Edwards.

1874—HY. EDWARDS, Proc. Cal. Acad. Sc., Vol. V, p. 184.

✓ var. *cinereana* Neumoegen & Dyar.

Whitish cinereous to sea-green, with basal, transverse anterior, transverse posterior, and subterminal lines, the transverse anterior and transverse posterior geminate, undulate and irregular, the basal and subterminal often more or less absent. An obscurely cordate brown discal dot; a terminal black line, sometimes becoming a row of dots. Median space usually darker, often brownish and there may be supplementary black marks filling in the space between basal and transverse anterior lines or black shades in median space. Secondaries white or a pale brown.

Expanse, 22—28 mm.

The race *lintnerana* is gray, the markings not very distinct.

Habitat, Northern Atlantic States.

The race *columbiana* varies from green to gray. In the gray form, var. *cinereana*, it differs from *lintnerana* in being larger, brighter, the colors more contrasted: the transverse anterior and transverse posterior lines both distinct, geminate, filled in with pale gray, while the secondaries are more whitish.

Habitat, Mountains of California and Pacific Northwest.

Subfamily EUDULINÆ.

Genus **Eudule** *Hübner*.

1823—HÜBNER, Zutr. Ex. Schmett., II, p. 14, n. 127.

Ameria Walker.

1854—WALKER, Cat. Brit. Mus., pt. II, p. 554.

Euphanessa Packard.

1864—PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 102.

Synopsis of Species.

Primaries immaculate.

Color, pinkish ochraceous **unicolor.**

Color, gray drab **texana.**

Primaries spotted.

Spots large, with one external margin **mendica.**

Spots small without any on margin **meridiana.**

E. unicolor *Robinson*.

1869—ROBINSON, Ann. Lyc. N. Y., Vol. IX, p. 153.

fragilis Strecker.

1878—STRECKER, Rep. Chief Eng., 1878, App. SS. p. 1859.

Uniformly pinkish ochraceous, translucent. Head and fore wings more ochraceous, antennæ black, filiform. Expanse 22 mm.

Habitat, Arizona to Texas.

E. texana *French*.

1889—FRENCH, Can. Ent., Vol. XXI, p. 161.

Gray drab, subdiaphanous; side of head, back of eyes, and base of fore wings and abdomen slightly ochraceous. Expanse, 22 mm.

Habitat, Texas. [French].

E. mendica *Walker*.

1854—WALKER, Cat. Brit. Mus., pt. II, p. 576.

biseriata Herrich-Schäffer.

1853—HERRICH-SCHAEFFER, Ausser. Schmett., I, fig. 441.

Subdiaphanous straw yellow tinged with ochereous. On primaries two transverse rows of pale purplish irregular spots, separated by the veins, with a single spot close to external margin between veins 3 and 4. Secondaries nearly diaphanous centrally. Expanse, 26 mm.

Habitat, Northern Atlantic States.

E. meridiana *Slosson*.

1889—SLOSSON, Ent. Amer., Vol. V, p. 7.

Brownish ochereous, darker than *mendica*. Two transverse lines of purplish spots, the transverse posterior quite regular and small, with no marginal spot. Secondaries immaculate. Expanse, 18 mm.

Habitat, Southern Atlantic States to New York.

SOME STUDIES OF THE FECUNDITY OF THE APPLE-LEAF PLANT-LOUSE.

Aphis mali Fitch.

By F. M. WEBSTER.

Of the three principal species of Aphides infesting our smaller cereal grains, this species occupies an anomalous and at the same time important position. In point of numbers it is usually in advance of *Toxoptera graminum*, and, usually, of *Siphonophora avenae*, and its effects on young wheat during the fall is, if anything more serious than either of the others, especially if the land be poor and the weather be dry. So far as my own observations go, it is more detrimental to the wheat than to the apple. The occurrence of the eggs on the twigs of apple, during winter, and the appearance of the young on the first tender buds and leaves in the spring, are familiar to all horticulturists. I have several times made the attempt to colonize the species on wheat plants, with individuals taken from the apple, but was never able to thoroughly succeed in this until this year, when a series of experiments was begun in the insectary which swept away any previous doubts on the subject of migrations.

Several years ago, on April 17th, all stages of *A mali* were found on the young buds of quince — a new food plant so far as published record goes — and being unrecognizable without the winged adults, the attempt was made to carry them on artificially until these would appear. In doing this a number escaped from the breeding cage where they were kept, and took up their abode on some young wheat, growing in a box on the same table. Not knowing with what generation I began investigating it on the quince, it is of course impossible to say whether, as with the Hop *Aphis*, it is not until the third brood is reached that adults attempt to escape to other plants, and if it was to this third brood to which the escaped individuals belonged. It will be only safe to say that they were winged and migrated. A wingless female from the quince also strayed from the cage and stationed herself on some of these wheat plants, and produced a number of young, but these all died and fell from the plants. At the same time, in a large cage out of doors, others of this species were being reared from the eggs on twigs of apple. Wheat was sown within this cage, and some of the winged adults, after leaving the young buds and

leaves, went first to the muslin sides of the cage and afterwards to the wheat plants. One of these remained for two weeks, alive, on one of the plants, but I could not see that she produced young. While these transitions were certainly made between the tree and grain plants, nature apparently chose to accomplish it only by her own methods, and would brook no interference or human assistance.

Early in March of the present year (1893) I placed in the insectary a couple of small seedling apple trees and to these bound twigs from the orchard, thickly stuck with eggs of this *Aphis mali*. In the same bench, about twenty feet away, wheat was sown, while some corn was planted in the intervening space. A pot containing a strawberry plant infested by another species of *Aphis*, and which were attended by ants, *Lasius flavus*, had previously been placed on this bench. With the hatching of the *mali* a large portion of the ants abandoned their wards on the strawberry and gave their attention to the new ones on the apple. The strawberry was then removed, but they still clung to their new found friends. As the population on the apple increased the ants distributed the apterous females to plants of *Poa*, *Setaria*, and *Ambrosia artemisiifolia*, but especially to the wheat, carrying them by the corn to the wheat beyond, which soon became overrun with aphis. Later, they began to colonize their wards on the corn, but this seemed to be less desirable than either the wheat or grass. Winged *mali* left the apple unaided, and after taking up their position on the wheat began their labor of reproduction. On this wheat being uprooted the indefatigable ants removed them to a few wheat plants still farther away from the apple.

The species also lives over winter in the wheat fields, at least during mild winters, and I have found females reproducing every month of the year. Here, in the west, when the young wheat comes up in September and October, the winged females appear on the plants and give birth to their young, and these crawling downward attach themselves to the stems just below the surface of the ground, or often on the roots themselves. Here they go on reproducing when the temperature is favorable, the adults being apterous, so far as observed by me, until spring, when they ascend to the foliage, the adults being after this both winged and wingless. On the stems and roots below the surface of the ground, they are of a greenish color tinged with a reddish brown, especially posteriorly, the full grown individuals often being wholly of a dark brown. It is during autumn that they do their greatest injury to wheat by sucking the juices from the young plants, often,

if on poor land and during dry weather, checking their growth and causing the foliage to turn yellow.

My previous experiments in rearing the species were in some respects unfortunate, in being interrupted, although there was some profit attached to the failures. The results, as well as the whole series of experiments, as they were carried out, are here given.

Infested wheat plants were taken from the field and placed in breeding cages, out of doors, April 5th. May 6th., from what appeared to be the second generation from the individuals from the fields, two pupæ were selected and isolated on wheat plants. On the 8th both began reproducing, but only one of them was retained, the other being destroyed. The retained female produced five young between 7.30 A. M. and 5.30 P. M. of the 8th, and 11 more up to 7.30 A. M. of the 9th. Six young were found on the morning of the 10th, five on the morning of the 11th, three on the morning of the 12th and three on the morning of the 13th, but the mother was nowhere to be found, she evidently having escaped from under the glass with which the plant was covered. Her progeny of the 8th, five in number, had been kept on a separate plant under another cover, and these, except one which was killed by accident, reached the adult stage on the 15th. Two of these were winged and two were wingless, and one of each produced young as follows:

May 15,	winged female had produced	0	and	wingless	8	young.
" 16	" " " " " "	0	"	"	11	"
" 17	" " " " " "	7	"	"	7	"
" 18	" " " " " "	3	"	"	8	"
" 19	" " " " " "	2	"	"	7	"
" 20	" " " " " "	3	"	"	5	"
" 21	" " " " " "	2	"	"	10	"
" 22	" " " " " "	3	"	"	9	"
" 23	" " " " " "	1	"	"	1	"
" 24	" " " " " "	3	"	"		"
" 25	" " " " " "	0	"	"		"
" 26	" " " " " "	0	"	"		"

The winged female died on the 26th, after producing 24 young in twelve days. The wingless female escaped on the 23rd, after producing 65 young in nine days.

Females were again secured and produced young on June 2nd, after which the parent was destroyed, the progeny themselves giving birth to young on the 8th. A wingless female was selected and reproduced as follows:

June 8, produced 7 young.				June 18, produced 1 young.			
" 9	"	3	"	" 19	"	1	"
" 10	"	3	"	" 20	"	1	"
" 11	"	6	"	" 21	"	2	"
" 12	"	6	"	" 22	"	4	"
" 13	"	5	"	" 23	"	1	"
" 14	"	4	"	" 24	"	1	"
" 15	"	5	"	" 25	"	1	"
" 16	"	3	"	" 26	"	1	"
" 17	"	4	"				

The female continued to live a few days longer but died without further issue, she having produced 59 young in 19 days.

The results of the rearing of this species show that, as with the others, the winged female is the least prolific. It is also probable that some individuals are more productive of young than others, and that the species as a whole may be more prolific early in the season than later on towards midsummer.

As a comparison of the rapidity with which the species multiplies I append the following record of similar experiments with the grain aphid, *Siphonophora avenae*:

A female was isolated on a wheat plant May 5, and on the next day, having in the meantime given birth to four young, she was destroyed. On the 14th two of these were also destroyed, the remainder reaching maturity, one being winged and the other apterous. These were both kept on plants under glass, and carefully watched, with the following results, the young being destroyed as fast as produced:

May 15, winged female had produced 1 and wingless 6 young.							
" 16	"	"	"	"	3	"	4
" 17	"	"	"	"	4	"	4
" 18	"	"	"	"	5	"	6
" 19	"	"	"	"	4	"	8
" 20	"	"	"	"	2	"	5
" 21	"	"	"	"	4	"	7
" 22	"	"	"	"	3	"	4
" 23	"	"	"	"	1	"	6
" 24	"	"	"	"	1	"	4
" 25	"	"	"	"	2	"	3
" 26	"	"	"	"	1	"	3
" 27	"	"	"	"	2	"	6
" 28	"	"	"	"	0	"	2
" 29	"	"	"	"	2	"	3

May 30, winged female had produced 3 and wingless 8 young.

"	31	"	"	"	"	1	"	"	2	"
June	1	"	"	"	"	0	"	"	2	"
"	2	"	"	"	"	0	"	"	0	"
"	3	"	"	"	"	1	"	"	1	"
"	4	"	"	"	"	0	"	"	3	"
"	5	"	"	"	"	0	"	"	2	"

The wingless female died on the 6th, but the winged female lived on, without issue, until the 11th of June. The period of reproduction being 19 days with the winged female and 21 days with the wingless, the former producing 40 and the latter 89 young.

I found that the young moulted on the second, and began reproducing either late on the seventh or early on the eighth day after birth. The insects and plants were inspected, and the young removed each morning, usually about 8 o'clock, so that the young were the production of the subsequent 24 hours.

NOTES ON SPIDERS.

BY NATHAN BANKS.

The following pages embrace some miscellaneous notes on spiders of the U. S. First I have given a list of the genera and species omitted from Dr. Marx' Catalogue; next some of the works containing descriptions of new species that have been published since Dr. Marx' Catalogue. Quite a number of synonyms are given and some other notes on species, then follows some keys and descriptions of new species.

GENERA OMITTED.

Liocranoides Keys. Neue Spinnen, III, 1881, place after *Phrurolithus*.

Glenognatha Simon. C. R. Ent. Soc. Fr., 1884, place after *Pachygnatha*.

Myrmecarachne Walsh. Proc. Am. Ent. Soc. 1864, = *Synemosyna*.

SPECIES OMITTED.

Actinopus audouini Lucas. Ann. Ent. Soc. Fr., 1845, p. 60, Amerique du Nord.

Micaria limnicum McCook. Proc. Acad. Nat. Sc., 1884, Description worthless.

Pythonissa sericata Koch. Die Arach. d. Drass. Md. = *P. bicolor* Hentz.

Dictyna philosteichus McCook. = *D. civica* Lucas.

Clubiona tibialis Em. N. Eng. Drass. etc., N. Eng., N. Y., D. C.

Agræca pratensis Em. N. Eng. Drass. etc., N. Eng., N. Y.

Liocranoides unicolor Keys. Neue Spinnen, III, Mammoth Cave, Ky.

Theridium lineamentum McCook. Agric. Ant. Texas, 1879, = *Lathroedectes mactans*.

Statoda distincta Thor. Colo. Aranea, 1877, Colo.

Crustulina lascivula Keys. Die Spinn. Am. Therid., 1886, Ga.

Acrosoma bovinum Thor. Nya Exotiska Epeirider, 1858, Ala.

Glenognatha emertoni Simon. C. R. Ent. Soc. Fr., 1884, Ariz.

Olios fasciculatus Simon. Rev. d. Sparass., Calif.

Lycosa febriculosa Becker. Ent. Soc. Belg., 1881, La.

Lycosa vulpina Em. N. Eng. Lycosidæ, Mass., N. Y.

Lycosa tigrina, McCook. Am. Ent. Soc., Vol. VII, p. XI, Mass., N. Y., Pa.

Tarentula pulchra Keys. Am. Citigradæ, 1876, N. Am.

Among the literature omitted by Dr. Marx may be mentioned the following:

McCook. — Many short papers on habits of spiders in the Proc. Acad. Nat. Sc. Phil.

BECKER. — Ent. Soc. Belg., 1881. Description of *Lycosa febriculosa*.

HOWARD. — Catalogue of the Invertebrates of S. Carolina. A list of spiders by Dr. Marx embracing many Mss. names.

WALSH. — Proc. Am. Ent. Soc., 1864. Description of *Myrmecarachne*.

SIMON. — C. R. Ent. Soc. Fr., 1884. Description of *Glenognatha*.

“ — Revision d. Sparassidæ. Description of *Olios fasciculatus*.

THORELL. — Nya Exotiska Eperider. Descriptions of *Acrosoma bovinum* and *Argiope avara*.

LUCAS. — Ann. Ent. Soc. Fr., 1845. Description of *Actinopus audouini*.

Since the publication of Dr. Marx catalogue; spiders of the United States have been described in the following literature:

BANKS. — Spider Fauna of Upper Cayuga Lake Basin. Proc. Acad. Nat. Sc. Phil., 1892.

“ — N. Am. Dysderidæ, Can. Ent., 1891.

CURTIS. — A New Jumping spider. Zoe, 1893, Jan.

EMERTON. — New England Spiders, Fam. Attidæ. Conn. Acad. Arts and Sciences, 1891.

EMERTON — New England Spiders, Fam. Thomisidæ. Conn. Acad. Arts and Sciences, 1892.

FOX. — New species of Ceratinella. Ent. Soc. Wash., 1891.

KEYSERLING & MARX. — Die Spinnen Amerikas. Part IV, Epeiridæ.

MARX. — A Contribution to the knowledge of North American Spiders. Ent. Soc. Wash., 1891.

MCCOCK. — The Spiders of the United States. — Orbweavers, Vol. II, p. 135.

SIMON. — Descr. espèces et genres nouveaux d. l. famille d. Avicularidæ. Ann. Soc. Ent. France, 1891.

“ — Liste d. espèces d. l. fam. d. Aviculariides, etc. Actes d. l. Soc. Linn. d. Bordeaux, 1891.

STONE. — The Lycosidæ of Penn. and N. Jersey. Proc. Acad. Nat. Sc. Phil., 1891.

Since my last paper (Ent. News, Dec. 1891.) I have noticed the following synonymy:

Drassus saccatus Em. is *D. neglectus* Keys.

Clubiona lenta Bks. is *C. pygmea* Bks.

Thargalia perplexa Bks. is *T. pinnata* Em.

Thargalia fallax Bks. is ♂ of *T. descriptus* Hentz.

Cicurina complicata Em. is *C. arcuata* Keys.

Hahnina bimaculata Em. is *H. agilis* Keys.

Linyphia galbea Keys. is *Lephtthyphantes minuta* Blk.

Erigone purpurascens Keys. is *Theridium anglicanum* Hentz.

Theridium ventillans Keys. is ♂ of *Theridula spherula* Hentz.

Erigone fabra Keys. is ♂ of *zygia* Keys.

Tmeticus minutus Bks. is ♂ of *T. distinctus* Bks.

Tmeticus luxuosus Bks. is ♂ of *Loph. venustum* Bks.

Epeira alba Keys. is *E. displicata* Hentz.

Xysticus inornatus Em. is *Synema bicolor* Keys.

Misumena georgiana Keys. is *M. spinosa* Keys.

Misumena americana Keys. is ♀ of *M. oblonga* Keys.

Misumena foliata Bks. is *M. rosea* Keys.

Philodromus brevis Em. is ♂ of *P. minutus* Bks.

Philodromus pernix Blk. is *P. vulgaris* Hentz.

Philodromus obscurus Blk. is *P. rufus* Walck.

Thanatus lycosoides Em. is *T. rubicundus* Keys.

Lycosa oblonga Bks. is *L. immaculata* Bks.

Lycosa rufa Keys. is ♀ of *L. ocreata* Hentz.

Lycosa polita Em. is *Trochosa rubicunda* Keys.

Lycosa communis Em. is *L. lepida* Keys. = *L. erratica* Hentz.

Pardosa nigripalpis Em. is *P. flavipes* Keys.

Tetragonophthalma undulata Keys. is *T. dubia* Hentz.
Phidippus gracilis Keys. is *Phileus princeps* Peck.
Phidippus clarus Keys. is *P. octopunctatus* Peck.
Phidippus ruber Keys. is *P. cardinalis* Hentz.
Phileus mexicanus Peck. is *P. multicolor* Hentz.
Icius alborittatus Keys. is *Phileus militaris* Hentz.
Icius vittatus Keys. is *I. palmarum* Hentz.
Icius crassiventer Keys. is *Dendryphantes octavus* Hentz.
Dendryphantes insignis Bks. is *D. octavus* Hentz.
Dendryphantes multicolor Peck. is *D. rarus* Hentz.
Habrocestum splendens Peck. is *H. decorus* Blk.
Salticus fuliginus Blk. is *Synageles scorpionia* Hentz.
Salticus borealis Blk. is near *Habrocestum covatum* Hentz.
Prostheclina cambridgii Peck. is *P. (Attus) aurata* Hentz.
Synemosyna noxiosa Hentz is *Synageles scorpionia* Hentz.

OTHER NOTES ON SPECIES.

Simon (Spiders of the Island of St. Vincent, p. 573) proposes *Sergiolus* for *Herpyllus variegata* Hentz. I think it hardly necessary in considering our fauna. *Agræca tristis* Keys. and *A. Walsinghami* Cambr. do not belong to *Agræca* but go in the subfamily *Corinnine*. Our genera of the subfamily have not been separated. Simon says (Faune d. Arach. d. Senegal) that *Herpyllus discretus* (sic) Hentz is a *Tylophora*. *T. ornata* Hentz seems to be a *Corinnomma*. *Frontina* should be changed to *Floronia* Sim. as the former is preoccupied; *Linyphia conferta* Hentz belongs to this genus. *Epeira infumata* Hentz is a *Vixia*. Emerton (New England Thomisidæ) has placed *Xysticus elegans* Keys. ♂ and *X. crudelis* Bks. ♀ under the name of *X. limbata* Keys. The ♂ *X. elegans* and *X. limbata* are certainly quite different species; to what females they belong can only be known by finding them together. *X. brunneus* Bks. is not *X. crudelis*, nor is *X. locuples* Keys. *X. gulosus* Keys. as Emerton asserts. *X. gramineus* Em. is found at Ithaca, N. Y., and on Long Island; I have a young ♀ from D. C.; it may turn out to be *X. emertoni* Keys. *Dicæ lepida* Thorell is a *Misumena*, related to *M. rosea* Keys. *Ebo latithorax* Keys. is found as far north as Michigan. *Habrocestum auratum* Peck is not Hentz' species of that name, I propose for it *agilis*, it is found at Ithaca, N. Y. *Attus auratum* Hentz is Peckham's *Prostheclina*, it occurs in Texas. *Phidippus tripunctatus* Hentz should be called *P. audax* Hentz as the latter was described before the former. I have a ♂ of Emerton's pretty *Euophrys monadnock* from West Cliff, Colorado. What

Peckham and Emerton describe and figure as such is certainly not Hentz' *Salticus ephhiatus* for the position of the eyes and shape of the cephalothorax is entirely different; it should be called *alborinctus* Koch; it occurs on L. I. and at D. C. *Synemosyna ephhiatus* Hentz, except for the legs, seems to be very close to what Peckham calls *scorpiona* Hentz.

KEYS AND DESCRIPTION.

Our genera of Drassidæ may be separated as below.

1	{ No dorsal groove	(Micarinæ) Micaria
	{ Dorsal groove present	(Drassinæ) 2
	{ Hind row of eyes more or less recurved	(Gnaphosini) 3
2	{ Hind row of eyes straight or procurved	(Drassini) 5
	{ Head less than one-half as wide in front as in middle	4
3	{ Head more than one-half as wide in front	Gnaphosa
	{ Mandibles with a toothed plate on the under side	Pythonissa
4	{ No such plate present	Pocillochroa
	{ A dorsal shield on base of abdomen	Echemus
5	{ No such shield	6
	{ P. M. E. oval	Drassus
6	{ P. M. E. round	7
	{ Lower spinnerets longest	Prosthesima
7	{ Lower spinnerets shorter than upper pair	Teminius

Our genera of Clubioninæ may be tabulated thus:

1	{ Two rows of very strong spines under tibiae I and II	(Phrurolithini) 2
	{ Tibiæ I and II not strongly spined	(Clubionini) 3
	{ Lower row of eyes strongly recurved	Liocranoides
2	{ Lower row of eyes not recurved	Phrurolithus
	{ First pair of legs longest	Chiracanthium
3	{ Fourth pair of legs longest	4
	{ Lip only one-third shorter than maxillæ	Clubiona
4	{ Lip not over one-half as long as maxillæ	5
	{ Lower row of eyes procurved	Agroeca
5	{ Lower row of eyes recurved	Hilke

The species of *Thargalia* known to me may be separated by the following color characters:

1	{ Legs lined with black	bivittata
	{ Legs not lined with black	2
	{ Abdomen red with a longitudinal black stripe each side	crocata
2	{ Abdomen not so marked	3
	{ Black, with a red spot or short stripe at tip of abdomen	descripta
3	{ Not so marked	4
	{ Without any black	5
4	{ Black or with black bands	6
	{ Red, without bands	amœna
5	{ Yellow, with two interrupted white bands	aurata

6	{ Anterior femora red	trilineata
	{ Anterior femora blackish	7
7	{ Posterior femora red or reddish, not black, many light bands on the abdomen.	8
	{ Posterior femora black	9
8	{ Hind legs distinctly black banded	ornata
	{ Hind legs not distinctly banded	pinnata
	{ One band near base of abdomen	agilis
9	{ Many light bands on the abdomen	longipalpis

T. descripta has been considered the ♀ of *T. crocata*, but such is not the case as I have a ♀ *crocata* similar to the ♂, and very different from *descriptus*. *T. cingulata* is probably *T. trilineata* of which *T. zonaria* appears to be but a variety, *T. marmorata* may be the same as *T. ornata*.

Our genera of Dictynidæ may be distinguished thus:

1	{ Eyes 6	Neophanes
	{ Eyes 8	2
2	{ Legs without spines, cribellum, undivided	3
	{ Spines on some legs, cribellum divided	4
3	{ A. M. E. very much smaller than the others	Prodalia
	{ A. M. E. equal in size to the others	Dictyna
4	{ Maxillæ inclined over the lip	Amaurobius
	{ Maxillæ straight	Titanœca

Tapinopa, a genus related to *Linyphia* but differing from all other Linyphiinæ in lacking spines to the legs, occurs in the eastern U. S. It may be described as follows:

Tapinopa bilineata n. sp.

Length ♀ 3.5 mm. Cephalothorax pale with a broad black stripe each side, which does not, however, reach the margins; mandibles yellowish, with a spot at base in front and a line at base on the side blackish; sternum brown, blackish on the edges; legs and palpi whitish, a broad band on middle of femur, patella, bands at middle and tips of tibia and metatarsus, black; two black bands on palpi. Abdomen pale, grayish brown, blotched with white, two rows of four spots above, tip with a few chevrons, sides with some oblique stripes, and venter almost wholly, black. Legs 1, 4, 2, 3. Head slightly projecting in front over the mandibles which are obliquely retreating, of large size, and have their lower margins armed with a row of slender spines. Clypeus low. A. M. E. the largest, other eyes about equal; A. M. E. projecting forward and downward on tubercles.

This species lives among grass or leaves close to the ground. It resembles *Stemonyphantes bucculentus* but readily separated by the absence of spines on legs, the structure of its mandibles, and the two rows of spots on the dorsum. The epigynum projects slightly as is common in *Bathyphantes*. I have it from Sea Cliff, N. Y. and Washington, D. C.

The Eastern species of *Linyphia* known to me may be separated as below.

- | | | |
|---|--|--------------------|
| | { Cephalothorax with a distinct median stripe | 2 |
| 1 | { Cephalothorax unicolorous | 3 |
| | { Legs spotted, abdomen with a median serrate brown stripe, stripe on cephalothorax narrow | phrygiana |
| 2 | { Legs unspotted, abdomen with large black spots, stripe on cephalothorax very broad | marginata |
| | { Abdomen marked with chocolate brown on posterior part | variabilis |
| 3 | { Abdomen marked with black | 4 |
| | { Abdomen with a broad median black stripe, connected behind by side stripes to the black venter | communis |
| 4 | { Abdomen black with a few light spots each side, sometimes connected, ♂ mandibles large | mandibulata |

The species known to me from the Pacific coast may be separated thus :

- | | | |
|---|---|----------------------|
| | { Cephalothorax with a median stripe | 2 |
| 1 | { Cephalothorax unicolorous | 3 |
| | { Red, legs not spotted | rubrofasciata |
| 2 | { Legs spotted, not red | phrygiana |
| | { Legs banded | digna |
| 3 | { Legs not banded | 4 |
| | { With a broad median black stripe on abdomen | pusilla |
| 4 | { Abdomen longer, with black lines and an apical spot | litigiosa |

L. reducta Keys, is a *Helophora*, closely related to *H. insignis* Blk., *L. arcuata* Keys, is a *Lepthyphantes* and near *L. nebulosus* Sund., *L. brevipes* Keys, is a *Bathyphantes*.

In the Eastern States *L. marginata* and *L. phrygiana* are the most common species; on the Pacific coast *L. litigiosa* and *L. digna* seem to be the two most common forms.

The males of the species of *Ceratinella* known to me may be separated by the following key:

- | | | |
|---|---|--------------------|
| | { The head with a transverse fissure | 2 |
| 1 | { Head even, no fissure | 4 |
| | { S. E. on tubercles | bulbosa |
| 2 | { S. E. not on tubercles | 3 |
| | { Dorsal shield very distinct | fissiceps |
| 3 | { Dorsal shield indistinct | atriceps |
| | { Basal shield covering large part of venter | 5 |
| 4 | { Basal shield much smaller | 6 |
| | { Tube of palpus shorter than the tarsus | micropalpis |
| 5 | { Tube of palpus longer than the tarsus, smaller species but with a larger palpus | minuta |
| | { Tibia of palpus with a long slender projection | 8 |
| 6 | { Tibia of palpus with a short projection | 7 |

7	{	The projection very broad, not narrowed toward tip	lætabilis
	{	The projection narrowed from base to tip	læta
8	{	P. M. E. less than diameter apart	melanocnemis
	{	P. M. E. more than diameter apart	9
9	{	Color dark gray or blackish	10
	{	Color pale yellow or reddish	11
10	{	Tibial hook black, stout, cephalothorax very dark	brunnea
	{	Tibial hook pale, slender, cephalothorax lighter	placida
11	{	Black of cephalothorax extends back to dorsal groove, very small white species	pygmæa
	{	Black of cephalothorax confined to eye-region	12
12	{	Tibial hook with two rounded teeth on side, narrowing toward the tip, cephalothorax yellow	emertoni
	{	Tibial hook without such teeth, broad at tip, cephalothorax reddish	similis

Ceratinella mæsta Bks. is a *Lophocarenum*, the only true species of *Lophocarenum* described from U. S. *Ceratinella annulipes* Bks. does not belong to the genus, I have a male from Poughkeepsie, N. Y., collected by Mr. Van Ingen, it is similar to the female, its palpus shows some relation to the Theridinae; I know of no genus for it. Simon (Arach. d. France) has called our *Ceratinella Ceraticelus*; but I consider that the name *Ceratinella* was given not so much to supplant *Ceratina* (preoccupied) as it was to designate the species placed by its author (Emerton) under it. The European forms called *Ceratina* are thus without a genus, I propose for them *Ceratinodes*. My *Ceratinella formosa* is not a true *Ceratinella*. I propose for it *Idionella* distinguished by the position of the horny shield. I have collected it on Long Island, N. Y.

The females of our species of *Aerosoma* are separable thus:

Abdomen with ten spines, three on each side and four at tip	rugosa
Abdomen with six spines, two on each side and two large ones at tip	spinea
Abdomen with four spines, all at tip	mitrata

In the Prairie Farmer 1861, p. 168, "Vespa" (Cyrus Thomas?) mentions *Gasteracantha spinicauda*, this is a synonym of *Aerosoma spinea*. *Aerosoma bovinum* Thorell is a synonym of *A. spinea*.

Our genera of the Tetragnathinae may be separated as follows:

1	{	With a ventral furrow	Glenognatha
	{	No ventral furrow	2
	{	Abdomen not twice as long as wide, not much longer than the cephalothorax	Pachygnatha
2	{	Abdomen more than twice as long as wide, much longer than the cephalothorax	3
3	{	S. E. not farther apart than M. E.	Tetragnatha
	{	S. E. farther apart than M. E.	4

- 4 (Spinnerets at the end of abdomen **Eugnatha**
) Abdomen projecting beyond spinnerets in a tail **Eucta**

Our species of the last three genera may be separated as in the following keys. Some species are very common and often noticed by all observers of nature. The webs are usually nearly horizontal, but sometimes quite oblique. The genital characters are nearly the same throughout, so that young forms are often as easily determinable as adult ones.

Tetragnatha ♂.

- Tibia of palpus barely longer than patella **laboriosa**
 Tibia of palpus twice as long as patella
 Fang of mandibles undulate **grallator**
 Fang of mandibles an even curve **extensa**

Tetragnatha ♀.

- Abdomen silvery, S. E. separated, L. S. E. smaller than the others, small species **laboriosa**
 Abdomen darker, S. E. closer together, equal
 Mandibles as long as cephalothorax **grallator**
 Mandibles two-thirds as long as cephalothorax **extensa**

Tetragnatha grallator *Hentz.*

The female has the abdomen enlarged near the base; the color darker than is usual in the group. The male varies much in size. Length of female 10—12 mm. Common in the Eastern States and Texas.

Tetragnatha extensa *Lin.*

Smaller than *grallator* and the abdomen shorter. The colors are often quite dark, the cephalothorax with dark stripes. Western specimens have the tibial joint of the palpi shorter than the eastern ones; and are usually darker. Length of female 8—10 mm.

This is a boreal species, crossing our country from Maine to Washington State. In the north it is the most common species of the group.

Tetragnatha laboriosa *Hentz.*

The female usually has a silvery abdomen, with a dark oblique line each side, and two or three silvery stripes on the dark venter. Sometimes there is a folium on the abdomen. The male is the smallest of the subfamily. Western males have the abdomen a little thicker than eastern ones. Length of female 6—8 mm.

Probably the whole United States; I have it from N. Eng., N. Y., Mich., D. C., La., Fla., Tex. and Wash. State.

T. illinoensis Keys., and *T. fluvialtilis* Keys., I consider as belonging to this species; both were described from females.

Eugnatha ♂.

- Tibial joint of the palpus not longer than patella, mandibles shorter than the cephalothorax **vermiformis**
- Tibial joint of the palpus twice as long as patella
- Mandibles shorter than the cephalothorax, a large tooth on the inner margin, outer tooth bifid at tip **straminea**
- Mandibles as long as the cephalothorax, all teeth on inner margin small, outer tooth not bifid **pallida**

Eugnatha ♀.

- Maxillæ not reaching to the end of fang, mandibles projecting almost horizontally **pallida**
- Maxillæ reaching to end of fang, mandibles projecting more vertically:
 - Outer side of mandibles nearly straight **vermiformis**
 - Outer side of mandibles concave **straminea**

Eugnatha vermiformis Em.

This species is somewhat rare. Length of female 12 mm. N. Y., N. Eng., L. I.

Eugnatha pallida Banks.

The female has mandibles longer than *vermiformis*, the teeth are smaller than in *straminea*. The outer margin of the mandibles more like *vermiformis*.

- One ♂ N. Y., 9 mm.; one ♂ N. Y. and one Fla. 7 mm.
- One ♀ N. Y. and one Fla. 12 mm.; one ♀ Fla. 9.5 mm.

Eugnatha straminea Em.

The abdomen of the female projects a little beyond the spinnerets but not once its diameter. Length of female 10 mm. N. Eng., N. Y., D. C., Mich.

Eucta.

Eucta caudata Em.

The male is similar to the female but smaller, the tibial joint of the palpus not much longer than the patellar. This is rare in the north but quite common in Florida. — Can., N. Y., N. Eng., D. C., Fla.

The species of *Nysticus* may be arranged in three groups; those that have clavate hairs as *N. nigromaculatus* and *N. feroculus*; those that have pale line on the anterior legs as *N. gulosus*, *N. limbatus*, etc. Those without the pale line on legs as *N. nervosus*, etc.

Coriarachne brunneipes nov. sp.

Length ♀ 9 mm. ♂ 5 mm. Cephalothorax and legs dark red brown, metatarsi and tarsi paler. A few small white spots on the cephalothorax and one near tip of femur above, abdomen (♀) black above with a large ill-defined central mark of grayish white, the edges very ragged, abdomen (♂) is almost covered with white, three large black spots each side send out branches which ramify through the white, sternum (♀) pale with a central darker spot, (♂) wholly dark brown venter gray, in the ♂ more reddish brown. The whole body is very much depressed, more than in *C. versicolor*, the legs are slenderer than in that species, tibia I being over three times as long as broad. The abdomen is more elongate than in *C. versicolor*. The epigynum consists of a cavity much narrower behind, similar in plan to that of *Gnaphosa*, from the anterior margin there is a projection with a rounded posterior margin, which nearly covers the anterior portion of the cavity. The tibial joint of the palpus has a prominent lateral projection with a curved point, the tube is quite short.

This species is quite common in Washington State. (T. Kincaid.)

The genera of the *Oxyopidae* may be readily separated as follows:

- 1 (Mandibles higher than the cephalothorax **Peucetia**
- 1 (Mandibles not as high as cephalothorax 2
- 2) P. M. E. about half as far apart as P. S. E. **Oxyopes**
- 2 / P. M. E. much more than half as far apart as P. S. E. . . . **Hamataliwa**

What Emerton calls *Oxyopes scalaris* Hentz (New England Lycosidae) is not that species but is new. I have seen an adult female in Dr. Fox's collection which he obtained in New Hampshire.

Oxyopes cinerea nov. sp.

Length ♀ 8 mm. Cephalothorax and mandibles reddish brown, somewhat more brown on the sides and lighter in the middle, eyes on black spots, traces of dark lines reaching from the A. M. E. down upon the mandibles, maxillæ reddish brown, lip darker, sternum reddish brown, lighter in the middle, legs and palpi yellowish with darker reddish markings on base and tip of femora, and on base, middle and tip of tibiæ and metatarsi; abdomen dark gray, two diverging short white stripes near base, and two oblique spots on each side, further back a light stripe on each side of venter, a wide median black stripe from epigynum to spinnerets. Cephalothorax highest at eye-region straight and barely sloping until near the posterior margin where it suddenly drops, clypeus straight, legs spiny, abdomen widest near base, apex pointed, more stubby than the other species. The epigynum consists of a short rounded finger directed forward, somewhat like *O. salticus* but not pointed.

I have received, from Mr. Trevor Kincaid, another new species of this genus which he finds quite commonly in Washington State.

Oxyopes rufipes nov. sp.

Length ♀ 10 mm., ♂ 7 mm. Cephalothorax reddish, usually with a light median stripe, eyes on black spots, mandibles and maxillæ reddish, usually

there are faint lines reaching from the A. M. E. down upon the mandibles, sternum reddish brown on the sides, paler in the center; legs reddish, more yellow at tips, a few dark spots at the base of hairs, dorsum of abdomen reddish brown, often with a light median stripe enclosing a spear-mark at base, and a short light mark on each side near tip; venter yellowish with a broad median brown stripe, spinnerets brown. The ♂ is darker than the ♀. Sometimes the legs are a little banded. Cephalothorax highest at eye-region, gradually sloping concavely until near the posterior end, where it suddenly curves down; legs spiny, abdomen widest in front, tapering to apex; the epigynum consists of a rounded finger, somewhat similar to *O. cinerea* but more slender. Male palpal organ black, the tarsus is more slender than in the other species, the tibia has on the inner side a short pointed projection similar to *O. salticus*, the basal part of the palpal organ is more complicated than in that species.

The four species of *Oxyopes* may be separated by the following table:

1	}	Femora with a black line on under-side	salticus
		Femora without a black line on under-side	2
2	}	Abdomen light, with black side and median stripes	scalaris
		Abdomen dark, with a few light spots	3
3	}	Dorsum of cephalothorax straight, about as high in middle as in eye-region	cinerea
		Dorsum of cephalothorax concave, higher in eye-region than in middle	rufipes

LOCAL ENTOMOLOGICAL NOTES.

Members of the New York Entomological Society and all others, are solicited to contribute to this column, their rare captures, local lists and other items of interest relating to the insect fauna of New York city and vicinity.

LIST OF THE COLEOPTERA OF NORTH EASTERN AMERICA, WITH SPECIAL REFERENCE TO THE FAUNA OF NEW YORK CITY AND VICINITY.

By CHARLES W. LENG AND WM. BEUTENMULLER.

(CONTINUED FROM PAGE 96.)

SCHIZOGENIUS *Putz.*

S. planulatus *Lec.*—N. Y. Taken by Mr. Linell at Coney Island.

S. lineolatus *Say.*—N. E. Amer. Lives under stones along river banks, June and Sept. Not common in this vicinity.

S. ferrugineus *Putz.*—N. E. Amer. Occurs in salt marshes. Not common in this vicinity.

S. amphibius *Hald.*—N. Y., Mo. Taken in this vicinity by Mr. Wm. Jülich.

ARDISTOMIS *Putz.*

A. obliquata *Putz.*—N. J. and southward. Taken at Atlantic City, N. J., by Mr. Liebeck.

A. morio *Dej.*—N. Y. to Fla. Taken in this vicinity by Mr. Jülich.

A. viridis *Say.*—N. E. Amer. Found in sandy banks. Not common in this vicinity.

A. puncticollis *Putz.*—Ohio (Dury).

PANAGÆUS *Lat.*

P. crucigerus *Say.*—N. Y., N. J. and southward. Rare in this vicinity. May and June under stones. Taken in April in deserted ant hills (W. B.).

P. fasciatus *Say.*—N. Y., N. J. and southward. Very rare in this vicinity. May and June.

NOMIUS *Laf.*

N. pygmæus *Dej.*—Taken at Newark, N. J., by Mr. Bischoff. Also found in Canada (Harrington).

BEMBIDIUM *Lat.*

B. punctatostriatum *Say.*—N. Y., N. J., O. Found along the banks of the Passaic, N. J., in May and Sept.

B. impressum *Fabr.*—Buffalo, N. Y. ♀

B. paludosum *Sturm.*—Buffalo, N. Y.

B. inæquale *Say.*—N. E. Amer. Found along river banks in May and Sept.

B. nitidulum *Dej.*—N. E. Amer. Found along the banks of the Passaic, N. J., in May and Sept.

B. nitidum *K'by.*—Buffalo, N. Y.

B. americanum *Dej.*—N. E. Amer. Rather common in this vicinity, along banks of ponds. May and Sept.

B. antiquum *Dej.*—N. Y., N. J. Along river banks, not common in this vicinity.

B. chalconum *Dej.*—N. Y., N. J., Ohio. Found along the banks of the Passaic in May and Sept.

B. concolor *K'by.*—Buffalo, N. Y.

B. nigrum *Say.*—N. Y., N. J., Can. Found along the banks of the Passaic, N. J., in May and Sept.

B. planatum *Lec.*—N. J. Taken in the same locality as the preceding species.

B. Kuprianovi *Mann.*—Buffalo, N. Y.

B. fugax *Lec.*—Buffalo, N. Y., Mo.

B. planum *Hald.*—Canada, Buffalo, N. Y.

B. rupestre *Dej.*—N. E. Amer. Common in this vicinity.

B. plagiatum *Zimm.*—Buffalo, N. Y.

- B. lacunarium** *Zimm.*—N. Y., N. J. Found along brooks at Fort Lee, N. J. (Linell) and at Coney Island (Leng).
- B. dorsale** *Say.*—Can., N. Y., N. J., Ohio.
- B. patrule** *Dej.*—N. Y., N. J., Ohio, Pa. Found along river banks, May and Sept.
- B. variegatum** *Say.*—N. E. Amer. Common in this vicinity.
- var. posticum* *Lec.*—Taken at Coney Island, N. Y. (Leng).
- B. intermedium** *Kby.*—N. Y. (Buffalo) N. J., Ohio, Canada.
- B. nigripes** *Kby.*—Pa., (also Or. Br. Col).
- B. versicolor** *Lec.*—N. Y., N. J., Ohio. Found along the banks of the Passaic, N. J., in May and Sept.
- B. constrictum** *Lec.*—N. Y., N. J. Taken at Coney Island (Leng). Common in N. J. Sept.
- B. contractum** *Say.*—N. Y., N. J. Found along the seashore.
- B. affine** *Say.*—N. Y., N. J., Ohio.
- B. assimile** *Gyll.*—Buffalo, N. Y.
- B. quadrimaculatum** *Linn.*—N. E. Amer. Common everywhere, in fields and gardens.
- B. semistriatum** *Hald.*—N. Y., N. J. May and Sept.
- B. picipes** *Kby.*—Ohio (Dury), Peekskill, N. Y. (Sherman), N. Hampshire.
- B. cordatum** *Lec.*—Ohio (Dury), also Mo.
- B. lævigatum** *Lec.*—Ohio, (Dury), also Mo.
- B. bifossulatum** *Lec.*—Peekskill, N. Y., (Sherman).
- B. bimaculatum** *Kby.*—Ottawa, Canada (Harrington).
- B. pedicellatum** *Lec.*—Pa. (also Missouri).

TACHYS *Schaum.*

- T. proximus** *Say.*—Ohio, Buffalo, N. Y., N. J., Pa. Found along the banks of the Passaic, N. J. May and Sept.
- T. scitulus** *Lec.*—Ohio, Buffalo, N. Y., N. J. Found in the same locality as the preceding.
- T. occultator** *Casey.*—N. J. Taken at Brigantine Beach by Dr. Hamilton in September.
- T. lævus** *Say.*—Ohio, Buffalo, N. Y., N. J., Pa. Rare in this vicinity.
- T. nanus** *Gyll.*—N. E. Amer. Common in this vicinity under bark of trees; runs very fast.
- T. flavicauda** *Say.*—N. E. Amer. Common under bark of trees. May and September.
- T. tripunctatus** *Say.*—N. Y., N. J., Pa. Taken along the banks of the Passaic, N. J., in May and Sept.
- T. vivax** *Lec.*—Ohio, Buffalo, N. Y., Pa.
- T. capax** *Lec.*—N. J. and westward. Found in cranberry bogs in N. J. (Smith).
- T. xanthopus** *Say.*—N. Y., N. J. and westward.
- T. incurvus** *Say.*—N. E. Amer. Common in the vicinity of N. Y. City.
- T. fuscicornis** *Chd.*—N. J.
- T. pulchellus** *Lec.*—Ohio and westward.
- T. ventricosus** *Lec.*—Peekskill, N. Y. (Sherman).

PATROBUS *Dej.*

- P. longicornis** *Say.*—N. E. Amer. Found in woods in moist places.
P. septentrionis *Dej.*—Northern States and Europe. Not found in this vicinity.
P. rugicollis *Rand.*—N. Y., Pa., Mass. and northward. Not found in this vicinity.

PERICOMPSUS *Lec.*

- P. ehippiatus** *Say.*—N. Y. and westward. Found in sandy places near the Hudson River, N. Y. (Sherman).

POGONUS *Dej.*

- P. texanus** *Chd.*—N. J. Rare at Atlantic City.

TRECHUS *Clair.*

- T. rubens** *Fabr.*—Nova Scotia, N. Europe.
T. chalybæus *Mann.*—Alaska to N. Hampshire.

MYIAS *Dej.*

- M. cyanescens** *Dej.*—N. Y., N. J. Taken in this vicinity at Fort Lee and Clifton, N. J., and on Staten Island, in June and July. Rare.
M. coracinus *Say.*—N. Y., N. J., Ohio. Rare.

PTEROSTICHUS *Bon.*

- P. adoxus** *Say.*—N. E. Amer. Not common in this vicinity.
P. rostratus *Nezom.*—Can., N. Y. and southward.
P. diligendus *Chaud.*—N. E. Amer. Not common in this vicinity.
P. honestus *Say.*—N. E. Amer. Not rare in this vicinity.
P. lachrymosus *Nezom.*—N. Y. and southward. Not rare in this vicinity.
P. stygicus *Say.*—N. E. Amer. Abundant in this vicinity.
P. coracinus *Nezom.*—N. E. Amer. Not rare at Snake Hill, and Short Hills, N. J.
P. relictus *Nezom.*—N. Y., Pa., Mich. Rare.
P. superciliosus *Say.*—N. Y., Pa., Mich. Rare.
P. moestus *Say.*—N. Y., N. J., Pa., W. Va. Rare in this vicinity.
P. punctatissimus *Rand.*—Mass. and Westward.
P. sculptus *Lec.*—N. Y. and southward. Taken at Atlantic City, N. J. (Smith).
P. Hamiltoni *Horn.*—Pa., E. Ohio, Md., W. Va. Not common.
P. Sayi *Brulle.*—N. E. Amer. Common in this vicinity.
P. lucublandus *Say.*—N. E. Amer. Very common everywhere.
P. ebeninus *Dej.*—N. Y. and southward. Rare in this vicinity.
P. caudicalis *Say.*—N. E. Amer. Rare in this vicinity.
P. luctuosus *Dej.*—N. E. Amer. Taken at Snake Hill, N. J. Rare.
P. corvinus *Dej.*—N. E. Amer. Not common in this vicinity.
P. purpuratus *Lec.*—N. Y. and westward. Not found in this vicinity. Rare.

- P. mutus* Say.—N. E. Amer. Very common everywhere in this vicinity.
P. pennsylvanicus Lec.—N. E. Amer. Not found in this vicinity.
P. orinomum Leach.—Canada, Nova Scotia.
P. Luczotii Dej.—N. Y. and northward. Not found in this vicinity.
P. erythropus Dej.—N. E. Amer. Rare in this vicinity.
P. patruelis Dej.—N. E. Amer. Common in this vicinity.
P. femoralis Kby.—Can., N. Y. and westward. Wis. (O. Dietz).
P. corrusculus Lec.—N. Y., Mass. Rare under moss.
P. mandibularis Kby.—N. Hampshire, Can.
P. Haldemani Lec.—N. Y. and southward. Rare on Staten Island (Leng).
P. tartaricus Say.—N. Y., southward and westward. Taken at Hoboken, N. J. and Astoria, L. I. May.
P. scrutator Lec.—N. Y., Can., Ill.
P. gravis, Lec.—Pa.
P. permundus Say.—Ohio.
P. substriatus Lec.—N. J. (Davis), N. Y. (Jülich) and southward.
P. rotundatus Lec.—N. Y. (Jülich), Ga. (Lec).
P. unicolor Say.—N. Y. and southward. Not found in this vicinity.
P. approximatus Lec.—Pa. and southward.
P. hudsonicus Lec.—Labrador.

EVARTHURUS Lec.

- E. sigillatus* Say.—N. J. and southward.
E. sodalis Lec.—Pa. and southward. Wis., Ohio (Dietz).
E. furtivus Lec.—Pa. and southward.

AMARA Bon.

- A. avida* Say.—N. E. Amer. Rare in this vicinity.
A. arenaria Lec.—Buffalo, N. Y., N. Hampshire.
A. exarata Dej.—N. E. Amer. Not common.
A. latior Kby.—N. J.
A. angustata Say.—N. E. Amer. Not rare in this vicinity.
A. pallipes Kby.—N. J. and westward.
A. impuncticollis Say. N. E. Amer. Common in this vicinity.
A. basillaris Say.—N. Y., N. J. (Linell).
A. cupreolata Putz.—N. J., Ill.
A. interstitialis Dej.—Can., N. Y., N. J. Not rare in this vicinity.
A. obesa Say.—N. Y., N. J., Can. and westward.
A. fallax Lec.—Buffalo, N. Y. and westward.
A. erratica Sturm.—Can., Vt., Mich.
A. chalcea Dej.—N. Y., N. J. and westward.
A. gibba Lec.—N. J.
A. rubrica Hald.—N. Y., N. J. Rare in this vicinity.
A. subænea Lec.—Can., N. Y., N. J.
A. musculus Say.—N. Y., N. J. and westward. Not common in this vicinity.
A. acutangula Putz.—N. J. Rare.
A. similis Kby.—Labrador.

- A. *polita* Lec.—Can., N. Y. (O. Dietz).
- A. *septentrionalis* Lec.—N. Y. (O. Dietz).
- A. *hyperborea* Dej.—Labrador.

LOXANDRUS Lec.

- L. *agilis* Dej.—Pa. and southward.

DIPLOCHILA Brulle.

- D. *laticollis* Lec.—New York and westward. Not rare in moist places, in this vicinity. May and June.
- var. major* Lec.—Found with the preceding.
- D. *impressicollis* Dej.—Can., N. Y. and westward.

DICÆLUS Bon.

- D. *dilatatus* Say.—N. Y. and westward. Rare in this vicinity. May and June.
- D. *purpuratus* Bon.—N. Y., Mass., southward and westward.
- D. *sculptilis* Say.—Ohio, southward and westward. Wis. (O. Dietz).
- D. *furvus* Dej.—Ohio, Southward and westward.
- D. *crenatus* Lec.—A southern species on the Buffalo list.
- D. *ovalis* Lec.—N. Y., west and southward. Taken at Snake Hill, N. J.
- D. *elongatus* Bon.—N. E. Amer. Not rare in this vicinity.
- D. *ambiguus* Laf.—N. Y., west and south. Not found in this vicinity.
- D. *teter* Bon.—N. E. Amer. Not rare along the Palisades, N. J.
- D. *politus* Dej.—N. E. Amer. Not rare in this vicinity.

LICINUS Lat.

- L. *silphoides* Fab.—Mass. and Europe.

BADISTER Clairv.

- B. *notatus* Hald.—Can., N. Y., N. J., westward and southward. Rare in this vicinity.
- B. *micans* Lec.—Mass., N. Y., N. J., Ill., Fla. Rare in this vicinity.
- B. *pulchellus* Lec.—Can., N. Y., Ill., Ind., Fla.
- B. *maculatus* Lec.—Pa.
- B. *ferrugineus* Dej.—Cal., Alaska (on the Buffalo list).
- B. *flavipes* Lec.—N. Y., La., Fla.
- B. *reflexus* Lec.—N. Y., Mich., La.

CALATHUS Bon.

- C. *gregarius* Say.—Can., N. Y. to Fla. to Tex. Common in various localities in this vicinity.
- C. *ingratus* Dej.—Can., Labrador, Alaska.
- C. *opaculus* Lec.—N. E. Amer. Rare in this vicinity.
- C. *advena* Lec.—Alaska to N. Hampshire.
- C. *impunctatus* Say.—N. E. Amer. Not rare in this vicinity, especially at the sea shore.

PLATYNUS *Bon.*

- P. angustatus* *Dej.*—Middle and Southern States. Rare at Fort Lee, N. J.
P. caudatus *Lec.*—Ohio.
P. hypolithus *Say.*—Middle and Southern States.
P. decens *Say.*—Can. to N. C. Scarce in this vicinity.
P. sinuatus *Dej.*—N. E. Amer. Not common in this vicinity.
P. opaculus *Lec.*—Middle and Western States. Rare at Fort Lee, N. J.
P. tenuicollis *Lec.*—Lake Superior. Taken at Atlantic City, N. J. (Castle).
P. cincticollis *Say.*—Middle and Southern States. Common under stones along brooks.
P. reflexus *Lec.*—Can. and Middle States. Found in same situation as the preceding species.
P. extensicollis *Say.*—N. E. Amer. Common under stones along brooks and rivers in this vicinity.
var. viridis *Lec.*—Southern and Western States. (On the Buffalo list).
P. decorus *Say.*—N. E. Amer. Not rare along the Passaic, N. J.
P. anchomenoides *Rand.*—Can. and Maine.
P. clemens *Lec.*—Nova Scotia.
P. errans *Say.*—Canada.
P. moerens *Dej.*—Can. and Atlantic States.
P. pusillus *Lec.*—Can., N. Y. and westward.
P. collaris *Say.*—Southern States. (On the Buffalo list).
P. tenuis *Lec.*—Can. and Middle States.
P. atratus *Lec.*—N. E. Amer. Rare in this vicinity.
P. melanarius *Dej.*—N. E. Amer. Common in this vicinity.
P. propinquus *G. & H.*—Can. to Mass., N. J.
P. affinis *Khy.* N. E. Amer. Rare in this vicinity.
P. corvus *Lec.*—Can. to Or.
P. metallescens *Lec.*—Lake Superior to N. J. Not rare in this vicinity.
P. deceptivus *Lec.*—Nova Scotia to Lake Superior.
P. cupripennis *Say.*—N. E. Amer. Common in this vicinity.
var. nitidulum *Dej.*—Bear Lake, Pa.
P. Hardyi *Lec.*—Newfoundland.
P. excavatus *Dej.*—Can., Middle and Western States. Rare in this vicinity.
P. ferreus *Hald.*—Middle and Western States. Not rare along the Palisades, N. J.
P. basalis *Lec.*—Pa., N. J., to Fla. Very rare. Taken at Hoboken, N. J. (Linell).
P. maculicollis *Dej.*—Cal. (On the Buffalo list).
P. variolatus *Lec.*—Cal. (On the Buffalo list).
P. nutans *Say.*—Can., N. Y. to Fla. Rare in this vicinity.
P. octopunctatus *Fabr.*—N. E. Amer. Rare in this vicinity.
P. placidus *Say.*—N. E. Amer. Common.
P. vicinus *G. & H.*—Can., Lake Superior.
P. obsoletus *Say.*—N. E. Amer. Rather common in this vicinity.
P. quadripunctatus *Dej.*—Can., Alaska, N. Y. (On the Buffalo list).
P. æruginosus *Dej.*—Atlantic States. Not common under bark in this vicinity.

P. crenistriatus Lec.—N. Y. and westward. Abundant on seashore of Long Island and New Jersey.

P. rubripes Zimm.—Middle and Western States. Not common in this vicinity.

P. punctiformis Say.—N. E. Amer. Rather common in this vicinity.

P. sordens Kby.—Can., to N. J. Rare in this vicinity.

P. picicornis Lec.—Can., N. Y. and westward. Not found around N. Y. City.

P. ruficornis Lec.—N. Y. and Westward. Wis. (O. Dietz).

P. retractus Lec.—Can., Pa., Mass. Lake Superior.

P. picipennis Kby.—Mass., N. Y., N. J. and northward.

P. lutulentus Lec.—N. E. Amer. Not common in this vicinity.

P. exaratus Mann.—Pa.

P. limbatus Say.—Can. (Couper). Mo.

OLISTHOPUS Dej.

O. parmatus Say.—N. E. Amer.

O. micans Lec.—N. J. southward and westward.

ATRANUS Lec.

A. pubescens Dej.—N. Y. and westward.

LEPTOTRACHELUS Lat.

L. dorsalis Fab.—N. Y. and westward.

CASSONIA Lat.

C. pennsylvanica L.—N. E. Amer.

C. ludoviciana Salle.—D. C. and South.

GALERITA Fab.

G. janus Fab.—N. E. Amer. Common everywhere.

G. bicolor Dru.—N. Y., N. J., Ga., Mo.

TETRAGONODERUS Dej.

T. fasciatus Hald.—N. Y. and westward.

LEBIA Lat.

L. grandis Heutz.—N. E. Amer. Common everywhere.

L. atriventris Say.—N. E. Amer. Not as common as the preceding species.

L. tricolor Say.—N. E. Amer.

L. pulchella Dej.—N. E. Amer. Not rare.

L. cyanipennis Dej.—N. J., Cal.

L. marginicollis Dej.—N. J. Rare.

L. viridis Say.—N. E. Amer. Common.

L. moesta Lec.—N. Y., N. J. and westward.

- L. pumila* Lec.—N. E. Amer. Not common.
L. pleuritica Lec.—N. E. Amer. Not common.
L. viridipennis Dej.—N. E. Amer.
L. lobulata Lec.—Ohio, Va., La.
L. ornata Say.—N. E. Amer.
L. collaris Dej.—Middle and Southern States.
L. analis Dej.—N. E. Amer.
L. fuscata Dej.—N. E. Amer.
var. frigida Chaud.—Mass.
L. scápularis Dej.—N. E. Amer.
L. vittata Fab.—N. Y., N. J., Pa. to Tex. Not common in this vicinity.
var. Spraguei Horn.—N. J. (Castle), Tex.
L. furcata—Lec. N. E. Amer.
L. bivittata Fab.—Mass., N. Y., N. J. Westward and Southward.

COPTODERA *Dej.*

- C. aerata* Dej.—N. E. Amer. Rare.

DROMIUS *Bon.*

- D. piceus* Dej.—Mass., N. Y., Pa. to Cal. Found under bark and on flowers.

APRISTUS *Chd.*

- A. cordicollis* Lec.—N. Y., N. J.
A. subsulcatus Dej.—N. Y., Can.

BLECHRUS *Mots.*

- B. nigrinus* Mann.—Can., N. Y. and westward. Found under bark.

METABLETUS *Sch.-Goeb.*

- M. americanus* Dej.—N. E. Amer.

AXINOPALPUS *Lec.*

- A. biplagiatus* Dej.—Can., Mass. to Calif.

CALLIDA *Dej.*

- C. viridipennis* Say.—N. Y. to Texas.
C. punctata Lec.—N. J., N. Y., Mich., O., La., Ks., Can.
C. purpurea Say.—N. J., N. Y., Mich., Ga., Mo., Ks., Neb.

PLOCHIONUS *Dej.*

- P. Bonfilsii* Dej.—Pa., Mex.
P. timidus Hald.—N. Y., N. J., Ala., Cal. Under bark.
P. amandus Hald.—N. Y. and Southward.

PINACODERA *Schaum.*

- P. limbata* Dej.—N. Y., N. J.
var. fuscata Dej.—N. Y.
P. platicollis Say.—N. Y., N. J., Fla., Tex.

CYMNIDIS *Lat.*

- C. cribricollis* Dej.—N. Y. and westward.
C. elegans Lec.—N. Y.
C. unicolor K'by.—L. Sup., Labrador.
C. americana Dej.—N. Y., N. J. and westward.
C. pilosa Lec.—Can., N. Y., N. J. and westward.
C. borealis Lec.—Can., Nova Scotia.
C. neglecta Hald.—Can., N. Y., N. J., Pa.

APENES *Lec.*

- A. lucidula* Dej.—N. Y., N. J., Fla. Seashore.
A. sinuata Say.—N. Y., N. J.

HELLUOMORPHA *Laf.*

- H. bicolor* Harr.—Mass. to Fla. and westward. Taken at Mosholu, N. Y., and Fort Lee, N. J. Rare.
H. ferruginea Lec.—N. Y. to Tex. Rare in this vicinity.

BRACHYNUS *Web.*

- B. viridipennis* Dej.—N. Y., N. J.
B. minutus Harr.—N. Y., N. J.
B. perplexus Dej.—Can., N. Y., N. J. and westward.
B. medius Harr.—N. E. Amer.
B. quadripennis Dej.—N. Y., N. J., Pa., Mass.
B. conformis Dej.—N. Y., N. J.
B. cyanipennis Say.—N. Y., N. J.
B. alternans Dej.—Can., N. Y., N. J. and westward.
B. fumans Fab.—N. E. Amer.
var. similis Lec.—N. E. Amer.
B. cordicollis Dej.—Can., N. Y., N. J. and westward.
B. americanus Lec.—Can., N. Y. and westward.
B. ballistarius Lec.—Can., Ill., Mo.

CHLAENIUS *Bon.*

- C. erythropus* Germ.—Ohio to Neb., La. Rare in N. J., Buffalo, N. Y., Fla. (O. Dietz).
C. fuscicornis Dej.—Gulf States to Ill. (On the Buffalo list.)
C. sericeus Forst.—N. E. Amer. Common everywhere.
C. laticollis Say.—N. Y. to Fla. and westward.
C. diffinis Chd.—Middle States Region.
C. aestivus Say.—N. E. Amer.
C. prasinus Dej.—Middle States to Col.
C. leucoscelis Chev.—N. E. Amer. Under stones by Croton River, N. Y.

- C. *solitarius* Say.—N. E. Amer. Not found in this vicinity.
- C. *vafer* Lec.—Texas. (On the Buffalo list.)
- C. *nemoralis* Say.—N. E. Amer. Common.
- C. *tricolor* Dej.—N. E. Amer. Common everywhere.
- C. *pennsylvanicus* Say.—N. Y., N. J. and northward.
- C. *impunctifrons* Say.—N. E. Amer. Not common.
- C. *niger* Rand.—N. E. Amer. Rare.
- C. *purpuricollis* Rand.—N. E. Amer. Very rare.
- C. *tomentosus* Say.—N. E. Amer. Common.
- C. *platyderus* Chd.—Ill., west and southward.

ANOMOGLOSSUS Chd.

- A. *emarginatus* Say.—N. E. Amer. Not rare in this vicinity.
- A. *pusillus* Say.—N. E. Amer. Rare in this vicinity.

BRACHYLOBUS Chd.

- B. *lithophilus* Say.—N. E. Amer. Rare in this vicinity.

LACHNOCREPIS Lec.

- L. *parallelus* Say.—N. Y. and westward.

OODES Bon.

- O. *amaroides* Dej.—N. Y., N. J., Pa., southward and westward. Very rare in this vicinity.
- O. *americanus* Dej.—N. Y. and southward.
- O. *fluvialis* Lec.—Can., N. Y., southward and westward.
- O. *Lecontei* Chd.—La., (On the N. J. list.)
- O. *cupraeus* Chd.—Tex., Mo. (On the Buffalo list.)

GEOPINUS Lec.

- G. *incrassatus* Dej.—N. Y., N. J. and westward. Sandy districts near water, often six inches deep.

NOTHOPUS Lec.

- N. *zabroides* Lec.—Ill. (O. Dietz.)

CRATACANTHUS Dej.

- C. *dubius* Dej.—N. Y., N. J. and westward. Found in sandy places, near water.

AGONODERUS Dej.

- A. *lineola* Fab.—N. E. Amer. Common everywhere.
- A. *infuscatus* Dej.—N. Y. and southward.
- A. *pallipes* Fab.—N. E. Amer. Common everywhere.
- A. *partarius* Say.—N. E. Amer.
- A. *pauperculus* Dej.—Southern States. (On the N. J. and Buffalo lists).
- A. *indistinctus* Dej.—N. Y., N. J.
- A. *testaceus* Dej.—N. Y., N. J.
- A. *micros* Lec.—Eastern States.

DISCODERUS *Lec.*

- D. parallelus* *Hald.*—N. J., southward and westward. Seashore.
D. impotens *Lec.*—Ohio. (O. Dietz.)

GYNANDROPUS *Dej.*

- G. hylacis* *Say.*—N. Y., N. J. Under bark.

HARPALUS *Lat.*

- H. dichrous* *Say.*—N. Y., N. J.
H. vulpeculus *Say.*—N. Y., N. J.
H. autumnalis *Say.*—N. Y., N. J. Rare at seashore.
H. erraticus *Say.*—Can., N. H., Mass., N. Y., N. J.
H. viridiæneus *Beaur.*—N. E. Amer.
H. basilaris *K'by.*—Can.
H. laticeps *Lec.*—Wis. (O. Dietz.) Can.
H. caliginosus *Fab.*—N. E. Amer. (U. S.)
H. faunus *Say.*—N. E. Amer.
H. convivus *Lec.*—N. J. Rare.
H. vagans *Lec.*—N. E. Amer.
H. pennsylvanicus *Dej.*—N. E. Amer. [U. S.]
var. compar *Lec.*—N. E. Amer.
var. erythropus *Dej.*—N. E. Amer.
H. spadiceus *Dej.*—N. J. [rare] and westward.
H. fallax *Lec.*—N. Y. [Linell], N. J.
H. pleruiticus *K'by.*—N. Y., N. J. and westward.
H. herbivagus *Say.*—N. E. Amer.
H. nitidulus *Chd.*—N. Y., N. J. Rare at seashore.
H. innocuus *Lec.*—Taken in this vicinity by Mr. Linell.
H. rufimanus *Lec.*—Pa.
H. gravis *Lec.*—Tex. [On the Buffalo list.]

SELENOPHORUS *Dej.*

- S. pedicularius* *Dej.*—N. Y. and southward. Seashore in Sept.
S. iripennis *Say.*—Ill., Ga., Tex. [On the Buffalo list.]
S. gagatinus *Dej.*—Mass. and westward.
S. opalinus *Lec.*—N. E. Amer. Seashore, Sept.
S. ovalis *Dej.*—N. J., Ga., Fla. Seashore, Sept.
S. ellipticus *Dej.*—N. Y., N. J., Ga., Tex. Seashore, Sept.

STENOLOPHUS *Dej.*

- S. carbonarius* *Brulle.*—Middle and Southern States. Seashore, Sept.
S. spretus *Dej.*—N. Y. and southward.
S. fuliginosus *Dej.*—N. Y., N. J. and westward.
S. plebeius *Dej.*—N. Y., N. J. Seashore, Sept.
S. conjunctus *Say.*—N. E. Amer. [U. S.]
S. ochropezus *Say.*—N. E. Amer.
S. dissimilis *Dej.*—Can., N. J., southward and westward.
S. alternans *Lec.*—Pa.

ACUPALPUS *Lat.*

- A. hydropticus* *Lec.*—N. Y., N. J. May.
A. carus *Lec.*—Can., N. J., N. Y.

BRADYCELLUS *Er.*

- B. linearis* *Lec.*—Pa., Wisc.
B. cognatus *Gyll.*—Europe and Northern America.
B. neglectus *Lec.*—Buffalo and northwest.
B. rupestris *Say.*—N. E. Amer.
B. tantillus *Dej.*—U. S.
B. nigriceps *Lec.*—N. Y., Va.

TACHYCELLUS *Moraw.*

- T. nigrinus* *Dej.*—Alaska to Can.
T. Kirbyi *Horn.*—Canada to Ohio.
T. atrimediis *Say.*—N. E. Amer.
T. badiipennis *Hald.*—N. E. Amer.

ANISODACTYLUS *Dej.*

- A. dulcicollis* *Laf.*—N. J. and southward.
A. rusticus *Say.*—N. E. Amer. Common everywhere.
A. carbonarius *Say.*—N. E. Amer.
A. interpunctatus *Kby.*—N. E. Amer.
A. agricola *Say.*—N. Y., southward and westward.
A. Harrisii *Lec.*—N. E. Amer.
A. nigerrimus *Dej.*—N. E. Amer.
A. nigrita *Dej.*—N. E. Amer.
A. melanopus *Hald.*—N. J., Pa., Ill.
A. discoideus *Dej.*—N. E. Amer. Rare.
A. baltimorensis *Say.*—N. E. Amer. Common.
A. laetus *Dej.*—N. Y., N. J., Ga., Tex.
A. coenus *Say.*—N. E. Amer.
A. sericeus *Harr.*—N. E. Amer.
A. lugubris *Dej.*—N. J., Ia., Can., Mo.
A. interstitialis *Say.*—N. E. Amer.
A. verticalis *Lec.*—N. E. Amer.
A. terminatus *Say.*—N. Y., N. J. and westward.
A. piceus *Lec.*—N. E. Amer.
A. semipunctatus *Lec.*—Or. [On the Buffalo list.]
A. punctulatus *Lec.*—Middle State Region.

(TO BE CONTINUED.)

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SPRING COLLECTING IN NORTHERN FLORIDA.

BY ANNIE TRUMBULL SLOSSON.

I left New York on April 12th, and reached Montgomery, Alabama, the next evening about nine. Around the electric lights near the hotel many insects were flying. I took four or five specimens of the sphinx, *Cherocampa tersa*, one *Dilophonota obscura* and some small noctuids and geometers. *Belostoma americana* and *Cybister fimbriolatus* were numerous, and I captured one specimen of *Calosoma scrutator*. The next day was like midsummer, hot and bright. I drove out of the city eastward and found insects plentiful; around the blossoms of various shrubs, especially the dwarf horse-chestnut (*Æsculus parva*) with its bright red flowers, were flying many Hymenoptera and Diptera, *Augochlora* and *Chrysis* with brilliant metallic tints of green and blue, *Melissodes*, *Megachile* and *Bombus*, while a few of the earlier Syrphidæ hovered around. There were many butterflies, but I made no notes concerning them and do not now recall the species. I remember taking *Eudamus lycidas*, *E. tityrus* and several other Hesperidæ. Under stones and chips I found *Anisodactylus dulcicollis*, *A. rusticus*, *Opatrius notus*, *Chlaenius tomentosus*, *Selenophorus pedicularis* and *Platynus rubripes*. On a leaf I found one specimen of *Eupogonius tomentosus*, and around flowers *Euphoria sepuchralis*, and *Chauliognathus marginalis* both so common in Florida. Three or four species of Curculionidæ were captured, a fine *Sphenophorus* sp. the well known *Hylobius pales* of wide distribution, and a pretty little *Ceotrinius* on *Cratægus* sp. Resting on a leaf of *Spiræa* I found that lovely little member of the Cassidini, *Coptocycla guttata*, its markings shining like burnished gold, but fading into dullness soon after death. Later in the day the weather changed, and

the evening was very cold. So the electric lights were quite deserted.

The next day we went by rail to Pensacola, Fla. The locality did not seem very favorable for collecting. The soil is sandy, and there is no luxuriance of vegetation. Scrub oak abounds, while that heath-like plant *Ceratiola ericoides* with its glossy, dry whorled leaves, never found except in barren, arid soil, grew everywhere. There was also a shrubby golden rod, *Solidago paucifloraculosa*, quite new to me, which seemed to thrive in the dry, hot sand. The aspect of things seemed discouraging; there were no woods or streams near the town, no moths came to our lights in the evening, no butterflies were seen about the garden flowers, and I feared my captures would be few. But, hard, persistent work day by day for a week brought me some very good things. Lepidoptera were exceedingly scarce. I took but one good moth, a pretty sphingid, *Leptisia circeæ* Hy. Edw. This I took at mid-day hovering around the blue flowers of *Amsonia ciliata* one of the milkweed family. But in Coleoptera I took many rare and interesting things. On the scrub oak were found *Anthaxia quercata* and *Brachys ovata* in great numbers. The pretty red weevil *Attelabus nigripes* and one specimen of a pretty Chrysomelid, fulvous spotted with black, *Metachroma quercata*. Here also I found that tiny Coccinellid, *Exochomus contristatus*, so useful throughout the Southern States as a devourer of the orange aphid and other insect pests.

Along the sandy paths through the scrub *Cicindela unicolor* was flying and lighting just as our *C. sexguttata* does. It was the only *Cicindela* I found here, as it was so early in the season. Under boards and chips I took *Pterostichus submarginatus*, *P. fallax*, *P. faber* *Harpalus compar*, *Anisodactylus agilis* and *Selenophorus ellipticus*. And one day under a pile of boards in a little deserted graveyard in the suburbs I found a fine female specimen of *Helluomorpha clairvillei*. Two days after I returned to the spot and beneath the same boards took another specimen, a male. In looking over my Pensacola captures I find several of the Histeridæ, Dermestidæ, and Staphylinidæ which bear on their labels the cabalistic initials D. D. These letters do not imply that the specimens were obtained by exchange, purchase or gift from one of our numerous entomological doctors of divinity, but that they came from that rather unpleasant, but prolific hunting-ground, a dead dog. Here I found *Hister levipes*, *Omosita colon*, *Trox foveicollis*, *Crocophilus villosus*, *Atenius cylindricus*, *Necrobia rufipes*

and several other species. But our very best trap for such Coleoptera is a dead snake! This never fails to furnish numerous specimens and great variety. From such ophidian mines I took *Saprinus* sp., *Dermestes vulpinus*, *Prometopia 6-maculatus*, and various species of *Silpha* and *Necrophorus*.

Under the bark of coniferous trees, chiefly pine, *Alaus myops* was abundant, and among them I, one day, captured a good specimen of that fine large Elater, *Agrypnus salleyi*. Along a sandy bluff near the water many Hymenoptera were flying, Pompilidae, Sphecidae and Larridae. Here I took *Ammophila cementaria*, *Larva americana*, *L. argentata*, *Tachysphex acuta*, *T.* sp. (probably undescribed), *Pompilus tropicus*, *P. posterus*, *Priocnemis validus* and *Priomyx bifoveolatus*. Around the blossoms of *Coreopsis* sp. I caught *Megachile generosa*, *M. georgica*, *Odynerus fulvipes*, *O. arvensis*, *Philanthus dubius* and many other honey-loving insects. Under seaweed along the shore I found several immature mole-crickets (*Gryllotalpa*). The water here is all salt or brackish, and I found little in the way of aquatic insects. A species of *Dinectes* was skimming about in several places. Our colored driver called them "Melon-bugs" and said they smelled "jes' like watermelon." There was a good deal of hickory growing hereabouts, and upon it I found a curious larva a semi-looper, which I took for a *Catocala*. Before I could examine it carefully it drew together some leaves in the glass where I had confined it, and soon changed to a slender dark brown pupa. I brought it north with me and at Franconia in June, nearly five weeks after pupation a fine specimen of *Eubolina stylobata* Harv. emerged. I do not know whether this larva has been described. It is not included in Mr. Hy. Edwards' list. I can only say that its appearance was *Catocala*-like, its general color a sort of pale violet-gray, and that there were oval spots of black on the venter. I found also on hickory the weevil, *Calandra caryae*.

From Pensacola I went to Suwanee Springs, "way down upon the S'wanee River." Here I found a very different flora and fauna, vegetation rich and luxuriant and all animal life abundant. Wild flowers were plentiful, trees and shrubs in full leafage, ground well watered, and consequently there were many insects.

On the muddy margin of the sulphur spring, *Cicindela tortuosa* was flying and lighting and I took one specimen of *C. abdominalis* among the pines in the forest. Lepidoptera were still very scarce. I have never seen such a remarkable dearth of both butterflies and

moths as I noticed in Florida this spring, and I hear from other parts of the south of the same scarcity. Though I watched the lights carefully every night I saw very few moths, on most evenings not a single one. I found two or three specimens of *Harveya auripennis*, and *Panopoda carneicosta* on the walls near lights, one *Arctia michabo*, one *Parorgyia* sp., a *Crocota* sp. three or four of the smaller Geometridæ and a few Pyralids—actually nothing more. But in other orders I found many rarities. Beautiful dragon flies—the “snake doctors” of the colored folk—abounded along the streams and would have delighted Dr. Lamborn by the way in which they caught and devoured unwary mosquitoes. I had the pleasure of adding from here to Mr. Calvert’s wonderful collection of Odonata, two species previously lacking, *Hagenius brevistylus*, a very large species, black and yellow with smoky wings, and *Gomphus dilatatus*, a singular looking insect with long slender abdomen, widely dilated at apex. *Libellula axillena* with gay, spotted wings was abundant, as were also *L. auripennis*, *Ischnura ramburii* and *Anomalagrion hastatum*. In the wood paths were flying many “bee-flies” (Bombylidæ). I took *Anthrax lucifer* a fine large fly with body covered with yellow hair and dark smoky wings tinged with fulvous; *A. fulvohirta*, *A. agrippina*, *A. sinuosa*, *Systoechus solitus*, and the pretty little *Oncodocera laucoprocta*, with body of black velvet, just tipped with snowy white. A big “robber-fly” *Proctacanthus brevipennis* was also flying in these same paths and *Cicindela unicolor* was abundant. There were many Scarabæidæ, several looking as if any one of them might have sat for the portrait of the “tumble bug” on the cover of our Journal. I found *Canthon lævis*, *C. depressipennis*, *Oonthophagus tuberculifrons*, *Copris carolina*, *Aphodius stercorosus*, *A.* sp., *Atenius cylindrus*, and *A. cognatus*. On the scrub oak I took *Cryptocephalus fulvipennis*, and *C. brevis*, besides most of the species taken in same situation at Pensacola. Running on mud near the water I found that graceful little creature *Ega sallei*, the first time I had encountered it.

Not far from the hotel, on each side of the horse car tracks leading from station, were grassy pine flats where grew many lovely flowers. The butterfly-pea (*Clitoria mariana*) is one of the most charming of the Leguminosæ, a twining plant with trifoliate leaves and large peablossom-like flowers of pinkish purple. Around these and the blossoms of *Amsonia*, *Psoralea lupinellus* and *Andromeda speciosa*, I captured *Oberca gracilis* and *O. ocellata*, *Amphionycha flammata*, *Lema texana* and many Hymenoptera and

Diptera. Here also on *Smilax* sp. I found a young larva of *Ecpantheria scribonia* and brought it home. It thrived well on various herbaceous plants, journeyed with me for a week by rail, fed eagerly on New York lettuce and cabbage, and then came with me to Franconia. Here it was so obliging as to eat anything I chose to give it, dandelion, plantain, dock and other homely weeds. It grew enormously large and finally spun a flimsy, gauzy cocoon of silk, covered with a yellowish viscid substance and transformed to a large pupa of dull black, just two months from the day found it in Suwanee. The imago appeared twenty-six days later.

Under boards *Pasimachus subleris* was common and I found with it two specimens of *Polypleura nitidus*. Other beetles found in like situations were *Cymindis planipennis*, *Tetragonodera intersectus*, and *Selenophorus palliatus*. On the window of my bedroom I took one specimen of *Euphorticus pubescens*; on the floor of hall the pretty little *Drapetes rubricollis*.

I went by rail from Suwanee to Charleston, S. C., and did no collecting en route. At one little station in Florida, just before crossing the Georgia line, a small darkey, seeing me pick up a beetle while the cars waited, offered to collect "dem bugses" for a nickel apiece. I closed with the offer and at the end of ten minutes had spent a quarter and purchased five specimens of *Strigoderma pygmaea*. The last negotiation was concluded after the train was in motion, the little imp skipping into the car with his struggling prize, dropping it into my lap, seizing the nickel with his grimy, black fingers, and jumping from the train at the risk of fracturing his wool covered skull. We spent one day in Charleston. I went down to the Battery in the forenoon, and found a few insects on the grass and trees there. The trees were being devoured by our New York pest *Orgyia leucostigma*, the larvæ crawling about everywhere and spinning their cocoons. On blossoms of the yellow medick I took one pair of *Collops eximius*; on a leaf *Galeruca puncticollis* and under stones several specimens of *Pterostichus sculptus*, and the ubiquitous *Anisodactylus agillis* which was abundant everywhere this season.

I am indebted to Mr. Charles Leibeck, Mr. W. J. Fox and Mr. C. W. Johnson for identifications.

My paper is already much too long, and, as I look over it, seems to have little point. I meant however, to call particular attention to what was the marked characteristic of my southern collecting this season, the wonderful scarcity of Lepidoptera.

There were brilliant electric lights at Pensacola, brightly burning lamps at Suwanee, and we watched them persistently, but nothing—or almost nothing—ever came. No day-flying moths, Geometridæ, deltoids, or microlepidoptera were seen. Even *Litosca convalescens* which takes the place there of our *Drasteria crechta* and is generally abundant, starting up in the grass or brush, flying and lighting every instant, was almost unknown this season. I have no theory of my own to account for this state of things. But I give you one advanced by Dossy, the colored boy who sometimes acted as my charioteer. "Seems like them can'te-flies all gwine off this year to World's Fa'r."

A STRANGE FORM OF CATOCALA.

BY GEORGE A. EHRLMAN, PITTSBURG, PA.

Catocala denussa sp. nov.

Male.—Antennæ light brown; palpi black; frontal space, (between the eyes) dark brown; thorax brown and finely scattered with ashen grey hairs, tegula edged with a light fawn color; abdomen light fawn and darker toward the tip. Upper surface of primaries: ground color brownish grey almost black with a silky caste. Similar to that in *C. antinympha* Hüb., the limbal area or space is void of having any transverse wavy lines; the reniform spot is very minute almost wanting, and the subreniform spot is similar to that in *C. antinympha*, in the middle area there are also no wavy lines; basal line light grey almost white; basal space also has no markings, the transverse anterior and posterior lines are very faint. Upper surface of secondaries: similar to those of *C. habilis* Grt., but the orange colored band of the inner space wider, hence making the median black band much narrower and more angulated.

Under surface: the same as in *Catocala habilis*, except that the outer margin of the primaries has not that light shading, but is of a pure blackish brown; the orange bands are paler and broader both on the primaries and secondaries than they are in *C. habilis*, but otherwise the same.

Habitat:—♂ in my collection, Allegheny County, Penn.

This is a strange form of *Catocala*, and seems more interesting than strange, by having the resemblance of two old and well known species; it is of the size of *C. habilis* but the characteristics of the upper surface of the anterior wings are allied to *Catocala antinympha*. At first sight it looks considerable like *C. muliercula* Gn. but is entirely distinct and has no relations with that species whatever, I hesitated at first to describe *Catocala denussa* as a species, and thought it but an extreme form of *C. habilis*, as variation has no limit in the genus *Catocala*, but when studying them side by side, I cannot be convinced otherwise, than that it is a good and reliable species.

A PRELIMINARY REVISION OF THE BOMBYCES OF AMERICA NORTH OF MEXICO.

By B. NEUMOEGEN AND HARRISON G. DYAR.

(Continued from page 148.)

Family ARCTIIDÆ.

Synopsis of subfamilies and genera.

Front tuberculate	Cydosiina.
No accessory cell	Cydosia.
Accessory cell present	Cerathosia.
Front not tuberculate.	
Head prominent, tongue moderate or strong.	
Secondaries large and ample, folded, habitus lithosiform	Eubaphina.
Vein 5 of secondaries faint or absent.	
Primaries long and narrow	Coscinia.
Primaries broad, trigonate	Eubaph.
Vein 5 of secondaries distinct.	
Primaries broad, trigonate	Haploa.
Primaries narrow, apices rounded	Utetheisa.
Secondaries trigonate, often disproportionately small; primaries often pointed at apex	Phægoterina.
Vein 8 of secondaries present.	
Veins 7—10 of primaries stalked.	
Primaries produced at apices, secondaries subcaudate	Euverna.
Primaries broad, secondaries proportionate	Pareuchætēs.
Vein 10 of primaries from subcostal on cell.	
Primaries broad, secondaries proportionate	Cycnia.
Primaries narrow, produced at apices, secondaries smaller.	
Vein 8 of secondaries distinct, but not long	Halisdota.
Vein 8 very short, spur like	Aemia.
Vein 8 of secondaries wanting.	
Vein 5 of secondaries present.	
Vein 10 of primaries from the subcostal.	Eucereon.
Veins 7—10 on a stalk	Zatrephes.
Vein 5 of secondaries wanting	Eupseudosoma.
Head more or less retracted, tongue weak or small	Arctiina.
Vein 8 of secondaries wanting	Euerythra.
Vein 8 present.	
Vein 7—10 of primaries stalked from apex of cell.	
Median spurs of hind tibiæ wanting.	
Anterior tibiæ unarmed.	
Antennæ of ♂ simple	Ecpantheria.
Antennæ of ♂ bipectinated	Leptarctia.
Anterior tibiæ armed at tip.	
Armature a stout curved spine; wings subdiaphanous blackish	Alexicles.

Armature a long curved spine, wings white	Seirarctia.
Armature a short spine on each side of tip	Estigmene.
Armature a small spur; ♀ antennæ simple	Hyphantria.
Median spurs of hind tibiæ present.	
Antennæ of ♂ simple.	
Vestiture of thorax scaly, appressed	Arachnis.
Vestiture hairy, short, erect.	
Apex of primaries acuminate	Pyrrharctia.
Apex of primaries square	Phragmatobia.
Antennæ of ♂ pectinate.	
Wings moderate, size medium.	
Ocelli close to margin of eye	Spilosoma.
Ocelli distant from margin.	
Front narrowed above and below	Elpis.
Front square, not narrowed	Neoarctia.
Wings broad, size large	Platarctia.
Vein 10 from subcostal on cell.	
Accessory cell wanting.	
Wings broad, size large	Arctia.
Wings moderate, smaller	Eyprepia.
Wings elongate, size very small	Kodiosoma.
Accessory cell present.	
Spurs of posterior tibiæ long.	
Size small; body rather slender	Parasemia.
Size large; body more robust	Hypercompa.
Spurs of posterior tibiæ very short	Ectypia.

Subfamily **Cydosiinæ.**

Genus **Cydosia** *Westwood.*

- 1841—WESTWOOD, Jardine Nat. Lib., Vol. XXXVII, p. 193.
 1883—SMITH, Proc. U. S. Nat. Mus., Vol. XI, p. 187.

C. nobilitella *Cramer.*

- 1782—CRAMER, Pap. Exot., Vol. III, pl. 264, fig. G.
imitella, Stretch.
 1873—STRETCH, Zyg. and Bomb. N. A., Vol. I, p. 163.

var. **aurivitta** *Grote & Robinson.*

- 1869—GROTE & ROBINSON, Trans. Am. Ent. Soc., Vol. II, p. 186

Brownish black with a blue reflection, secondaries paler. End of abdomen ochereous brown in ♂. Primaries crossed by two golden brown bands, the outer arcuate opposite the cell, and a subquadrate golden brown discal spot. Between these markings are a series of large rounded white spots in four or five rows, two or three spots in a row. These may be entirely absent (*var. aurivitta*). Expanse, 20—32 mm.

Habitat, Cuba, Mexico, Texas.

Genus **Cerathosia** *Smith.*

1887—SMITH, Ent. Amer., Vol. III, p. 79.

C. tricolor *Smith.*

1887—SMITH, Ent. Amer., Vol. III, p. 79.

Thorax and primaries silky white with many black dots, not forming distinct rows except at outer margin of primaries where they form an outer irregular subterminal and terminal one. Abdomen and secondaries immaculate, pale straw yellow. Expanse, 25 mm.

Habitat, Texas.

Subfamily **Eubaphinæ.**

Genus **Coscinia** *Hübner.*

1822—HÜBNER, Verz. bek. Schmett., p. 169.

Spiris Hübner.

1822—HÜBNER, Verz. bek. Schmett., p. 169.

Eulepis Curtis.

1825—CURTIS, Brit. Ent., Vol. II, pl. 50.

Emydia Boisduval.

1829—BOISDUVAL, Ind. Meth. p. 39.

C. ampla *Grote.*

1878—GROTE, Can. Ent., Vol. X, p. 232.

Fore wings white above, secondaries and underside pale gray. Costa and terminal line black, the latter interrupted by the veins. Two small black spots at end of cell, one in centre of cell, and three more near base forming a triangle: some of these occasionally faint or absent. Secondaries with terminal black line, immaculate. Fringe white. Expanse, 32 mm.

Habitat, Arizona.

Genus **Eubaphe** *Hübner.*

1823—HÜBNER, Zutr. Ex Schmett., Vol. II, p. 9.

Crocota Hübner.

1823—HÜBNER, Zutr. Ex Schmett., Vol. II, p. 28.

Holomelina Herrich-Schäffer.

1855—HERRICH-SCHAFFER, Ausser. Schmett., Vol. I, p. 17

Synopsis of species.

Secondaries with a very broad, brownish black unbroken marginal border.

- Fore wings brownish black **laeta.**
- Fore wings leaden gray **intermedia.**
- Fore wings fawn color **ostenta.**

Secondaries with a narrow or broken blackish border, often faint or entirely absent.

- Fore wings pale stone color, dusted with red **costata.**
Fore wings brownish tawny, unspotted, sometimes suffused with black.
Hind wings red **opella.**
Hind wings black *var.* **nigricans.**
Fore wings varying from deep chocolate brown to dull ochre yellow,
often with a darker submarginal band.
Broad winged, fragile; expanse, 25—30 mm.; marks slight.
Secondaries immaculate **immaculata.**
Secondaries with two or three dusky spots *var.* **trimaculosa.**
Narrower winged; expanse, 16—25 mm.; often heavily
marked.
Wings unspotted.
Fore wings brownish **aurantiaca.**
Fore wings ochraceous.
Of normal size *var.* **rubicundaria.**
Size very small (16 mm.) *var.* **diminutiva.**
Hind wings spotted with blackish.
Fore wings without white spots.
A few marginal black spots on hind wings *var.* **ferruginosa.**
A continuous black band *var.* **brevicornis.**
Fore wings with white spots *var.* **quinaria.**

E. laeta Guérin.

1839—44—GUÉRIN, Icon. R. Anim. Ins., p. 519.

treatii Grote.

1865—GROTE, Proc. Ent. Soc. Phil., Vol. IV., p. 322.

rubropicta Packard.

1887—PACKARD, Ent. Amer., Vol. III, p. 52.

Brownish black, collar, abdomen and basal two-thirds of secondaries brick red. Expanse, 18—25 mm.

Habitat, Atlantic States to Texas.

E. intermedia Graef.

1887—GRAEF, Ent. Amer., Vol. III, p. 42.

var. **parvula** Neumoegen & Dyar.

1893—NEUMOEGEN & DYAR, Ent. News., Vol. IV, p. 140.

Thorax and fore wings slate gray, collar and basal part of secondaries bright red; abdomen and outer margin of secondaries black. This border varies in width from two thirds the width of wing (typical) to one third or less (*var. parvula*). Expanse 22 mm.

Habitat, Colorado to Texas.

E. ostenta Hy, Edwards.

1881—HY, EDWARDS, Papilio, Vol. I, p. 12.

Primaries and thorax brownish ochraceous; abdomen black above, red on the sides; secondaries red at the base with an outer black border with irregular edge. This border extends along outer and anal margins being very broad opposite anal angle. Expanse, 30 mm.

Habitat, Arizona.

E. costata *Stretch*.

1885—STRETCH, Ent. Amer., Vol. I, p. 103.

opelloides Graef.

1887—GRAEF, Ent. Amer., Vol. III, p. 42.

Thorax pale stone color, collar narrowly edged with red; abdomen red. Primaries pale stone color, dusted with red scales which are most conspicuous, along costa and on discal cross-vein.

Secondaries pale reddish. Expanse, 28 mm.

Habitat, Texas [Stretch].

E. opella *Grote*.

1863—GROTE, Proc. Ent. Soc., Phil., Vol. I, p. 345.

var. nigricans *Reakirt*.

1864—REAKIRT, Proc. Ent. Soc., Phil., Vol. II, p. 371.

nigrifera Walker.

1865—WALKER, Cat. Brit. Mus., pt. XXXII, p. 499.

obscura Stretch.

1885—STRETCH, Ent. Amer., Vol. I, p. 103.

Brownish tawny, more or less shaded with black. Secondaries reddish with discal spot, or entirely blackish. In the *var. nigricans*, the whole insect is suffused with black. Expanse, 30 mm.

Habitat, Atlantic States.

E. immaculata *Reakirt*.

1864—REAKIRT, Proc. Ent. Soc., Phil., Vol. II, p. 372.

var. trimaculosa *Reakirt*.

1864—REAKIRT, Proc. Ent. Soc., Phil., Vol. II, p. 372.

Fore wings rose color, shaded with brownish at base, subterminally and in a discal spot; or the brownish tint may extend nearly evenly over the whole wing. Sometimes a faint, round, whitish spot in the interspace below origin of vein 2. Secondaries rosy, immaculate, or with a submarginal row of three dusky spots, the two nearest anal angle connected. Expanse, 25—30 mm.

Habitat, Northern Atlantic States.

E. aurantiaca *Hübner*.

1823—HÜBNER, Zutr. Ex Schmett., Vol. II, n. 206.

var. rubicundaria *Hübner*.

1823—HÜBNER, Zutr. Ex Schmett., Vol. II, n. 256.

rosa French.

1890—FRENCH, Can. Ent., Vol. XXII, p. 133.

var. diminutiva *Graef*.

1887—GRAEF, Ent. Amer., Vol. III, p. 42.

var. ferruginosa *Walker*.

1854—WALKER, Cat. Brit. Mus., Vol. II, p. 535.

var. brevicornis *Walker*.

1854—WALKER, Cat. Brit. Mus., Vol. II, p. 536.

belfragei Stretch.

1885—STRETCH, Ent. Amer., Vol. I, p. 103.

var. quinaria *Grote*.

1863—GROTE, Proc. Ent. Soc., Phil., Vol. II, p. 30.

choriona Reakirt.

1864—REAKIRT, Proc. Ent. Soc., Phil., Vol. II, p. 371.

bimaculata Saunders

1869—SAUNDERS, Can. Ent., Vol. II, p. 5.

Fore wings chocolate brown to yellowish fawn color, immaculate or indistinctly shaded with transverse brown bands, with obscure discal dot, and occasionally one or more large whitish spots (*var. quinaria*). Secondaries reddish, or rosy red, immaculate or with a rather broad outer blackish border, and discal dot or the border may be broken up into spots. Expanse, 20—28 mm; of *var. diminutiva* 16 mm.

Habitat, Atlantic States to Rocky Mountains and Texas.

Genus **Haploa** *Hübner*.

1822—HÜBNER, Verz. bek. Schmett., p. 182.

Synopsis of species.

Secondaries yellow.

Fore wings marked with an incomplete brown border.

A half band from internal margin before anal angle, pointing upward

clymene.

Several complete slender bands

colona.

Fore wings white

var. conscita.

Secondaries white.

Fore wings with brown marks.

Wings crossed by several distinct bands, which may be more or less obsolete.

The most distinct band an oblique one from below apex to outer quarter of inner margin.

Besides this two or three other transverse bands **lecontei.**

Only the oblique band complete *var.* **confinis.**

Oblique band broken *var.* **militaris.**

The most distinct band a reversed oblique one from about middle of costa to internal angle.

This band forming about a right angle with the costal stripe **contigua.**

Forming an oblique angle with costal stripe and supplemented by other bands **reversa.**

Wings divided into eight to ten rounded spots by confused brown bands, the basal spots sometimes confluent **confusa.**

Fore wings white.

Size moderate, wings thickly scaled [see *lecontei* and *reversa*.]

Small and more fragile **vestalis.**

H. clymene *Brown.*

1776—BROWN, Ill. Zool., p. 96.

interrupto-marginata Beauvois.

1824—BEAUVOIS, In. Afr. and Amer., p. 265.

comma Walker.

1855—WALKER, Cat. Brit. Mus., Vol. III, p. 652.

Fore wings yellowish white, a dark brown stripe on costa from base nearly to apex; another on outer margin widest centrally, a third along inner margin, sending up a rounded projection opposite end of cell. Secondaries orange ochraceous with a black spot near anal angle. Head ochereous, thorax yellowish white, abdomen ochereous, a broad brown dorsal band on thorax and abdomen. Expanse, 45 mm.

Habitat, Atlantic States.

H. colona *Hübner.*

1804—HÜBNER, Eur. Schmett., Vol. II, fig. 135.

[*clymene* Esper.

1786—ESPER, Schmett., Vol. IV, p. 10.

carolina Harris.

1841—HARRIS, Rep. Ins. Mass., p. 243.

var. **conscita** *Walker.*

1865—WALKER, Cat. Brit. Mus., pt. XXXII, p. 377.

lactata Smith.

1887—SMITH, Ent. Amer., Vol. III, p. 25.

Marked like *clymene* except that there is no projection from the band on inner margin, and there are the following additional bands:—a brown band from inner third of costa to above internal angle; another from near middle of costa to below internal angle crossing the former. A third from above the junction of the first

to just below apex. This latter band is projected toward costa and outer margin forming sometimes a fourth band from outer fourth of costa to middle of outer margin. These bands may be more or less absent, and in the var. *conscita* the wings are immaculate. Expanse, 55 mm.

Habitat, Southern Atlantic States to Texas.

H. lecontei Guérin.

1829—44—GUÉRIN, Icon. R. An. Ins., p. 517.

leucomelas Herrich-Schäffer.

1858—HERRICH-SCHAEFFER, Ausser. Schmett., Vol. I, fig. 431.

var. **confinis** Walker.

1855—WALKER, Cat. Brit. Mus., Vol. III, p. 651.

var. **militaris** Harris.

1841—HARRIS, Rep. Ins. Mass., p. 243.

var. **fulvicosta** Clemens.*

1861—CLEMENS, Proc. Acad. Sci., Phil., 1860, p. 536.

White; head ochereous, body with a more or less well defined dorsal brown stripe. Besides the usual brown border, the fore wings have an oblique stripe from just below apex to outer fourth of inner margin, and three transverse equidistant bands. The two outer from costa to the stripe, the basal one to internal margin. In the less distinctly spotted forms these bands disappear, the oblique band and finally the border also, leaving the wing white with ochereous costal margin (var. *fulvicosta*). Expanse, 45 mm.

Habitat, Atlantic States westward.

H. contigua Walker.

1855—WALKER, Cat. Brit. Mus., pt. III, p. 651.

In this form the transverse bands consist of two, an inner oblique from internal angle to near middle of costa, and an outer band from just below apex, joining the inner band near its middle and running nearly parallel to the costa. In less well marked forms, the outer band disappears first.

Habitat, Atlantic States.

* This name evidently applies to no natural species. Both *lecontei* and *reversa* and perhaps also *contigua* produce forms without any black marks, which are indistinguishable by maculation. Since the name *fulvicosta* covers portions of two or more species, we propose to restrict it to the white variety of *lecontei*, and suggest a new name for the corresponding form of *reversa*.

H. reversa *Stretch*.

1885—STREICH, Ent. Amer., Vol. 1, p. 104.

suffusa Smith.

1887—SMITH, Ent. Amer., Vol. III, p. 25.

var. duplicata *Neumoegen & Dyar*.

White, marked like *colona*. The brown markings disappear as in that species, leaving an immaculate white form (*var. duplicata*).

Habitat, Southern States

H. confusa *Lyman*.

1887—LYMAN, Can. Ent., Vol. XIX, p. 185.

White, the body parts normally marked. Primaries marked as in *lecontei* but confused by an additional band (as in *reversa*) which runs from the internal angle upward and inward, and tends to divide the median white space so that the wing appears brown with six or seven rounded white spots. The disappearance of the bands takes place as in *lecontei*, from the base outward; but the oblique band is not left complete, but as a sharply angulated line from inner margin to apex, bent at right angles at its lower third and joined to the costa by the one or two outer transverse bands. Expanse, 35—40 mm.

Habitat, Northern Atlantic States, New York to Canada

H. vestalis *Packard*.

1864—PACKARD, Proc. Ent. Soc., Phil., Vol. III, p. 105.

1887—SMITH, Proc. U. S. Nat. Mus., p. 351.

Head very pale yellow, antennæ very pale brown. Thorax and abdomen white, immaculate, legs pale fulvous. Primaries white, usually immaculate, often with the costal and outer margin a little dusky. Secondaries and under side pure white. Expanse, 33—37 mm.

Habitat, Northern Atlantic States westward. [Smith].

Genus **Utetheisa** *Hübner*.

1822—HÜBNER, Verz. bek. Schmett., p. 168.

Deiopeia Stephens.

1829—STEPHENS, Ill. Brit. Ent., Haust., Vol. II, p. 92.

Synopsis of species.

Transverse bands of primaries orange ochraceous.

Bands complete, secondaries pink **bella**.

Bands indistinct or absent except on costal edge.

Secondaries red *var.* **hybrida**.

Secondaries white *var.* **terminalis**.

Transverse bands deep rose red.

Bands complete, secondaries pink or partly so **venusta**
Bands absent except on costal edge, secondaries white **ornatrix**.

U. bella *Linnaeus*.

1758—LINNAEUS, Syst. Nat., Vol. I, p. 534.

var. hybrida *Butler*.

1877—BUTLER, Trans. Ent. Soc., London, p. 321.

intermedia *Butler*.

1877—BUTLER, Trans. Ent. Soc., London, p. 361.

✓ *var. terminalis* *Neumoegen & Dyar*.

White, a black spot on vertex of head, two on collar and three rows on thorax. Primaries white with five transverse orange colored bands, the two outer connected by an oblique band. Alternating with these are six rows of black spots and a terminal more compact row. Secondaries rose red or pink with an outer black border, a spot near anal angle confluent with it and a subapical oblique band. Expanse, 40 mm.

Habitat, Atlantic States.

The *var. terminalis* differs in having no pink on secondaries; white with a black border. On primaries the orange bands are indicated on costa and slightly near internal margin and subterminally. Black dots present only on costa, base and subterminally and terminally.

U. venusta *Dalman*.

1823—DALMAN, Anal. Ent., p. 28.

speciosa *Walker*.

1854—WALKER, Cat. Brit. Mus., pt. II, p. 568.

Like *U. bella* but the bands rose red instead of orange. One specimen has an orange tint.

Habitat, West Indies.

U. ornatrix *Linnaeus*.

1758—LINNAEUS, Syst. Nat., (3) no

Bands represented by straight, even, narrow lines on costa (not shades as in *var. terminalis*), subterminal red band present. Black dots on costa, base, subterminally and terminally exactly as in *var. terminalis*. Secondaries white, with black border variable.

Habitat, Texas to Brazil, West Indies.

Subfamily **Phægopterinæ.**

Genus **Euverna** *Neumoegen & Dyar.*

1893—NEUMOEGEN & DYAR, Ent. News, Vol. IV, p. 141

E. clio *Packard.*

1864—PACKARD, Proc. Ent. Soc., Phil., Vol. III, p. 120.

White, veins of primaries partly lined with black. Thorax with three black streaks. Collar and patagia with a buff line. Abdomen ochereous above, with dorsal and lateral small black spots. Expanse, 50 mm.

Habitat, Colorado, Arizona, Southern California.

Genus **Pareuchaetes** *Grote.*

1865—GROTE, Proc. Ent. Soc., Phil., Vol. V, p. 245.

P. cadaverosa *Grote.*

1865—GROTE, Proc. Ent. Soc., Phil., Vol. V, p. 245.

Pale ochereous, immaculate, secondaries paler, abdomen dark ochereous with small dorsal black spots. Expanse, 25 mm.

Habitat, Cuba, Florida.

Genus **Cycnia** *Hübner.*

1818—HÜBNER, Zutr. Ex Schmett., V. I, p. 7.

Euchaetes Harris.

1841—HARRIS, Ins. Mass. p. 257.

Tanada Walker.

1856—WALKER, Cat. Brit. Mus., pt. VII, p. 1745.

Pygarctia Grote.

1871—GROTE, Can. Ent., Vol. III, p. 124.

✓ *Synopsis of species.*

An oblique, pale, contrasting stripe from back of head to base of fore wing; sexes usually dissimilar.

Abdomen banded **zonalis.**

Abdomen spotted.

Secondaries of ♂ translucent centrally **scepsiformis.**

Secondaries of ♀ opaque **albicosta.**

No such contrasting stripe; sexes similar.

Costa and internal margin striped.

Stripes red **spraguei.**

Stripes yellow.

Wings dark slate gray **abdominalis.**

Wings very pale gray **vivida.**

Costa only striped.

Wings more or less slate color **eglenensis.**

Wings white.

Costal stripe extending nearly to apex **tenera.**

- Costal stripe short, at base only.
 Size small (less than 35 mm.) *var. pudens.*
 Size larger (45 mm. or more) *race. sciurus.*
- Wings unstriped.
 Wings entirely white.
 Abdomen yellow **oregonensis.**
 Abdomen red.
 Vertex of head white **elegans.**
 Vertex of head red *var. roseicapitis.*
- Wings slate gray or brown.
 Abdomen yellow } **egle.**
 Abdomen red.
 Hind wings unicolorous.
 Fore wings pale stone color **murina.**
 Fore wings dull white **bolteri.**
 Hind wings with a pink patch at internal angle . . . **perlevis.**

C. zonalis *Grote.*

1882—GROTE, *Papilio*, Vol. II, p. 131.

Blackish gray, costa ochereous, with spot on patagia, collar and vertex of head (forming an oblique band) continuing the stripes, that on head pinkish. Abdomen banded with red and black above, anal tuft white. The ♂ is unknown and is probably very dissimilar to the ♀.

Habitat, Arizona.

C. scepiformis *Graef.**

1887—GRAEF, *Ent. Amer.*, Vol. III, p. 43.

♂ Dark blackish gray, the secondaries transparent from the base to middle of wing. Collar slightly scaled with crimson; from this along shoulder to beneath base of primaries a band of white. Abdomen bright crimson with black dorsal and lateral spots. Expanse, 28 mm. ♀ Unknown.

Habitat, Texas.

C. albicosta *Walker.*

1855—WALKER, *Cat. Brit. Mus.*, pt. III, p. 630.

1892—KIRBY, *Cat. Lep. Het.*, Vol. I, p. 206.

fumidus Hy, Edwards.

1884—HY, EDWARDS, *Pap.*, Vol. IV, p. 61.

Blackish gray, color of *zonalis*; an oblique band on prothorax in both sexes, and costa of primaries in ♀ only, white. Abdomen red above with dorsal and lateral black spots; anal tuft white in ♀ only.

Habitat, Mexico.

* Mr. Beutenmüller suggests to us that this may be *C. albicosta* when worn by flight.

C. spraguei *Grote.*

1875—GROTE, Can. Ent., Vol. VII, p. 290.

conspicua Neumoegen.

1890—NEUMOEGEN, Ent. Amer., Vol. VI, p. 177.

Fore wings pale stone color, not contrasting with the almost white secondaries. Collar, edges of patagia, abdomen, costa and internal margin of primaries crimson. Abdomen with minute dorsal black dots. Expanse, 28 mm.

Habitat, Colorado.

C. abdominalis *Grote.*

1871—GROTE, Can. Ent., Vol. III, p. 124.

Dark slate gray on both wings, collar, edges of patagia, costa and internal margin of primaries ochereous yellow, abdomen red with small dorsal black spots. Expanse, 35—45 mm.

Habitat, Florida.

C. vivida *Grote.*

1882—GROTE, Papilio, Vol. II, p. 131.

Very pale slate gray, color of *spraguei* from which this species differs only in that the costa and internal margin of primaries are pale yellow instead of red. Body parts colored with red as in *spraguei*. Expanse, 33 mm.

Habitat, Texas.

C. eglensis *Clemens.*

1861—CLEMENS, Proc. Acad. Sci., Phil., 1860, p. 533.

inopinatus Hy. Edwards.

1882—HY. EDWARDS, Pap., Vol. II, p. 13.

White with lead color tinge, to mouse color, costal margin buff for the basal half. Abdomen buff with dorsal and lateral row of black spots. Expanse, 30—32 mm.

Habitat, Atlantic States.

C. tenera *Hübner.*

1818—HÜBNER, Zutr. Ex Schmett., Vol. I, p. 7.

collaris Fitch.

1856—FITCH, Rep. Ins., N. Y., Vol. III, p. 265.

antica Walker.

1856—WALKER, Cat. Brit. Mus., pt. VII, p. 1745.

var. pudens Hy. Edwards.

1882—HY. EDWARDS, Pap., Vol. II, p. 120.

race **sciurus** *Boisduval*.

1869—BOISDUVAL, Ann. Soc. Ent., Belg., Vol. XII, p. 79.

yosemite Hy. Edwards.

1884—HY. EDWARDS, Pap., Vol. III, p. 146.

White; head, collar, anterior part of thorax and costa of primaries nearly to apex, ochereous yellow. A smoky shade in discal cell. Abdomen tinged with ochereous, with dorsal and lateral black spots. Expanse, 28—35 mm.

Habitat, Atlantic States to Texas.

The race *sciurus* is larger, with a buff dash at base of costa.

Habitat, California.

C. oregonensis *Stretch*.

1874—STRETCH, Zyg. and Bomb., N. A., p. 187.

Pale, smoky lead color, the veins white. Head and abdomen, except at tip, ochraceous, with dorsal and lateral rows of black spots. Secondaries and tip of abdomen nearly white. Expanse, 35 mm.

Habitat, Northern Atlantic States and Pacific Northwest.

C. elegans *Stretch*.

1874—STRETCH, Zyg. and Bomb. N. A., p. 189.

✓ *var. roseicapitis* *Neumoegen & Dyar*.

White, head narrowly rosy behind. Abdomen rosy red above with minute blackish dorsal spots. Last segment of abdomen of ♀ tufted with white.

Var. roseicapitis. Upper half of front, and vertex of head, rosy red.

Habitat, California and Arizona.

C. egle *Drury*.

1773—DRURY, Ill. Ex. Ent., Vol. II, pl. 20, fig. 3.

Mouse gray, abdomen and bases of antennæ ochereous, the former with usual black spots, and white tipped in the . . . Fore wings unicolorous, slightly sprinkled with white scales. Secondaries very slightly paler. Expanse, 35 mm.

Habitat, Atlantic States westward.

C. murina *Stretch*.

1885—STRETCH, Ent. Am., Vol. I, p. 106.

Slate gray, color of egle; collar, edge of patagia very narrowly, and abdomen above, red. Vein at end of cell faintly indicated in yellowish. Expanse, 25 mm.

Habitat, Texas.

C. bolteri *Stretch.*

1855—STRETCH, Ent. Amer., Vol. I, p. 106.

Collar, thorax, and primaries white with faint gray shadings. Secondaries pale slate gray. Abdomen red above with anal tuft of ♀ white. Expanse, 35 mm.

Habitat, Texas.

C. perlevis *Grote.*

1882—GROTE, Pap., Vol. II, p. 131.

Very close to *murina*. The color is a little darker, and the internal third of secondaries at anal margin covered by a rosy pink patch. The abdomen has a series of distinct but small, dorsal, black spots. Expanse, 25 mm.

Habitat, Arizona.

Genus **Halisidota** *Hübner.*

1822—HÜBNER, Verz. bek. Schmettl., p. 170.

Lophocampa Harris.

1841—HARRIS, Ins. Mass., p. 258.

Theages Walker.

1855—WALKER, Cat. Brit. Mus., pt. III, p. 721.

Euhalesidota Grote.

1865—GROTE, Proc. Ent. Soc., Phil., Vol. V, p. 243.

Synopsis of species.

- | | |
|--|----------------------|
| Thorax black, patagia purplish | strigosa. |
| Thorax not black. | |
| Wings thinly scaled, subtranslucent, maculation banded. | |
| Abdomen yellowish. | |
| Maculation of primaries strongly outlined in blackish | interlineata. |
| Maculation but feebly outlined | tesselaris. |
| Abdomen red | edwardsii. |
| Wings opaquely scaled; maculation various. | |
| Maculation transversely banded, confused or obsolete. | |
| Distinctly banded with brown and yellow | maculata. |
| Uniform yellow; apex pointed | pura. |
| Straw yellow, with confused brown spots | longa. |
| Maculation distinctly spotted, the spots corresponding to the intervals between bands. | |
| Thoracic parts largely ocherous. | |
| Spots on primaries ocherous. | |
| Purplish brown shades centrally | minima. |
| No shades; finely brown dotted | mixta. |
| Spots distinctly whitish | caryæ. |
| Thoracic parts white and brown. | |
| Vertex of head and collar brown and whitish | argentata. |
| Vertex of head and collar white | ingens. |
| Maculation of longitudinal brown lines of the veins on a white ground | ambigua. |

H. strigosa *Walker.*

1885—WALKER, Cat. Brit. Mus., pt. III, p. 615.

laqueata Hy. Edwards.

1887—HY. EDWARDS, Ent. Amer., Vol. II, p. 166.

Thorax black, inner half of patagia and edge of collar pink flesh color. Abdomen deep red above with lateral black spots and last segment black. Wings translucent, primaries blackish brown, streaked with pale pink, in no definite markings, giving a longitudinally strigose appearance. Secondaries colorless, with outer brown border. Expanse, 45 mm.

Habitat, Hayti, Jamaica, Florida.*

H. interlineata *Walker.*

1855—WALKER, Cat. Brit. Mus., Vol. III, p. 739.

incunda Herrich-Schäffer.

1855—HERRICH-SCHAEFFER, Ausser. Schmett., fig. 285.

cinctipes Grote.

1865—GROTE, Proc. Ent. Soc., Phil., Vol. V, p. 242.

1890—MÖSCHLER, Abhand., Senck., Ges., Vol. XVI, p. 115.

davisii Hy. Edwards.

1875—HY. EDWARDS, Proc. Cal. Acad. Sci., Vol. V, p. 305.

Brownish ochraceous, marked as in *tessellaris* but the borders of the catenulate maculations very distinct, black, the basal markings confluent with a triangular patch between vein 1 and median. Abdomen dark ochereous above, patagia and collar lined with sea-green. Expanse, 55—60 mm.

Habitat, Brazil, Mexico, Florida, Texas and Arizona.

H. tessellaris *Abbot & Smith.*

1797—ABBOT & SMITH, Lep. Ins., Ga., Vol. II, p. 75.

antiphola Walsh.

1864—WALSH, Proc. Bost. Soc., N. H., Vol. IX, p. 288.

form harrisii *Walsh.*

1864—WALSH, Proc. Ent. Soc., Phil., Vol. III, p. 430.

Pale straw yellow, the abdomen above buff, the patagia lined inwardly with green. Six bands of a darker tint cross the fore wings, the fourth not reaching below median vein. These bands are quadrate-catenulate and neatly lined on each side with brown-black. They vary much in width, examples occurring in which they are almost completely confluent.

The form *harrisii* Walsh does not differ in markings. It is considered to be a distinct species on account of larval differences

* The moth described by Mr. Edwards, was sent to him by Mr. Bruce, who informs me that it came from Florida and not from Texas as mentioned by Mr. Edwards. Edt.

which consist of orange hair pencils; in *tessellaris*, these structures are black. Expanse, 40 mm.

Habitat, Atlantic States westward.

H. edwardsii Packard.

1864—PACKARD, Proc. Ent. Soc., Phil., Vol. III, p. 129.

translucida Walker.

1865—WALKER, Cat. Brit. Mus., pt. XXXI, p. 310.

quercus Boisduval.

1869—BOISDUVAL, Ann. Ent. Soc., Belg., Vol. XII, p. 81.

race **labecula** Grote.

1851—GROTE, Papilio, Vol. I, p. 174.

Thorax sordid buff yellow, abdomen red above, often marked with terminal black dorsal patches in the ♀. Fore wings heavily sprinkled with chocolate brown, more or less translucent, often markedly so. Six clay yellow bands cross the wings, slightly waved, the sixth (marginal) often obsolete. In very translucent specimens, the bands are distinct only on costa and internal margin.

Habitat, California.

The race *labecula* differs in having no pink tint on the secondaries, while all the markings are slightly more diffused.

Habitat, Rocky Mountain region.

H. maculata Harris.

1841—HARRIS, Ins., Mass., p. 259.

fulvoflava Walker.

1855—WALKER, Cat. Brit. Mus., pt. III, p. 733.

guttifera Herrich-Schäffer.

1855—HERRICH-SCHAEFFER, Ausser. Schmett., fig. 284.

race **angulifera** Walker.

1866—WALKER, Lord's Nat. in Vanev., Vol. II, p. 355.

alni Hy. Edwards.

1877—HY. EDWARDS, Proc. Cal. Acad. Sci., Vol. VII, p. 129.

race **agassizii** Packard.

1864—PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 128.

californica Walker.

1864—WALKER, Cat. Brit. Mus., pt. XXXI, p. 371.

salicis Boisduval.

1869—BOISDUVAL, Ann. Ent. Soc., Belg., Vol. XII, p. 81.

Head and thorax brownish ochereous, with two diffuse brown bands on the latter. Abdomen and hind wings whitish. Fore wings light yellow with six transverse, deep brown, irregular bands. The second to fourth (from base) are usually more or less confluent, the fifth is often sharply dentate outwardly and the sixth consists of a row of rounded intervenular spots. The markings

are subject to great variation, being sometimes confluent so as to cover most of the wing.

Habitat, Northern Atlantic States westward.

The race *angulifera* does not differ in the imago. The larva when young possesses red tufts instead of black ones as in *maculata*.

Habitat, Sierra Nevada of Cal., Pacific Northwest.

In the race *agassizii*, the color of the insect is a deeper yellow. It corresponds nearly with Ridgway's figure of "maize yellow" (Ridg. Nom. Col. Pl. VI, f. 21.) while the race described above are "straw yellow" (Ridg., Pl. VI, f. 17). The brown marks tend to become suffused by the yellow ground color, often largely disappearing, but leaving a spot in the fourth band at the end of the cell of the normal distinctness. This discal spot is a characteristic feature of *agassizii* and only disappears in very heavily marked specimens. This form differs almost enough to entitle it to specific rank.

Habitat, Coast region of California.

H. pura *Neumagen*.

1882—NEUMAGEN, *Papilio*, Vol. II, p. 133.

Bright ochraceous; anterior wings very pointed, long. Secondaries whitish stramineous. On primaries, a brown discal dot and occasionally some faint brown motlings suggesting the markings of *H. maculata*. Expanse, 45 mm.

Habitat, Arizona.

H. longa *Grote*.

1880—GROTE, *Can. Ent.*, Vol. XII, p. 213.

Pale yellowish, with irregular brown dots more or less numerous; along median vein outwardly a brown streak, continued to apex more or less perfectly by two brown spots. Expanse, 45 mm.

Habitat, Florida.

H. minima *Neumagen*.

1882—NEUMAGEN, *Papilio*, Vol. III, p. 138.

1892—KIRBY, *Cat. Lep. Het.*, Vol. I, p. 211.

armillata Hy. Edwards.

1884—HY. EDWARDS, *Papilio*, Vol. IV, p. 76.

Pale ochereous, the spots reduced, partly obsolete, concolorous with ground, and defined by pale brown. Middle of wing, or most of it, overspread with purplish brown. Of the five rows of spots, the basal ones are enlarged, the others small and indistinct on middle of wing. Expanse, 35 mm.

Habitat, Mexico, Arizona.

H. mixta *Neumagen*.

1882—NEUMAGEN, *Papilio*, Vol. II, p. 133.

Like *caryæ* but the spots concolorous; defined by pale brown rings, all the space between them filled in thickly with pale brown dots. The oblique brown line as in *caryæ*, but less distinct. Expanse, 40—50 mm.

Habitat, Arizona.

H. caryæ *Harris*.

1841—HARRIS, *Ins. Mass.*, p. 258.

annulifascia WALKER.

1853—WALKER, *Cat. Brit. Mus.*, pt. III, p. 734.

porphyria Herrich-Schäffer.

1855—HERRICH-SCHAEFFER, *Ausser. Schmett.*, fig. 283.

Straw yellow with diffuse brown thoracic marks. Hind wings whitish. Fore wings heavily dotted with deep brown, becoming a shade beyond the cell, and an oblique line from costa near base to above internal margin. Five transverse rows of unequal fairly well rounded spots, the outer three or four rows white and slightly silvery. The third row does not reach below vein 2. Fringe checkered with white at ends of veins. Expanse, 40—50 mm.

Habitat, Atlantic States westward.

H. argentata *Packard*.

1864—PACKARD, *Proc. Ent. Soc., Phil.*, Vol. III, p. 129.

race subalpina *French*.

1890—FRENCH, *Can. Ent.*, Vol. XXII, p. 47.

race sobrina *Stretch*.

1872—STRETCH, *Zyg. and Bomb. N. A.*, Vol. I, p. 135.

Thorax, abdomen and secondaries brownish cream color, the secondaries paler. Borders of patagia, centre of thorax and three marks on collar, dark brown. Primaries dark brown with five somewhat ill defined rows of distinct, rounded, silvery white spots, becoming cream colored on costa, the brown ground dusted with cream color. Discal and apical brown marks on secondaries. Expanse, 45—55 mm.

Habitat, Mts. of California, and Pacific Northwest.

Race *subalpina*. The ground color of fore wings is rather more broken up by pale color.

Habitat, Rocky Mountain region.

Race *sobrina*. The brown ground color is deep and uniform, and the spots smaller than in *argentata*.

Habitat, Coast region of California.

H. ingens Hy. *Edwards.*

1881—HY, EDWARDS, Papilio, Vol. I, p. 39.
scopularis Stretch.
1885—STRETCH, Ent. Amer., Vol. I, p. 106.

Head, sides and centre of collar, terminal two-thirds of patagia and centre of thorax white. Abdomen ocher yellow above with lateral brown spots. Inner half and outer fourth of base of patagia, and ground color of primaries dark brown. Silvery white spots as in *argentata*, but larger and more confluent, almost the same color on costa as elsewhere. Secondaries whitish with small apical brown spots. Expanse, 55 mm.

Habitat, Rocky Mountain region to Arizona.

H. ambigua *Strecker.*

1878—STRECKER, Proc. Dav. Acad. Sci., Vol. II, p. 274.
bolteri, Hy. Edwards.
1884—HY, EDWARDS, Papilio, Vol. IV, p. 121.

Fore wings light brown, all the interspaces containing white longitudinal streaks; veins brighter brown. Thorax pale brown the patagia and collar edged with darker. Abdomen pale pinkish above. Expanse, 50 mm.

Habitat, Colorado.

Genus **Aemilia** *Kirby.*

1892—KIRBY, Cat. Lep. Het., Vol. I, p. 218.
|| *Ameles* Walker.
1855—WALKER, Cat. Brit. Mus., pt. III, p. 711.

Synopsis of species.

Abdomen rosy red **roseata.**
Abdomen yellow **occidentalis.**

A. roseata *Walker.*

1868—WALKER, Lord's Nat. in Vanc., Vol. II, p. 336.
sanguivenosa Neumegen.
1892—NEUMEGEN, Can. Ent., Vol. XXIV, p. 228.

var. cinnamonea Boisduval.

1868—BOISDUVAL, Ann. Soc. Ent. Belg., Vol. XII, p. 80.
1869—GROTE & ROBINSON, Trans. Am. Ent. Soc., Vol. III, p. 175.

var. significans Hy. *Edwards.*

1888—HY, EDWARDS, Ent. Amer., Vol. III, p. 182.

Bright red; secondaries whitish subtranslucent, patagia whitish centrally. Primaries brown, veins and margins red. Of the five bands of spots on primaries, the basal ones are yellowish,

the three outer rows whitish, the last one composed of heart shaped spots. Expanse, 35 mm.

Habitat, California and the Pacific Northwest.

var. cinnamomea. "Fore wings bright red with some ill defined areas of yellow towards the base near internal margin. One example from Sonora [Mexico]" [Boisduval].

var. significans. White spots on fore wings ill defined, diffuse, confluent, forming bands which cross the veins, so that the latter are only red in the areas where the brown ground color prevails. One example from New Mexico.

A. occidentalis French.

1890—FRENCH, Can. Ent., Vol. XXII, p. 46.

Exactly like *roscata* but ochraceous where that is red.

Habitat, Colorado.

Genus **Eucereon** Hubner.

1822?—HÜBNER, Verz. bek. Schmettl., p. 123.

E. carolina Hy. Edwards.

1887—HY. EDWARDS, Ent. Amer., Vol. II, p. 160.

Dark brown, abdomen tinged with ochereous. Ground color of primaries sordid whitish, the veins pale brown separating a series of small dark brown spots arranged in five irregular rows, like those in *E. archias*, but smaller. Secondaries hyaline with outer smoky brown border. The species is paler than *archias*.

Habitat, Southern States.

Genus **Zatrephes** Hubner.

1822?—HÜBNER, Verz. bek. Schmettl., p. 171.

Z. trigona Grote.

1879—GROTE, N. Am. Ent., Vol. I, p. 146.

Thorax lead color, collar and patagia outlined in dull orange; palpi, fore femora and side of collar crimson. Abdomen crimson above with lateral black spots, white below. Fore wings lead color shading into pinkish at internal angle. A large subapical, irregularly tetragonal, hyaline patch, bordered with yellow and black and containing four black dots on the veins. Near base of wing two diffuse yellow patches and a third further out, close to the hyaline patch. Secondaries white, with pink tinge along abdominal margin. Expanse, 36 mm.

Habitat, Colorado, New Mexico.

Genus **Eupseudosoma** *Grote.*

1865—GROTE, Proc. Ent. Soc., Phil., Vol. V, p. 240.

E. floridum *Grote.*

1882—GROTE, Can. Ent., Vol. XIV, p. 187.

immaculata Graef.

1887—GRAEF, Ent. Amer., Vol. III, p. 42.

Silvery white; abdomen bright red above centrally with a dorsal white line. Vertex of head yellowish. This form is probably not specifically distinct from the South American *E. involutum* Sepp.

Habitat, Florida, Cuba.

Subfamily **Arctiinæ.**

Genus **Euerythra** *Harvey.*

1876—HARVEY, Can. Ent., Vol. VIII, p. 5.

Synopsis of species.

A median longitudinal blackish band	phasma.
No median longitudinal blackish band	trimaculata.

E. phasma *Harvey.*

1876—HARVEY, Can. Ent., Vol. VIII, p. 5.

White; abdomen red ringed, a long band of blackish brown from base to middle of outer margin crossed by another from apex to internal margin. A small discal spot, and one near base below longitudinal band. All the marks divided by yellowish veins. Expanse, 28 mm.

Habitat, Texas.

E. trimaculata *Smith.*

1887—SMITH, Proc. U. S. Nat. Mus., Vol. X, p. 336.

White; abdomen red ringed centrally. Three brown marks; two on costa near base and near apex respectively, and one on internal margin near internal angle, all obscurely divided by paler veins. A minute discal dot.

Habitat, Texas.

Genus **Ecpantheria** *Hubner.*

1822—HÜBNER, Verz. bek. Schmett., p. 183.

Synopsis of species.

Size large, secondaries caudate.

With black bordered, white abdominal spots **garzoni.**

With black abdominal spots **ocularia.**

Basal spots on fore wings confluent *var. confluens.*

Discal area of wings denuded *var. denudata.*

Size smaller, secondaries rounded *permaculata.*

E. garzoni Oberthur.

1881—OBERTHÜR, Etudes d'ent., pl. XIII, fig. 3.

sennettii Lintner.

1884—LINTNER, Papilio, Vol. IV, p. 147.

White; the ring like markings on the wings, brown, narrow, well filled with white. On secondaries, a submedian and small marginal row of rings, partly filled in with black. Abdomen dark ocher yellow above, with subdorsal row of white spots edged narrowly with black, the last pair confluent in a U shaped mark. Expanse, 55 mm.

Habitat, Mexico, Texas.

E. oclaria Fabricius.

1775—FABRICIUS, Syst. Ent., p. 564, n. 29.

scribonia Stoll.

1790—STOLL, Suppl. Cram. V., pl. 41, f. 3

1892—KIRBY, Cat. Lep. Het., Vol. I, p. 216.

chryseis Olivier.

1790—OLIVIER, Enc. Meth., Vol. V, p. 58, n. 123.

oculatissima Abbot and Smith.

1797—ABBOT & SMITH, Lep. Ins. Ga., Vol. II, pl. 69.

var. confluens Oberthur.

1884—OBERTHÜR, Etudes d'ent., p. 110, t. 17 figs. 3 and 5.

var. denudata Slosson.

1888—SLOSSON, Ent. Amer., Vol. III, p. 212.

White, with black rings on thorax and fore wings, those on thorax occasionally filled in with black. Along costa and internal margin, the rings are filled in with bluish white. Abdomen dark ocher above, with dorsal bands of deep shining blue black on the posterior parts of the segments, leaving a row of square ocher dorsal spots narrowly connected with an ocher subdorsal line. A row of black square lateral spots. Expanse, 58—80 mm.

Habitat, Southern Atlantic States to New York.

E. permaculata Packard.

1872—PACKARD, Rep. Peab. Acad., Vol. IV, p. 86.

1890—SMITH, Can. Ent., Vol. XXII, p. 179.

reducta Grote.

1878—GROTE, Bull. U. S. Geol. Surv., vol. III, p. 799.

chilensis Oberthur.

1881—OBERTHÜR, Etudes d'Ent., p. 111, pl. XX, fig. 5.

1883—BURMEISTER, An. Mus. B. Aires, Vol. III, p. 39, n. 18.

caca Strecker.

1885—STECKER, Proc. Acad. N. S. Phil., 1884, p. 283.

White, with somewhat angular black spots instead of rings, but the same in pattern. Abdomen pale ochereous, with dorsal and lateral black spots, the former subconfluent into a broad band becoming smoky brown toward base. Secondaries well rounded, not at all caudate, with indistinct smoky marginal spots. Expanse, 42 mm.

Habitat, Rocky Mountain region west to California, south to Chile.

Genus **Leptarctia** *Stretch*.

1872—STRETCH, *Zyg. and Bomb. N. A.*, p. 118.

L. californiæ *Walker*.

1855—WALKER, *Cat. Brit. Mus.*, pl. III, p. 625.

lena Boisduval.

1869—BOISDUVAL, *Ann. Soc. Ent. Belg.*, Vol. XII, p. 73.

adnata Boisduval.

1869—BOISDUVAL, *Ann. Soc. Ent., Belg.*, Vol. XII, p. 73.

fulvofasciata Butler.

1881—BUTLER, *Ann. Nat. Hist.*, (5) Vol. VIII, p. 313.

wrightii French.

1889—FRENCH, *Can. Ent.*, Vol. XXI, p. 224.

var. **decia** *Boisduval*.

1869—BOISDUVAL, *Ann. Soc. Ent. Belg.*, Vol. XII, p. 72.

boisduvalii Butler.

1881—BUTLER, *Ann. Nat. Hist.* (5) Vol. VIII, p. 313.

latifasciata Butler.

1881—BUTLER, *Ann. Nat. Hist.* (5) Vol. VIII, p. 313.

albifascia French.

1889—FRENCH, *Can. Ent.*, Vol. XXI, p. 223.

occidentalis French.

1889—FRENCH, *Can. Ent.*, Vol. XXI, p. 223.

var. **dimidiata** *Stretch*.

1872—STRETCH, *Zyg. and Bomb. N. A.*, p. 118.

stretchii Butler.

1881—BUTLER, *Ann. Nat. Hist.* (5) Vol. VII, p. 312.

Black, patagia with a yellow line: femora of fore legs red. Primaries black, or grayish black, with three irregular and broken yellowish lines, the outer almost **W**-shaped, these lines are often absent. A whitish basal dash. Secondaries yellow or red (*var. decia*) with marginal black spots, black border, or entirely black (*var. dimidiata*) or black with a median pale yellow or red line. Expanse, 25 mm.

Habitat, Rocky Mountains and Sierra Nevada.

Genus *Alexicles* Grote.

1883—GROTE, Trans. Kansas Ac. Sci., Vol. VIII, p. 46.
1893—DYAR, Can. Ent., Vol. XXV, p. 328.

A. aspersa Grote.

1883—GROTE, Trans. Kansas Ac. Sci., Vol. VIII., p. 46.

Subdiaphanous blackish. Fore wings obscurely clouded with black at base, subterminally and more distinctly, at end of discal cell. Veins, especially on outer half of wing, marked narrowly with white, but interruptedly, giving the appearance of short streaks. Secondaries scarcely paler, with faint discal spot. Posterior margin of eyes and annulations of tarsi reddish. Expanse, 36 mm.

Habitat, New Mexico.

Genus *Seirarctia* Packard.

1864—PACKARD, Proc. Ent. Soc., Phil., Vol. III, p. 119.

S. echo Abbot & Smith.

1797—ABBOT & SMITH, Lep. Ins. Ga., Vol. II, pl. 68.

White, abdomen marked with ocherous with dorsal and lateral black spots centrally. Fore wings white; veins white, but each vein bordered on both sides by a rather broad dark brown band. Secondaries white with traces of the brown markings at margin. Expanse, 55—60 mm.

Habitat, Southern States.

Genus *Estigmene* Hübner.

1822—HÜBNER, Verz. bek. Schmettl., p. 184.
Leucarctia Packard.

1864—PACKARD, Proc. Ent. Soc., Phil., Vol. III, p. 124.

Synopsis of species.

Fore wings black spotted **acraea.**
Fore wings white, immaculate **albida.**

E. acraea Drury.

1773—DRURY, Ill. Ex. Ent., Vol. I, pl. 3, fig. 2.
caprolina Drury.

1773—DRURY, Ill. Ex. Ent., Vol. I, pl. 3, fig. 3.
menthastrina Martyn.

1797—MARTYN, Psyche, pl. 15, fig. 38.
pseuderminea Harris.

1841—HARRIS, Rep. Ins. Inj. Veg., p. 251.
californica Packard.

1864—PACKARD, Proc. Ent. Soc., Phil. Vol. III, p. 121.
packardii Schaupp.

1882—SCHAUPP, Ch. list Brook. Ent. Soc., p. 8.

White, antennæ black. Fore wings white with a number of black spots which form about six irregular rows. Secondaries and whole under side in ♂ ocher yellow, white in ♀ with a few submarginal and discal black spots. Abdomen with a central ocher yellow band and dorsal and lateral black spots. Expanse, 50—60 mm.

Habitat, North America.

E. albida *Stretch*.

1874—STRETCH, *Zyg. and Bomb. N. A.*, Vol. I, p. 203

White, antennæ black, wings immaculate; secondaries with traces of black spots. Abdomen clear yellow ocher above, except the apical segment and the basal hairs. Expanse, 30 mm.

Habitat, California to Mexico.

Genus **Hyphantria** *Harris*.

1841—HARRIS, *Ins. Mass.*, p. 255.

H. cunea *Drury*.

1773—DRURY, *Ill. Ex. Ent.*, Vol. I, pl. 15, fig. 4.

punctatissima Abbot and Smith.

1797—ABBOT & SMITH, *Lep. Ins., Ga.*, Vol. II, pl. 10.

congrua Walker.

1855—WALKER, *Cat. Brit. Mus.*, Vol. III, p. 669.

punctata Fitch.

1856—FITCH, *Rep. Ins., N. Y.*, Vol. III, p. 387.

pallida Packard.

1864—PACKARD, *Proc. Ent. Soc., Phil.*, Vol. III, p. 118.

1890—SKINNER, *Ent. News*, Vol. I, p. 51.

var. **budea** *Hübner*.

1823—HÜBNER, *Zutr. Ex Schmett.*, Vol. II, ff. 387-8.

textor Harris.

1841—HARRIS, *Rep. Ins. Mass.*, p. 255.

candida Walker.

1864—WALKER, *Cat. Brit. Mus.*, pt. XXXI, p. 291.

Entirely white, fore femora yellow. In the form *cunea*, there are many black spots on primaries forming about six rows when fully present. Expanse, 20—30 mm.

Habitat, North America, throughout.

Genus **Arachnis** *Geyer*.

1837—GEYER, *Zutr. Ex. Schmett.*, Vol. V, p. 28.

Synopsis of species.

Secondaries red.

Primaries red below **aulea.**

Primaries yellow below **picta.**

Secondaries yellow **zuni.**

E. aulea *Geyer.*

1837—GEYER, Zutr. Ex. Schmettl., Vol. V, ff. 913-4.

incarnata Walker.

1855—WALKER, Cat. Brit. Mus., pt. III, p. 690.

Transverse, serpentine, gray, black-bordered lines as in *picta* on a white ground; but more produced longitudinally so as to appear oblique, leaving but little of the ground color visible. Secondaries red in both sexes the three bands dark gray, partly confluent.

Habitat, Honduras, Mexico.

A. picta *Packard.*

1864—PACKARD, Proc. Ent. Soc., Phil., Vol. III, p. 126.

race *citra* *Neumegen & Dyar.*

1893—NEUMEGEN & DYAR, Ent. News, Vol. IV, p. 140.

Primaries white with six serpentine, cinereous, black-bordered bands, confused at the outer margin; on the under side of primaries the ground color becomes yellow at basal two thirds. Secondaries red, with three irregular cinereous bands, broken in the ♂. Abdomen red with dorsal and lateral gray spots: white below. Expanse, 45—55 mm.

Habitat, Southern California to Mexico.

In the race *citra*, the ground color of primaries is yellowish.

Habitat, Colorado.

A. zuni *Neumegen.*

1890—NEUMEGEN, Ent. Amer., Vol. VI, p. 173.

White, with six gray serpentine bands partly broken, but confluent in a line from base to apex, their character as bands largely obscured. Secondaries white, yellow on costa and internal margin, with irregular gray spots. Abdomen yellow, with gray dorsal and lateral bands. Expanse, 50 mm.

Habitat, New Mexico.

Genus **Pyrrharctia** *Packard.*

1864—PACKARD, Proc. Ent. Soc., Phil., Vol. III, p. 120.

P. isabella *Abbot & Smith.*

1797—ABBOT & SMITH, Lep. Ins. Ga., Vol. II, pl. 68.

californica Packard.

1864—PACKARD, Proc. Ent. Soc., Phil., Vol. III, p. 121.

Of a peculiar brownish yellow, abdomen with dorsal and lateral black spots. On primaries are some diffuse black dots, defined in about three faint dusky bands. Secondaries whitish

in ♂, pinkish in ♀ with discal and submarginal black spots.
Expanse, 55 mm.

Habitat, North America.

Genus **Phragmatobia** *Stephens*.

1828—STEPHENS, Ill. Brit. Ent., Haust., Vol. II, p. 73.

Synopsis of species.

Expanse, 30—35 mm.	fuliginosa.
Expanse, 40 mm.	assimilans.

P. fuliginosa *Linnaeus*.

1758—LINNAEUS, Syst. Nat., Vol. I, p. 509.

rubricosa Harris.

1841—HARRIS, Ins. Mass., p. 253

Dark brown, subdiaphanous with two black discal dots on primaries. Secondaries reddish with black discal dots and outer border, or entirely black. Abdomen reddish, or red with dorsal and lateral black spots. Expanse, 30—35 mm.

Habitat, Northern Atlantic States, north and west. Europe, western Asia.

P. assimilans *Walker*.

1855—WALKER, Cat. Brit. Mus., pt. III, p. 535.

var. **franconia** *Slosson*.

1891—SLOSSON, Ent. News, Vol. II, p. p. 41.

Larger than *fuliginosa* and more tending to reddish tints on primaries; wings more opaque. In the *var. franconia* a distinct black median band crosses the fore wing. Expanse, 40 mm.

Habitat, Mountains of New York and New England northward.

(TO BE CONTINUED.)

FOUR NEW GENERA AND SPECIES OF WEST AFRICAN SESIIDÆ.

BY W. J. HOLLAND, PH. D.

In the following paper I give descriptions of four new genera and species of tropical West African Sesiidae, which were collected for me by the Rev. Dr. Good in the valley of the Ogové, about two hundred miles from the mouth of the river. I have compared the insects with the collections contained in the British Museum, the National Collection at Paris, and various English and French private collections, to which I have had access, and have satisfied myself with reasonable certainty that they have not as yet been described. Very little, in fact, has as yet been done to elucidate the natural history of the African species of this exceedingly interesting family of lepidopterous insects. I judge that there must be many exceedingly curious forms in this group yet to be discovered in the rich tropical forests of equatorial Africa.

*Cicinnocnemis** gen. nov.

♂.—Palpi long, produced, and directed upward, widely separated at the base, and converging toward the extremities; the third joint half as long as the second, which is greatly elongated; all the joints are heavily clothed with hair. The antennæ are more than half as long as the costa of the primaries, terete, imbricated, simple at the tips. The second and third pair of legs have the tibiæ swollen at their extremities. The second pair are armed at the extremity with double spurs; the third pair have double median and double terminal spurs; the third pair also have upon the upperside of the tibiæ near their upper extremity peculiar brush-like tufts of hair. The abdomen has a series of brush-like lateral tufts of hair on the five last segments. On the next to the last segment there are in addition two lengthy pencils of hair which are directed downward. At the anal extremity are two divergent similiar pencils of hair. In the primaries, vein five springs from the lower end of the cell; vein six from the upper end of the cell; veins seven and eight are stalked, the stalk springing from the same point as veins six and nine. In the secondaries vein one has two branches; four and five spring from the lower end of the cell; six and seven are stalked; and eight runs parallel to the costa from the base, terminating upon the costa before reaching the apex. Type *C. cornuta* Hölzl.

C. cornuta sp. nov.

♂.—Palpi black on the upper side, bright orange below; front bright orange; collar, upper side of thorax, and abdomen deep black; the lateral tufts of hairs bright orange; the anal tufts black; the pectus and the lower side of the abdomen bright orange; the lower side of the thorax black with greenish iridescent reflex-

* *κίκιννος* = cinnabus; *κνήμη* = tibia.

tions. The legs are bright orange with the upper side of the femora, the upper side of the tarsi of the first and second pairs, and a narrow streak on the sides of the tibiae of the third pair velvety black. The primaries on the upper side are deep black with bright greenish blue streaks upon the median nerve and at the origin of the subcostal nervules. The secondaries are brownish with a brilliant violaceous gloss on the outer margin. On the underside, the wings are black glossed with violet-blue, shading into pinkish in certain lights. The costa of the primaries at the base is orange-yellow, and a narrow bright orange-yellow ray runs from the base of the secondaries to the outer margin near the middle. The outer margin near the anal angle is narrowly tinged with orange-yellow. Expanse, 44 mm.

This very beautiful and singular insect mimics in its general appearance certain African wasps. The type is unique.



CICINNOCNEMIS CORNUTA HOLL. ♂, ♀.

Cicinnoscelis** gen. nov.

♂.—Palpi moderately large, porrect, curving forward and upwardly, with the first and second joints flattened horizontally and heavily clothed with hairs, the third joint fine, cylindrical, and almost naked. The antennae are moderately long, thickened at the middle and furnished with short double pectinations from base to tip. The first pair of legs are short, without spurs on the tibiae; the second pair are moderately long, armed with a single minute inner spur beyond the middle, and with three spurs at the end, the middle one long, the other two short; the third pair of legs is relatively very long, the tibiae and tarsi being greatly produced. The tibiae in this pair are armed with a very long spur about the middle, and with two shorter spurs at the end, and are very heavily clothed with long, hair-like scales directed inwardly toward the abdomen. The tarsi are heavily clothed with short hairs. The abdomen is greatly produced and provided with a conspicuous tuft of anal hairs. The primaries are narrow, elongated, with the apex and outer margin moderately rounded. The secondaries are narrow, elongated with the outer and inner margins evenly rounded. In the primaries there is a deep pit or depression on the under side in the cell near the costa before the base. Veins 2 and 3 are very close together and parallel, vein 4 and 5 spring from the lower angle of the cell, veins 7 and 8 are stalked; veins 9, 10 and 11 together with 6, 7 and 8 all spring from near the upper angle of the cell. In the secondaries the cell

* * κίκιννος — cinnus; σκέλος = crus.

is long and narrow and acutely pointed at the end.* The internal vein has two branches: veins 4 and 5 spring from the lower angle of the cell, 6 and 7 from the upper angle; vein 8 runs parallel to the costa and is closely appressed to vein 7 at its outer extremity. Type *C. longipes* Holland.

C. longipes sp. nov.

♂.—Genae white. Palpi, antennae, and entire body black. Femora black, tibiae and tarsi orange margined with black. On the upper side the primaries are black; and the secondaries of the same color glossed with morpho-blue near the apex and with translucent spots on the inner margin between the nervules. The fringes of the secondaries are broadly black. On the underside the wings are much as on the upper side. Expanse, 55 mm.



CICINNOSCELIS LONGIPES HOLL. ♂, ♀.

Tipulamima† gen. nov.

♂.—Palpi slender, moderately compressed, third joint narrow, long, pointed. The antennae are cylindrical, squamose. The body is long, narrow, tapering, and slightly tufted at the anal extremity. The first pair of legs are short, feeble; the second are longer, armed with double spurs at the end of the tibiae, the third pair are very long armed with double spurs at the middle and at the ends of the tibiae. The primaries are narrow, produced, rounded at the apex and on the outer margin. The secondaries are relatively broader, rounded at the apex, and slightly lobed on the outer margin near the anal angle. After several attempts to minutely ascertain and depict the neurulation I have given up the attempt as it would be necessary to make a microscopic mount of the wings, which I am unwilling to do as the specimen is thus far unique in collections. Type *T. flavifrons* Holland.

T. flavifrons sp. nov.

♂.—Antennae and eyes black. The palpi, front, collar, patagia, and the front half of the thorax orange-yellow. The remainder of the thorax and the entire abdomen are black with steel-blue reflections. The front pair of legs and the femora and tibiae of the second pair are orange-yellow, the tarsi of the second pair

* The cut is defective. A line should be inserted from the point where veins 4 and 5 unite to the point of union between veins 6 and 7.

† Tipula = nomen generis dipterorum, mimia.

and the third pair throughout are blue-black. The anterior wings are blue-black with a narrow translucent ray near base. The secondaries are also blue-black with the basal third translucent, and an elongated subpyriform translucent bar beyond the cell just above and parallel to the third median nervule. Expanse, 28 mm.



TIPULAMIMA FLAVIFRONS
HOLL. ♂, ♀.



TRICHOBATES SEXSTRIATA
HOLL. ♂, ♀.

Trichobates|| gen. nov.

♂.—Palpi moderately long, and compressed; the first and second joints hairy, the third joint minute and subconical. The antennæ are relatively long, dilated beyond the middle, squamose. The anterior legs have the tibiæ without spurs, heavily clothed with hairs. The second pair of legs have double spurs at the end of the tibiæ, which are still more heavily clothed with hairs than the first pair. The third pair of legs have a median and double terminal spurs on the tibiæ, which are profusely clothed with hairs and have at the upper end a broad fan-like brush of hairs which spreads out and covers the hairy brush-like covering of the tibiæ. The venuration I have not been able to accurately determine for the same reason as in the case of the last genus. Type *T. sexstriata* Holland.

T. sexstriata sp. nov.

♂ Palpi black above, bright orange-yellow below. The antennæ are black, marked with white before the tip on the upper-side. The front is black. The collar is blue-green. The top of the thorax is black defined posteriorly by a narrow white line. The patagia are orange-yellow. The abdomen is black, banded at the base and on the middle of the upper side with orange-yellow, and before the tip, which is black, with crimson. The pectus is white; the lower side of the thorax is black; the lower side of the abdomen is crimson with a ventral row of black dots. The femora of the three pair of legs are black, marked at either end with white. The tibiæ are bright crimson, with the upper ends black. The crimson brush of hairs on the tibiæ of the second pair is banded on the middle with white. On the third pair the crimson brush is marked externally by a round black spot. The fan-like brush at the upper end of the tibiæ of the last pair is fulvous orange. The primaries above and below are black, crossed by three yellowish semitranslucent bands. The secondaries are black with the middle area diaphanous and devoid of scales. On the underside the secondaries have in addition to the markings of the upper side a yellowish transverse band running from the anal angle inwardly to the middle, and the inner margin laved with yellowish before the base. Expanse, 32 mm.

This gaily colored and singular moth is altogether one of the most beautiful insects of the group to which it belongs.

|| Τριχοβατῆς = qui comam tingit.

LOCAL ENTOMOLOGICAL NOTES.

Members of the New York Entomological Society and all others, are solicited to contribute to this column, their rare captures, local lists and other items of interest relating to the insect fauna of New York city and vicinity.

LIST OF THE COLEOPTERA OF NORTH EASTERN AMERICA, WITH SPECIAL REFERENCE TO THE FAUNA OF NEW YORK CITY AND VICINITY.

BY CHARLES W. LENG and WM. BEUTENMULLER.

(CONTINUED FROM PAGE 146).

HALIPLIDÆ.

HALIPLUS *Latr.*

H. fasciatus *Aube.*—Found near N. Y. City and all Middle and Western States.

H. punctatus *Aube.*—Found near N. Y. City and all Middle and Western States.

H. triopsis *Say.*—Taken near N. Y. City and all Middle and Western States, Canada.

H. ruficollis *De G.*—Found near N. Y. City and all Middle and Western States, Canada and westward (also Europe).

H. longulus *Lec.*—Taken in this vicinity, Mass., Lake Superior (also Wyoming).

H. cribrarius *Lec.*—Not found near N. Y. City. Occurs in Vermont, Lake Superior and Can. (also Dakota).

H. borealis *Lec.*—Michigan (Hubbard & Schwarz).

CNEMIDOTUS *Er.*

C. 12 punctatus *Say.*—Near N. Y. City and all Middle and Western States, Canada.

C. edentulus *Lec.*—Near N. Y. City and all Middle and Western States.

C. muticus *Lec.*—Middle and Western States.

DYTISCIDÆ.

All the Dytiscidæ are water beetles, swimming freely and occur in ponds large and small. They also fly well and thus are taken at electric lights and on glass roofs, stunned by falling upon them in mistake for water.

CANTHYDRUS *Sharp.*

C. bicolor *Say.*—Rare near N. Y. City. Occurs abundantly further south, Conn., N. J., Pa., (also Va., Ga., Fla.).

HYDROCANTHUS *Say*.

H. iricolor *Say*.—Abundant in Woodside Lake (Staten Island) and elsewhere near N. Y. City, also N. J., Pa., O., (and Ga., La., Fla.).

LACCOPHILUS *Leach*.

L. maculosus *Germ.*—N. E. Amer. In every pond, the most common water-beetle.

L. proximus *Say*.—Lake Superior Region. Not yet recognized in our ponds, but occurs at Peekskill (Sherman), also reported from N. J., Can., O., Iowa, Ill., (also Tex., Fla., Neb. and Cal.).

L. fasciatus *Aube.*—Occurs here with *L. maculosus*, but less common, also found all over the United States.

L. undatus *Aube.*—Northfield Iron Ore ponds (Staten Island), rare; also N. J., Pa.

L. gentilis *Lec.*—N. Y., La.

HYDROVATUS *Mots.*

H. cuspidatus *Germ.*—Very abundant on Staten Island, also in all Middle and Western States.

H. pustulatus *Muls.*—N. J., Ill., Vt.

DESMOPACHRIA *Bab.*

D. convexa *Aube.*—N. Y. City and vicinity. Common on Staten Island; N. J., and Middle States.

BIDESSUS *Sharp.*

B. flavicollis *Lec.*—Ill., Pa., (Crotch).

B. affinis *Say*.—Our common species is called by this name, also reported from the Atlantic Region, N. J., Ohio, Lake Superior, (also Tex., N. Mex., Cal. and Vanc.).

B. lacustris *Say*.—Rare near N. Y. City. Reported to inhabit the Atlantic Region, Ohio (Dury), Lake Superior.

B. fuscatus *Cr.*—Lake Superior to Fla (Crotch). Found abundantly at Peekskill, N. Y., among submerged leaves in a wooded swamp (Sherman).

B. granarius *Aube.*—Rare on Staten Island N. J. (Smith), Vermont (Roberts), Southern States (Crotch).

CELINA *Aube.*

C. angustata *Aube.*—Very rarely found in the Iron Ore ponds on Staten Island. Reported from the Southern States (Crotch).

COELAMBUS *Thom.*

C. inæqualis *Fabr.*—Near N. Y. City, N. J., Middle and Western States, Lake Superior, Can. (also Europe).

C. punctatus *Say*.—Near N. Y. City, N. J. (Smith), Va., Middle and Western States, Col.

- C. farctus* Lec.—N. J. (Crotch), Mass.
C. turbidus Lec.—Near N. Y. City, Mass., Vt., Ohio (Dury).
C. medialis Lec.—Near N. Y. City, (also San Diego, Calif.).
C. nubilus Lec.—Near N. Y. City, Buffalo, N. Y., N. J., O. (also Kan., Col., Tex.).
C. suturalis Lec.—Lake Superior.
C. impressopunctatus Sch.—Near N. Y. City, N. J., Mass., Ill., Lake Superior, Can. (also Asia). This species on Staten Island, inhabits the salt meadow creeks.
C. acaroides Lec.—Ohio (Dury).
C. dissimilis G. & H.—Lake Superior.

DERONECTES *Sharp.*

- D. depressus* Fabr.—Canada. Buffalo, N. Y. (Reinecke), Michigan (Schwarz), (also N. Europe).
D. catascopium Say.—Peekskill, N. Y. Very rare. Quebec, Can. (Cooper), Iowa and Vancouver also Labrador.
D. griseostriatus De G.—Found near N. Y. City, N. J., Mass., N. Y., Can., Lake Superior and westward to Cal. (also Arctic Siberia and Alpine and northern Europe).

HYDROPORUS *Clairv.*

- H. aulicus* Aube.—Not found here. Tenn.
H. concinnus Lec.—Rare near N. Y. City, N. J., Can., O., Ill. (also Neb.).
H. pulcher Lec.—Not found here. Reported from N. J. (Smith), Vt. (Roberts).
H. mellitus Lec.—Occurs in New England.
H. undulatus Say.—Common in this vicinity, N. J., Pa., Conn.
H. spurius Lec.—Rare in this vicinity. Vt. (Roberts), Canada.
H. consimilis Lec.—Not found here. N. J., Lake Superior, Ohio (Dury), Ottawa, Can. (Harrington).
H. sericeus Lec.—Not found in this vicinity. Can., Lake Superior, Ill.
H. proximus Aube.—Canada.
H. hybridus Aube.—Canada (Harrington).
H. striatopunctatus Muls.—Found in this vicinity and Middle States.
H. anticus Sharp.—Not found here. Vt. (Roberts).
H. mixtus Lec.—N. Y. City and vicinity, N. Hampsh. (Slosson), Vt. (also Neb.).
H. alpinus Payk.—N. Y. City and vicinity, Can., Lake Superior, Hudson Bay region (also Lapland and Norway).
H. obscurus Sturm.—N. J.
H. tenebrosus Lec.—N. J., Lake Superior, Labrador.
H. signatus Mann.—Can., Ill. Reported from Peekskill, N. Y.
H. tristis Payk.—N. Y. City and vicinity, Mass., Vt. and Arctic region, Lake Superior, Can. to Alaska (also northern Siberia and Europe).
H. americanus Aube.—N. Y. City and vicinity, N. J., Peekskill, N. Y., in submerged moss in swamp. Ottawa, Can. (Harrington).
H. dichrous Muls.—N. Y. City and vicinity, N. J., Ill., Canada.
H. niger Say.—Not found here. Can., Vt., N. Hampshire.

- H. modestus** *Aube.*—N. Y. City and vicinity, N. J., Conn., Canada.
H. stagnalis *G. & H.*—N. Y. City and vicinity, N. J., Can., Vt., Lake Superior.
H. oblitus *Aube.*—Peekskill, N. Y. Rare. Middle States, Lake Superior.
H. difformis *Lec.*—N. Y., Mass. (also Ga.).
H. oblongus *Steph.*—Can., L. Superior, Pa., Mich. (also Vancouver, Finland and Arctic Siberia).
H. tartaricus *Lec.*—Peekskill, N. Y. (Sherman), Vt., Lake Superior, Can. (also Hudson Bay, Col. and Arctic Siberia).
H. laccophilinus *Lec.*—Peekskill, N. Y. (Sherman).
H. caliginosus *Lec.*—Lake Superior, Quebec, Canada (Cooper), Labrador.
H. septentrionalis *Gyll.*—Lake Superior, eastern Siberia and north. Europe.
H. vilis *Lec.*—Lake Superior.
H. notabilis *Lec.*—Lake Superior, Can.
H. atriceps *Cr.*—White Mts., N.H. (also Finland, Scotland, Arctic Siberia).

ILYBIUS *De Geer.*

- I. ater** *De G.*—Reported from Pa. It is a European species and the determination may be incorrect.
I. pleuriticus *Lec.*—Reported from Pa. and Lake Superior, (also Kan., Alaska, Siberia and Europe).
I. angustior *Gyll.*—Occurs in Labrador, Lake Superior (also Kansas).
I. biguttatus *Germ.*—Abundant near N. Y. City, N. J., Pa., Conn., O., Ill., Michigan, Can. (Couper).
I. fraterculus *Lec.*—N. Y. City and vicinity, Michigan (Schwarz), also Neb. and Kans.
I. 4-maculatus *Aube.*—Occurs at Peekskill, N. Y., N. Hampsh. (Slosson), Quebec, Can. (Couper), (Sherman), (also in Or. and Alaska).
I. ignarus *Lec.*—Occurs at Peekskill, N. Y., rarely in a wooded swamp, (Sherman), Michigan (Schwarz).
I. confusus *Aube.*—Michigan (Schwarz), Lake Superior.
I. assimilis *Kby.*—Canada

COPTOTOMUS *Say.*

- C. interrogatus** *Fabr.*—Abundant in ponds near N. Y. City, N. J., Pa., Conn., O., Mich., Can., (also Ga., Mo., Tex. and Cal.).

ILYBIOSOMA *Cr.*

- I. bifarius** *Kby.*—Canada, Lake Superior Region, (Schwarz).

COPELATUS *Er.*

- C. glyphicus** *Say.*—Abundant near N. Y. City, in N. J., Pa., Can., Ill., (also Fla., La., Tex. and Kan.). Very common under stones along inlets of the Hudson River. Rare in ponds (Sherman), Ohio (Dury).
C. Chevrolatii *Aube.*—Lake Superior Region (Schwarz).

MATUS Aube.

M. bicarinatus Say.—Abundant near N. Y. City, N. J., Quebec, Can. (Couper).

AGABETES Cr.

A. acuductus Harr.—Occurs in pools in the woods on Staten Island; common in a wooded swamp at Peekskill (Sherman), Pa. and Can.

AGABUS Leach.

A. parallelus Lec.—Rare at Peekskill (Sherman), Lake Superior, N. Hampshire, Labrador.

A. seriatus Say.—Common in this vicinity, in N. J., Pa., Vt., Can.

A. obtusatus Say.—Abundant near N. Y. City, in N. J., Can., Lake Superior.

A. stagninus Say.—Found in this vicinity (W. B.) Reported from Pa., Ohio (Dury), Ottawa, Can. (Harrington).

A. semivittatus Lec.—Reported from Pa., Ohio, Can. (also Kan. Tex.).

A. punctatus Mels.—Not common in this vicinity (W. B.), N. J. (Smith), Pa., Canada (also Ga.).

A. semipunctatus Kly.—Reported from Can., Lake Superior, Labrador, (also Mo).

A. inscriptus Cr.—Labrador.

A. punctulatus Aube.—Newfoundland, Lake Superior, Can., Pa., (also Wash. State).

A. taeniolatus Harr.—Reported in N. J. (Smith), Pa., Ohio (Dury).

A. disintegratus Cr.—N. E. Amer. Common in this vicinity, (also Neb., Kan., Ariz., Tex.).

A. nigroæneus Er.—Lake Superior, Can. (also Kan., Calif., Europe and Siberia).

A. hypomelas Mann.—Quebec, Canada (Couper).

A. tristis Aube.—Quebec, Canada (Couper).

A. leptapsis Lec.—Michigan.

A. reticulatus Kly.—Rare near Peekskill, N. Y. (Sherman).

A. infuscatus Aube.—Rare near N. Y. City. Lake Superior.

A. Lecontei Cr.—New Hampshire (Austin).

A. erythropterus Say.—N. Y. City and vicinity, N. J., Pa., Mass., Lake Superior.

A. congener Payk.—N. Y. City and vicinity, Vt., Pa., Mass., Labrador, Greenland, Wht. Mts. N. H. (Europe and Siberia).

A. arcticus Payk.—Labrador (also Scotland, Lapland and Arctic Siberia).

A. gagates Aube.—N. Y. City and vicinity, common. Pa., Vt., N. J., Mass., Lake Superior.

A. clavatus Lec.—Reported from N. J. (also Kan.).

A. fimbriatus Lec.—Reported from N. J., Pa., Lake Superior, Canada.

A. anthracinus Mann.—Canada, Lake Superior (also Alaska).

A. confinis Gyll.—Vermont, Lake Superior, Michigan, New Hampshire, Can., (also Hudson Bay, Alaska, Sweden, Finland).

A. subfuscatus Sharp.—Canada (Kilman).

A. ambiguus Say.—Lake Superior Region, Labrador.

A. longulus Lec.—Michigan.

SCUTOPTERUS *Esch.*

S. angustus Lec.—Canada, Lake Superior (also Kan.).

S. Hornii Cr.—Canada.

RHANTUS *Esch.*

R. flavogriseus Cr.—Found near N. Y. City, Michigan (Schwarz).

R. binotatus Harr.—N. E. Amer. (also the whole U. S.).

R. calidus Fabr.—Rare near N. Y. City, N. J. (also Ga.).

R. bistriatus Bergst.—N. Y., N. J., Mass., Ill., Lake Superior, northward and westward (also Europe and Siberia).

A. sinuatus Lec.—Peekskill, N. Y., rare (Sherman), Michigan (Schwarz).

COLYMBETES *Clair.*

C. sculptus Harr.—N. E. Amer. (also Id., Mont., Or., Cal.).

C. grœnlandicus Aube.—Greenland.

HYDATICUS *Leach.*

H. stagnalis Fabr.—Found near N. Y. City; Pa., N. Hampsh. (Slosson), Mich., Wisc. (also N. Europe and N. Siberia).

H. piceus Lec.—Taken near N. Y. City, N. J., Pa., Ill., Lake Superior and Canada).

H. bimarginatus Say.—Taken near N. Y. City, N. J., Pa., Ohio (also Ga., Fla.).

DYTISCUS *Linn.*

D. sublimbatus Lec.—Ohio (Dury), Lake Superior, Canada.

D. fasciventris Say.—N. Y. City and vicinity, N. J., Pa., New Hampshire (Slosson), Lake Superior, Ohio, Canada.

D. hybridus Aube.—N. Y. City and vicinity, N. J., Pa., Ill., Ohio (also Kan.).

D. verticalis Say.—N. Y. City and vicinity, N. J., N. Hampsh. (Slosson), Pa., Lake Superior, Can.

D. Harrisii Kby.—N. J., Pa., Lake Superior, N. Hampsh. (Slosson), Can. (also Kan., Vanc.).

D. marginicollis Lec.—Ohio (Dury), Ill.

D. dauricus Gebl.—Maine to Alaska, Michigan (Schwarz), Quebec, Can. (Couper).

ACILIUS *Leach.*

A. semisulcatus Aube.—N. E. Amer.

A. fraternus Harr.—N. E. Amer. Common.

*A. mediatu*s Say.—N. E. Amer.

THERMONECTES *Esch.*

T. ornaticollis Aube.—N. Y. City and vicinity, Pa., Ill. (also Tex., N. Mex. and Kan.).

T. basilaris Harr.—N. E. Amer. (also Ga., Tex.).

GRAPHODERES *Esch.*

G. liberus *Say.*—N. Y. City and vicinity, N. J., Pa., Conn., Mass., Lake Superior.

G. fasciatocollis *Harr.*—N. Y. City and vicinity, N. J., Pa., Mich. (also Cal., Wash., Europe, N. Siberia).

CYBISTER *Curt.*

C. fimbriolatus *Say.*—N. Y. City and vicinity, N. J., O., Pa. (also Ga., La., Kansas).

GYRINIDÆ.

The Gyrinidæ are also water beetles, but live habitually on its surface where they may be seen in schools, swimming in circles and mingling together. They are commonly called whirligigs also apple-bugs, owing to their peculiar apple-like odor.

GYRINUS *Linn.*

G. minutus *Fabr.*—Lake Superior and Labrador (also Hud. Bay, Wash., Europe and Asia).

G. rockinghamensis *Lec.*—N. Y., N. J. (also N. C. and Fla.).

G. confinis *Lec.*—Buffalo, N. Y. (Reinecke), Lake Superior Region and westward.

G. fraternus *Coup.*—Canada Lake Superior.

G. limbatus *Say.*—N. Y., N. J., Canada, Lake Superior.

G. dichrous *Lec.*—Reported from N. Y. City and vicinity, N. Eng., N. J., N. Y., Lake Superior (also Ga.).

G. pectoralis *Lec.*—Lake Superior Region.

G. elevatus *Lec.*—Reported from N. Y. (also Utah)

G. ventralis *Kb.*—N. E. Amer. Abundant.

G. aquiris *Lec.*—Middle States, Lake Superior.

G. maculiventris *Lec.*—Buffalo, N. Y. (Reinecke), Lake Superior.

G. canadensis *Reg.*—Pa., (?); Canada.

G. affinis *Aube.*—N. E. Amer. Abundant.

G. analis *Sav.*—N. E. Amer. Abundant.

G. marinus *Gyll.*—Greenland.

G. borealis *Aube.*—N. E. Amer. Abundant.

G. lugens *Lec.*—N. Eng., Lake Superior. Rare in N. J., Ohio

G. picipes *Aube.*—Peekskill, N. Y. (Sherman), Labrador, Lake Superior (Hubbard & Schwarz), (also B. Col.)

G. æneolus *Lec.*—Lake Superior (Hubbard & Schwarz), Ill.

DINEUTES *MacL.*

D. vittatus *Germ.*—N. Y. City and vicinity, N. J., Middle and Southern States.

D. discolor *Aube.*—Very common in this vicinity, N. E. Amer.

D. serrulatus *Lec.*—Rare in Middle States, more common South

D. assimilis *Aube.*—N. E. Amer. Common in this vicinity.

D. emarginatus *Say.*—Scarce in this vicinity. N. J., Middle and Northern States.

GYRETES *Brulle*.

G. sinuatus *Lee.*—Quincy, Ill. (also Cal.)

HYDROPHILIDÆ.

This family includes genera of different habits.

HELOPHORUS *Fabr.*

These are water beetles found clinging to aquatic plants and when dislodged they must float on the surface, until brought in contact with another stem or leaf.

H. lacustris *Lee.*—N. Y. City and vicinity, N. J., Lake Superior, Canada.

H. obscurus *Lee.*—Taken in this vicinity on Staten Island, Canada (Harrington), (also Calif.).

H. linearis *Say.*—Buffalo, N. Y. (Reinecke), (also Hud. Bay).

H. lineatus *Say.*—N. Y. City and vicinity, N. J., Middle States, Ohio, Lake Superior, Can. (also Neb.).

H. tuberculatus *Gyll.*—N. J., rare, N. Ill., Can., Mich., Lake Superior, Wisc. (also Europe and Asia).

HYDROCHUS *Leach*.

H. scabratus *Muls.*—N. Y. City and vicinity, N. J., Middle and Southern States (also Ia).

H. rugosus *Muls.*—Middle States.

H. inæqualis *Lee.*—N. Y. City and vicinity, N. J., (also Ia).

H. subcupreus *Rand.*—N. Y. City and vicinity, N. J., Can., (Harrington).

H. variolatus *Lee.*—N. J. (also Ia. and Cal.).

H. squamifer *Lee.*—Buffalo, N. Y. (Reinecke), Quebec, Can. (Couper).

H. simplex *Lee.*—Buffalo, N. Y. (Reinecke).

OCHTHEBIUS *Leach*.

Live on the under side of stones in clear running shallow water.

O. benefossus *Lee.*—On the N. J. list, Vt. (Roberts).

O. nitidus *Lee.*—Pa., Lake Superior.

O. foveicollis *Lee.*—Pa. (also Fla. and N. Mex.).

HYDREXA *Kug.*

Live in the mud of pond bottoms and on aquatic plants under water.

H. pennsylvanica *Kies.*—Not rare on Staten Island, N. J., Lake Superior, Can. (also Wyom.).

HYDROPHILUS *Geoff*

Swim freely in the ponds like Dytiscide, but with less power.

H. ovatus *G. & H.*—Rare on Staten Island, N. Y., N. J., Pa., O. (not rare in Washington, D. C.).

H. triangularis *Say.*—N. E. Amer. (the whole U. S.) not rare in N. Y. City and vicinity at electric lights.

H. nimbatus *Say*.—Very common, N. Y. City and vicinity, N. J., O., Can. (also Ga., Tex., Neb.)

H. mixtus *Lee*.—N. Y., N. J., O., Can.

H. glaber *Hbst.*—N. Y. City and vicinity, common, N. J., Lake Superior, O., Can. (also Ga., Neb.).

H. striolatus *Lee*.—Ohio (Dury).

HYDROCHARIS *Lat.*

Habits similar to the preceding

H. obtusatus *Say*.—N. Y. City and vicinity, not common, N. J., Pa., N. Eng., Can., Ill., O., (Middle and Southern States).

BEROSUS *Leach.*

Habits same as the preceding; rather rare.

B. exiguus *Say*.—Pa. and southward.

B. pantherinus *Lee*.—N. Y. City and vicinity, N. J., Ill., O., (also Mo., Tex.).

B. peregrinus *Hbst.*—N. Y. City and vicinity, N. J., Ohio, Can., Middle and Southern States.

B. immaculatus *Zimm.*—Ill. (also N. C. and Mo.).

B. infuscatus *Lee*.—N. J. Atlantic Slope to the Pacific.

B. pugnax *Lee*.—Ill. (also Mo.).

B. striatus *Say*.—N. Y. City and vicinity, N. J., Pa., N. Eng., Middle States, O., Can.

CHETARTURIA *Steph.*

C. atra *Lee*.—N. Y. (Leconte).

LACCOBIUS *Er.*

L. agilis *Rand.*—N. Y. City and vicinity, N. J., O., Middle States, Lake Superior, Can. (also Kan.).

PHILHYDRUS *Sol.*

Habits similar to the preceding.

P. nebulosus *Say*.—N. Y. City and vicinity, N. J., Ohio, Lake Superior, Can. (also Ga., Kan., Neb., Ariz., Tex. and Cal.).

P. ochraceus *Mels.*—N. J., Conn., Ohio, Can., Middle and Southern States (also Mex.).

P. reflexipennis *Zimm.*—N. Y. City and vicinity, N. J., Vt. (Roberts), (also Del.).

P. cinctus *Say*.—N. Y. City and vicinity, Can., New Eng. States, westward to Kan., and south to Ga.

P. diffusus *Lee*.—N. Y. City and vicinity, N. J., Ill., Can. (also Neb., Dak., Wyo. and Calif.).

P. perplexus *Lee*.—N. Y. City and vicinity, N. J., Pa., Ill., Lake Superior, Can., southward to Fla., and westward to Tex.

P. Hamiltoni *Horn.*—N. Y. City and vicinity, N. J., Can., Mass. (also N. Cal. and Or.)

HELOCHARES *Muls.*

P. maculicollis *Muls.*—Ohio (Dury), Ill. (also Mo., Ky., N. C., Fla. to Tex.)

CYMBIODYTA *Bedel.*

H. fimbriata *Mels.*—N. Y. City and vicinity, N. J., Vt., Pa., Middle States, N. Eng. States, Can. (also Tex.).

H. lacustris *Lec.*—N. Y. City and vicinity, N. J., Lake Superior, Canada, New. Eng.

H. rotundatus *Say.*—N. J. rare, Pa., Mass., Can. (also N. C.).

C. Blanchardi *Horn.*—Vt., Watkins Glen, N. Y. (Slosson), Mass., Pa. also D. C.).

HELECOMBUS *Horn.*

H. bifidus *Lec.*—N. Y. City and vicinity, N. J., Middle and Southern States, N. Eng., Can., Labrador.

HYDROBIUS *Leach.*

H. tessellatus *Ziegl.*—N. Y. City and vicinity, Can., Middle States to Fla., and N. Eng. to Ill.

H. tumidus *Lec.*—N. Y., Pa., Can., Middle States to Fla.

H. globulosus *Say.*—N. Y. City and vicinity, N. J., Pa., Mass., Canada Middle and N. Eng. States.

H. fuscipes *Linn.*—N. Y., N. J., Pa., Vt., N. Hampsh., Can., westward to Cal. and Alaska (also Europe and Siberia).

CRENIPHILUS *Mots.*

C. digestus *Lec.*—Lake Superior, Niagara, N. H., Can. to N. Mex.

C. subcupreus *Lec.*—N. Y. City and vicinity, N. J., O., Pa., Can., Middle and N. Eng. States, Lake Superior (also Neb., Fla., Cal., Or., Ariz., Tex.).

C. depectus *Lec.*—Eastern and Middle States, Pa., Ill., Can., Mich., Mass.

C. suturalis *Lec.*—N. J., Peekskill, N. Y. (Sherman), Middle States, Can. (also Ga.).

C. monticola *Horn.*—White Mts., N. H., Pa. (Horn).

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ERRATA.

Page 10, line 28,	for Syntomeince read Syntomeinæ.
" 10, " 29,	" Zygaœenin read Zygaœinæ.
" 10, " 29,	" Diopline read Dioplinæ.
" 14, " 14,	" Anthomus read Anthonomus.
" 21, " 34,	" Cirtotellix read Cirtotettix.
" 36, " 22,	insert Rhynchophora.
" 77, " 27,	for Hagan read Hagen.
" 109, " 27,	" 1872 read 1827.
" 112, " 28,	" 1857 read 1837.
" 115, " 24,	" tenuifacia read tenuifascia.
" 118, " 13,	insert on before external.
" 118, " 31,	for 1853 read 1855.
" 119, " 3,	" Fitch read Fabr.
" 123, " 16,	" subsequent read preceding.
" 163, " 18,	" Cenus read Genus.
" 172, " 33,	" cinnamonea read cinnamomea.
" 179, " 1,	" E. read A.

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No. 1.

A PRELIMINARY REVISION OF THE BOMBYCES OF AMERICA NORTH OF MEXICO.

BY B. NEUMOEGEN AND HARRISON G. DYAR.

(CONTINUED FROM VOL. I, PAGE 180)

Genus *Spilosoma* *Stephens*.

1828—*Spilosoma* STEPHENS, Ill. Brit. Ent., Hist., Vol. II, p. 74.

Synopsis of species.

Fore wings square at tip.

Abdomen spotted.

Primaries white **virginica.**

Primaries faintly ochraceous **prima.**

Abdomen immaculate white **latipennis.**

Fore wings, acuminate, outer margin more oblique.

Legs yellow at base **antigone.**

Legs red at base.

Abdomen black spotted **vestalis.**

Abdomen immaculate white var **amelaina.**

S. virginica *Fabricius*.

1798—*Bombyx virginica* FABRICIUS, Nat. Syst. Suppl., p. 437.

var. **dubia** *Walker*.

1855—*Cyenia dubia* WALKER, Cal. Brit. Mus., pt. III, p. 682.

1893—*Spilosoma virginica* var. *dubia* DYAR, Can. Ent., Vol. XXV, p. 180.

White with black discal dot on primaries and sometimes submarginal ones on secondaries. Abdomen ochereous subdorsally with black dorsal and lateral spots. Fore coxæ and femora ochraceous. Expanse, 38—50 mm. — In the aberration *dubia* the wings are mouse gray with whitish veins.

Habitat, Atlantic States westward to Pacific Northwest.

S. prima *Slosson*.

1889—*S. prima* SLOSSON, Ent. Amer., Vol. V, p. 40.

White, but somewhat sordid or yellowish with scattered dots of dark brown. The fore tibiæ more smoky than in *virginica* which this insect closely resembles.

Habitat, Northern New York and New England northward.

S. antigone *Strecker*.

1878—*S. antigone* STRECKER, Rep. Chief Eng. Ruffner, App. ss., p. 1860;
1889—SMITH, Ent. Amer., Vol. V, p. 119.

White, fore tibiæ ochraceous. On fore wings is a black discal dot and occasionally a few dark brown dots, forming an outer band. Expanse, 45—50 mm.

Habitat, Atlantic States to Rocky Mountains.

S. latipennis *Stretch*.

1872—*S. latipennis* STRETCH, Zyg. and Bomb. N. A., p. 133.

White, fore tibiæ red. Pectinations of antennæ, and eyes black. Expanse, 40 mm.

Habitat, Atlantic States.

S. vestalis *Packard*.

1864—*S. vestalis* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 125.

var. **amelaina** *Dyar*.

1893—*S. vestalis* var. *amelaina* DYAR, Psyche, Vol. VI, p. 512.

White, fore tibiæ red. Abdomen with dorsal and lateral black spots. Fore wings with a variable number of black dots especially along costa and in an outer band. Expanse, 45—55 mm. The *var. amelaina* has the abdominal spots partly or wholly wanting.

Habitat, California and Pacific Northwest.

Genus **Elpis** *Dyar*.

1893—*Elpis* DYAR, Ent. News, Vol. IV, p. 36.

Synopsis of species.

Stalk of antennæ and thorax with red hairs.

Fore wings brown with red tint	rubra.
Red predominating	<i>var.</i> walsinghami.
Brown largely predominating	<i>var.</i> danbyi.

Stalk of antennæ whitish, thorax pale brown or russet.

Secondaries partly or largely blackish	vagans.
Secondaries pale	<i>var.</i> rufula.

E. rubra *Neumoegen*.

1881—*Antarctia rubra* NEUMOEGEN, Pap., Vol. I, p. 79.

var. walsinghami Butler.

1881—*Antarctia walsinghami* BUTLER, Ann. Nat. Hist., Vol. VIII, p. 311.

var. danbyi Neumoegen & Dyar.

1893—NEUMEGEN & DYAR, Ent. News, Vol. IV, p. 141.

Thorax red, or brown with a red tinge (*var. danbyi*). Fore wings brown with red tinge or largely red (*var. walsinghami*) with a blackish discal dot. Secondaries black, wings thinly scaled, subtranslucent. Expanse, 30 mm.

Habitat, Pacific Northwest.

E. vagans Boisduval.

1852—*Arctia vagans* BOISDUVAL, Ann. Ent. Soc. France, (2), Vol. X, p. 322.

1875—*Spilosoma pteridis* HY. EDWARDS, Proc. Cal. Acad. Sci., Vol. V, p. 265.

var. rufula Boisduval.

1855—*Nemophila rufula* BOISDUVAL, Bull. Soc. Ent. France (3), Vol. III, p. 32.

1864—*Antarctia punctata* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 123.

1881—*Antarctia proba* HY. EDWARDS, Pap., Vol. I, p. 39.

Male; drab, sprinkled with black scales with black discal dots, Secondaries often largely or wholly black. Female brownish red with irrorations and markings as in the ♂. Expanse, 35 mm.

Habitat, California.

Genus **Neoarctia** Neumoegen & Dyar.

1893—*Neoarctia* NEUMEGEN & DYAR, Ent. News., Vol. IV, p. 141.

Synopsis of species.

Dark brown, marks indistinct **beanii.**
 Black, marks distinct **brucei.**

N. beanii Neumoegen.

1891—*Antarctia beanii* NEUMEGEN, Can. Ent., Vol. XXIII, p. 123.

var. fuscosa Neumoegen.

1891—*A. beanii* var. *fuscosa* NEUMEGEN, Can. Ent., Vol. XXIII, p. 124.

Chocolate brown, abdomen reddish laterally. Fore wings subtranslucent, with a basal band and costal patch, outer transverse and angular terminal bands of pinkish color, faintly marked or absent (*var. fuscosa*). Secondaries pinkish with mesial and submarginal brown bands. Expanse, 35 mm.

Habitat, Northern Rocky Mountains.

N. brucei Hy. Edwards.

1888—*Arctia brucei* HY. EDWARDS, Ent. Amer., Vol. III, p. 183.

Black; collar and end of abdomen reddish flesh color. Fore wings with sub-basal and transverse posterior bands, a rounded, triangular costal spot, and occasionally a terminal **w**-mark of same color. **W**-mark irregular, often absent. Secondaries pale red, with median and outer row of confluent black spots, the median sometimes wanting. Expanse, 35 mm.

Habitat, Colorado.

Genus *Platarctia* Packard.

1864—*Platarctia* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 109.

Synopsis of species.

Size large; primaries brown. **hyperborea.**
 Smaller, primaries black.
 Markings lemon yellow; basal half of secondaries black **yarrowi.**
 Markings buff; secondaries black only at base *var.* **remissa.**

P. hyperborea Curtis.

1835—*Euprepia hyperboreus* CURTIS, Ross, 2nd Voy. App., p. 271.

1850—*Arctia parthenos* HARRIS, Agassiz Lake Sup., p. 390.

1860—*Arctia borealis* MÖSCHLER, Wiener Ent. Monat., Vol. IV, p. 360.

Fore wings dark brown with blackish shade. Several small white spots, especially along costa and submedian fold, representing the usual bands. Secondaries ocher yellow, sub-median band and discal spot connected by rays with a large basal black patch. Abdomen black with ocher yellow tip; collar red behind, patagia white-lined. Expanse, 70 mm.

Habitat, Mountains of New England northward.

P. yarrowi Stretch.

1874—*Arctia yarrowi* STRETCH, Zyg. and Bomb. N. A., Vol. I, p. 221;

1893—BEAN, Psyche, Vol. VI, p. 523.

var. remissa Hy. Edwards.

1888—*Arctia remissa* HY. EDWARDS, Ent. Amer., Vol. III, p. 184.

Primaries black; three square yellow patches on costa, and three similar ones on internal margin; a transverse band from costa to internal angle and an angular subapical mark, which are traces of the broken up **w**-mark. Secondaries black at base, red outwardly, with rounded black submarginal and discal spots. Body black, red at tip. Expanse, 44 mm.

Habitat, Rocky Mountain region of Canada to Hudson's Bay, Arizona, Wyoming, Vancouver Is., B. C.

Genus *Arctia* Schrank.

1802—*Arctia* SCHRANK, Fauna Boica, Vol. II (2), p. 151.

1822—*Épicallia* HÜBNER, Verz. bek. Schmett., p. 182.

A. virginalis Boisduval.

1852—*Arctia virginalis* BOISDUVAL, Ann. Soc. Ent. Fr. (2), Vol. X, p. 321.

var. **guttata** Boisduval.

1852—BOISDUVAL, Ann. Soc. Ent. Fr. (2), Vol. X, p. 321.

var. **ochracea** Stretch.

1872—STRETCH, Zyg. and Bomb. N. A., Vol. I, p. 71.

Thorax and primaries black. Head, a spot on back of thorax, abdomen and secondaries orange ochraceous. Dorsal transverse bands on abdomen, and two bands with discal and marginal spots on secondaries black. On fore wings, five bands of large well rounded spots, the outer band waved. A yellow spot on patagia. In the var. *guttata* the secondaries are nearly entirely black. Expanse, 50—60 mm.

Habitat, California and the Pacific Northwest to the Rocky Mountains.

Genus *Eyprepia* Ochsenheimer.

1810—*Eyprepia*, OCHSENHEIMER, Schmett. Eur., Vol. III, p. 299.

1855—*Apantesis* WALKER, Cal. Brit. Mus., pt. III, p. 331.

1854—*Callarctia* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 114.

1866—*Cymbalophora* RAMBUR, Cat. Lep. And., Vol. II, p. 231.

1886—*Orodemnius* WALLENGREN, Skand. Heter., Vol. II, p. 315.

Synopsis of groups. *

Veins of primaries pale lined, linings rarely obsolete in one species.

Size medium to large, vestiture of wings opaque.

Terminal **w**-mark present, the fourth transverse line either straight or but slightly angulated **Callarctia.** -

Terminal **x**-mark, formed of the terminal **w** and the strongly angulated fourth line **Mimarctia.** † *nr2*

Size small, vestiture subdiaphanous; lines somewhat confused. **Orodemnius.** -

Veins not lined.

Terminal **w**-mark **Cymbalophora.** -

Terminal **x**-mark **Apantesis.** -

* The normal thorax, in this genus, is yellowish with two black stripes on collar and three on thorax. We have indicated the bands on the fore wings as follows: — band 1, sub-basal half band, resting on costa; band 2, transverse anterior band; band 3, median band; band 4, transverse posterior band, immediately adjoining band 5, the angular terminal or **w**-mark. A longitudinal band along submedian fold, joining the angular terminal and forming with it a furcation above internal angle.

GROUP CALLARCTIA *Packard*.1864—*Callarctia* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 114.*Synopsis of species.*

Linings of veins broad, especially along the median vein.

Size large; one or two incomplete transverse bands besides the **w**-mark.Hind wings red **virgo.**Hind wings yellow *var.* **citrinaria.**

Size smaller.

Hind wings yellow.

No transverse bands except the **w** **virguncula.**Trace of one or more of these bands *var.* **otiosa.**

Hind wings pink; linings of veins very broad.

Pale marks pinkish **michabo.**Of a deeper color, more reddish *var.* **minea.**

Lining on median vein narrow, confined to the vein.

Secondaries red, without any tendency to melanism; marginal spots rarely confluent.

Size large; primaries usually with three transverse bands.

Only two transverse bands present **intermedia.**Three transverse bands present *var.* **stretchii.**

Size smaller with two or less bands.

Third line broken or absent; fourth seldom rigid.

Third and fourth lines present **parthenice.**Third line absent, fourth broken *var.* **approximata.**Third and fourth lines present, rigid, parallel **rectilinea.**

Secondaries yellow or orange red with a strong tendency to melanism; rarely intirely black; marginal spots often confluent, basal spots often present.

Hind wings entirely black **anna.**Hind wings yellow, with even black border *var.* **persephone.**

Hind wings yellow or red, lightly or heavily spotted or nearly entirely black. Basal spots present in well marked specimens.

Three or four bands on primaries (full maculation)

Veins indistinctly lined or not lined at all **ornata.**Veins narrowly lined *var.* **achaia.**Less than three bands on primaries, sometimes but one; but **w**-marks present *var.* **complicata.****E. virgo** *Linnæus*.1758—*Bombyx virgo* LINNÆUS, Syst. Nat., Vol. I, p. 501.*var.* **citrinaria** *Neumægen & Dyar*.1893—*Euprepia virgo var. citrinaria* NEUMÆGEN & DYAR, Ent. News, Vol. IV, p. 142.Fore wings black; all the margins, veins and longitudinal stripes, pinkish cream color. The terminal **w**-mark is distinct, the transverse posterior (4th) line reaches from costa to stripe, angu-

lated slightly on median vein. The median (3rd) line usually reaches from costa to median vein but it may project below median vein or be absent. Rarely the 4th line is partly absent. Secondaries vermilion red with double marginal row of subtriangular black spots and two to five discal spots. Thorax normal; abdomen red with dorsal and lateral black spots. The var. *citrinaria* differs only in the color of secondaries. Expanse, 35—50 mm.

Habitat, Atlantic States westward.

E. *virguncula* Kirby.

1837—*Callimorpha virguncula* KIRBY, Richardson Fauna Bor. Amer., Vol. IV, p. 304.

var. *otiosa* Neumegen & Dyar.

1893—*Euprepia virguncula* var. *otiosa* NEUMEGEN & DYAR, Ent. News., Vol. IV, p. 142.

Smaller than *virgo*, all the transverse lines except the w-mark absent. Secondaries and abdomen dark ocher yellow, the former with double marginal row of spots, one discal spot, and a series of basal streaks which may become extended and fuse with the enlarged spots rendering the wing largely black. The dorsal abdominal spots are fused into a band. Expanse, 30—40 mm.

Habitat, Northern Atlantic States westward.

The var. *otiosa* has slight traces of one or more of the normal transverse lines.

E. *michabo* Grote.

1875—*Arctia michabo* GROTE, Can. Ent., Vol. VII, p. 196.

var. *minea* Slosson.

1892—*A. minea* SLOSSON, Ent. News., Vol. III, p. 257.

Pale marks flesh cream color, line 3 oblique, in cell from costa to median vein: line 4 slightly angulated, sometimes almost forming an irregular x with w-mark. W broad. Veins lined, that on median broader than the vein, but only slightly so, approaching the *parthenice* group. Apex of primaries pointed. Secondaries flesh red, pale in ♂; one to four discal, submarginal and marginal black spots. Secondaries tend to be subtranslucent recalling *arge* which the species also approaches in wing shape, but it has not the x-mark so well developed. Expanse, 43 mm.

Habitat, Atlantic States westward.

E. *intermedia* Stretch.

1874—*Arctia intermedia* STRETCH, Zyg. and Bomb. N. A., Vol. I, p. 216.

1878—*Arctia cithona* STRECKER, Lep. Roph. and Hel., p. 131.

var. stretchii Grote.

1881—*A. stretchii* GROTE, Can. Ent., Vol. VII, p. 197.

Like *parthenice* but larger. On primaries, 2nd, 3rd and 4th lines from costa to longitudinal stripe, or to internal margin, or exactly like *parthenice*. Expanse, 50 or more mm.

Habitat, Southern Atlantic States from New York to Texas.

E. parthenice Kirby.

1837—*Callimorpha parthenice* KIRBY, Rich. Fauna Bor. Amer., Vol. IV, p. 303.

1864—*Arctia saundersii* GROTE, Proc. Ent. Soc. Phil., Vol. III, p. 75.

var. approximata Stretch.

1885—STRETCH, Ent. Amer., Vol. I, p. 104.

Fore wings marked as in *virgo* except that the median vein is only narrowly lined with pale. The median line (3) often reaches from costa to longitudinal stripe, but it may be entirely absent. The transverse posterior (4th) line is less strongly angulated than in *virgo*, rarely partly absent, giving the variety *approximata*. Secondaries red with double marginal row and one discal spot. Expanse, 30—35 mm.

Habitat, Northern New York and New England to Canada.

E. rectilinea French.

1879—*Arctia rectilinea* FRENCH, Can. Ent., Vol. XI, p. 45.

Differs from *parthenice* only in the obliquity of the two transverse lines which are present. The median (3rd) line runs from costa to median vein at origin of vein 2, while the transverse posterior (4th) line is straight, not angulated at median vein. The lines are thus parallel and do not converge as in *parthenice*.

Habitat, Mississippi Valley, rare in the Atlantic States.

E. anna Grote.

1863—*Arctia anna* GROTE, Proc. Ent. Soc. Phil., Vol. II, p. 335.

var. persephone Grote.

1863—*A. persephone* GROTE, Proc. Ent. Soc. Phil., Vol. II, p. 433.

Veins narrow lined, linear. Longitudinal stripe, 4th line and w-mark present; also 3rd line from sub-costal to median veins, or reduced, or absent. Secondaries ochreous, with discal dot and broad black border, or all black. Abdomen ochreous with black dorsal and lateral bands or entirely black. Expanse, 40—45 mm.

Habitat, Atlantic States.

E. ornata Packard.

- 1864—*Callartia ornata* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 115.
- 1881—*Arctia simplicior* BUTLER, Ann. and Mag. N. H. (6), Vol. VIII, p. 311.
- 1893—*Arctia blakei* var. *perpicta* DYAR, Psyche, Vol. VI, p. 381.

var. **achaea** Grote & Robinson.

- 1868—*Arctia achaea* GROTE & ROBINSON, Trans. Amer. Ent. Soc., Vol. I, p. 334.
- 1872—*Arctia edwardsii* STRETCH, Zyg. and Bomb. N. A., Vol. I, p. 77.

var. **complicata** Walker.

- 1864—*Arctia complicata* WALKER, Cat. Brit. Mus., pt. XXXI, p. 279.
- 1868—*Arctia dahurica* GROTE, Trans. Amer. Ent. Soc., Vol. I, p. 336.
- 1872—*Arctia othracea* STRETCH, Zyg. and Bomb. N. A., Vol. I, p. 125.
- 1881—*Arctia barda* HY. EDWARDS, Papilio, Vol. I, p. 39.

Fore wings black; linings of veins narrow, variable in distinctness, being absent in the form *ornata*, present in *achaea*. The complete transverse maculation is present, but variable, the basal half line disappearing first, followed by the transverse anterior and median lines, producing the form *complicata*. Secondaries deep ocher yellow, orange or red, with double marginal spots, and one discal, besides two basal streaks which are usually very distinct. The spots very much in size, often spreading and becoming confluent, covering the whole wing except for an irregular central area. Expanse, 30—35 mm.

Habitat, California and the Pacific Northwest.

GROUP MIMARCTIA *Neumegen & Dyar.*

Synopsis of species.

- Three transverse bands more or less complete besides the angular terminal band **arge.**
- Three bands absent, and also the angular terminal, either absent or reduced var. **nervosa.**

E. arge Drury.

- 1773—*Noctua arge* DRURY, Ill. Ex. Ent., Vol. I, pl. 18, f. 3.
- 1775—*Bombyx dioue* FABRICIUS, Syst. Ent., p. 572.
- 1781—*Noctua incarnatorubra* GOEZE, Ent. Beytr., Vol. III (3), p. 241.
- 1797—*Bombyx coelebs* MARTYN, Psyche, pl. II, f. 25.
- 1869—*Chelonia nereia* BOISDUVAL, Ann. Soc. Ent. Belg., Vol. XII, p. 77.
- 1869—*Chelonia doris* BOISDUVAL, Ann. Soc. Ent. Belg., Vol. XII, p. 77.

var. **nervosa** *Neumegen & Dyar.*

- 1893—*Euprepia arge* var. *nervosa* NEUMEGEN & DYAR, Ent. News., Vol. IV, p. 142.

Pale marks pinkish cream color, broad, predominating. Lines 2 to 4 and w mark present. Lines 2 and 3 cross the cell only, and project triangularly from costa and median vein respectively.

Line 3 is bent at right angles on median vein, forming terminal x-mark with the central limbs of the **w**. Secondaries whitish in ♂, pale salmon red in ♀, with marginal and submarginal rows and one discal black spot but reduced in size and broken by the veins. Abdomen cream color, the spots small. Expanse, 35—40 mm.

Habitat, Atlantic States westward to California.

GROUP ORODEMNIAS *Wallengren*.

1886—*Orodemnias* WALLENGREN, Skand. Het., Vol. II, p. 315.

Synopsis of species

Secondaries yellowish white.

Pale maculations of fore wings extensive **quenselii**.

Maculations reduced var. **speciosa**.

Secondaries red **obliterata**.

E. quenselii *Paykull*.

1791—*Bombyx quenselii* PAYKULL, Act. Hafn., Vol. II, p. 99.

1793—*Bombyx strigosa* FABRICIUS, Ent. Syst., Vol. III (1), p. 454.

1849—*Euprepia gelida* MÖSCHLER, Steil. Ent. Zeit., Vol. IX, p. 174.

var. **speciosa** *Möschler*.

1864—*Arctia speciosa* MÖSCHLER, Wien. Ent. Monat., Vol. VIII, p. 105.

Black; secondaries of ♂ largely black with paler shadings, of ♀ partly and irregularly yellow. Primaries of ♂ with the veins narrowly lined; bands 3 to 4 present from sub-costal to median veins, narrow, reduced, irregular. **W**-mark irregular. In ♀, the marks are broader, confused, light yellow. Bands 2, 3 and 4 present from sub-costal to median vein. **W**-mark blurred. Expanse, 30—35 mm.

Habitat, Arctic regions.

E. obliterata *Stretch*.

1885—*Arctia obliterata* STRETCH, Ent. Amer., Vol. I, p. 105.

Thorax normal, abdomen yellowish, normal. Primaries blackish brown. Costa, fringes and inner margin, veins, longitudinal stripe, terminal **w**-mark and costal half of 4th band, pale yellow. Traces of median band. Secondaries dull red, the black spots present as marginal, submarginal and discal ones. Expanse 33 mm.

Habitat, unknown.

GROUP CYMBALOPHORA *Rambur*.

1866—*Cymbalophora* RAMBUR, Cat. Lep. And., Vol. II, p. 231.

Synopsis of species.

- Tip of abdomen black, dorsal spots reduced.
 Secondaries of ♂ whitish with black spots **proxima.**
 Secondaries without black spots *var.* **autholea.**
 Dorsal abdominal spots moderate, the terminal one not larger.
 Primaries with normal maculation.
 Three or more transverse lines beside the **w**-mark.
 Size small.
 Fore wings black **cervinoides.**
 Fore wings brown **bolanderi.**
 Size moderate.
 Hind wings of ♂ pink.
 Thorax normal **blakei.**
 Thorax black *var.* **nevadensis.**
 Hind wings yellow' *var.* **sulphurica.**
 Hind wings deep red.
 Four lines present, narrow, normal **superba.**
 Lines broad, blurred, red centered **favorita.**
 Two or less transverse lines; rarely traces of three
 Fore wings brown.
 One line beside **w**-mark **williamsii.**
 Two or three lines *var.* **determinata.**
 Fore wings black.
 Hind wings red.
w-mark present **phyllira.**
w-mark absent *var.* **figurata.**
 Hind wings partly yellow *var.* **celia.**
 Hind wings black *var.* **excelsa.**
 Primaries with the maculation broken into a series of spots;
 often largely black.
 Hind wings with a black border.
 A few pale dots on fore wings **placentia.**
 Many pale dots *var.* **flammea.**
 Hind wings largely black *var.* **snowi.**

E. proxima Guérin.

1844—*Chelonia proxima* GUÉRIN, Icon. R. Amer., Vol. II, p. 514.
 1855—*Euprepia docta* WALKER, Cat. Brit. Mus., Vol. III, p. 592.
 1867—*Arctia mexicana* GROTE & ROBINSON, Ann. Lyc. N. Y., Vol. VIII,
 p. 367.
 1874—*Arctia arizonensis* STRETCH, Zyg. & Bomb. N. A., p. 217.
 1885—*Arctia mormonica* NEUMEGEN, Ent. Amer., Vol. I, p. 93.

var. **autholea** Boisduval.

1869—*Chelonia autholea* BOISDUVAL, Ann. Soc. Ent. Belg., Vol. XII, p. 76.

Head and thorax ocher yellow, collar immaculate, thorax with the three normal black stripes. Abdomen vermillion above, the dorsal spots very small, but terminal segment entirely black. Veins

of primaries not lined with pale scales, except the median which is narrowly and continuously lined. Longitudinal streak, 2nd to 4th lines, and terminal w-mark present, often very broad and reducing the black ground to angular spots. The 3rd and 4th lines may become confluent laterally, or rarely, the 2nd and 3rd lines become so. Less often the black predominates, the 2nd line (transverse anterior) and even part of the 3rd (median) line, disappearing. Secondaries whitish in ♂ with pink abdominal border: deep red in ♀ with marginal and 1 to 3 discal dots. These dots are absent in the ♂ of the form *autholea*. Expanse, 35—45 mm.

Habitat, region west of the Rockies to Southern California and Mexico.

E. cervinoides *Strecker*.

1876—*Arctia cervinoides* STRECKER, Proc. Acad. Phil., p. 151.

Black, thorax normal, but black bands very wide. Secondaries with discal spot, marginal border and basal streaks pale black on whitish ground. Primaries brownish black, longitudinal band, w-mark, 2nd, 3rd and 4th bands present, and traces of 1st but variable, sometimes extending entirely across wing. Expanse, 22 mm.

Habitat, Colorado.

E. bolanderi *Stretch*.

1872—*Arctia bolanderi* STRETCH, Zyg. and Bomb. N. A., p. 76.

Thorax and abdomen normal; primaries brown with three transverse bands more or less well developed; the w-mark and longitudinal band present. Secondaries yellow or red with normal spottings present, one discal dot and traces of other marks. Size small. Expanse, 30 mm.

Habitat, Rocky Mountains and Sierra Nevada.

E. blakei *Grote*.

1864—*Arctia blakei* GROTE, Proc. Ent. Soc. Phil., Vol. III, p. 523.

1881—*Arctia incornupta* IV. EDWARDS, Papilio, Vol. I, p. 38.

1889—*Arctia shastaensis* FRENCH, Can. Ent., Vol. XXI, pp. 35, 162.

var. nevadensis *Grote & Robinson*.

1866—*Arctia nevadensis* GROTE & ROBINSON, Proc. Ent. Soc. Phil., Vol. VI, p. 1

1872—*Arctia behrii* STRETCH, Zyg. and Bomb. N. A., p. 75.

var. sulphurica *Neumogen*.

1885—*Arctia nevadensis* var. *sulphurica* NEUMÖGEN, Ent. Amer., Vol. I, p. 93.

1883—*Arctia ochracea* NEUMÖGEN, Papilio, Vol. III, p. 151.

1885—*Arctia elongata* STRETCH, Ent. Amer., Vol. I, p. 105.

Thorax with normal maculation or entirely black (var. *nevadensis*). Median vein not pale lined, the longitudinal line and all the transverse bands present. The lines vary much in width, but have a greater tendency to be narrow than in *proxima*. Secondaries pink in the ♂, rarely yellow (var. *sulphurica*), red in the ♀ with double marginal and one to three discal dots, the latter rarely produced towards the base. Abdomen pink or ocher, the dorsal and lateral spots moderate, even throughout, not different on the terminal segments. Expanse, 30—35 mm.

Habitat, Rocky Mountain region west to the Pacific.

E. superba Stretch.

1874—*Arctia superba* STRETCH, Zyg. and Bomb. N. A., p. 227.

1878—*Arctia geneura* STRECKER, Proc. Dav. Acad. Sc., Vol. II, p. 270.

Lines, as in *blakei*, but narrow and partly broken. Secondaries deep red but in some specimens much like *blakei*.

Habitat, Colorado, British Columbia.

E. favorita Neumagen.

1890—*Arctia favorita* NEUMEGEN, Ent. Amer., Vol. VI, p. 173.

Like *blakei*, but line 1 absent, or but a trace left. Primaries black, but looking slightly brownish. Lines broad, confluent or normal, or all absent but lines 3 and 4. This form differs from *williamsii* only in being more black, and having the secondaries redder. It is very close to *superba*.

Habitat, Rocky Mountain region.

E. williamsii Dodge.

1871—*Arctia williamsii* DODGE, Can. Ent., Vol. III, p. 167.

var. **determinata** Neumagen.

1881—*Arctia determinata* NEUMEGEN, Pap., Vol. I, p. 28.

1890—*Arctia dieckii* NEUMEGEN, Ent. Amer., Vol. VI, p. 62.

Primaries brown with black shades; secondaries dark red inclining to pinkish. On primaries, the longitudinal band and w-mark with one or two other bands. In the var. *determinata* two bands are present, the 3rd and 4th.

Habitat, Rocky Mountain region.

E. phyllira Drury.

1773—*Callimorpha phyllira* DRURY, Ill. Ex. Ent., Vol. I, pl. 7, f. 2.

1781—*Geometra B-ata* GÖEZE, Ent. Betyr., Vol. III (3), p. 428.

1797—*Bombyx plantagina* MARTYN, Psyche, pl. 15, ff. 36-7.

1881—*Arctia dodgei* BUTLER, Ent. Mo. Mag., Vol. XVIII, p. 136.

var. figurata Drury.1773—*Bombyx figurata* DRURY, Ill. Ex. Ent., Vol. II, p. 12.1822—*Euplagia ceramica* HÜBNER, Verz. bek. Schmett., p. 180.1878—*Arctia f-pallida* STRECKER, Rep. Chief Eng. 1878, App. ss, p. 1860.*var. celia* Saunders.1863—*Arctia celia* SAUNDERS, Proc. Ent. Soc. Phil., Vol. II, p. 59.1888—*Arctia franconia* HY. EDWARDS, Ent. Amer., Vol. III, p. 184.*var. excelsa* Neumögen.1883—*Arctia excelsa* NEUMÖGEN, Pap., Vol. III, p. 70.1887—*Arctia lugubris* HULST, Ent. Amer., Vol. II, p. 182.

Thorax normal, abdomen red with normal spots. Primaries black, longitudinal stripe, lines 3—4, and w-mark moderate, cream colored. Lines 3 and 4 divergent or parallel, from costa to stripe. Secondaries red; discal, marginal, and submarginal spots present, variable, sometimes confluent and covering nearly the whole wing. Expanse, 40 mm.

Habitat, Southern States, rare in New York and New England.

E. placentia Smith & Abbott.1797—*Phalena placentia* SMITH & ABBOTT, Lep. Ins. Ga., Vol. II, pl. 65.*var. snowi* Grote.1875—*Arctia snowi* GROTE, Can. Ent., Vol. VII, p. 197.1878—*Arctia quadranotata* STRECKER, Proc. Dav. Acad. Sc., Vol. II, p. 271.*var. flammea* Neumögen.1881—*Arctia flammea* NEUMÖGEN, Pap., Vol. I, p. 9.

Thorax and primaries black: secondaries red with normal discal and marginal spots, to all black. Abdomen red, with dorsal and lateral bands. On primaries, a discal flesh red spot (of band 3) or part of band 4 or traces of w-mark, all broken by veins.

Habitat, Southern States to Mississippi Valley.

GROUP APANTESIS Walker.

1855—*Apantesis* WALKER, Cal. Brit. Mus., pt. III, p. 331.*Synopsis of species.*Costal margin of primaries black **nais.**

Costal margin yellow.

Abdomen rosy red, marks of primaries usually complete . . . **phalerata.**Abdomen yellow, often largely black; marks partly absent . . . **vittata.****E. nais** Drury.1773—*Noctua nais* DRURY, Ill. Ex. Ent., Vol. I, pl. 7, f. 3.1781—*Bombyx cuneata* GOEZE, Ent. Betyr., Vol. III (3), p. 65.1797—*Bombyx defloriana* MARTYN, Psyche, pl. 28, ff. 78—9.1881—*Arctia ochreatea* BUTLER, Ent. Mo. Mag., Vol. XVIII, p. 136.

Thorax normal, or more often collar immaculate. Abdomen ocher yellow with dorsal and lateral black bands widest centrally. Fore wings black, a stripe near costa and longitudinal band present; transverse posterior line and terminal w-mark also present, the former bent at right angles and usually its lower limb fused with the line on median vein. It does not extend below the longitudinal stripe. Markings often become obsolete from without inwards, the w-mark disappearing first. Secondaries pale ocher, rarely partly pinkish with double marginal row and one discal spot. Expanse, 25—30 mm.

Habitat, Atlantic States westward

E. phalerata *Harris*,

1841—*Arctia phalerata* HARRIS, Ins. Mass., p. 274.

1881—*Arctia rhoda* BUTLER, Ent. Mo. Mag., Vol. XVIII. p. 136,

1881—*Arctia incompleta* BUTLER, Ann. Mag. N. H. (5), Vol. VIII. p. 311.

Thorax normal, abdomen red, rarely yellow, marked like *nais*. Fore wings as in *nais* except that the costal stripe reaches the costa and the w-mark is only very rarely at all incomplete. Secondaries pink in ♂, especially along abdominal border, rarely entirely ocherous; red in ♀; the black marks as in *nais*, but sometimes very small or absent.

Habitat, Atlantic States westward.

E. vittata *Fabricius*,

1787—*Bombyx vittata* FABRICIUS, Mant. Ins., Vol. II, p. 127.

1855—*Apantesis radians* WALKER, Cat. Brit. Mus., pt. III, p. 632.

1863—*Arctia decorata* SAUNDERS, Proc. Ent. Soc. Phil., Vol. II, p. 60.

1864—*Aloa colorata* WALKER, Cat. Brit. Mus., pt. XXXI, p. 301.

Marked like *nais* except that the costal band reaches the costa. The black abdominal bands are broad and frequently cover most of the abdomen. Hind wings ocher or red, the spots as in *nais* but often form a complete broad black border. Expanse, 30—35 mm.

Habitat, Atlantic States.

Genus **Kodiosoma** *Stretch*.

1872—*Kodiosoma* STRETCH, Zyg. and Bomb. N. A., Vol. I, p. 67.

Synopsis of species.

Secondaries black.

Abdomen yellow at tip **nigra.**

Abdomen black throughout **eavesii.**

Secondaries red at base **tricolor.**

Secondaries yellow at base **fulva.**

K. nigra *Stretch*.1872—*K. nigra* STRETCH, Zyg. and Bomb. N. A., Vol. I, p. 68.

Black, thinly scaled, prothorax, anal tuft, costa of primaries and a faint oblique transverse band, yellow. Expanse, 22 mm.

Habitat, California [Stretch].**K. cavesii** *Stretch*.1872—*K. cavesii* STRETCH, Zyg. and Bomb. N. A., Vol. I, p. 69.

Black, wings translucent centrally. Prothorax, costal edge, and a faint or partly obsolete band, furcate toward costa; pale yellow. Expanse, 22 mm.

Habitat, Nevada, California.**K. tricolor** *Stretch*.1871—*K. tricolor* STRETCH, Zyg. and Bomb. N. A., Vol. I, p. 67.

Black; secondaries clear red except at margin. Prothorax, base of costa and a transverse band on primaries pale yellowish. Abdomen red above, black at tip. Expanse, 25 mm.

Habitat, Nevada [Stretch].**K. fulva** *Stretch*.1872—*K. fulva* STRETCH, Zyg. and Bom. N. A., Vol. I, p. 67.

Black; secondaries pale buff for basal two-thirds. Prothorax, tip of abdomen, costal edge and a narrow, angulated, transverse band on primaries, pale buff. Expanse, 23 mm.

Habitat, California.Genus **Parasemia** *Hübner*.1822?—*Parasemia* HÜBNER, Verz. bek. Schmett., p. 121.1828—*Nemophila* STEPHENS, Ill. Brit. Ent. Haust., Vol. II, p. 12.1865—*Eupsychoma* GROTE, Proc. Ent. Soc. Phil., Vol. IV, p. 317.*Synopsis of varieties.*

Hind wings black and white.

A discal dot on fore wings **petrosa.**No discal dot var. **geddesi.**Hind wings black and yellow or reddish var **modesta.**

Hind wings black.

A discal dot on fore wings var. **geometrica**No discal dot var. **scudderi.****P. petrosa** *Walker*.1855—*Nemophila petrosa* WALKER, Cat. Brit. Mus., Vol. III, p. 626.var. **geddesi** *Neumögen*.1884—*N. geddesi* NEUMÖGEN, Pap., Vol. III, p. 137.

var. modesta Packard.1864—*Platarctia modesta* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 113.1868—*Nemophila caespitis* GROTE & ROBINSON, Trans. Am. Ent. Soc., Vol. I, p. 337.1868—*Nemophila chiorii* GROTE & ROBINSON, Trans. Am. Ent. Soc., Vol. I, p. 338.*var. geometrica* Grote.1865—*Eupsychoma geometrica* GROTE, Proc. Ent. Soc. Phil., Vol. IV, p. 318.*var. scudderii* Packard.1864—*Platarctia scudderii* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 113.1885—*Nemophila schwynii* HY. EDWARDS, Can. Ent., Vol. XVII, p. 65.

Black; collar, except black central dot, and base of costa, buff; a longitudinal band, oblique sub-apical band and discal dot with traces of another near apex, white or yellow, or absent. Secondaries white, red, or yellow, or partly or wholly black. Expanse, 35 mm.

Habitat, Mountains of Colorado and California to Canada and British Columbia.

Genus *Hypercompa* Hübner.1805?—*Hypercompa* HÜBNER, Tentamen, p. 1.1822—*Zoote* HÜBNER, Verz. bek. Schmett., p. 181.**H. caja** Linneus.1758—*Bombyx caja* LINNEUS, Syst. Nat., Vol. I, p. 500.*race americana* Harris.1841—*Aretia americana* HARRIS, Rep. Ins. Mass., p. 246.*race utahensis* Hy Edwards.1887—*Eup. caja* var. *utahensis* HY. EDWARDS, Ent. Amer., Vol. II, p. 166.*var. transmontana* Neumegen & Dyar.1893—*H. caja* var. *transmontana* NEUMEGEN & DYAR, Ent. News, Vol. IV, p. 214.*race opulenta* Hy. Edwards.1881—*Euprepia opulenta* HY. EDWARDS, Pap., Vol. I, p. 38.

Primaries and thorax dark brown with transverse anterior and transverse posterior and angular terminal white bands and two costal dots representing additional bands. A longitudinal band along submedian fold, often absent. Secondaries pale reddish to yellow with one or more discal and three large round submarginal blue-black spots. Abdomen reddish with dorsal black spots. Expanse, 55—65 mm.

Habitat, Europe and America.

The American forms differ in general from the European in lacking the longitudinal white band. The form *caja* with red secondaries inhabits the Pacific Northwest. Race *americana* inhabits the Northern Atlantic States. The race *utahensis*, from the Rocky Mountains region, differs in the broader white bands and yellow secondaries. It corresponds strictly to the form *wiskotti* Staud. from Asia Minor, differing in the character pointed out. The form *opulenta* from Alaska seems to be only a race of *caja* in which the white marks are enormously developed. The var. *transmontana* is more marked with white than *utahensis*, less so than *opulenta*.

Genus **Ectypia** Clemens.

1861—*Ectypia* CLEMENS, Proc. Acad. Sci. Phil. 1860, p. 529.

E. bivittata Clemens.

1861—*Ectypia bivittata* CLEMENS, Proc. Acad. Sci. Phil., 1860, p. 530.

1887—*Spilosoma nigroflava* GRAEF, Ent. Amer., Vol. III, p. 43.

White; patagia with luteous and black stripe. Abdomen with dorsal and lateral black spots and sub-dorsal orange yellow shade.

On primaries, a number of elongate black spots in three irregular rows; one spot on origin of vein 2 is somewhat arrow-shaped. Secondaries white. Expanse, 45 mm.

Habitat, Texas.

In this species the accessory cell may be absent as shown by the observation of Prof. J. B. Smith.

Family AGARISTIDÆ.

Synopsis of genera.

- Veins 7—9 of primaries from a stalk at end of accessory cell.
- Antennæ of ♂ simple **Seudyra.**
- Antennæ of ♂ pectinated **Psychomorpha.**
- Vein 7 from accessory cell; veins 8 and 9 stalked.
- Antennæ swollen before tip **Alypia.**
- Antennæ filiform, serrate at pectinate.
- Vein 5 of secondaries distinct.
- Thorax not tufted.
- Wings narrow; body slender **Alypioides.**
- Wings broad, square at apices; color black **Pseudalypia.**
- Wings trigonate; body robust.
- Antennæ short, serrate; an enormous trifid frontal plate-like process **Eupseudomorpha.**
- Antennæ long, filiform; a frontal plate with lip-shaped outer margin **Copidryas.**
- Thorax with central scaled tuft.
- Antennæ filiform **Euthisanotia.**
- Antennæ pectinated **Ciris.**
- Vein 5 weak or absent **(Acherdoa in Liparidæ).**

Genus **Seudyra** *Stretch.*

- 1875—*Seudyra* STRETCH, Cist. Ent., Vol. II, p. 19.
 1882—*Fenaria* GROTE, Papilio, Vol. II, p. 132; 1892—KIRBY, Cat. Lep. Het., Vol. I, p. 39.

S. sabulosa *Felder.*

- 1874—*Agarista sabulosa* FELDER, Reise der Novara, Vol. II, pt. 2, pl. CVII, f. 11.
 1874—*Eusemia ? sabulosa* BOISDUVAL, Rev. Zool., Vol. II, (3), p. 106.
 1892—*Metagarista ? sabulosa* KIRBY, Cal. Lep. Het., Vol. I, p. 41.
 1882—*Fenaria scvorsa* GROTE, Papilio, Vol. II, p. 132.
 1882—*Phagorista scvorsa* GROTE, Papilio, Vol. II, p. 189; 1883—Can. Ent., Vol. XV, p. 5.

Thorax reddish brown, with gray hairs. Fore wings reddish brown, uneven, shaded with blackish centrally. A reniform and orbicular discal dot outlined in dark brown. Beyond the former, a large sordid white space, showing faintly a narrow, arcuate, slightly waved, transverse-posterior line. Subterminal line blackish, undulate, obscure. Secondaries bright ochre yellow with a moderately broad, very even black border all around the outer margin. Abdomen smooth gray. Expanse, 27 mm.

Habitat, Arizona, California.

Genus **Psychomorpha** *Harris.*

- 1839—*Psychomorpha* HARRIS, Amer. Journ. Sci., Vol. XXXVI, p. 319.

P. epimenis *Drury.*

- 1780—*Noctua epimenis* DRURY, Ill. Ex. Ent., Vol. III, pl. 29, f. 2.

Black, sprinkled with blue scales. A large pale yellow patch on primaries covering the space from costa to near internal angle, indented at the end of the cell by the black reniform spot which, together with the orbicular one, are defined from the ground by the absence of blue scales. A large, ovate, submarginal, reddish patch on secondaries. Expanse, 20 mm.

Habitat, Atlantic States.

Genus **Alypia** *Hübner.*

- 1825—*Alypia* HÜBNER, Verz. bek. Schmett., p. 351.
 1873—*Androloma* GROTE, Bull. Buff. Soc., Vol. I, p. 30.

Synopsis of species.

Primaries with three yellow patches.

Spots divided by black veins.

Tibie of fore legs black **ridingsii,**

Tibie of fore legs orange.

Spots on secondaries white.

Outer spot on primaries narrow	mac-cullochii.
Outer spot on primaries broad, ovate	<i>race</i> lorquinii.
Spots on secondaries yellow	similis.
Spots not divided by the veins.	
Four patches, the outer spot divided	mariposa.
Three patches, outer spot complete, lunate	<i>var.</i> lunata.
Primaries with two patches.	
Secondaries with two spots.	
Spots of primaries yellow, of secondaries white.	
Without distinct costal enlargement on ♂ primaries.	
Spots well rounded.	
Basal spot of secondaries large, extensive	octomaculata.
Basal spot small, rounded	<i>var.</i> albomaculata.
Spots elongate, resembling transverse bands	wittfeldii.
With a distinct costal enlargement in ♂	disparata.
Spots all yellow	dipsaci.
Spots all white	brannani.
Secondaries with one spot, or rarely traces of a second	langtonii.

A. ridingsii Grote.

1864—*Alypia ridingsii* GROTE, Proc. Ent. Soc. Phil., Vol. III, p. 521.

Black, without costal swelling. Collar yellow at the sides. Fore tibiæ black, middle ones orange. Three yellow spots on primaries and two on secondaries, as in *mac-cullochii*; variable in size from small and well separated to large or even confluent. Expanse, 30 mm.

Habitat, Rocky Mountain region and mountains of California.

A. mac-cullochii Kirby.

1837—*Alypia mac-cullochii* KIRBY, Faun. Bor. Amer., Vol. IV, p. 301.

race lorquinii Grote & Robinson.

1868 *Alypia lorquinii* GROTE & ROBINSON, Trans. Am. Ent. Soc., Vol. I, p. 328.

Black. Costa of ♂ with a subhyaline enlargement. Fore and middle tibiæ orange. A basal triangular, round, discal spot and outer ovate yellow patch on primaries, divided by the veins. Two white patches on secondaries, separated by a large black discal dot, divided by the black veins. Patagia and two dots on collar covered by yellowish hairs. Expanse, 25 mm.

Habitat, Canada, Rocky Mountains.

A. similis Stretch.

1872—*Alypia similis* STRETCH, Zyg. and Bomb. N. A., p. 14.

1874—*Alypia edwardsii* BOISDUVAL, Rev. Zool. (3), Vol. II, p. 63.

var. conjuncta Hy. Edwards.

1883—*Alypia similis var. conjuncta* HY. EDWARDS, Pap., Vol. III, p. 34.

Closely similar to race *lorquinii*, but the spots larger, and those on secondaries yellow. Rarely the spots on primaries become partly confluent (var. *conjuncta*).

Habitat, California.

A. mariposa Grote & Robinson.

1868—*Alypia mariposa* GROTE & ROBINSON, Trans. Am. Ent. Soc., Vol. I, p. 329.

var. **lunata** Stretch.

1872—*Alypia lunata* STRETCH, Zyg. and Bomb. N. A., p. 15.

Black; collar yellow at the sides; tibiæ as in *ridingii*. Fore yellow spots on primaries, the outer two before apex and internal angle respectively and sometimes united (var. *lunata*). Secondaries with a discal dot and outer yellow band, the latter obscurely cut by black veins. Expanse, 35 mm.

Habitat, California.

In this species, veins 7 to 9 arise from a short stalk from accessory cell.

A. octomaculata Fabricius.

1775—*Sesia octomaculata* FABRICIUS, Syst. Ent., p. 830.

1791—*Zygaena bimaculata* GMELIN, Syst. Nat., Vol. I (5), p. 2398.

1825—*Alypia quadriguttalis* HÜBNER, Verz. bek. Schmett., p. 351.

1887—*Alypia matuta* HY. EDWARDS, Pap., Vol. III, p. 33.

var. **albomaculata** Stoll.

1782—*Noctua albomaculata* STOLL, Pap. Ex. IV, pl. 345, f. C.

1810—*Alypia octomaculalis* HÜBNER, Zutr. Ex. Schmett., Vol. I, p. 22, ff. 119—20.

1825—*Agarista octomaculata* LATREILLE, Encycl. Méth., Vol. IX, p. 803.

Black, patagia and central dot of collar yellow, fore and middle tibiæ orange. Two rounded yellow spots on primaries and two white ones on secondaries, the basal one much enlarged and reaching near to base of wing, or small and rounded (var. *albomaculata*). Expanse, 30 mm.

Habitat, Atlantic States.

A. wittfeldii Hy. Edwards.

1883—*Alypia wittfeldii* HY. EDWARDS, Pap., Vol. III, p. 34.

Black; fore and middle tibiæ orange red, patagia yellow; two elongate, yellow, transverse patches on primaries, reaching from near margin to near costa, alternating with three patches of metallic blue scales. Two white spots on secondaries, slightly elongated transversely. Expanse, 35 mm.

Habitat, Florida.

A. disparata Hy. Edwards.1884—*Alypia disparata* HY. EDWARDS, Pap., Vol. IV, p. 13.1887—*Alypia gracileuta* GRAEF, Ent. Amer., Vol. III, p. 41.1892—*Alypia desperata* KIRBY, Cat. Lep. Het., Vol. I, p. 35.

More slender than *wittfeldii*, with narrower, more pointed primaries. Costal margin distinctly swollen and sub-hyaline. The markings are like *wittfeldii*, but the spots are more rounded as in *var. albomaculata*. Expanse, 35—38 mm.

Habitat, Texas, Mexico.

A. dipsaci Grote & Robinson.1868—*Alypia dipsaci* GROTE & ROBINSON, Trans. Am. Ent. Soc., Vol. I, p. 326.

Black; patagia pale yellow; anterior and middle tibiae orange. Two yellow rounded spots on each wing. Expanse, 28 mm.

Habitat, California.

A. brannani Stretch.1872—*Alypia braunni* STRETCH, Zyg. and Bomb. N. A., Vol. I, p. 8.

Black; patagia yellow, costa concave as in *ridingsii*. Two white rounded spots on each wing. Expanse, 33 mm.

Habitat, Sierra Nevada of California.

A. langtonii Couper.1865—*Alypia langtonii* COUPER, Can. Nat. (2), Vol. II, p. 64.1868—*Alypia sacramenti* GROTE & ROBINSON, Trans. Am. Ent. Soc., Vol. I, p. 327.1884—*Alypia hudsonica* HY. EDWARDS, Pap., Vol. IV, p. 43.

Black; anterior and middle tibiae orange, patagia yellow. Two oval or rounded triangular spots on primaries and a single one on secondaries, pale yellow, or sometimes whitish, with a patch of metallic blue scales between them, more or less distinct. Sometimes traces of a second sub-basal spot on secondaries. Expanse, 35 mm.

Habitat, Canada, mountains of New England and New York and the Pacific coast:

Genus **Alypioides** Grote.1883—*Alypioides* GROTE, Trans. Kansas Soc., Vol. VIII, p. 46.**A. crescens** Walker.1856—*Eusmia ? crescens* WALKER, Cat. Brit. Mus., pt. VII, p. 1774.1869—*Agarista groti* BOISDUVAL, Ann. Soc. Ent. Belg., Vol. XII, p. 70.1883—*Alypioides flavilinguis* GROTE, Trans. Kans. Soc., Vol. VIII, p. 46.

Black; tongue orange, collar spotted with yellow; two yellow spots in the cell and a large ovate one beyond, alternating with patches of blue scales. Secondaries with a single, rounded, yellow patch. Expanse, 40 mm.

Habitat, California to New Mexico.

Genus **Pseudalypia** Hy. *Edwards*.

1874—*Pseudalypia* Hy. EDWARDS, Proc. Cal. Acad. Sci., Vol. V, p. 101.

P. crotchii Hy. *Edwards*.

1874—Hy. EDWARDS, Proc. Cal. Acad. Sci., Vol. V, p. 101.

var. atrata Hy. *Edwards*.

1884—Hy. EDWARDS, Papilio, Vol. IV, p. 121.

Head, thorax, patagia and abdomen deep glossy black, with a slight bronze tinge. Collar, base of palpi and abdominal tuft, golden orange. Palpi, golden orange beneath. Primaries, glossy black, a greenish metallic tinge. The costa for about three-fourths of its length and a narrow, slightly curved band crossing the wing beyond the middle, cream white. Apical edge of fringe white. Secondaries dull black with a slightly brownish hue. Fringe cream white except toward anal angle where it is black. Under side similar to upper with the band of primaries more broadly defined, and with a whitish tinge toward their base. Expanse, 22 mm. The variety is entirely brassy black except costa, which is narrowly cream white.

Habitat, Southern California.

Genus **Eupseudomorpha** Dyar.

1893—*Eupseudomorpha* DYAR, Can. Ent., Vol. XXV, p. 28.

1880—*Edwardsia* NEUMEGEN, Can. Ent., Vol. XII, p. 67.

1892—*Edwardsia* KIRBY, Cat. Lep. Het., Vol. I, p. 36.

E. brillians *Neumegen*.

1880—*Edwardsia brillians* NEUMEGEN, Can. Ent., Vol. XII, p. 67.

Black; patagia and collar pale yellow centrally. On primaries, are an ovate orbicular and reniform spot, ocher yellow. A sub-terminal brick-red band preceded by a bluish white one. Three white marks alternating with the discal spots and adapted to their shape: two bluish white marks in interspace between vein 1 and median vein, divided by an oblique black line. Fringe white. Secondaries immaculate. Below, on primaries, part of the marks are reproduced in ocher. Expanse, 35 mm.

Habitat, Texas.

Genus *Copidryas* Grote.1876—*Copidryas* GROTE, Can. Ent., Vol. VIII, p. 99.*C. gloveri* Grote & Robinson.1868—*Euschirrhopterus gloveri* GROTE & ROBINSON, Trans. Am. Ent. Soc. Phil., Vol. II, p. 185.

Primaries white; thorax, a narrow costal border reaching nearly to apex, and a very broad border along outer and internal margins, dark gray. Reniform and orbicular spots gray, outlined in black: a row of black terminal dots. Secondaries ocher yellow with outer gray border and terminal black line; fringes pale. Expanse, 35 mm.

Habitat, Texas.Genus *Euthisanotia* Hübner.1825—*Euthisanotia* HÜBNER, Zutr. Ex. Schmett., Vol. III, p. 12.1836—*Eubryas* BOISDUVAL, Spéc. gén. Léop., Vol. I, pl. 14, f. 9.* *Synopsis of species.*

Secondaries with complete marginal band.

No discal dot on secondaries **unio.**A distinct black discal dot above **brevipennis.**Secondaries with a partial marginal band, absent at apex, **grata.**Secondaries without a marginal band var. **sanctæ-johannis.****E. unio** Hübner.1825—*Euthisanotia unio* HÜBNER, Zutr. Ex. Schmett., Vol. III, p. 12.

White; head and center of thorax with a tuft of curled black scales. A dark purplish costal border two-thirds of length into, which are fused the partly obsolete reniform and orbicular spots. A broad, outer, brown border, edged within narrowly with olive green, and containing a neatly waved white line, shading inwards and enclosing some darker patches before the white line. On internal margin a triangular olive patch contiguous to the outer border and scattered with bluish scales. Secondaries yellow with marginal light brown border, neatly marked with dark brown narrow lunules. Expanse, 35 mm.

Habitat, Atlantic States westward.

E. brevipennis *Stretch*.

1874—*Eudryas brevipennis* STRETCH, Zyg. and Bomb. N. A., Vol. I, p. 151.

Close to *unio*, but the discal dots more distinct and the markings in the marginal band confused. On secondaries, a distinct black discal dot, the brown border evenly clouded, without any distinct marks. Expanse, 30 mm.

Habitat, California.

E. grata *Fabricius*.

1793—*Bombyx grata* FABRICIUS, Ent. Syst., Vol. III, p. 457.

1874—*Eudryas assimilis* BOISDUVAL, Rev. Zool. (3), Vol. II, p. 59.

var. **sanctæ-johannis** *Walker*.

1856—*Eudryas sanctæ-johannis* WALKER, Cat. Brit. Mus., pt. IX, p. 144.

Larger than *unio*, the marking all very dark brown, with bluish white, indistinctly geminate, subterminal line on primaries. Triangular patch on internal margin large, its olive border spreading toward the centre of the wing (occasionally largely obscuring the white ground color, *var. sanctæ-johannis* [?]). Secondaries yellow, the brown marginal band fading out before apex, marked with an obscure pale bluish line. Expanse, 50 mm.

Habitat, Atlantic States westward.

Genus **Ciris** *Grote*.

1863—*Ciris* GROTE, Proc. Ent. Soc. Phil., Vol. II, p. 65.

C. wilsonii *Grote*.

1863—*Ciris wilsonii* GROTE, Proc. Ent. Soc. Phil., Vol. II, p. 65.

Snow white; head, collar, and centre of thorax, metallic blue-brown; an olive green costal shade fused to a reniform and discal spot. An outer border of purplish brown containing a neatly undulate, irregularly geminate, terminal line and bordered within with olive green. This tint obtains along internal margin, ending in a projection upward near base of wing. On secondaries, a deep brown patch at anal angle. Expanse, 45 mm.

Habitat, Texas.

Family PERICOPIDÆ.

Synopsis of genera.

Accessory cell present	Daritis.
No accessory cell.	
Veins 7 - 10 of primaries stalked from apex of cell	Composia.
Vein 10 from the sub-costal	Gnophæla.

Genus **Daritis** Walker.

1855—*Daritis* WALKER, Cat. Lep. Brit. Mus., pt. III, p. 618.

1870—*Dorimonia* BOISDUVAL, Lep. Guat., p. 98; 1892—*Kirby*, Cat. Lep. Het., Vol. I, p. 186.

D. thetis Klug.

1836—*Euprepia thetis* KLUG, Neue Schmett., p. 6, ff. 12.

var. howardi Hy. Edwards.

1887—*Daritis thetis* var. *howardi* HY. EDWARDS, Ent. Amer., Vol. II, p. 165.

Thorax black, with pale yellow triangular mark on patagia. Abdomen brick red above with dorsal black line. Primaries black with pale yellow discal mark and longitudinal band from base sending three branches to internal angle, middle of outer margin, and costa before apex respectively, all divided by the black veins. Secondaries ocher, with red border enclosing intervenular blue spots: all the markings bordered with black and separated by black veins. A large black discal spot. Expanse, 95 mm.

Habitat, New Mexico.

Genus **Composia** Hübner.

1822—*Composia* HÜBNER, Verz. bek. Schmett., p. 179.

1870—*Cocastrea* BOISDUVAL, Lep. Guat., p. 88.

C. fidellissima Herrich-Schäffer.

1866—HERRICH-SCHÄFFER, Corr. Blat. Regensb., Vol. XX, p. 131; 1890—DVAR, Ent. News., Vol. I, p. 105; 1890—FRENCH, Ent. News., Vol. I, p. 153 (as *C. olympia*); 1892—KIRBY, Cat. Lep. Het., Vol. I, p. 190.

Black, with a strong blue reflection in the basal and outer part of cell of fore wing and basal two-thirds of hind wing. A bright red patch on base of costa, trisected by two black spots. A row of unequal rounded white spots border both wings outwardly, supplemented by two abbreviated rows, running from the costal edge of fore wing, obliquely outward. There are several small whitish dots on the thorax, and the abdomen is shining blue above. Expanse, 55 mm.

Habitat, Cuba, Florida.

Genus *Gnophæla* Walker.1854—*Gnophæla* WALKER, Cat. Brit. Mus., pt. 11, p. 330.1863—*Omoiala* GROTE & ROBINSON, Proc. Ent. Soc. Phil., Vol. 11, p. 334.1865—*Callalucia* GROTE, Proc. Ent. Soc. Phil., Vol. IV, p. 315.*Synopsis of species.*

Hind wings largely pale	vermiculata.
Hind wings with moderate pale spots.	
Spots whitish, elongate; wings narrow	<i>var. discreta.</i>
Spots pale yellow, abbreviated	latipennis.
Hind wings black	clappiana.

G. vermiculata Grote & Robinson.1863—*Omoiala vermiculata* GROTE & ROBINSON, Proc. Ent. Soc. Phil., Vol. 11, p. 334.1881—*Gnophæla continua* HY. EDWARDS, Pap., Vol. I, p. 80.*var. discreta* Stretch.1878—*Gnophæla hopfferi* *var. discreta* STRETCH, Surv. W. 100th Mer. Wheeler, p. 802.1884—*Gnophæla arizona* FRENCH, Pap., Vol. IV, p. 20.1885—*Gnophæla morrisoni* DRUCE, Biol. Centr. Amer. Lep. Het., Vol. I, p. 116, pl. 12, f. 7.

Black, with the whole central area of both wings, except the veins and a large discal dot, very pale yellow. The discal spot may extend down obliquely to internal angle, or the basal half of the cell may be filled in with black (*var. discreta*). Expanse, 45—50 mm.

Habitat, Rocky Mountain Region to Mexico; Pacific North West.

G. latipennis Boisduval.1852—*Glaucopis latipennis* BOISDUVAL, Ann. Soc. Ent. Fr. (2), Vol. X, p. 320.1868—*G. hopfferi* GROTE & ROBINSON, Trans. Am. Ent. Soc., Vol. 11, p. 332.

Black; sides of collar and chest orange. On fore wing are three or four sub-apical intervenular pale yellow spots, and three larger ones on the disk, which are separated only by the median vein and vein 2. Secondaries similar, the sub-apical spots two in number, and the middle of the three discal ones much reduced in size. Expanse, 50 mm.

Habitat, Pacific States to Mexico.

G. clappiana Holland.1891—*Gnophæla clappiana* HOLLAND, Ent. News., Vol. 11, p. 156.

Black, with a quadrate pale yellow spot at end of cell and three small oval spots below apex; a minute white spot at base. Fringe of secondaries white.

Habitat. Colorado [Holland].



Family LIPARIDÆ.

Synopsis of genera.

Costa of primaries convex.

Antennæ of ♂ pectinated to the tip.

Female wingless or with rudimentary wings **Notolophus.**

Female with well developed wings.

Vein 5 of secondaries distinct:

Accessory cell present.

Abdomen tufted at base with metallic scales **Olene.**

Abdomen untufted **Dasychira.**

No accessory cell **Porthetria.**

Vein 5 of secondaries weak or absent **Acherdoa.**

Antennæ of ♂ pectinated for the basal two-thirds only **Dyaria.**

Costa of primaries concave.

Accessory cell present; veins 7—9 stalked **Aon.**

Genus **Notolophus** *Germar.*

1812—*Notolophus* GERMAR, Syst. Gloss. Prodr., p. 35.

1866—*Micropterygyna* RAMBUR, Cat. Léop. Andalusie, p. 281 note.

1876—*Apterogynis* GUÉNÉE, Stat. Sci. d'Eure et Loire, p. 78.

Synopsis of species.

Secondaries with more or less of a red-brown tinge.

Both wings red-brown.

Fore wings nearly unicolorous **antiqua.**

Fore wings much paler centrally *var.* **badia.**

Fore wings only slightly reddish.

Secondaries reddish centrally.

Markings faint; size small **vetusta.**

Markings distinct; larger **gulosa.**

Secondaries with a very faint trace only of reddish **cana.**

Secondaries gray or blackish, without any red tint above or below.

Wings dark, heavily marked often tinged with ochereous **definita.**

Wings light gray, seldom heavily marked.

White spot near internal angle distinct **leucostigma.**

White spot obsolete, markings faint *var.* **obliviosa.**

N. antiqua *Linnaeus.*

1758—*Bombyx antiqua* LINNÆUS, Syst. Nat., Vol. I, p. 503.

1865—*Orgyia nova* FITCH, Rep. Ins. N. Y., Vol. VIII, p. 193.

var. badia Hy. Edwards.

1874—*Orgyia badia* HY. EDWARDS, Proc. Cal. Acad. Sci., Vol. V, p. 188.

♂ Rusty brown, with darker transverse anterior and transverse posterior and sub-terminal lines, the latter obscure, but a very distinct bright, white spot before internal angle. Reniform discal spot faintly outlined. In the variety *badia* the basal space and space from trans.-post. line to margin is heavily shaded with blackish brown. Expanse, 25—30 mm.

Habitat, Canada and Northern United States.

N. vetusta Boisduval.

1852—*Orgyia vetusta* BOISDUVAL, Ann. Ent. Soc. France, Vol. X, p. 322.

Blackish brown or gray with a red tinge, the markings obscured. White spot present, but not very large. Secondaries blackish brown with a darker border. Expanse ♂, 20—25 mm.

Habitat, Coast region of California.

N. gulosa Hy. Edwards.

1881—*Orgyia gulosa* HY. EDWARDS, Papilio, Vol. I, p. 61.

1893—*Orgyia gulosa* DYAR, Psyche, Vol. VI, p. 438.

Fore wings gray, slightly tinged with brown. Markings very distinct; reniform spot pale, outlined by a brown ring; veins indicated by dark scales. Secondaries reddish centrally with a blackish border. Expanse, 25 mm.

Habitat, Coast region of California.

N. cana Hy. Edwards.

1881—*Orgyia cana* HY. EDWARDS, Papilio, Vol. I, p. 61.

1892—*Orgyia cana* DYAR, Psyche, Vol. VI, p. 203.

Smooth dark gray, the lines black broad, well defined. Reniform outlined in brown and filled in with yellowish. Subterminal line white, the white mark above internal angle small, crescent shaped, or obsolete. Secondaries blackish tinged with brown, uniformly colored.

Habitat, Sierra Nevada of California.

N. definita Packard.

1864—*Orgyia definita* PACKARD, Prot. Ent. Soc. Phil., Vol. III, p. 332.

Dark gray, often tinged with dull ochreous along internal margin and subterminal space; lines black, heavily marked; subterminal line whitish; white spot variable sometimes obsolete. Between transverse posterior and subterminal lines, there are usually a series of black longitudinal shades crossing the transverse

posterior line opposite the reniform. Secondaries uniformly blackish with a red tinge. The ♀ is uniformly sordid white.

Habitat, Northern Atlantic States.

N. leucostigma *Abbott & Smith.*

1797—*Phalæna leucostigma* ABBOTT & SMITH, Lep. Ins. Ga., Vol. II, pl. 79.

1832—*Cladophora leucographa* GEYER, Zutr. Ex. Schmett., Vol. IV, p. 33.

1856—*Orgyia intermedia* FITCH, 2d rept. nox. ins. N. Y., p. 213.

1856—*Orgyia borealis* FITCH, 2d rept. nox. ins. N. Y., p. 213.

var. obliviosa *Hy. Edwards.*

1886—*Orgyia obliviosa* HY. EDWARDS, Ent. Amer., Vol. II, p. 13.

1890—*Orgyia inornata* BEUTENMÜLLER*, Psyche, Vol. V, p. 300.

Pale slate gray; markings moderate or obsolete, white spot well defined or absent. Secondaries uniformly brownish gray, varying in shade from pale to dark.

Habitat, Atlantic States westward.

Genus **Olene** *Hübner.*

1823—*Olene* HÜBNER, Zutr. Ex. Schmett., Vol. II, p. 19; 1883—MOORE, Lep. Ceylon, Vol. II, p. 95.

1855—*Nioda* WALKER, Cat. Brit. Mus., pt. V, p. 1069.

1855—*Rilia* WALKER, Cat. Brit. Mus., pt. V, p. 1075.

1864—*Parorgyia* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 332.

1869—*Turriga* WALKER, Char. Lep. Het., p. 15.

Synopsis of species.

Markings of primaries entirely obscure, secondaries brownish. **cinnamomea.**

Markings black or partly so; secondaries gray or blackish.

Wings sparsely irrorate with black scales, lines distinct, especially t. p.

No distinct white discal patch on primaries: dark shade beyond t. p. line not reaching to terminal line, fading out and ill defined outwardly with a whitish edge.

A longitudinal black bar along s.-m. fold **achatina.**

This bar absent *var. tephra.*

A distinct white discal patch on primaries, and dark shade reaching to t. line, sharply defined outwardly, especially in a point between veins 6 and 7.

Veins not distinctly black lined.

Basal space gray and brown **leucophæa.**

Basal space with an ochereous patch *var. basiflava.*

Veins black lined *var. atrivenosa.*

Wings densely irrorate with black, pulverulent, all the markings

obscured, but discernible **plagiata.**

* The larva of this species described by me, is totally distinct from the well known *O. leucostigma* and not identical as considered by Mr. Dyar (Psyche, Vol. VI, p. 420).

WM. BEUTENMULLER.

(TO BE CONTINUED.)

NOTES ON LEPIDOPTERA FOUND ON
VANCOUVER ISLAND.

BY W. H. DANBY, VICTORIA, B. C.

The following notes culled from my field-diary may probably be of interest to readers of the "Journal," and are intended to give a partial account of captures, of the local Lepidoptera, inhabiting the southern part of Vancouver Island. Although the late Hy. Edwards, and also G. R. Crotch, visited Victoria some twenty years ago, collecting many new genera and species, there has been but little done since that day, towards making the list of species occurring here complete; in fact such an undertaking would entail many years of energetic labor, still as every additional item of information tends to bring us nearer to our desire, it is a pleasure to be able to add my quota.

The year 1892 opened stormy, though with a mild winter as regards temperature, the spring was exceedingly wet, and the summer short, being followed by a very rainy fall. These conditions apparently created a bad entomological year, as regards Lepidoptera, yet, such an excessively moist spring, did an immense amount of good, by nearly exterminating the Vancouver Island Oak-looper (*Ellopia Somnaria* Hulst) thus enabling the oak tree that had suffered for the previous three or four years from its ravages to recover their natural appearance and beauty.

In Victoria District the most common Diurnal was *Vanessa antiopa*, the most rare *Vanessa californica*; *Limenitis lorquini*, and *Neophasia menapia*, were very numerous in certain localities, especially along the Cowitchan River, upon the surface of which were thousands of defunct imagos of both species.

I made three trips to the mountains after *Chionobas gigas*: but only managed to secure two males, consequently was much disappointed in not obtaining ova for Mr. W. H. Edwards of Coalburgh, W. Va.; this year however, I hope to be successful. This beautiful Satyrid is to be found among the Highlands of South Vancouver Island from the East to the West coasts, and is far more common than generally supposed, the time of its appearance varies, according to climatic changes, it appears to breed in the valleys or basins, formed by the hills, and I imagine the female seldom leaves there, while the male after copulation, flies to the

peaks of the surrounding mountains; naturally therefore, the finest specimens are taken in the breeding grounds.

The electric light proved very useful in attracting the Noctuidæ, most of my captures being made through its agency, I found however that while collecting at night was remunerative, most specimens were more or less damaged, I therefore tried early morning, about daybreak (the time when the lights are extinguished) and found (as conjectured) that the imagos settled upon the poles, and fences near by, the ropes used for lowering and hoisting the arc-lamps being a favorite resting place; even when nothing was discernable to the eye, a sudden snap jerk of the rope would knock quite a few to the ground by its violent vibration,—yet as certain species are on the wing only at certain hours of the night it necessitates collecting during the dark hours to secure the most rare of those species.

The Geometrina family is bountifully represented here, and many species have been collected; but as they are not yet determined, I shall mention them together with captures of Noctuidæ during 1893 in my next communication. *Orgyia nova* is yearly abundant in Victoria and its cocoons may be seen everywhere, yet it is hardly the pest one would imagine it to be from its numbers. *Melitea taylori* is also plentiful, the larvæ feeding on (*Plantago lanceolata* the narrow leaved plantain. I report the capture of *Papilio ajax* upon the authority of a brother entomologist at Duncans Station, who took a single specimen and as far as I am informed, the first recorded on this Island. Although not a Coleopterist I have taken many good things, amongst them being *Sciopithes arcuatus*, *Sphærites glabratus*, *Sinodendron rugosum*, *Pachyta spurca*, etc., these have been distributed to Eastern friends. A single specimen of *Ulochetes leoninus*, which is one of the few short winged species of this family in our fauna, was taken at Albert Bay, and is now in the collection of the Natural History Society of British Columbia at Victoria.

I have to thank my friends Mr. B. Neumoegen, of New York, Prof. John B. Smith, of New Brunswick, N. J., Mr. W. H. Edwards, of Coalburgh, W. Va., and Prof. James Fletcher, of Ottawa, for their kindness in determining, and naming specimens, thus enabling me to classify my captures.

The following list comprises the Diurnals taken by myself and others during 1892 and 1893, the Heterocera being my own captures for 1892 only, localities and dates are given where known,

in hopes that at some future time, they may be turned to account by entomologists travelling this way, and who may be induced to pay Victoria a visit.

RHOPALOCERA.

	Locality.	Remarks.
1 <i>Papilio ajax</i> <i>Linn.</i>	Duncans,	Very rare.
2 <i>rutulus</i> <i>Bdv.</i>	Victoria,	Common.
3 <i>turnus</i> <i>Linn.</i>	"	"
4 <i>zolicaon</i> <i>Bdv.</i>	"	Scarce.
5 <i>Parnassius clodius</i> <i>Men.</i>	Goldstream,	Common.
6 <i>Neophasia menapia</i> <i>Feld.</i>	Cedar Hill,	"
7 <i>Pieris napi</i> <i>Esp.</i>	Victoria,	"
8 <i>pallida</i> <i>Scud.</i>	"	"
9 <i>venosa</i> "	"	"
10 <i>Anthocharis ausonides</i> <i>Bdv.</i>	Beacon Hill,	"
11 <i>sara</i> <i>Bdv.</i>	Victoria,	"
12 <i>stella</i> <i>Edw.</i>	"	Scarce.
13 <i>Colias eurytheme</i> <i>Bdv.</i>	"	"
14 <i>ariadne</i> <i>Edw.</i>	"	"
15 <i>keewaydin</i> <i>Edw.</i>	"	"
16 <i>occidentalis</i> <i>Scud.</i>	Goldstream,	Scarce.
17 <i>philodice</i> <i>Gdt.</i>	Parsons Br.	"
18 var <i>albinic</i> <i>Edw.</i>	"	Rare.
19 <i>Thecla iroides</i> <i>Bdv.</i>	Goldstream,	Common.
20 <i>irus</i> <i>Gdt.</i>	"	"
21 <i>melinus</i> <i>Hbn.</i>	Victoria,	"
22 <i>blenina</i> <i>Herw.</i> } var <i>siva</i> <i>Edw.</i> }	Goldstream,	Scarce.
23 <i>californica</i> <i>Edw.</i>	"	"
24 <i>Lycæna antiacis</i> <i>Bdv.</i>	Victoria,	Common.
25 <i>phileros</i> "	Thetis Lake,	"
26 <i>sæpiolus</i> "	Victoria,	"
27 <i>amyntula</i> "	Goldstream,	"
28 <i>pseudargiolus</i> <i>Bd.-Lec.</i> } var <i>lucia</i> <i>Kirby.</i> }	"	"
29 <i>scudderii</i> <i>Edw.</i>	"	"
30 <i>mellissa?</i> <i>Edw.</i>	"	"
31 <i>Chrysophanus helloides</i> <i>Bdv.</i>	Victoria,	"
32 <i>Danaïs archippus</i> <i>Fabr.</i>	"	Rare.
33 <i>Argynnis bremerii</i> <i>Edw.</i>	"	Common.
34 <i>epithore</i> <i>Bdv.</i>	"	"

	Locality.	Remarks.
35 <i>Argynnis zerene?</i> <i>Bdv.</i>	Victoria,	Rare.
36 <i>myrina</i> <i>Cram.</i>	"	"
37 <i>rhodope</i> <i>Edw.</i>	Mt. Austin,	Scarce.
38 <i>Melitæa cooperi</i> <i>Behr.</i>	Mt. District,	"
39 <i>rubicunda</i> , <i>Hy. Edw.</i>	Victoria,	"
40 <i>taylori</i> <i>Edw.</i>	"	Common.
41 <i>Phyciodes pratensis</i> <i>Edw.</i>	"	"
42 <i>tharos</i> <i>Dru.</i>	Mt. District,	"
43 <i>Grapta satyrus</i> <i>Edw.</i>	Victoria,	"
44 <i>silenus</i> "	Goldstream,	"
45 <i>zephyrus</i> "	"	"
46 <i>Vanessa antiopa</i> <i>Linn.</i>	Victoria,	"
47 <i>californica</i> <i>Bdv.</i>	"	Rare.
48 <i>milberti</i> , <i>Gdt.</i>	"	Common.
49 <i>Pyrameis atalanta</i> <i>Linn.</i>	"	"
50 <i>cardui</i> "	"	"
51 <i>carye</i> <i>Hbn.</i>	"	Scarce.
52 <i>Limenitis lorquini</i> <i>Bdv.</i>	Cedar Hill,	Common.
53 <i>Cœnonympha ampelos</i> <i>Edw.</i>	Victoria,	"
54 <i>Chionobas gigas</i> <i>Bull.</i>	Goldstream,	"
55 <i>Pamphila agricola</i> <i>Bdv.</i>	Victoria,	"
56 <i>nevada</i> <i>Scud.</i>	Shawnigan L.,	Scarce.
57 <i>Nisoniades propertius</i> <i>Lint.</i>	Victoria,	Common.
58 <i>juvenalis</i> <i>Fabr.</i>	Goldstream,	Scarce.
59 <i>icelus</i> <i>Lint.</i>	Langford,	"
60 <i>Carterocephalus mandan</i> <i>Edw.</i>	Lomenos,	"
61 <i>Amblyscirtes vialis</i> <i>Edw.</i>	Goldstream,	"
62 <i>Pyrgus cæspitalis</i> <i>Bdv.</i>	"	"
63 <i>Eudamus pylades</i> <i>Scud.</i>	"	"

HETEROCERA.

	Date.	Locality.	Remarks.
SPHINGIDÆ.			
MACROGLOSSINÆ.			
1		Victoria,	Common.
CHEROCAMPINÆ.			
2	May	"	"
ARCTIIDÆ.			
ARCTINÆ.			
3	June 13,	"	Common.

	Date.	Locality.	Remarks.
4 <i>Arctia superba</i> <i>Stretch</i> .		Victoria,	Scarce.
5 <i>Leptarectia californiæ</i> <i>Walk.</i> } var <i>latifasciata</i> <i>Bull.</i> }	June 10,	"	Common.
6 <i>Pyrrharctia isabella</i> <i>S. & A.</i>	June 25,	"	"
7 <i>Antarctia rubra</i> <i>Neum.</i>	May 20,	"	"
8 <i>Elpis rubra</i> <i>Neum.</i> } var <i>danbyi</i> }	"	"	Rare.
9 <i>Spilosoma virginica</i> <i>Fabr.</i>	"	"	Common.
10 <i>Halisidota maculata</i> <i>Harr.</i>	" 14,	"	"
11 subalpina <i>French.</i>	" 27,	"	Scarce.

NOTODONTIDÆ.

12+ <i>Eumelia danbyi</i> <i>Neum.</i>	April 26,	"	Rare.
13 <i>Pheosia portlandia</i> <i>Hy. Edw.</i>	May 6,	"	Common.
14 <i>Cerura occidentalis</i> <i>Lint.</i>		"	Rare.

BOMBYCIDÆ.

15 <i>Clisiocampa californica</i> <i>Pack.</i>	Aug. 10,	"	Common.
16 <i>Tolype velleda</i> <i>Stoll.</i>		"	Rare.
17 <i>Gastropacha americana</i> <i>Harr.</i>	May 20,	"	Common.

NOCTUIDÆ.

18 <i>Panthea fureilla</i> <i>Pack.</i>	Aug. 15,	"	"
19 <i>Momophana comstocki</i> <i>Grt.</i>	April 10,	"	Scarce.
20 <i>Harpyia albicoma</i> <i>Str.</i>	June 13,	"	Common.
21 <i>Acronycta felina</i> <i>Grt.</i>	March 26,	"	"
22 oblongata <i>S. & A.</i>	May 30,	Lulu Isld,	"
23 <i>Peridroma occulta</i> <i>Linm.</i>		Victoria,	Rare.
24 <i>Rhizagrotis confusa</i> <i>Smith.</i>	July 22,	"	"
25 <i>Carneades euroides</i> <i>Grt.</i>	Aug. 11,	"	"
26 insignata <i>Walk.</i>		"	"
27 <i>Feltia subgothica</i> <i>Steph.</i>		"	Common.
28 <i>Mamestra liquida</i> <i>Grt.</i>		"	"
29 picta <i>Harr.</i>		"	"
30 egens <i>Walk.</i> } var <i>cinnabarina</i> <i>Grt.</i> }	Sept.	"	"
31 olivacea <i>Morr.</i>	Aug.	"	"
32 cuneata <i>Grt.</i>		"	Scarce.
33 <i>Hadena laterita</i> <i>Hbn.</i>	July 17,	"	Common.
34 <i>devastatrix</i> <i>Brac.</i>	Sept. 10,	"	"
35 albina <i>Grt.</i>	April 13,	"	Scarce.
36 castanea <i>Grt.</i>	June 26,	"	Common.
37 divesta "	July 24,	"	"

	Date.	Locality.	Remarks.
38‡ <i>Polia contadina</i> <i>Smith.</i>	Sept. 13,	Victoria,	Very rare.
39 <i>Eupsephopæctes procinctus</i> <i>Grt.</i>	" 3,	"	Scarce.
40 <i>Trigonophora periculosa</i> <i>Gn.</i>	" 13,	"	Common.
41 <i>Leucania pallens</i> <i>Linn.</i>	" 2,	"	"
42 <i>lapidaria</i> <i>Grt.</i>	" 7,	"	Scarce.
43 <i>Taniocampa pacifica</i> <i>Harv.</i>		"	Rare.
44 <i>alia</i> <i>Gn.</i>	April 15,	"	Common.
45‡ <i>ferrigera</i> <i>Smith</i>	" 10,	"	"
46 <i>Stretchia normalis</i> <i>Grt.</i>		"	Rare.
47 <i>plusiiformis</i> <i>Hy-Edw.</i>	April 9,	"	Scarce.
48 <i>Metalepsis cornuta</i> <i>Gr.</i>	" 26,	"	"
49 <i>Zotheca tranquila</i> "	" 11,	"	Rare.
50 <i>viridifera</i> "	" 11,	"	Common.
51 <i>Orthosia crispa</i> <i>Harv.</i>		"	Scarce.
52 <i>Scoliopteryx libatrix</i> <i>Lin.</i>	Sept. 28,	"	Common.
53 <i>Litholomia napæa</i> <i>Morr.</i>	April 10,	"	"
54 <i>Xylina oregonensis</i> <i>Harv.</i>	March 15,	"	Scarce.
55 <i>pexata</i> <i>Grt.</i>	April 10,	"	"
56 <i>Xylomiges hiemalis</i> <i>Grt.</i>	March 15,	"	Common.
57 <i>crucialis</i> <i>Harv.</i>	April 12,	"	"
58 <i>patalis</i> <i>Grt.</i>	June 27,	"	Scarce.
59‡ <i>pulchella</i> <i>Smith.</i>	May 6,	"	"
60‡ <i>candida</i> "	April 10,	"	Common.
61‡ <i>cognata</i> "	" 3,	"	"
62 <i>Pleroma obliquata</i> <i>Smith.</i>	March 19,	"	Rare.
63‡ <i>apposita</i> "	April 15,	"	"
64 <i>Calocampa nupera</i> <i>Lint.</i>		"	Common.
65‡ <i>Rancora strigata</i> <i>Smith.</i>	June 25,	"	Very rare.
66 <i>Behrensia conchiformis</i> <i>Grt.</i>	April 1,	"	Scarce.
67 <i>Plusia corrusca</i> <i>Strk.</i>	Sept. 1,	"	"
68 <i>Heliothis dipsaceus</i> <i>Lin.</i> } <i>var phlogophagus</i> <i>G. & R.</i> }		"	"
69 <i>Drasteria cærulea</i> <i>Grt.</i>	May 10,	"	"
70 <i>Euclidia cuspeida</i> <i>Hbn.</i>	June 17,	"	"

† Nov. gen. n. sp.

‡ N. sp.

* N. var.



THE LARVA AND PUPA OF EUCATERVA VARIARIA GRT.

By C. H. TYLER TOWNSEND.

In an article in *Can. Ent.* 1892, p. 200, the finding of the cocoons of this species in August in northern New Mexico is recorded. The larvæ had not then been observed, however, and were unknown.

On May 27, 1893, I beat numbers of the larvæ of this phalænid from *Chilopsis* bushes along arroyos on the mesæ to the east of Las Cruces. The larvæ were of various sizes. Spinning larvæ were also found, and newly formed pupæ in their peculiar thin silken cocoons. This finding of the pupæ in May indicates evidently three broods of this species in this region, since the pupæ were previously found in August, disclosing the moths in that month.

The following is a description of the full-grown larva and pupa;

Larva.—Length, about 31 to 33 mm.; greatest width, about $3\frac{1}{2}$ to 4 mm. Color pale green, creamy on dorsal regions, yellow on sides with black dots. Head and anal segment creamy with black dots. Spinning larvæ are more creamy, and have a pinkish shade on dorsum.

An elongate geometrid larva, with two pairs of prolegs, on segments 10 and 13. Head a little narrower than prothorax, the latter a little narrower than meso- and meta-thorax. Other segments nearly same width, slightly widening about 10, and narrowing again to anus. Prothorax shorter than other thoracic segments. Segments 5 to 9 elongate, longer than wide, except 5, and about equal in length; 10 hardly as long as wide, 11 and 12 shorter than 10; anal segment a little longer than preceding, with a sinuate transverse suture on dorsum. A broad lateral yellow stripe running the whole length of the body on each side next to venter; dorsal of this and parallel to it, is another much narrower yellow stripe, while there is usually apparent a very faint and more or less interrupted one between the two. Venter also with a median yellowish longitudinal stripe, and a faint one on each side. Body nearly bare, with only some very scant short hairs, head with more distinct hairs.

Described from several specimens. Colors noted in life. The food-plant is *Chilopsis saligna*.

Pupa.—Length 14 to 18 mm.; greatest width, 4 to 5 mm. Color creamy whitish, anal horns pale brownish. Wing, antennal,

and leg sheaths somewhat more pellucid in color, extending vertically to near or a little beyond middle of eighth segment. First three abdominal segments short, fourth to sixth about twice as long and nearly equal both in length and in width, the three remaining segments (11 to 13) shortened and narrowed. Anal segment terminated by eight recurved hooks, six being in a transverse row, and one dorsal of each end of the row, the median pair longer than the others.

Described from several specimens. Colors noted in life.

For brief description of the net-like silken cocoon, see Can. Ent. l. c. The cocoons are very beautifully made.

LOCAL ENTOMOLOGICAL NOTES.

Members of the New York Entomological Society and all others, are solicited to contribute to this column, their rare captures, local lists and other items of interest relating to the insect fauna of New York city and vicinity.

THE SEVENTEEN-YEAR CICADA ON STATEN ISLAND.

By WM. T. DAVIS.

The Seventeen-year Cicada occurred in vast numbers on Staten Island in 1877, and consequently will appear there again during the coming summer. This brood has been numbered XII by Prof. Riley, and Dr. Fitch wrote of it in 1855 as inhabiting the valley of the Hudson River.

It may not be uninteresting in view of these facts, to record the straggling specimens of the Periodical Cicada which have been observed on the Island since 1877, a more detailed account of which may be found in the Proceedings of the Natural Science Association of Staten Island.

In 1881, Brood XVIII, appeared on the Island in some numbers. Mr. Leng and I found a pupa under a stone, and on the 5th of June eight specimens were collected. By the 12th of the month they had become quite numerous, and I counted about one tree, fifty-two pupa skins. The brood to which these insects belonged

does not appear in great numbers in the east, but is mainly located in Wisconsin and neighboring states. Staten Island, Essex Co., N. J., and Germantown, Penn., were apparently the only eastern localities from which the insect was reported in 1881.

In 1885, Brood XXII was to make its appearance in the east, but the only evidence of the Cicada on the Island, was the finding of a single wing along a wood path in the Clove Valley. In Pennsylvania the insects occurred in great numbers, and more sparingly in New Jersey, and in the vicinity of Brooklyn on Long Island.

In 1888, I found a single male Cicada on the Island on the 16th of June. It was unable to fly as one of its fore wings was deformed, and consequently must have been borne in the immediate vicinity.

What follows for 1889 and 1890 probably applies to Brood VIII, which was expected to make its appearance in the first named year on Long Island and in parts of Pennsylvania and West Virginia. In Vol. I, No. 4, of the Proceedings of the Entomological Society of Washington, this Brood is recorded from North Carolina and West Virginia, and in less numbers from the District of Columbia, Maryland and New Jersey.

In the summer of 1889 Mr. Jos. C. Thompson gave me a pupa skin of a red-eyed Cicada, which he had found on a grass stem, and which was the only evidence I secured of the presence of the insect on the Island.

In 1890 the Cicadas were not expected to appear in any part of the country, but they were, however, more common in Staten Island than in 1889. In early summer three pupa skins and two imagos were found, and on September 8th, I dug a live pupa from a hill of potatoes.

In 1892 the Seventeen-year Cicada were heard singing in three different districts of the Island, and specimens were also secured.

In 1893 they were more numerous than in the previous year, and were heard singing in various parts of the Island. Mr. Leng's children gave me specimens collected in his garden at West New Brighton. It is not unlikely that the Cicadas of 1892 and 1893 were precursors of the general swarm that is to come early next summer.



THE PHALANGIDA OF NEW YORK.

BY NATHAN BANKS.

The State of New York extending from Lake Erie to the Atlantic coast lies in parts of several quite different faunal regions; viz., the Western or Prairie, the Northern or Mountains, and the Atlantic or Southern region. So it will doubtless appear that the Phalangid fauna of the state is quite extensive, and this list can only claim to be preliminary. Most of the species that I give, have, however, never been recorded from the State.

There are two families represented, both belonging to the Phalangida Plagiostethi (Palpatores).

A claw at end of palpus **Phalangidæ.**
 No claw to palpus **Nemastomatidæ.**

Of the Nemastomatidæ we have but one genus and species, *Phlegmacera cavicoles* Pack. This was described from the caves of Kentucky but is not a strictly cave form as I have collected it in a gorge at Ithaca, N. Y., and Prof. C. M. Weed records it from New Hampshire under the name of *Sabacon spinosus*. The Phalangidæ, the more common forms of the order, and ordinarily called "daddy-long-legs", "harvest-men", etc., embrace several genera.

1	{	Several prominent spines on second joint of palpus	2
	{	Whithout prominent spines on palpus	4
2	{	Eye-tubercle smooth, eyes very large	Caddo.
	{	Eye-tubercle spinose, eyes normal	3
3	{	No false articulations in metatarsi I, eye-tubercle quite remote from anterior margin	Lacinius.
	{	At least one false articulation in metatarsus I, eye-tubercle farther forward	Oligolophus.
4	{	A group of spines on anterior margin of cephalothorax, dorsum with transverse rows of spines	Phalangium.
	{	Anterior margin smooth, abdomen smooth	5
5	{	Femur I much shorter than body, in females not as large as width of body	Leptobunus.
	{	Femur I longer than body, or in some females a little shorter than body	Liobunum.

Of Caddo we have but one species. *C. agilis* Banks, found on Long Island. Its enormously large eyes readily separate it from all other Phalangids. It belongs to the southern fauna as it is known from D. C.

Oligolophus and *Lacinius* are each represented by a single species, *O. pictus* Wood and *L. ohioensis* Weed, both of which occur at Ithaca, N. Y.

Phalangium has one species *P. cinereum* Wood, which doubtless occurs throughout the State, it belongs to the Boreal fauna, but it occurs as far south as Long Island. It is usually found near buildings.

Leptobunus was erected for a Californian species, but two other species were placed in it, one of which, *L. grande* Say, I have received from Poughkeepsie, N. Y., collected by Mr. Van Ingen. It is a southern form, and this is doubtless as far north as the species extends on the Atlantic coast.

Of *Liobunum*, I have seen six species from the State. The males may be separated as follows:

- | | | |
|---|--|------------------------|
| 1 | { A small projection on second joint of palpus | L. calcar. |
| | { No such projection | 2 |
| 2 | { Palpi wholly black, legs black | L. nigropalpi. |
| | { Palpi not wholly black | 3 |
| 3 | { Dorsum with a distinct black stripe | L. dorsatum. |
| | { Dorsum without distinct stripe | 4 |
| 4 | { Body very small, 3—4 mm. long, legs darker near tips | L. politum. |
| | { Body larger, 5—8 mm. long, legs not darker near tips | 5 |
| 5 | { Dorsum brownish, eye-tubercle smooth | L. ventricosum. |
| | { Dorsum golden, eye-tubercle spinose | L. verrucosum. |

Liobunum dorsatum Wood.

This is by far the most common species in the northeastern United States. On Long Island the males seem to be more numerous than the females.

Liobunum nigropalpi Wood.

This is an uncommon species; it occurs sparingly at Ithaca, N. Y.

Liobunum calcar Wood.

This is a quite rare form, I have one male from Ithaca, N. Y.

Liobunum ventricosum Wood.

This species is common in the State; unlike the other species of the genus this is adult in early summer. The young were called *L. formosum* by Wood.

Liobunum verrucosum Wood.

This beautiful species is quite rare; I have taken it several times on Long Island.

Liobunum politum Weed.

This is a much smaller species than the other forms. It is not uncommon on Long Island.

LIST OF THE COLEOPTERA OF NORTH
EASTERN AMERICA,
WITH SPECIAL REFERENCE TO THE FAUNA OF NEW
YORK CITY AND VICINITY.

By CHARLES W. LENG and WM. BEUTENMULLER.

(CONTINUED FROM Vol. I, PAGE 194).

CERCYON *Leach*.

Live in putrid vegetable matter.

- C. centromaculatum* *Sturm.*—N. Y. City and vicinity, N. J., Pa., Mich., (also Europe).
C. prætextatum *Say.*—N. E. Amer., south to Fla. and west to Kan.
C. ocellatum *Say.*—N. Y. City and vicinity, N. J., Mich., Can., and Ill.
C. pygmæum *Ill.*—N. E. Amer., common; (also Europe and Asia).
C. unipunctatum *Linn.*—N. E. Amer. (also Europe).
C. melanocephalus *Linn.*—N. E. Amer., west to Mo. (also Europe, Africa and Asia).
C. litoralis *Gyll.*—Taken in this vicinity on Coney Island, Rockaway and Long Beach, N. J., Pa., Ill. (also Europe).
C. analis *Payk.*—N. Y., N. J., Pa., N. Eng., Ill., Mich. (also Europe and Asia).
C. pubescens *Lec.*—Ohio (Dury).
C. naviculare *Zimm.*—Can. and Mich., southward to D. C. and La., westward to Kan. Taken at Peekskill, N. Y.
C. nigriceps *Marsh.*—Can. to La. and Ind. (also Calif.).
C. indistinctus *Horn.*—Can. to Pa. (Horn).
C. hæmorrhoidalis *Fabr.*—N. E. Amer. (also Europe, Africa and Asia).
C. lugubris *Payk.*—Can., New Eng. States to Md. (also Cal., Nev. and Europe).
C. tristis *Ill.*—Ohio, Mich., westward to Cal. and Wash. (also Europe to Siberia).
C. granarius *Er.*—Mass., Pa. and D. C. (also Europe).

PHÆNONOTUM *Sharp*.

Habits same as the preceding.

- P. estriatum* *Say.*—N. Y. City and vicinity, N. J. southward to Fla. and Tex., west to Mo.

PEMELUS *Horn*.

- P. costatus* *Lec.*—Pa., Ohio (also D. C. and Tenn.).

CRYPTOPLEURUM *Muls.*

- C. minutum* *Fabr.*—Can., N. Eng. States south to Md. (also Europe, Siberia and Japan).
C. americanum *Horn.*—Ohio.

ADDITIONS AND CORRECTIONS TO THE LIST OF
CICINDELIDÆ AND CARABIDÆ.

Extras of the List of the Carabidæ of North Eastern America have been submitted to Dr. Hamilton and Mess. Frederick Blanchard, Charles Dury, H. W. Wenzel, Ottomar Reinecke, C. W. Strumberg, A. Bolter, and the Collection of U. S. National Museum and many corrections have been made known to us as well as the following additional species.

CICINDELIDÆ.

TETRACHA *Hope*.

T. carolina *Linn.*—Occurs in So. Ill. (Strumberg).

T. virginica *Linn.*—Occurs in So. N. J. (Wenzel) and in Pa., So. Ohio, Ind., Ky. (Hamilton). Habits nocturnal; found in So. N. J. under wood and stones (Wenzel).

CICINDELA *Linn.*

C. celeripes *Lec.*—Ill. to Dakota (Hamilton).

var. cursitans *Lec.*—So. Ill. (Strumberg).

C. scutellaris *var. Lecontei* *Hald.*—Found by Moffatt near Hamilton, Can., quite abundant in sandy openings in the woods (Reinecke).

var. rugifrons *Dej.*—Lakewood, N. J., May, Shinnecock Hills, L. I., Sept. (Bradford).

C. purpurea *var. limbalis* *Lec.*—N. Y. (Hamilton).

CARABIDÆ.

OMOPHRON *Lat.*

O. ovale *Horn.*—Ohio (Reinecke).

CYCHRUS *Fab.*

C. Guyoti *Lec.*—Mountains of Va., Roan Mt. N. C. (Dury).

NOMARETUS *Lec.*

N. cavicollis *Lec.*—Buffalo, N. Y., also Ia., Mo. (Bolter).

N. debilis *Lec.*—Roan Mt. N. C. (Dury).

CARABUS *Linn.*

C. Maeander *Fisch*—N. Ill. also Minn., Alaska (Coll. U. S. N. M.), Magdalen Is., St. Pierre, Miquelon (Blanchard), N. Ill.; common (Bolter).

C. tædatus *Fab.*—L. Sup. to Oregon and Alaska also to Colo. and N. Mex. (Hamilton).

C. gladiator *Mots.*—Hudson Bay Region (Hamilton).

C. granulatus *Dej.*—Bay of Fundy (Harrington), also Europe and Western Asia to Turkestan.

C. palustris —. Canada (Coll. U. S. Nat. Mus.).

CALOSOMA *Web.*

C. frigidum *Kirby.*—Buffalo, N. Y. (Reinecke).

ELAPHIRUS *Fab.*

E. laevigatus *Lec.*—Mich., Br. Col. (Hamilton).

DIACHILA *Mots.*

D. subpolaris *Lec.*—Hudson Bay Region (Hamilton).

BLETHISA *Bon.*

B. multipunctata *Lin.*—N. Ill., very rare (Bolter).

LORICERA *Lat.*

L. cærulescens *Lin.*—Br. Col., L. Sup., Canada (Coll. U. S. Nat. Mus.), Magdalen Is. (Blanchard), White Fish Pl. L. Sup. (Reinecke).

L. pilicornis *Fab.*—Mich., L. Sup., Severn River, Ont., Magdalen Is., Nova Scotia; also Europe and East and West Siberia (Hamilton).

OPISTHIUS *Kby.*

O. Richardsoni *Ky.*—Hudson Bay Region and through the Rocky Mts. to Colo. (Hamilton).

NOTIOPHILUS *Dum.*

N. sylvaticus *Fsch.*—White Mts., N. H. (Blanchard).

NEBRIA *Lat.*

N. hudsonica *Lec.*—Hudson Bay Region (Hamilton).

N. nivalis *Payk.*—Greenland and Lapland (Hamilton).

PELOPHILA *Dej.*

P. Eschscholtzii *Mann.*—Ill., Alaska (Hamilton).

P. rudis *Lec.*—"Lat. 58° Long. 110°" (Hamilton).

P. Ulkei *Horn.*—Hudson Bay Region (Hamilton).

MORIO *Lat.*

M. monilicornis *Lat.*—N. Y. to Fla. (Coll. U. S. Nat. Mus.).

BEMBIDIUM *Lat.*

B. mutatum *G. & H.*—N. Hampshire (Blanchard).

B. lugubre *Lec.*—Not rare at Galesburg, Ill. (Strumberg).

B. postremum *Say.*—Ill. (Strumberg), Pa. (Bolter), (Hamilton), Iowa (Reinecke), Mass. (Blanchard).

B. planiusculum *Mann.*—Ill., Wash., N. Mex. (Bolter).

B. transversale *Dej.*—Mich. (Reinecke), Mich. to Colo. (Hamilton).

B. simplex *Lec.*—N. H. (Reinecke), Pa. (Hamilton).

B. scopolinum *Kby.*—Mich. (Reinecke), Ontario, common (Hamilton), N. H. (Blanchard).

B. dilatatum *Lec.*—Eastern Pa. (Hamilton).

B. striola *Lec.*—Mich. (Hamilton).

B. longulum *Lec.*—Pa. (Hamilton).

B. tetraglyptum *Mann.*—Mich., also Colo., Alaska (Hamilton).

B. bimaculatum *Kby.*—65° N. Lat., also Colo., N. Mex., Can. (Hamilton).

B. lampros *Hbst.*—Cambridge, Mass., Can., also Europe, Siberia (Hamilton) (Blanchard).

B. Grapii *Gyll.*—N. H., N. Y., L. Sup. to Alaska (Hamilton), Magdalen Isld. (Blanchard).

B. versutum *Lec.*—No. Mich. (Hamilton), Mass. (Blanchard).

B. conspersum *Chaud.*—Pa., Can., N. W. Terr. (Hamilton).

B. aeneicolle *Lec.*—L. Sup. (Hamilton).

B. quadraticollis *Mann.*—Mich., H. B. T., B. C., Alaska (Hamilton).

B. sulcatum *Lec.*—Ill. (Bolter), Pa., L. Sup. (Hamilton), Mass. (Blanchard).

B. cautum *Lec.*—Ill. (Bolter), Mass., Colo., Michigan (Hamilton), N. H. (Blanchard).

- B. anguliferum** *Lec.*—D. C., Ill., So. Cal. (Bolter), Mich. (Hamilton).
B. dentellum *Thumb.* = **arcuatum** *Lec.* = **undulatum** *Sturm.*—Ill., Pa. (Bolter), Ill., found in dampwoods (Strumberg), common in Pa. (Hamilton), Mass. (Bolter), also in Br. Col. and Europe (Hamilton), Mass., Fla., Ill. (Blanchard).
B. fraternum *Lec.*—Ill., also Ia., So. Cal. (Bolter), Wisc. (Reinecke).
B. mixtum *Lec.*—Nantucket, Mass. (Bolter), also Mont., Minn., So. Cal., N. Mexico.
B. lucidum *Lec.*—Ill., Minn., N. C. (Bolter), Mich., Colo. (Hamilton), Magdalen Isld. (Blanchard), Lake Sup. (Leconte).
B. flavopictum *Mots.* = **pictum** *Lec.*—Ill., Ohio (Hamilton).
B. incrematum *Lec.*—Quebec, Br. Col., Or., Alaska (Hamilton).
B. morulum *Lec.*—Hudson Bay Region (Hamilton).
B. oblongulum *Mann.*—N. Y. City (Palm), Canada (Coll. U. S. Nat. Mus.), Me., Mass. (Blanchard), rare Ill. (Strumberg), N. H. (Reinecke), Alaska (Hamilton).

ANILLUS *Dur.*

- A. fortis** *Horn.*—Ohio (Dury).

TACHYS *Schaum.*

- T. corruscus** *Lec.*—Ill. (Strumberg), common in woodland especially where the soil is rich and black.
T. ferrugineus *Dej.*—Ill. (Strumberg), Ark. (Bolter), N. Y., Colo. (Hamilton), Mass. (Blanchard), Ohio (Dury).
T. aenescens *Lee*—Ark. (Bolter).
T. granarius *Dej.*—Ill. (Bolter), Pa., Ga. (Hamilton), D. C. (Blanchard).
T. dolosus *Lec.*—Ill., Mo., Tex., D. C., Ariz. (Bolter), Mass. (Blanchard).
T. pumilus *Dej.*—Ill., Fla. (Bolter).
T. nebulosus *Chd.*—Pa. (Reinecke).
T. gemellus *Casey.*—N. J. (Hamilton).

ANOPHTHALMUS *Sturm.*

The species of Anophthalmus, blind cave beetles, are doubtfully included in our list; *eremita* Horn occurring in Ind.; *pusio* Horn in Virginia; all the others in Kentucky (Hamilton).

TRECHUS *Clair.*

- T. hydropicus** *Horn.*—Md. (Bolter), Va. (Hamilton).

PTEROSTICHUS *Bon.*

- P. grandiceps** *Chd.*—Tenn. (Bolter).
P. ventralis *Say.*—Ill., Ark., Mo., Fla. (Bolter).
P. incisus *Lec.*—Ill. (Strumberg).
P. fallax *Dej.*—Tenn., Ark. (Bolter).
P. congestus *Men.*—Wis. (Reinecke).
P. vinctus *Lec.*—Allegheny, Pa. (Hamilton).
P. obscurus *Say.*—Allegheny, Pa. (Hamilton), Ohio (Dury).
P. strenuus *Lec.*—Buffalo, N. Y. (Reinecke).
P. obsoletus *Say.*—Ohio, Ill. (Hamilton).
P. femoralis *Ar.* var. **desidiosus** *Lec.*—Ill., Mo. (Bolter).
P. emptetricola *Dej.*—R. A. (Bolter), H. B. T. and Alaska (Hamilton), N. H. (Blanchard).
P. submarginatus *Say.*—Ill., Fla., W. T. (Bolter).

- P. vitreus* Dej.—Mt. Wash., N. H. (Slosson).
P. vindicatus Mann.—White Mts., N. H. (Slosson).
P. hudsonicus Lec.—White Mts., N. H. (Slosson).

EVARTHUS Lec.

- E. orbatus* Newm.—Ill., rare (Strumberg), Ky., Tex., Mo. (Bolter), Wis. (Reinecke).
E. cinctus Lec.—Allegheny, Pa. (Reinecke), (Hamilton).
E. seximpressus Lec.—Ill., not common (Strumberg), Mo., Ia. (Bolter), Ia. (Reinecke), Ill. (Hamilton).
E. americanus Dej.—Wis. (Reinecke), Ohio (Dury), Pa. (Wenzel).
E. colossus Lec.—Ill. (Reinecke).

AMARA Bon.

- A. remotestriata* Dej.—N. Y., Colo. (Coll. U. S. Nat. Mus.), Alaska to Labrador, N. J., N. Mex. (Hamilton).
A. fulvipes Putz.—Ill., rare (Strumberg), Mo., N. Mex. (Bolter), Pa. (Hamilton).
A. laticollis Lec.—Ill., Mo. (Bolter), 64° N. Lat., Neb. (Hamilton).
A. apricarius Payk.—Nantucket (Bolter), Mass., Magdalen Isld. (Blanchard).
A. protensa Putz.—Ill. (Bolter).
A. terrestris Lec.—Nantucket, N. Mex. (Bolter), Ia., Wis. (Reinecke).
A. crassispina Lec.—L. Sup. (Hamilton), Mass. (Blanchard).
A. rufimana Kby.—54° N. Lat. (Hamilton), Magdalen Isld. (Blanchard).
A. elongata Lec.—L. Sup. (Hamilton).
A. canadensis Putz.—Canada (Hamilton).
A. carinata Lec.—Ill. (Blanchard).
A. similis Kby.—White Mts. (Slosson).

LOXANDRUS Lec.

- A. hyperborea* Kby.—White Mts. (Slosson).
A. latior Kby.—White Mts., N. H. (Slosson).
L. celer Dej.—Ill. (Bolter).
L. minor Chd.—Ill., not common (Strumberg), Mo. (Bolter).
L. erraticus Dej.—Ill. (Reinecke), (Blanchard).

DIPLOCHILA Bon.

- D. obtusa* Lec.—Ill. (Bolter), (Hamilton).

DICAELUS Bon.

- D. splendidus* Say.—Rock Isl. and Quincy, Ill. (Strumberg), Iowa (Reinecke).

BADISTER Clair.

- B. obtusus* Lec.—L. Sup. (Hamilton).
B. reflexus Lec.—Pa. (Wenzel).

PLATYNUS Bon.

- P. 4-maculatus* Horn.—No. Westn. N. Y. (Hamilton), L. Sup., N. Foundland (Leconte).
P. maurus Mots.—New Foundland, L. Sup. (Hamilton).
P. piceolus Lec.—H. B. T. to Br. Col. (Hamilton).
P. carbo Lec.—H. B. T., L. Sup. (Hamilton).
P. albicus Dej.—L. Sup. to Ga. (Hamilton).
P. perforatus Newm.—H. B. T. (Hamilton).

- P. cupreus* Lec.—H. B. T. to L. Sup. (Hamilton).
P. crassicollis Dej.—H. B. T. (Hamilton).
P. bembidioides K'by.—L. Sup., H. B. T., Alaska (Hamilton).
P. picticornis Nixon.—Ill. (Strumberg), (Bolter), Iowa (Reinecke), L. Sup. to Ga. (Hamilton).
P. ovipennis Mann.—Ill., Or. (Bolter).
P. bicolor Dej.—Ill., N. C. (Bolter).
P. subcordatus Lec.—Wis. (Reinecke).
P. nigriceps Lec.—N. Y. (Reinecke), L. Sup., Br. Col. (Hamilton), Pa. (Wenzel).
P. fossiger Dej.—Cal., Or., L. Sup. (Bolter).
P. gemellus Lec.—Mass., Ind. (Blanchard).

ANCHONODERUS Reiche.

- A. myops* Reiche = *4-notatus* Horn.—N. Ill. (Reinecke).

PERIGONA Lap.

- P. nigriceps* Dej.—D. C., S. C., Ga., Fla. (Hamilton).

LEBIA Lat.

- L. divisa* Lec.—Galesburg, Ill., rare (Strumberg).
L. pectita Horn.—Mass. (Blanchard).

DROMIUS Bon.

- D. atriceps* Lec.—Va. beach (Wenzel).

BLECHRUS Mots.

- B. pusio* Lec.—Allegheny, Pa. (Hamilton).

CALLIDA Dej.

- C. decora* Fab.—S. Ill. (Reinecke).
C. fulgida Dej.—N. J. (Reinecke). Mass., also Nebr. (Blanchard).

PENTAGONICA Schm-Goeb.

- P. flavipes* Lec.—Ill., Fla., Ariz. (Hamilton).
P. flavipes var. *bicolor* Lec.—Ill., not rare; hibernates among leaves in dampwoods (Strumberg).

HELLUOMORPHA Lap.

- H. laticornis* Dej.—Ill. (Reinecke).
H. nigripennis Dej.—Cap May and Atlantic Co., N. J. (Wenzel).

BRACHYNUS W'cb.

- B. lateralis* Dej.—Ill., Fla. (Bolter).

MISCODERA Esch.

- M. arctica* Payk.—Mich., New Foundland, also Alaska, Siberia and Europe (Hamilton).

CHELENIUS Bon.

- C. brevilabris* Lec.—Ill., not rare at Galesburg (Strumberg), Ill. (Hamilton), Ohio (Dury).
C. augustus New.—Va. beach (Wenzel).

ODES Bon.

- O. 14-striatus* Chd.—Ohio (Blanchard).

HARPALUS Lat.

- H. amputatus* Say.—Can. to N. Mex. (Hamilton).
H. longior K'by.—Can., Pa., W. Va. (Hamilton).
H. megacephalus Lec.—Can., Pa. (Hamilton).
H. opacipennis Hald.—Pa., Ks., Br. Col. (Hamilton), Mass. (Blanchard).
H. Lewisi Lec.—L. Sup. (Hamilton).
H. obesulus Lec.—Winnipeg (Hamilton).
H. varicornis Lec.—Can., L. Sup. (Hamilton).
H. testaceus Lec.—Ill. (Hamilton).
H. fulvilabris Mann.—Mich. (Hamilton).
H. ventralis Lec.—N. Y. (Coll. U. S. Nat. Mus.).
H. viduus Lec.—Allegheny, Pa. (Hamilton), Mass. (Blanchard).

SELENOPHORUS *Dej.*

S. palliatus *Fab.*—Allegheny, Pa., W. Va. and southward (Hamilton).

STENOLOPHUS *Dej.*

S. limbalis *Lec.*—N. Ill. (Reinecke).

ACUPALPUS *Lat.*

A. rectangulus *Chd.*—Mass. (Blanchard).

BRADYCELLUS *Er.*

B. cordicollis *Lec.*—L. Sup. (Hamilton).

ANISODACTYLUS *Dej.*

A. nitidipennis *Lec.*—Mass., Pa. (Blanchard).

The following corrections in nomenclature have been made by Dr. Hamilton —

Dyschirius pumilus *Dej.* should be *aeneus* *Dej.*

Clivina collaris *Hbst.* should be *fossor* *Linn.*

Bembidium impressum *Fab.* should be *carinula* *Chaud.*

B. paludosum† *Sturm* should be *littorale* *Oliv.* 1791.

B. planum‖ *Hald* should be *Guexi* *Chaud.*

B. rupestre *Dej.* (*littorale*† *Oliv.* 1792) should be *ustulatum* *Linn.*

B. plagiatum and *lacanurium* = *picipes* *Kby.* (Horn Trans. Am. Ent., Vol. XVIII, p. 34.)

B. impressum is *carinula* *Chd.* in Henshaw's List.

Tachys incurvus *Say* is said to be the species described by Leconte as *pulchellus* and Chaudoir gives the name *nebulosus* to the species referred by Leconte to *incurvus*, so in the list instead of *incurvus* *Say.* place *nebulosus* *Chd.* and instead of *pulchellus* *Lec.* substitute *incurvus* *Say.*

Pterostichus diligendus *Chd.* should be *apalachius* *Lec.* mss.

Platynus obsoletus *Say* should be *Bogemanni* *Dej.*

P. picicornis *Lec.* should be *fragilis* *Mann.*

Blechnus nigrinus *Mann* should be *glabratus* *Dufst.*

Plochionus Bonfilsii *Dej.* should be *pallens* *Fab.*

Oodes Lecontei *Chd.* should be *12-striatus* *Chd.*

Anisodactylus punctulatus should be *nigerrimus* *Dej.* (Blanchard).

The following species, heretofore included on apparently good authority, have been questioned and we shall be glad to learn further particulars from any collector who has taken them —

Cychnus heros *Harr.*

Nebria Eschscholtzii *Men.*

Schizogenius planulatus *Lec.*

Bembidium bifossulatum *Lec.*

Calosoma triste and *obsoletum* *Say.*

Tachys ventricosus *Lec.*

Platynus maculicollis *Dej.*

Platynus variolatus *Lec.*

Platynus exaratus *Mann.*

Platynus limbatus *Say.*

Chlænienus fuscicornis *Dej.*

Chlænienus vafer *Lec.*

Anisodactylus semipunctatus *Lec.*

Cicindela unipunctata *Fab.* Mr. Wenzel writes in reference to this species: "This beetle is nocturnal; I captured several July 3d at Da Costa, N. J."

Cicindela purpurea *Olivier.* Dr. Hamilton says: "This species hibernates."

Omophron robustum *Horn.* Mr. Dury says: "The locality of this insect was the banks of Mill Creek (not Ohio River) and is now obliterated."

Carabus nemoralis *Muls.* Taken in New Brunswick not in Maine.

Lebia vittata *Fabr.* Is not this species confounded with *L. pectata* in collections. Horn's species was formerly supposed to be *vittata* *Fabr.* (Blanchard).

Harpalus pleruiticus (Vol. I, p. 145) should be *pleruiticus*.

Harpalus innocuus *Lec.* was included in error.

Philophuga viridicollis occasionally appears in collections as *Callida purpurea* (Blanchard).

(TO BE CONTINUED.)

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ON THE LYCOSIDÆ OF COLORADO.

By NATHAN BANKS.

In 1877 Dr. T. Thorell described in the Bull. U. S. Geol. Survey, ten new species of Lycosidæ from Colorado. They were chiefly collected in the central and northern portions of the state. Since then no other species have been recorded from the state. During the past few years, I have received several collections of spiders from Colorado; principally from Dr. C. F. Baker, Mr. T. D. A. Cockerell, and Prof. C. P. Gillette. From these I have been enabled to determine several of Dr. Thorell's species and to recognize some new forms. A mountainous region is especially rich in Lycosidæ, so that from more extended collecting we may expect many more forms.

Lycosa, Thorell is what American students know as *Pardosa*; *Tarantula*, Thorell is our *Lycosa*. Thorell, in the paper quoted, questioned whether Latreille had ever considered *Lycosa tarantula* as the type of the genus. Latreille, in his "Ordre Naturel des Crustacés", distinctly gives *L. tarantula* as the type.

Lycosa grandis, sp. nov.

Length 22 mm.; ceph. 11 mm. Cephalothorax brown, with a narrow pale yellow stripe in the middle, reaching to eyes of second row; a broad yellow stripe each side on the margins; mandibles brown with long white hairs; maxilla and lip dark brown; sternum, coxæ and legs pale yellowish, without spots or marks; the tarsi and tips of metatarsi brownish; abdomen brownish above, showing a basal spear-mark and a few small spots, sides and venter wholly pale yellow; spinnerets brownish. Anterior row of eyes procurved, shorter than the second row, which are less than their diameter apart. Legs large and stout, IV pair about three times as long as the cephalothorax. The tibia of the male palpus is about twice as long as broad; the hook short and blunt, the tube long and slender.

One male Fort Collins, Colorado (Baker): This species is readily recognized by its large size and pale color.

***Lycosa carolinensis* Hentz.**

A male from Ft. Collins seems to belong to this species, but the cephalothorax is paler and the abdomen is distinctly spotted above.

***Lycosa coloradensis*, sp. nov.**

Length ♂ 11—13 mm. Cephalothorax pale gray, with a brown stripe each side reaching from the eyes to near hind margin, widest on the thoracic portion, and sometimes there broken into spots; eyes on a black band; mandibles yellow-brown; maxilla, lip, sternum and coxae black; legs yellowish, black bands at tips of the femora and tibiae distinct below, barely showing above; also a band on tips of posterior metatarsi; tips of tarsi blackish; abdomen yellowish above, with a brown basal spear-mark and a number of brown spots somewhat regularly connected to each other and to the spear-mark; some isolated spots on the sides; venter pale, with a black spot covering the base of abdomen as far as the lung slits; also an apical black spot in front of the spinnerets. Anterior row of eyes equal, procurved, shorter than the second row, which are nearly their diameter apart and larger than those of the third row; legs moderately slender, the IV pair about three and one-half times as long as the cephalothorax; tibia of male palpus one and one-half times as long as broad; the palpal organ with a large, transverse basal body, from under which projects the quite slender and sharp-pointed hook; above a rounded, transversely-ridged body. The ♀ is similar to the ♂ (15 mm. long), with shorter legs. The epigynum is red, it is an oblong cavity with undulate margins, from the bottom projects a capitate septum.

Two males and two females; Ft. Collins, Colo. (Baker). Readily recognized by the coloring of the under side of the body.

***Lycosa scalaris* Thorell, (sub *Tarentula*).**

Two specimens, Fort Collins (Baker), and two West Cliff (Cockerell). It has considerable resemblance to *L. communis* Em. but is distinct.

***Lycosa modesta* Thorell, (sub *Tarentula*).**

Two specimens Ft. Collins (Gillette and Baker); three West Cliff (Cockerell). It has some resemblance to the eastern *L. nigroventris*.

***Lycosa brunneiventris*, sp. nov.**

Length 12 mm. Cephalothorax brown, black around eyes, with a broad, central, pale stripe; sternum and coxae dark brown; legs yellow-brown, the femora somewhat darkened above but without any distinct rings; abdomen brownish above with a basal black spear-mark, giving off behind several black chevrons; venter pale brown. The cephalothorax is barely shorter than tibia plus patella IV, and about one-third the length of leg IV; anterior row of eyes nearly straight, barely shorter than the second row, which are no larger than those of the third and fully

their diameter apart. Epigynum very small, a short flask-shaped cavity containing a septum, which in front is only a line, but behind triangular and very broad.

One female, Ft. Collins, Colo. (Baker). Under stones. Resembles the preceding species but has a pale venter and quite different epigynum.

***Pardosa concinna* Thorell, (sub *Lycosa*).**

Several specimens, Ft. Collins, under stones, (Baker); West Cliff (Cockerell). Very much like the eastern *P. brunnea* Em. which may be only a variety.

***Pardosa sternalis* Thorell, (sub *Lycosa*).**

One specimen, Ft. Collins, sweeping alfalfa (Baker). Another (Gillette).

***Pardosa coloradensis*, sp. nov.**

Length 6—7 mm. Cephalothorax marked as in *P. concinna* Th.; legs darker and with distinct blackish rings; sternum dark-brown; venter pale; abdomen black above, with a pale basal spear-mark, and behind two converging rows of pale spots, much more distinct than in *P. concinna*. The epigynum consists of an oval area, with a small cavity in its posterior portion nearly covered by a short lobe.

Three females, West Cliff, Colo. (Cockerell). Darker and slightly larger than *P. concinna* and with entirely different epigynum.

***Pardosa uncata* Thorell, (sub *Lycosa*).**

Two immature specimens from Ft. Collins (Baker), I believe belong to this species.

***Pardosa dorsalis*, sp. nov.**

Length 6 mm. Cephalothorax dark brown, head black, the usual pale central, constricted and geminated stripe very distinct; faint indications of a few very small lateral spots; sternum dark brown; legs yellow-brown, distinctly ringed with black on femora, tibiae and metatarsi; abdomen with an obscure pale stripe above, containing a basal, black-margined spear-mark, behind which is a series of transversal connected spots; venter brownish, paler at base. The epigynum consists of a cavity broader than long, nearly covered by a large rounded lobe, full as broad as long and slightly broader in the middle than at base.

One female, of the usual form of the genus but distinguished by its peculiar epigynum. West Cliff (Cockerell).

***Pardosa indagatrix* Thorell, (sub *Lycosa*).**

Several specimens which I refer to this species from Ft. Collins, under stones (Baker and Gillette).

***Pardosa iracunda* Thorell, (sub *Lycosa*).**

In the pale color of the patella of the male palpus this resembles *P. minima* Keys., but the palpal organ is quite different and the species is larger. One male and one female. Ft. Collins, Colo. (Baker). One male (Gillette).

***Pardosa atra*, sp. nov.**

Length 7 mm. Black, with an indistinct pale central mark on the cephalothorax, no lateral marks; sternum black; legs black and thickly black-haired, with indistinct pale rings on the tibiae and metatarsi, coxae with pale spots at base; abdomen black, with a broad but very obscure pale stripe above; venter pale on basal half, rest black. The epigynum consists of a red, oval area, with a cavity in the posterior portion, which is much the broader in front, and is divided by a clavate septum, narrower than the space each side.

One female, West Cliff (Cockerell).

***Trochosa cinerea* Fabr.**

Two specimens, Ft. Collins, Colo. (Baker), one from West Cliff (Cockerell).

***Trochosa parva*, sp. nov.**

Length 6—8 mm. Cephalothorax yellow, eye-region black, an irregular black stripe each side on the thoracic part, the margins black; mandibles blackish; sternum brownish, paler in the centre; coxae yellow; venter gray; legs yellow with many distinct black spots and bands; abdomen yellowish-gray above, with a basal black-margined spear-mark, and behind several black chevrons and spots. Head low; anterior row of eyes as long as second row; legs thickly clothed with fine erect hairs; sternum constricted between the hind coxae; epigynum a blackish lobe, longer than broad and emarginate behind; the male palpus is similar to that of *T. cinerea*, but the tarsus is not as slender and the tube has a little tooth above, the hook is quite long, slender and curved, the patella is barely longer than broad. This species shows the same variation in coloring as *T. polita* Em.; the small specimens have the sides of the cephalothorax shining blackish, and a pale space above; the abdomen is more densely spotted.

Several specimens, Ft. Collins, Colo., under stones. (Baker, and Gillette).

***Dolomedes scriptus* Heutz.**

One specimen, Ft. Collins (Baker).

***Pardosa sinistra* Th., *P. tristis* Th., and *P. impavida* Th.** are all unknown to me.

SYNOPSIS OF THE DIPTEROUS
genus **SYMPHOROMYIA.**

By D. W. COQUILLET, WASHINGTON, D. C.

The first representatives of this genus in North America were described in October, 1886; in that month Dr. Williston published descriptions of two new species in the Transactions Am. Ent. Society, Vol. XIII, page 287. In the following year, the late M. Bigot, of France, published descriptions of what purported to be six new species (Bulletin Soc. Ent. de France, 1887, pages 12 to 15), each founded on a single specimen; in a note, however, he acknowledges that his *picticornis* and *trivittata* are synonyms of Williston's *plagens* and *pachyceras* respectively. A careful study of his descriptions indicates that *atripes* and *comata* refer to one and the same species, and that this is but the female of *pachyceras* Will.; *fulvipes* appears to be but the other sex of *latipalpis*. This reduces his six names to one — *latipalpis*.

The following Table contains all the species of *Symphoromyia* known to me as occurring in North America; types of the new species have been deposited in the U. S. National Museum. I am indebted to Mr. W. A. Snow, of the Kansas State University, for kindly examining and reporting upon the types of Dr. Williston's two species:

- Antennæ black, the third joint yellowish; palpi and halteres brown.
 - Face of male bare, abdomen wholly black, shining . . . ♂ **plagens** Will.
- Antennæ black, the first joint yellowish; palpi and halteres yellow.
 - Abdomen of female opaque, gray pollinose, the sixth and following segments yellowish . . . ♀ **modesta**, sp. n.
- Antennæ wholly yellowish, palpi also yellowish.
 - Knob of halteres yellow, abdomen of female opaque, . . . ♂ ♀ **latipalpis** Bigot.
 - Knob of halteres black, abdomen of female shining . . . ♀ **limata**, sp. n.
- Antennæ wholly black.
 - Females.
 - Knob of halteres and palpi yellow, abdomen shining except on the first segment, labella soft and broad . . . **johnsoni**, sp. n.
 - Knob of halteres and palpi black.
 - Labella very slender, horny; a brown spot on thorax above each wing, abdomen opaque . . . **cruenta**, sp. n.
 - Labella broad and soft, no brown spots above wings, abdomen sub-shining . . . **pachyceras** Will.

Males.

Face hairy.

Proboscis rigid, porrect; body velvet-black, two vittae and lateral margins of thorax gray pollinose . . . **cruenta**, sp. n.

Proboscis soft, retracted.

Body gray pollinose, pile of palpi whitish . . . **johnsoni**, sp. n.

Body not gray pollinose, pile of palpi black . . . **pachyceras** Will.

Face bare, proboscis soft, retracted.

Pile of palpi, occiput and thorax largely whitish, body opaque, gray pollinose, proboscis five-sixths as long as the palpi **fera**, sp. n.

Pile of palpi, occiput and thorax largely black, proboscis less than one-half as long as the palpi.

Body opaque, gray pollinose, pile of abdomen largely whitish **trucis**, sp. n.

Body shining, nearly destitute of gray pollen, pile of abdomen largely black **pullata**, sp. n.

Symphoromyia modesta, sp. nov.

♀ — Black, the following parts brownish-yellow: first antennal joint, palpi, proboscis except the labium, halteres, sixth and following abdominal segments, and the legs excepting apices of tarsi; head and body opaque, gray pollinose, thorax marked with three blackish vittae besides a triangular spot above each wing; pile of head and its members largely black, that on lower part of occiput yellowish-white; pile of thorax, scutellum, dorsum of abdomen posteriorly, and of the legs largely black, that on each end of pleura and on base and sides of abdomen largely yellowish-white; proboscis rigid, shorter than the palpi, labium retractile, very robust; hind coxæ slightly produced forward near the apex, middle coxæ destitute of a pencil of bristles; wings grayish hyaline, stigma pale brown. Length 7 mm.

California. Three specimens, in May.

Symphoromyia limata, sp. nov.

♀ — Head black, opaque, gray pollinose; antennæ, palpi and proboscis except the labium, brownish-yellow; pile of front, antennæ and palpi largely black, that of occiput yellowish-white. Thorax and scutellum black, opaque, gray pollinose, the pile largely black; thorax marked with three dark brown vittae, the outer ones bordered internally with light gray; pile in front of halteres yellowish-white. Abdomen black, shining, not pollinose, the fifth and following segments brownish-yellow; pile of first segment and sides of the second yellowish-white, that on rest of abdomen largely black. Legs black, the underside and apex of femora, tibia and base of tarsi sometimes yellowish. Knob of halteres black; hind coxæ slightly produced forward near the apex, middle coxæ destitute of a pencil of bristles. Wings grayish-hyaline, stigma grayish-brown. Length 7 to 10 mm.

Southern California. Twenty females, in June.

Symphoromyia johnsoni, sp. nov.

♂ — Black, including the palpi and halteres, only the front and middle tibiae

and bases of their metatarsi yellow; pile of antennæ, face and upper part of occiput largely black, that of palpi and lower part of occiput white. Proboscis retractile, one-half as long as the palpi. Body opaque, gray pollinose, thorax marked with three faint brownish vittæ; pile of thorax and scutellum mixed black and white, that on the pleura and abdomen white, on apex of abdomen largely black. Middle coxæ at their tips in front bearing a pencil of stiff black bristles, equalling the coxæ in length and curving backward at their tips; hind coxæ before their apices in front produced forward in the form of a rounded knob one-half as long as the diameter of the coxa. Wings grayish hyaline, stigma brown.

♀ — Differs from the ♂ as follows: All tibiæ and tarsi black, halteres yellow. Proboscis yellow, rigid, slightly longer than the palpi; labium robust, retractile; face bare; bristles on middle coxæ black and yellow, not forming pencils; abdomen shining except on the first segment. Length 6.5 to 7 mm.

Washington (O. B. Johnson) and British Columbia (H. F. Wickham). One male and seven females.

Respectfully dedicated to Prof. Johnson, who has succeeded in unearthing many interesting forms of Diptera in his locality.

Symphoromyia cruenta, sp. nov.

♂ — Black, including the palpi and halteres, the pile also black or largely so. Head and body opaque velvety, not gray pollinose excepting two vittæ and the lateral margins of the thorax. Face pilose; proboscis rigid, slender, one-half longer than the palpi, labella slender. Hind coxæ only slightly produced near the apex in front, pile of middle coxæ not forming pencils. Wings gray, lighter toward the apex, stigma brown.

♀ — Differs from the ♂ as follows: Pile on sides of face, on palpi, occiput, abdomen and femora largely pale yellowish. Head and body brownish-gray pollinose, not velvety, thorax marked with three broad, brownish-black vittæ besides a triangular spot above each wing, the outer vittæ deeply emarginate near the front-end of this spot. Labium slender, elongate, horny. Length 6 to 8 mm.

Southern California. Sixteen males and twenty-eight females, in March and April. Both sexes were captured at the same time and place.

Symphoromyia truncis, sp. nov.

♂ — Black, including the palpi and knob of halteres, only the tibiæ sometimes yellowish. Pile of head and thorax largely black, that of the abdomen yellowish-white. Face bare; proboscis retractile, scarcely one-half as long as the palpi. Head and body opaque, gray pollinose, thorax marked with three lighter vittæ. Hind coxæ produced near the apex in front in the form of a rounded knob; pile of middle coxæ short, not forming pencils. Wings grayish, stigma brown. Length 7 mm.

Southern California. Three males, in March and April.

Symphoromyia fera, sp. nov.

♂ — Differs from the above description of *trucis* as follows: Pile of palpi, occiput, thorax, scutellum and legs largely or wholly yellowish-white; proboscis five-sixths as long as the palpi. Length 8 mm.

Colorado. Two males.

The side pieces of the hypopygium are compressed, and terminate in a downwardly directed claw, before which they are broadly dilated in a lobe on the under side.

Symphoromyia pullata, sp. nov.

♂ — Black, including the palpi and halteres. Pile also largely black, that in front of halteres and on sides of first abdominal segment sometimes largely whitish. Face bare; proboscis retractile, scarcely one-half as long as the palpi. Head and body sub-shining, not gray pollinose, thorax not vittate. Coxæ as in *trucis*. Wings grayish-hyaline, slightly yellowish along the costa, stigma dark-brown. Length 7 mm.

New Hampshire (Mrs. A. T. Slosson) and Colorado. Two males.

DESCRIPTION OF A NEW TREE-CRICKET.

By WM. BEUTENMÜLLER.

Æcanthus pini, sp. nov.

♂ — Head and antennæ testaceous; thorax somewhat paler, with a yellowish longitudinal stripe on each side above; eyes black; anterior pairs of legs testaceous; femora of posterior pair green, tibiæ testaceous; body beneath black with the sides yellowish-green; above blackish with a green stripe along the back; elytra transparent with the veins grass-green; hind wings slightly protruding beyond the elytra, veins also green. Length, from head to tip of body 12 mm.; Length of elytra 11 mm. Width 4.5 mm., Female somewhat paler than the male; tip of ovipositor black; the hind wings extend a little more beyond the elytra than in the male; size same.

Six males and four females. Windham Co., Connecticut.

Resembles *Æ. fasciatus*, but may be readily distinguished by the grass-green venation. The insect lives only on pine trees and usually on the high branches. Its song is a continuous, soft and metallic reeeeee, with numerous undulations. When many individuals are heard together, their stridulation sounds not unlike the jingling of sleighbells at a distance.

PRELIMINARY REVISION OF THE BOMBYCES OF AMERICA NORTH OF MEXICO.

By B. NEUMEGEN AND HARRISON G. DYAR.

(CONTINUED FROM PAGE 30.)

O. cinnamomea Grote & Robinson.

1866—*Parorgyia cinnamomea* GROTE & ROBINSON, Proc. Ent. Soc. Phil., Vol. VI, p. 6.

Cinnamon brown, markings all brown and rather obscure. Broken outline of reniform spot and terminal line black, pulverulent. Median space more or less whitish gray, the subterminal brown shade bordered outwardly by a whitish shade which becomes defined near internal angle. The peculiar brown shade is characteristic.

Habitat, Atlantic States.

O. achatina Abbot & Smith.

1797—*Phalena achatina* ABBOT & SMITH, Lep. Ins. Ga., Vol. II, pl. 77.

1866—*Parorgyia parallela* GROTE & ROBINSON, Proc. Ent. Soc. Phil., Vol. VI, p. 5.

var. tephra Hübner.

1805?—*Dasychira vulgaris tephra* HÜBNER, Samml. Exot. Schmett., Vol. I.

1866—*Parorgyia obliquata* GROTE & ROBINSON, Proc. Ent. Soc. Phil., Vol. VI, p. 4.

Fore wings ochraceous gray with white shade centrally around obsolete black ringed reniform. Basal, transverse anterior and transverse posterior lines black, irregular, sometimes partly absent. Between transverse posterior and subterminal lines a brown shade defined outwardly by the whitish subterminal line. Secondaries dull brownish with faint discal dot and outer band, or largely blackish. A black bar along submedian fold from base nearly to margin is present in the typical form. Expanse, 30—50 mm.

Habitat, Atlantic States to Texas and Mexico.

O. leucophæa Abbot & Smith.

1797—*Phalena leucophæa* ABBOT & SMITH, Lep. Ins. Ga., Vol. II, pl. 78.

1866—*Parorgyia clintonii* GROTE & ROBINSON, Proc. Ent. Soc. Phil., Vol. VI, p. 3.

var. basiflava Packard.1864—*Parorgyia basiflava* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 332.*var. atrivenosa* Palm.*1893—*Parorgyia atrivenosa* PALM, Journ. N. Y. Ent. Soc., Vol. I, p. 21.

Differs from *achatina* in the character of the subterminal shading, which is blackish brown, sharply defined outwardly by a series of darker or concolorous dashes, the one between veins 6 and 7 reaching almost to margin of wing. Median space largely shaded with white. There is occasionally a longitudinal black bar as in *achatina*.

Habitat, Atlantic States southwestward.

O. plagiata Walker.1855—*Acyphas plagiata* WALKER, Cat. Brit. Mus., pt. IV, p. 7991856—*Dasychira atomaria* WALKER, Cat. Brit. Mus., pt. VII, p. 1739.

Nearly uniform ochraceous gray, irrorate with black scales, reniform outlined in black on a white ground. Markings essentially as in *leucophaea*, from which this species differs in the uniform markings, not contrasted, and the heavy irrorations.

Habitat, Northern N. Y. and N. E., Rocky Mountains, Canada and Pacific Northwest.

Genus **Porthetria** Hübner.†1822?—*Porthetria* HÜBNER, Verz. bek. Schmett., p. 160.**P. dispar** Linnaeus.1758—*Bombyx dispar* LINNAEUS, Syst. Nat., Vol. I, p. 501, n. 27.

♂ Smoky brown, paler on primaries centrally beyond cell, with dark brown dentate transverse anterior and transverse posterior and subterminal lines: two discal dots, outer one lunate. Fringe spotted with dusky. Expanse, 25 mm.

♀ White, tip of abdomen brown. Lines on primaries as in the ♂, smoky brown with a central shade below the outer discal dot. Fringe spotted with brown. Antennæ black. Expanse, 45 mm.

Habitat, Medford, Massachusetts, and vicinity; Europe. [Introduced.]

Genus **Dasychira** Hübner.1810—*Dasychira* HÜBNER, Tentamen, p. 1.*I consider this a valid species and not a variety of *leucophaea*.—Wm. Beutenmüller.†This name should be replaced by *Lymantria* Hübn. See Hampton, Moths of India, Vol. I, p. 459.—H. G. Dyar.

Synopsis of species.

Secondaries yellowish with black border **rossii**.
 Secondaries uniformly smoky blackish **grœnlandica**.

D. rossii *Curtis*.

1835—*Larva rossii* CURTIS, 2d Voyage, Ross, App., p. 70.

Blackish gray, transverse anterior and transverse posterior lines and discal dot black, pulverulent, indistinct, the lines undulate. A dentate irregular subterminal line, faint between veins 1 and 2, becoming a large round black spot bordered outwardly by white, with which color all the lines are obscurely defined. Secondaries black, with a large central area pale sordid yellow. Expanse, 35 mm.

Habitat, Arctic regions.

D. grœnlandica *Homeyer*.

1874—*Dasychira grœnlandica* HOMEYER, 2te Deutsche Nordpolarfahrt, Vol. II, p. 469.

1892—*Dasychira grœnlandica* SKINNER & MENGEL, Proc. Acad. Nat. Sci. Phil. Smoky black, sub-diaphanous; primaries of ♂ with the veins marked in black; ♀ nearly devoid of markings. [Skinner & Mengel.]

Habitat, Greenland.

[NOTE. The following three genera, which may all be Noctuids, are included here until their proper relations are better known; since if looked for among the Bombyces, they fall into the present location in our synopsis of families.]

Genus **Acherdoa** *Walker*.

1865—*Acherdoa* WALKER, Cat. Brit. Mus., pt. XXXII, p. 451.

1884—*Varina* NEUMEGEN, Papilio, Vol. IV, p. 94; 1892—SMITH, Can. Ent., Vol. XXIV, p. 135; 1893—PACKARD, Can. Ent., Vol. XXV, p. 151.

A. ferraria *Walker*.

1865—*Acherdoa ferraria* WALKER, Cat. Brit. Mus., pt. XXXII, p. 451.

1884—*Varina ornata* NEUMEGEN, Papilio, Vol. IV, p. 94.

Reddish brown, secondaries brownish black. Basal, transverse anterior and transverse posterior narrow black lines, the two latter with a broad distinct white edging on the lower half: between them the wing is deep brown with a black shade. A minute orbicular and larger eniform, pale brown discal spots, the latter bordered with white. A pale subterminal line, often obsolete superiorly, near internal angle defined by several large pulverulent black marks. A narrow terminal black line. Between basal and

transverse anterior lines, below median vein, a diffuse, rusty-brown patch. Expanse, 25 mm.

Habitat, Southern States.

Genus **Dyaria** *Neumøgen*.

1893—*Dyaria* NEUMØGEN, Can. Ent., Vol. XXV, p. 213.

D. singularis *Neumøgen*.

1893—*Dyaria singularis* NEUMØGEN, Can. Ent., Vol. XXV, p. 215.

Gray; thorax with distinct brown irrorations; abdomen hairy, brownish. Color of wings pale gray, slightly silvery. T. a. line narrow, black, arcuate, inclosing a grizzled black and brown basal space with an elevated tuft below median vein. Median space irrorate with black with a tuft in the cell. T. a. line arcuate outwardly over the sub-costal nervures, inwardly below; black, edged outwardly with sordid white, the upper curve filled in with blackish brown. A submarginal row of round spots, white outwardly, and terminal elongate marks. Secondaries similarly marked, rather less distinctly and without tufts. Expanse, 28 mm.

Habitat, Northern Atlantic States (?)

Genus **Aon** *Neumøgen*.

1893—*Aon* NEUMØGEN, Ent. News, Vol. III, p. 258.

A. noctuiformis *Neumøgen*.

1893—*Aon noctuiformis* NEUMØGEN, Ent. News, Vol. III, p. 258.

Primaries gray with black discal dot and black irrorations especially toward base. A dull reddish shade extending upward from internal margin. Subterminally and terminally the veins are indicated in black, with irregular black shadings on terminal third of wings, divided submarginally by a pale ochereous shade which spreads up from the internal angle, narrowing superiorly and cut by the black veins. In the interspace between veins 6 and 7, a pale gray shade. Secondaries pale whitish. Body parts gray. Expanse, 29 mm.

Habitat, Texas.

Family DREPANIDÆ.

Synopsis of genera.

Accessory cell either absent or very long and narrow.

No accessory cell; veins 7 and 8 of hind wings united outwardly **Eudeilinia**.

Accessory cell present; veins 7 and 8 free **Oreta**.

Accessory cell present, broad, distinct.

Outer margin of primaries entire, falcate **Platypteryx.**

Outer margin deeply excavate at the termination of the veins . . . **Falcaria.**

Genus **Eudeilinia** Packard.*

1876—*Eudeilinia* PACKARD, Mono. Geom. Moths, U.S. Geol. Surv. (Hayden), Vol. X, p. 303.

E. herminiata Guenée.

1857—*Corycia herminiata* GUENÉE, Phal., Vol. II, p. 58.

1873—*Eudeilinia biseriata* PACKARD, 5th Rept. Peab. Acad., p. 68.

White; fore and middle legs blackish brown beneath. Both with t. a. and t. p. bands of indistinct smoky spots on the veins, the t. p. band broadly sinuate. Two discal dots on the under side of both wings. Expanse, 28 mm.

Habitat, Northern Atlantic States.

Genus **Oreta** Walker.

1855—*Oreta* WALKER, Cat. Brit. Mus., pt. V, p. 1166.

1863—*Dryopteris* GROTE, Proc. Ent. Soc. Phil., Vol. I, p. 346.

Synopsis of species.

Pale dull rose color, with yellow band **rosea.**

Uniformly dull rose color with no yellow band **irrorata.**

O. rosea Walker.

1855—*Drepana rosea* WALKER, Cat. Brit. Mus., pt. V, p. 1164.

1856—*Cilix americana* HERRICH-SCHLEFFER, Ausser. Schmett., Vol. I, f. 470.

1862—*Platypteryx formula* GROTE, Proc. Acad. Nat. Sci. Phil., 1862, p. 60.

var. marginata Walker.

1855—*Drepana marginata* WALKER, Cat. Brit. Mus., pt. V, p. 1165.

Yellow, fore legs brick red; thorax, two-thirds of primaries and basal half of secondaries, pale brownish rose color, slightly strigose. A darker, more purplish, marginal border on primaries, darkest at apex, with two rounded spots at internal angle, and the apex of secondaries of the same color. Two minute white discal dots on primaries. Expanse, 25 mm.

In the *var. marginata*, the rose-color shading at the bases of the wings becomes very obscure, leaving them largely yellow except for the dark outer border.

Habitat, Northern Atlantic States.

O. irrorata Packard.

1864—*Dryopteris irrorata* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 377.

* Prof. J. H. Comstock has very kindly called my attention to this genus. I find our species closely related to *Anzata* Wlk. (See Kirby, Cat. Lep. Het., Vol. I, p. 735.)—H. G. Dyar.

Dull rose color throughout, more reddish than *rosea*, with brown strigæ and irrorations. At t. a. and t. p. irregular dark line, the latter duplicated by a streak from apex. Secondaries with three faint transverse blackish lines. Expanse, 35 mm.

Habitat, Northern New York, New England, Canada.

Genus **Platypteryx** *Laspeyres*.

1803—*Platypteryx* LASPEYRES, Neue Schrift. Ges. Nat. Freunde Berl., Vol. IV, p. 29.

1822—*Drepana* HÜBNER, Verz. bek. Schmett., p. 149.

P. arcuata *Walker*.

1855—*Drepana arcuata* WALKER, Cat. Brit. Mus., Vol. V, p. 1164.

1862—*Platypteryx fabula* GROTE, Proc. Acad. Nat. Sci. Phil., p. 59.

dim. form genicula *Grote*.

1862—*Platypteryx genicula* GROTE, Proc. Acad. Nat. Sci. Phil., p. 59.

1834—?*Drepana fasciata* STEPHENS, Ill. Brit. Ent. Haust., Vol. IV, p. 8 ;

1856—WALKER, Cat. Brit. Mus., Vol. IV, p. 1163.

race siculifer *Packard*.

1872—*Drepana siculifer* PACKARD, Peab. Acad. Sci., Vol. IV, p. 87.

Pale ochereous or pale straw-yellow with two black discal dots and four narrow undulating bands beside a rusty-brownish one which is straight and runs to apex into a purplish cloud. Secondaries marked with similar undulating bands, most distinct on internal margin.

The form *genicula* is dark-yellow and less distinctly marked.

Habitat, Northern Atlantic States.

The race *siculifer* is larger and more distinctly marked.

Habitat, California and Pacific Northwest.

Genus **Falcaria** *Haworth*.

1809—*Falcaria* HAWORTH, Lep. Brit., Vol. II, p. 147.

1864—*Edaapteryx* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 275.

F. bilineata *Packard*.

1864—*Edaapteryx bilineata* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 376.

dim. form levis *Hudson*.

1893—*Prionia levis* HUDSON, Can. Ent., Vol. XXV, p. 24.

Light yellowish; secondaries very pale. Primaries covered with brown striæ and crossed by two parallel, straight, brown lines. A minute brown discal dot. Outer margin faintly shaded with brown. This species is three brooded. The third brood, the form *levis*, lacks the strigæ.

Habitat, Northern Atlantic States.

Family PYROMORPHIDÆ.

Synopsis of genera.

Subcostal veins from cell, unbranched ; size small	Acoloithus.
Subcostal veins partly stalked or 8 and 9 approximate at origin.	
Wings broad, rounded.	
Costa very convex ; wing broad	Pyromorpha.
Costa straight or nearly so, wings more elongate	Tripocris.
Wings very narrow, elongate	Harrisina.

Genus **Acoloithus** *Clemens.*

1861—*Acoloithus* CLEMENS, Proc. Acad. Nat. Sci. Phil., 1860, p. 539.

A. falsarius *Clemens.*

1861—*Acoloithus falsarius* CLEMENS, Proc. Acad. Nat. Sci. Phil., 1860, p. 540.

1864—*Harrisina sanborni* PACKARD, Proc. Essex Inst., Vol. IV, p. 32.

Entirely black, with very narrow reddish collar. Expanse, 18—20 mm.

Habitat, Atlantic States westward.

Genus **Pyromorpha** *Herrich-Schäffer.*

1854—*Pyromorpha* HERRICH-SCHLEFFER, Saml. Ausser. Schmett., Vol. I, f. 222.

1861—*Malthaca* CLEMENS, Proc. Acad. Nat. Sci. Phil., 1860, p. 540.

P. dimidiata *Herrich-Schäffer.*

1854—*Pyromorpha dimidiata* HERRICH-SCHLEFFER, Saml. Ausser. Schmett., Vol. I, f. 222.

1854—*Lycomorpha centralis* WALKER, Cat. Brit. Mus., pt. II, p. 288.

1861—*Malthaca perlucidula* CLEMENS, Proc. Acad. Nat. Sci. Phil., 1860, p. 541.

Black, the wings translucent with a pale buff patch on basal half of primaries above vein 1 b. Expanse, 25 mm.

Habitat, Atlantic States.

Genus **Tripocris** *Grote.*

1873—*Tripocris* GROTE, Bull. Buff. Soc., Vol. I, p. 35.

Synopsis of species.

Body ocher yellow	fusca.
Abdomen black dorsally.	
Body or wings more or less colored.	
Thorax black centrally and on patagia.	

Primaries yellow, except along costa and outer margin	rata.
Primaries red except outer part of wing	latercula.
Thorax colored.	
Head, thorax and most of primaries pinkish red	constans.
These parts ocher yellow	<i>var.</i> sancta.
Body and wings entirely black.	
Black with metallic reflection	smithsonianus.
Brownish black, the veins prominent	marteni.

T. fusca Hy. *Edwards.*

1884—*Pyromorpha fusca* HY. EDWARDS, Papilio, Vol. IV, p. 43.

Thorax and abdomen ochraceous; head and wings black, the latter translucent. Expanse, 25 mm.

Habitat, Arizona.

T. rata Hy. *Edwards.*

1882—*Lycomorpha rata* HY. EDWARDS, Vol. II, p. 124.

Black; collar and lateral line on abdomen ochraceous. Primaries dark ocher with broad outer border (one-fourth of wing) and narrow costal edge and basal half of secondaries ocherous. Expanse, 18 mm.

Habitat, Arizona.

T. latercula Hy. *Edwards.*

1882—*Lycomorpha latercula* HY. EDWARDS, Papilio, Vol. II, p. 124.

Black; primaries light red, outer fourth black, this color produced narrowly half way to base along costa and internal margin. Costal edge of secondaries red. Expanse, 20 mm.

Habitat, Arizona.

T. constans Hy. *Edwards.*

1881—*Lycomorpha constans* HY. EDWARDS, Papilio, Vol. I, p. 81.

var. **sancta** Neumogen & Dyar.

Head, collar and thorax pinkish red; abdomen black; primaries light orange or reddish with outer margin (one-fourth) black. Costal edge of secondaries narrowly orange. Expanse, 18 mm.

Habitat, Arizona.

The *var. sancta* has the orange parts ochraceous on both body and wings, the black border of primaries narrower.

Habitat, New Mexico.

T. smithsonianus Clemens.

1861—*Procris smithsonianus* CLEMENS, Proc. Acad. Nat. Sci. Phil., 1860, p. 540.

Entirely black; wings subtranslucent with slight bluish reflection. Expanse, 20 mm.

Habitat, Texas, New Mexico.

T. martenii *French.*

1884—*Triprocris martenii* FRENCH, *Papilio*, Vol. III, p. 191.

Brownish black, translucent; veins appearing distinctly, not obscured by the vestiture. Expanse, 24 mm.

Habitat, Arizona.

Genus **Harrisina** *Packard.*

1864—*Harrisina* PACKARD, *Proc. Essex Inst.*, Vol. IV, p. 31.

Synopsis of species.

Collar black	coracina.
Collar red.	
Size medium (20—30 mm.); black, slightly metallic.	
Collar orange	americana.
Collar, base of patagia and underside of head and breast orange	australis.
Larger (40 mm.) lustrous bluish green	metallica.

H. coracina *Clemens.*

1861—*Aglaope coracina* CLEMENS, *Proc. Acad. Nat. Sci. Phil.*, 1860, p. 539.

1887—*Harrisina nigrina* GRÆF. *Ent. Amer.*, Vol. III, p. 41.

Entirely dull black, the abdomen with a bluish lustre. Expanse, 20 mm.

Habitat, Texas.

H. americana *Guérin.*

1829—44—*Aglaope americana* GUÉRIN, *Icon. R. Anim. Ins.*, p. 500, pl. 84 bis f. 11.

1872—*Harrisina texana* STRETCH, *Zyg. & Bomb. N. A.*, Vol. I, p. 181.

Black; the wings subtranslucent. Collar broadly orange red narrowing to a line on the under side. Expanse, 25 mm.

Habitat, Atlantic States westward to the Mississippi Valley and Texas.

H. australis *Stretch.*

1885—*Harrisina australis* STRETCH, *Ent. Amer.*, Vol. I, p. 102.

Greenish black; prothorax reddish orange, the color extending to the base of the patagia, under side of head, and breast. Expanse, 29 mm.

Habitat, Florida [Stretch].

H. metallica *Stretch*.1885—*Harrisina metallica* STRETCH, Ent. Amer., Vol. I, p. 102.

Lustrous bluish green, with the wings a shade yellower than the abdomen. Prothorax orange, the color not extending to the head. Expanse, 40 mm.

Habitat, New Mexico [Stretch].

Family LIMACODIDÆ.

Synopsis of genera.

Primaries without accessory cell.

Antennæ of ♂ pectinated on basal third.

Vein 10 on a stalk from end of cell.

Vein 10 given off before vein 7; sexes similar.

Body parts robust **Euclea.**

Body parts more slender **Monoleuca.**

Vein 7 given off before vein 10.

Vein 6 from upper part of cross vein; 9 and 10 forming wide angles **Sisyrosea.**

Vein 6 from middle of cross vein; 9 and 10 forming rather acute angles.

Body parts robust; sexes very dissimilar **Phobetron.**

Body parts more slender; sexes alike (?) **Semyra.**

Vein 10 from sub-costal on cell.

Primaries 11-veined; vein 7 wanting **Adoneta.**

Primaries 12-veined.

Internal margin of primaries straight **Parasa.**

Internal margin slightly excavate **Sibine.**

Antennæ of ♂ simple, thickened at base.

Vein 7 from near apex of cell, close to subcostal.

Vein 10 from a stalk **Eulimacodes.**

Vein 10 from sub-costal **Apoda.**

Vein 7 from the cross-vein, as near to vein 6 as to the sub-costal.

Vein 10 from a stalk **Heterogenea.**

Vein 10 from sub-costal.

Apices of primaries rectangular **Tortricidia.**

Apices rounded **Packardia.**

Primaries with large accessory cell (see *Zenzera* etc. in Cossidæ).

Genus **Euclea** *Hübner*.

1822?—*Euclea* HÜBNER, Verz. Bek. Schmett., p. 149.

Synopsis of species and varieties.

Thorax brown.

Green of primaries not covering cell.

Spots rounded, discal dot round **nana.**

Spots angular, discal dot elongated.

Wing dark brown.

Small basal and sub-apical green spots **delphinii.**

Basal patch large, bifid *var.* **querceti.**

Patches connected by a row of dots *var.* **interjecta.**

Green forming a continuous band *var.* **viridiclava.**

Wing ferruginous brown, or paler *var.* **ferruginea.**

Green of primaries covering cell.

Sinus in the green patch filled in with rust-red.

Discal dot absent **pænulata.**

Discal dot present *var.* **elliottii.**

Sinus obsolescent, not discolored **incisa.**

Thorax green **indetermina.**

E. nana Dyar.

1891—*Euclea nana* DYAR, Ent. News, Vol. II, p. 61; 1891—Trans. Am. Ent. Soc., Vol. XVIII, p. 150.

Deep reddish brown. A punctiform black discal dot. A large bifid green patch with silver border, resting on internal margin, well rounded and succeeded by a ferruginous patch divided by vein 1. A sub-apical small circular green patch. Secondaries paler. Expanse, 15 mm.

Habitat, Florida.

E. delphinii Boisduval.

1832—*Limacodes delphinii* BOISDUVAL, Cuvier An. King. (Griffith), pl. ciii. f. 6.

1832—*Limacodes strigata* BOISDUVAL, Cuvier An. King. (Griffith), pl. ciii. f. 7.

1854—*Limacodes quercicola* HERRICH-SCHLEFFER, Saml. Ausser. Schmett., f. 175.

1860—*Nochelia tardigrada* CLEMENS, Proc. Acad. Nat. Sci. Phil., Vol. XII, p. 160.

1891—*Euclea cippus* DYAR, Trans. Am. Ent. Soc., Vol. XVIII, p. 151.

var. **querceti** Herrich-Schüffer.

1854—*Limacodes querceti* HERRICH-SCHLEFFER, Saml. Ausser. Schmett., f. 174.

1864—*Euclea bifida* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 338.

var. **interjecta** Dyar.

1891—*Euclea cippus* var. *interjecta* DYAR, Ent. News, Vol. II, p. 61.

var. **viridiclava** Walker.

1855—*Euclea viridiclava* WALKER, Cat. Brit. Mus., Vol. V, p. 1154.

1864—*Euclea monitor* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 337.

var. **ferruginea** Packard.

1864—*Euclea ferruginea* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 337.

Deep reddish brown with oval discal dot. A small triangular sub-basal green patch separated by a silvery line from a larger

ferruginous patch. A minute triangular sub-apical green dot also succeeded by ferruginous. Expanse, 17—22 mm.

Habitat, Atlantic States to Canada and westward.

var. querceti.—The basal patch throws out a green line over the ferruginous patch.

var. interjecta.—The end of this green line is connected with the sub-apical dot by a row of additional dots.

var. viridiclava.—The green marks fused into a continuous band.

var. ferruginea.—Differs only in the ground color which is paler, being less brown and more ferruginous or ochereous.

Habitat, Atlantic States.

E. pænulata Clemens.

1860—*Empretia pænulata* CLEMENS, Proc. Acad. Nat. Sci. Phil., Vol. XII, p. 159.

var. elliottii Pearsall.

1887—*Euclea elliottii* PEARSALL, Ent. Amer., Vol. II, p. 209.

Differs from *delphinii* only in that the green coloration covers the discal cell, extending to the base of the wing, and forming a large triangular indented patch as in *incisa*. The black discal dot is frequently present.

Habitat, Northern Atlantic States westward.

E. incisa Harvey.

1876—*Parasa incisa* HARVEY, Can. Ent., Vol. VIII, p. 5.

Thorax and primaries dark wood-brown except for a large green patch covering most of primaries, slightly indented above internal angle. Abdomen and secondaries pale stramineous, with fringe brownish. Expanse, 18—25 mm.

Habitat, Texas.

E. indetermina Boisduval.

1832—*Limacodes indetermina* BOISDUVAL, Cuvier An. King. (Griffith), pl. 103, f. 8.

1864—*Limacodes viridis* REAKIRT, Proc. Ent. Soc. Phil., Vol. III, p. 251.

1864—*Callochloa vernata* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 339.

Thorax green, abdomen ochereous brown. Primaries crossed by a very broad green band which reaches base at internal margin leaving a triangular space at costa and terminal space blackish wood-brown, with blackish shade centrally on external margin. Secondaries ochereous brown, pale at base.

Habitat, Atlantic States.

Genus **Monoleuca** Grote & Robinson.

1869—*Monoleuca* GROTE & ROBINSON, Trans. Am. Ent. Soc., Vol. II, p. 187.

Synopsis of species.

Transverse band upright.

Band white.

Band narrow ; preceded by a ferruginous shade **subdentosa.**

Band wider ; wing concolorous **semifascia.**

Band yellow **sulfurea.**

Transverse band oblique **obliqua.**

M. subdentosa Dyar.

1891—*Monoleuca subdentosa* DYAR, Trans. Am. Ent. Soc., Vol. XVIII, p. 156.

Brown, secondaries paler. Half band on centre of internal margin narrow, twice regularly undulate, preceded by a brighter brown shade.

Habitat, Florida.

M. semifascia Walker.

1855—*Limacoides semifascia* WALKER, Cat. Brit. Mus., pt. V, p. 1151.

Uniform deep brown ; secondaries paler. The white half band is straight near internal margin but becomes broadened and irregularly waved at the middle of the wing.

Habitat, Southern States to Texas.

M. sulfurea Grote.

1880—*Monoleuca sulphurea* GROTE, North Am. Ent., Vol. I, p. 60.

Uniform brown ; the half band reaches median vein ; straight, with minute dentose projections silvery white with a slight yellow tinge.

Habitat, Florida.

M. obliqua Hy. Edwards.

1886—*Monoleuca obliqua* HY. EDWARDS, Ent. Amer., Vol. II, p. 10.

Uniform brown, the silvery white line very oblique, running almost to base. ♂ antennæ very shortly pectinated and only for basal third. Secondaries much paler than fore wings.

Habitat, Florida.

Genus **Sisyrosea** Grote.

1876—*Sisyrosea* GROTE, Can. Ent., Vol. VIII, p. 112.

1864—*Isa* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 347 ; 1891—DYAR, Ent. News, Vol. II, p. 156.

1892—*Sosiosa* KIRBY, Cat. Lep. Hel., Vol. I, p. 551.

Synopsis of species.

Wings without distinct lines **inornata.**

Two transverse parallel dark lines **nasoni.**

S. inornata Grote & Robinson.

1867—*Limacodes inornata* GROTE & ROBINSON, Ann. Lyc. N. Y., Vol. VIII, p. 372.

♂ Flesh brown centrally on primaries, shaded broadly at base and external margin with rusty-brown and purplish. Hind wings chocolate brown. ♀ entirely flesh-brown, slightly chocolate tinted especially on secondaries, showing hardly a trace of the shading of the ♂. Expanse, 15—20 mm.

Habitat, Northern Atlantic States.

S. nasoni Grote.

1876—*Sisyrosea nasoni* GROTE, Can. Ent., Vol. VIII, p. 112.

1882—*Limacodes rude* HY. EDWARDS, Papilio, Vol. II, p. 12.

Pale brownish; primaries with two oblique parallel dark brown lines, the outer sub-terminal, both faintly pale bordered outwardly. Expanse, 25—32 mm.

Habitat, Southern States.

Genus **Phobetron** Hübner.

1827?—*Phobetron* HÜBNER, Verz. bek. Schmett., p. 398.

1841—*Ecnomidea* WESTWOOD, Nat. Lib. Ex. Moths, p. 183.

P. pithecium Abbot & Smith.

1797—*Phalena pithecium* ABBOT & SMITH, Lep. Ins. Ga., Vol. II, pl. 74.

1827—*Phobetron abbotana* HÜBNER, Verz. bek. Schmett., p. 398.

1864—*Thyridopteryx nigricans* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 350.

1864—*Limacodes hyalinus* WALSH, Proc. Bost. Soc. N. H., Vol. IX, p. 299.

1864—*Limacodes? tetradactylus* WALSH, Proc. Bost. Soc. N. H., Vol. IX, p. 300.

♂ Black, the tibiae of middle legs with straw-yellow hairs. Wings smoky hyaline with black borders, broad on anal margin of secondaries. Thorax tufted with black and brown; a blackish discal dot on primaries.

♀ Fore wings opaque, wood-brown, shaded over with black, especially at base and apex. Three transverse brown-black bands, basal, median, and transverse posterior, the first two sometimes obsolete, the outer dentate inwardly, appearing as if produced into contiguous finger shaped processes, into which a blackish median shading extends. An obscure discal dot either pale or blackish. Fringe deep brown. Secondaries blackish; a terminal wood-brown shade. Expanse, 17—25 mm.

Habitat, Atlantic States westward.

Genus *Semyra* Walker.

1855—*Semyra* WALKER, Cat. Brit. Mus., pt. V, p. 1130.

S. beutenmuelleri Hy. Edwards.

1887—*Limacodes beutenmuelleri* HY. EDWARDS, Can. Ent., Vol. XIX, p. 145.

Squammation and aspect of ♀ *Phobetron pithecium*. Primaries deep-brown, irrorate with bluish scales, with irregular patches of pale ochereous at middle of costa, beyond cell and along internal margin, these spots scarcely confluent. The apex, to middle of outer margin, pale ochereous. Secondaries blackish. Thorax with the colors of primaries intermixed; abdomen brown. Expanse, 22 mm. ♂ unknown.

Habitat, Florida.

Genus *Adoneta* Clemens. ✓

1860—*Adoneta* CLEMENS, Proc. Acad. Nat. Sci. Phil., Vol. XII, p. 158.

Synopsis of species.

Fore wings brown, shaded with blackish and gray.

Moderate in size, 18—20 mm., slightly shaded **spinuloides.**

Very small, 14—15 mm., darkly shaded **pygmæa.**

Fore wings quite uniform, not shaded **leucosigma.**

A. spinuloides Herrich-Schäffer.

1854—*Limacodes spinuloides* HERRICH-SCHLEFFER, Saml. Ausser. Schmett., Vol. I, ff. 187—8.

1860—*Adoneta voluta* CLEMENS, Proc. Acad. Nat. Sci. Phil., Vol. XII, p. 158.

1865—*Limacodes ferrigera* WALKER, Cat. Brit. Mus., pt. XXXII, p. 486.

Primaries chocolate brown with oval black discal spot and large terminal spots; a sub-basal and sub-apical narrow transverse white streak, on internal margin and costa respectively, the sub-apical one curved and the two connected by an arcuate row of black dots. Within these lines, the wing is shaded with whitish and black, and in some specimens, these shades prevail sub-terminally also. Secondaries pale brown. Expanse, 18—20 mm.

Habitat, Atlantic States.

A. pygmæa Grote & Robinson.

1868—*Adoneta pygmæa* GROTE & ROBINSON, Trans. Am. Ent. Soc., Vol. II, p. 189.

Primaries brownish or wholly suffused with blackish with white linear marks as in *spinuloides*. No terminal line. Expanse, 14—15 mm.

Habitat, Texas.

A. leucosigma Packard.1864—*Cyclopteryx leucosigma* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 345.

Cinnamon brown with white marks and a curved row of black dots as in *spinuloides*, but without whitish and black shadings. A dark linear discal spot. Expanse, 18 mm.

Habitat, Atlantic States to Texas.

Genus **Parasa** Moore.1859—*Parasa* MOORE, Cat. Lep. Mus. E. I. C., Vol. II, p. 413.1864—*Callochloa* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 339.**P. chloris** Herrich-Schäffer.1854—*Neura chloris* HERRICH-SCHÄFFER, Saml. Auss. Schmett., Vol. I, f. 176.1881—*Parasa fraterna* GROTE, Papilio, Vol. I, p. 5.

Thorax green, abdomen brown. Fore wings crossed by a broad green band which reaches base at internal margin. Terminal space evenly brown. Secondaries ochreous, outer third brown. Expanse, 18—22 mm.

abitat, Northern Atlantic States.

Genus **Sibine** Herrich-Schäffer.1855—*Sibine* HERRICH-SCHÄFFER, Saml. Auss. Schmett., Vol. I, p. 7.1860—*Empretia* CLEMENS, Proc. Acad. Nat. Sci. Phil., Vol. XII, p. 1551866—*Eupalia* WALKER, Cat. Brit. Mus., pt. XXXV, p. 1927.1878—*Neomiresa* BUTLER, Trans. Ent. Soc. Lond., p. 74.**S. stimulea** Clemens.1860—*Empretia stimulea* CLEMENS, Proc. Acad. Nat. Sci. Phil., Vol. XII, p. 158.1869—*Limacodes ephippiatus* HARRIS, Corresp., p. 301, pl. 1, ff 7, 8, pl. 2, f. 10.

Thorax and fore wings lustrous deep seal brown. Secondaries and abdomen chocolate brown. A blackish shade in cell and below median vein. Two or three minute white dots sub-apically and another below median vein beyond base. Expanse, 15—25 mm.

Habitat, Atlantic States, especially southward.

Genus **Eulimacodes** Möschler.1878—*Eulimacodes* MÖSCHLER, Verh. Zool.-Bot. Ges. Wien., Vol. XXVII, p. 672.*Synopsis of species.*

Costal portion of wing brown, contrasting with portion at internal margin

scapha-
trigona.

Ground of color of wing uniform

E. scapha *Harris.*

1841—*Limacodes scapha* HARRIS, Rep. Ins. Mass., p. 303; 1864—WALSH, Proc. Bost. Soc. N. H., Vol. IX, p. 298.

1855—*Limacodes undifera* WALKER, Cat. Brit. Mus., pt. V, p. 1149.

Wood-brown. Costal area of primaries deep reddish brown, enclosing a black discal dot and separated by a very much curved silvery line from the rest of the wing. The silvery color spreads downward, gradually fading into wood-brown. Secondaries chocolate brown. Expanse, 25 mm.

Habitat, Atlantic States westward.

E. trigona *Hy. Edwards.*

1882—*Limacodes trigona* Hy. EDWARDS, Papilio, Vol. II, p. 12

Pale wood-brown, secondaries pale chocolate but paler than in *scapha*: at base of primaries, is a rounded triangular silvery white mark, surrounded by a chocolate brown cloud which obtains faintly at apex also. Antennæ with distinct serrations, but not pectinate. Expanse, 30 mm.

Habitat, Arizona.

Genus **Apoda** *Haworth.*

1809—*Apoda* HAWORTH, Lep. Brit., Vol. II, p. 137.

1810?—*Cochlidion* HÜBNER, Tentamen, p. 2.

1825—*Limacodes* LATREILLE, Fam. Nat., p. 474.

Synopsis of species.

Space included by transverse maculation, discolorous.

Fore wings wood-brown **biguttata.**

Fore wings ocherous.

A spot of ground color at internal angle **rectilinea.**

No distinct spot at internal angle *var.* **latomia.**

Ground color of wing concolorous.

Size moderate: expanse, 27 mm **y-inversa.**

Size smaller: expanse, 20 mm *var.* **parallela.**

A. biguttata *Packard.*

1864—*Limacodes biguttata* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 341.

1865—*Limacodes tetraspilaris* WALKER, Cat. Brit. Mus., Vol. XXXII, p. 486.

Wood-brown, secondaries blackish. A very broad inverted Y-shaped paler band across the wing, defined by its whitish borders and cutting off at apex and at internal margin a triangular space which is of a contrasting dark ocherous brown. Expanse, 20—25 mm.

Habitat, Northern Atlantic States.

A. rectilinea *Grote & Robinson.*

1868—*Lithacodes rectilinea* GROTE & ROBINSON, Trans. Am. Ent. Soc., Vol. II, p. 188.

var. latomia Harvey.1875—*Limacodes latomia* HARVEY, Can. Ent., Vol. IX, p. 75.

Ochraceous brown, secondaries paler. Space between the oblique blackish transverse lines discolorous, grayish. Apex concolorous with base. A spot of ground color at internal angle, absent in the *var. latomia*. Expanse, 22 mm.

Habitat, Southern States.**A. y-inversa** Packard.1864—*Limacodes y-inversa* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 341.*var. parallela* Hy. Edwards.1886—*Limacodes parallela* HY. EDWARDS, Ent. Amer., Vol. II, p. 10.

Brownish ochereous, secondaries paler. An oblique brown line from middle of costa to basal third of internal margin. Another reversed oblique line from outer one-third of costa to above internal angle on exterior margin; a third fainter line, parallel to the first, reaching from outer third of internal margin to middle of the second line. Expanse, 25 mm.

The *var. parallela* has the sub-apical oblique line nearer the apex, and is smaller. Expanse, 20 mm.

Habitat, Atlantic States.Genus **Heterogenea** Knoch.1793—*Heterogenea* KNOCH, Beitr. Insect., Vol. III, p. 60.*Synopsis of species.*

Wings partly obscured by brown shades	cæsonia.
Wings with lines only	flexuosa.

H. cæsonia Grote.1880—*Limacodes cæsonia* GROTE, North Am. Ent., Vol. I, p. 60.1864—? *Heterogenea shurtleffii* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 346.

Ochereous, a large blackish brown patch occupying the centre of the wing, filling in the normal maculation, but leaving a spot of the ground color centrally and at internal angle or extending diffusely to apex and rendering the whole wing brownish except the basal third. Secondaries blackish, ochereous at base. Expanse, 18—23 mm.

Habitat, Northern Atlantic States.**H. flexuosa** Grote.1854—? *Limacodes textula* HERRICH-SCHLEFFER, Auss. Schmett., Vol. I, f. 184.1880—*Limacodes flexuosa* GROTE, North Am. Ent., Vol. I, p. 60.1887—*Lithacodia graffi* PACKARD, Ent. Amer., Vol. III, p. 52.

Ocherous, the fore wings darker, more brownish. Markings like *A. γ-inversa*, but confused and indistinct. Expanse, 15—22 mm.
Habitat, Northern Atlantic States.

Genus **Tortricidia** Packard.

- 1864—*Tortricidia* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 347.
- 1864—*Lithacodes* PACKARD*, Proc. Ent. Soc. Phil., Vol. III, p. 345.
- 1864—*Krona* REAKIRT, Proc. Ent. Soc. Phil., Vol. III, p. 441.

Synopsis of species.

Fore wings crossed by faint lines or shades, or immaculate.

Faint lines only present if any.

Hind wings pale.

The lines discernible **flavula.**
 Fore wings immaculate var. **pallida.**

Hind wings uniform blackish **minuta.**

A extensive brown shading **testacea.**

Fore wings crossed by a toothed white line.

A dark shade outside this line **fasciola.**

This shade absent var. **laticlavata.**

T. flavula Herrich-Schäffer.

1854—*Limacodes flavula* HERRICH-SCHLEFFER, Ausser. Schmett., Vol. I, f. 185.

var. **pallida** Herrich-Schäffer.

1854—*Limacodes pallida* HERRICH-SCHLEFFER, Ausser. Schmett., Vol. I, f. 183.

Lustrous silky flesh-brown, darker along external margin with traces of brown lines. Secondaries pale straw-yellow, darker along fringes. Expanse, 13—18 mm.

The var. *pallida* is immaculate.

Habitat, Northern Atlantic States.

T. minuta Reakirt.

1864—*Limacodes minuta* REAKIRT, Proc. Ent. Soc. Phil., Vol. III, p. 251.

Fore wings and body clay colored with a silky look; hind wings blackish or brownish. Expanse, 10—12 mm.

Habitat, Atlantic States.

[Description kindly furnished us by Dr. Herman Strecker.]

T. testacea Packard.

1864—*Tortricidia testacea* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 348.

Brownish ochraceous, especially brown on the outer half of the wing, forming a broad diffuse transverse shade, best defined on the venules. Secondaries pale stramineous. Expanse, 16 mm.

Habitat, Northern Atlantic States.

* A genus of Noctuidæ; Hübner. Verz. bek. Schmett., p. 205 (1816).

T. fasciola *Herrich-Schäffer.*1854—*Limacodes fasciola* HERRICH-SCHÄFFER, Ausser. Schmett., Vol. I, f. 186.*var. laticlavia* *Clemens.*1860—*Limacodes laticlavia* CLEMENS, Proc. Acad. Nat. Sci. Phil., Vol. XII, p. 157.

Ocherous brown, secondaries blackish or straw color. A white band crosses fore wing centrally with a tooth outward, followed (except in *var. laticlavia*) by a broad purplish brown shade. A curved brown line from internal angle to costa at end of white band. Expanse, 16—20 mm.

Habitat, Atlantic States.

Genus **Packardia** *Grote & Robinson.*1866—*Packardia* GROTE & ROBINSON, Ann. Lyc. Nat. Hist. N. Y., Vol. VIII, p. 373.1864—*Cyrtosia* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 342.*Synopsis of species.*

Spots above internal angle of primaries black or blackish.

Fore wings bronzy brown **elegans.**
 Fore wings whitish buff *var. fusca.*

Spots above internal angle white.

Secondaries whitish **geminata.**
 Secondaries blackish.

Fore wings obscured by dark shadings **albipunctata.**

Fore wings only slightly obscured *var. ocellata.*

P. elegans *Packard.*1864—*Cyrtosia elegans* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 342.1881—*Packardia nigripunctata* GOODELL, Can. Ent., Vol. XIII, p. 30.*var. fusca* *Packard.*

1864—PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 343.

Blackish or bronzy brown to pale whitish buff. Two oblique whitish lines, outer reaching only to a third line which runs from near middle of costa to internal angle contiguous to two or three superposed black spots. Inner white line bordered with blackish. Expanse, 20 mm.

Habitat, Northern Atlantic States.

(TO BE CONTINUED.)

NEW WEST AFRICAN BUTTERFLIES.

By GEORGE A. EHRMANN, PITTSBURG, PENN.

Pseudopontia cepheus, sp. nov.

Male—Upper side of all the wings pure white; apex of primaries has a sharp cut square black spot, and in the sub-apical space there is a medium size black triangulate spot. Under side of primaries, the ground color is the same as above with the markings on the apical and sub-apical space faintly reproduced; the basal space is slightly shaded with pale green, marbled with faint black striae. Under side of secondaries white, delicately marbled with faint black striae. Expanse, $1\frac{3}{4}$ inch.

Types 2 ♂♂ in my collection from Grand Sess, West Africa.

Mycalesis erysichthon, sp. nov.

Male—Upper side of all the wings the color is lovely mouse-brown with a shade lighter along the abdominal margin of the secondaries, and the elongate scales near the inner margin of primaries are silky black. Under side of primaries and secondaries from the base to the space a little beyond the discal cells, are a shade or two lighter than above and uniform throughout in this space, then follows a sharp defined, irregular, dark-brown stria from the costa of the primaries to the abdominal margin of the secondaries, there is also an ill defined brownish band in the discal cell of the primaries from the costa to the lower discal nervure, thence from the irregular stria, which runs through both pairs of wings to the outer margin this space is olivaceous, clouded slightly with brown; in this space on the fore wings near the apex are three small ocellated spots connected with one another, the central one being the largest, and in the limbal area there is one much larger than the rest of those on the primaries; on the secondaries is a row of seven more ocellated spots, which are irregular in size, the fifth from the apex being the largest. All these spots are pupiled with white points leaving none of them blind whatever. Expanse, $1\frac{1}{2}$ inch.

Type ♂ in my collection from Piquinini Sess, Liberia, West Africa.

This species bears considerable resemblance in pattern on the under side to *M. felderi* Butler, from the Philippines, but in the shape of the wings is nearest to *M. sanaos* Hew from Ashanti.

Argiolus hollandii, sp. nov.

Male—Upper side, thorax and abdomen brownish, shaded with pale blue scales; costa and outer margin brown, widest at the apex; discal space with a black elongate bar; the rest of the fore wings is of a beautiful azure blue. Secondaries on the upper side, costal and abdominal margins pale brown, and from the base to the median space of the costa is a broad black bar; the rest of the wing is azure blue; the anal angle has an orange spot pupiled with black; fringes brown; tails black tipped with white. Under side of both pairs of wings, the ground color is of a

pale fawn, with six irregular white striæ on the secondaries, and four on the primaries, there is also a large black lunate spot in the center of the fore wings just below the middle of the discal cell, the ocellate spot of the secondaries on the anal angle is deep maroon centered with black. There is also an additional ocellate spot between veins two and three, which is orange centered with black, this later spot has no trace on the upper side. Expanse, $1\frac{1}{8}$ inch. Female, the same as the male but less brilliant and the brown border is wider and more straight cut on the upper side of the primaries. Size same as the male.

Types 1 ♂ and 3 ♀ ♀ in my collection. Hab. Grand Sess, Liberia, West Africa.

I take much pleasure in dedicating this gem to my good friend and fellow companion in the study of all that is beautiful in nature, Dr. W. J. Holland of Pittsburg, Pa., and to whom we owe a debt for the knowledge which he has given us on the Lepidoptera of Western Africa.

Liptena pseudosoyauxii, sp. nov.

Female—Upper side, head, thorax, antennæ and tips of palpi black, the rest of the palpi white. Abdomen leadish-brown; base of primaries suffused with lead colored scales; outer margin pale brown widest at the apex; the rest of the primaries are white. Secondaries white with a large brownish black apical spot and five marginal elongate spots of the same color. Under side of primaries pure white. Under side of secondaries the same as the primaries except a round black sub-costal spot near the apex, and two on the outer margin, one on the anal angle and one between veins 2 and 3, there is also a faint yellowish sub-discal band.

Type 1 ♀ in my collection, from Bigtown, Liberia, West Africa.



SOME NEW SANTO DOMINGO TACHINIDÆ.

By C. H. TYLER TOWNSEND.

The following new species of *Trichopoda*, and new genus and species of *Ocypterina*, were collected in the Island of Santo Domingo by Mr. F. Frazer. They were sent me by Dr. Williston for study, and form part of the University of Kansas collection.

Trichopoda subcilipes, sp. nov.

Length, 9 to 10 mm. Three males and one female. Facial depression, sides of face extending on sides of front, cheeks, and occiput soft golden yellow pollinose, the facial depression less thickly so. Frontal vitta reddish-brown, darker at vertex, the impressed line or furrow next facial ridges concolorous with vitta. Antennæ reddish-orange, third joint a little longer than second, arista brownish. Palpi yellowish. Thoracic dorsum and pleuræ in front of suture of same golden yellow, with a median broad black stripe abbreviated behind, and a black spot on each

side. Small black spot just back of humeri. Rest of thorax black, except a golden yellow prescutellar parallelogram. Rest of pleuræ black except a golden yellow spot next above middle coxæ. Scutellum black. Abdomen cylindrical, yellow, last two segments particularly golden yellow pollinose; fourth segment, sometimes also the fifth, tinged with reddish; first segment black in middle, second black anteriorly and with a black median vitta which becomes more or less obsolete on fourth segment where its ends. The anterior margin of third segment is more narrowly black, this black front border in both second and third segments being widened laterally on sides of abdomen. The incisure between third and fourth segments very narrowly black. Legs reddish-yellow, coxæ silvery pollinose, the front and middle femora on anterior side in middle with a black spot, the hind femora with a black band in middle which is broader on anterior side. Ends of all the tibiæ, especially hind pair, more or less blackish; tarsi wholly black, claws, except at tips, and pulvilli yellow. Distal half or third of hind femora black ciliate on outer edge. Wings bright yellow on anterior margin, blackish or smoky in middle, and nearly hyaline on hind border.

The female differs only in her shorter claws, more cylindrical abdomen, and in the yellow of wings being less strongly contrasted with the smoky, the latter being much fainter.

Ocypterosipha, gen. nov.

Belongs in *Ocypterina*. Eyes bare, front and face about one-third width of head, front and epistoma angularly prominent, the head in profile being quite square with angular corners. Antennæ fully as long as face, porrect, first two joints short; third long and widened distally, knife-blade-shaped, concave on upper edge, strongly convex on lower. Arista long, bare, curving terminally over the end of third joint. Proboscis long and slender, almost hair-like, when fully exerted more than three times as long as height of head, very slightly thickened at tip, labella not developed. No palpi present. Thorax about same width as head. Abdomen slightly narrower, cylindrical, a little narrowed at base and anus. A few short macrochaetæ on segments two to five. Legs rather long and slender, especially front tarsi, claws and pulvilli short. Wings about as long as abdomen, moderately broad, rounded at tip, apical cell closed in margin at tip of wing, quite evenly pointed in outline distally. Hind cross-vein nearly straight.

Ocypterosipha willistoni, sp. nov.

Length, 7 mm. (exclusive of antennæ). Two specimens. Face silvery white, front black. Antennæ, arista, proboscis, occiput, whole of thorax, scutellum, and legs black. Occiput with a silvery area on sides next eye margin. Abdomen entirely orange-red, the anus more or less narrowly blackish. A median pair of short macrochaetæ, and a lateral single one, apparently on segments two to four, and several marginal on fifth segment, also sparse, short, black, appressed hairs on abdomen. Tegulae pure white, each composed of two scales, the upper scale smaller. Wings uniformly smoky blackish.

I take pleasure in dedicating this species to Dr. S. W. Williston.

NOTE ON *CICINDELA SCUTELLARIS**var. LECONTEI Dej.*

By J. ALSTON MOFFAT, LONDON, Canada.

Seeing in the Journal, Vol. II, p. 43, that I am reported as the only known captor of *Cicindela lecontei* in North Eastern America. A few notes upon it may be of interest to some of the readers.

It is about 16 years since I first met Mr. Reinecké in Buffalo, and whilst in conversation with him, I in some way alluded to my having taken *C. lecontei*, when he seriously questioned the correctness of my identification. Assuring me that he had never taken it, and that it was not taken at all in that locality. It is only now that I realize what good reason he had for his scepticism: although Mr. Pettit informed me that I had a monopoly of that beetle. There were two spots where it was to be found in the vicinity of Hamilton, and so far as I know it was rigidly confined to these two. One was on a common within the city limits, on an elevation where the sod had been removed to secure sand for building purposes, and on the loose sand there exposed I used to find it at times quite plentiful. The other was some distance from there, with a marsh lying between, on a piece of waste land that was used as a rifle range.

The top of a hill had to be cut off in making the range, as it interfered with the view. A circular spot of loose sand was thus made, surrounded with second growth trees, and there I found it even more abundant at times than on the other. From these two spots I supplied Mr. Reinecke with all the specimens he required for exchange.

It was double brooded. The first brood appearing during May, according to the weather. The second in August. The color of the first brood was a rich purplish brown. That of the second was tinged with green, some of the specimens were quite green. These never appeared in the spring brood. Its season was extremely short, lasting between two and three weeks. It was very sensitive to the weather. If a cold east wind was blowing, it was not to be seen. A passing cloud would drive it under cover.

Some years the weather would be so unfavorable during its first brood, that there were but few days when it could be secured, and one had to be prompt in attending to these favorable days if they wished to secure any. This may account in some measure for so few collectors having observed it, and it may yet be found to be more generally distributed than is at present known.

NOTES ON SOME PARASITES OF VESPA.

Plate I, Figs. 1—13.

By Rev. J. L. ZABRISKIE.

Vespa, from "*vespillio*", the undertaker, whose duty was to carry off the corpse of the poor for burial in the evening, is a very appropriate name for our social wasps, because of their habit of carrying their prey — larvæ and imagines of other insects as food for the young.

These social wasps have three forms in the colony — queens, or developed females; workers, or undeveloped females; and males. The cells of the nest are not used for storing food, but only for rearing the young. The cells vary in size to suit the three forms of the colony, the smallest for the workers being constructed first, and the larger for the females and males being constructed among the last. The cells are hexagonal in form, and arranged closely side by side in the combs, like those of the honey-bee, but with this marked difference. The honey-bee hangs the combs perpendicularly, and has the cells projecting on both sides of the combs horizontally, excepting the queen cells, which are remarkably large and hang downward. The Vespidae arrange the combs horizontally, and have the cells projecting only from the under side, and so, of course, hanging downward perpendicularly and opening at the lower end.

In the collection of the American Museum of Natural History, New York, are two nests of *Vespa maculata* L. with some of the combs attached solidly and vertically to the inner surface of the protective covering, which seem to be abnormal instances.

Polistes attaches these horizontal combs by pedicels to twigs and trunks of trees, under surfaces of stones, and eaves of buildings, but leaves the combs without any protective covering.

The species of *Vespa*, comprising our hornets and yellow-jackets, build their nests in cavities in the ground, in and under stumps, under stones, attached to trunks, limbs and twigs of trees, and under the eaves of buildings. The combs are arranged in horizontal tiers, sometimes as many as eight in number, fastened concentrically, one directly beneath the other, by strong pedicels, leaving a clear passage way between each pair of combs; and, whatever the situation, the series of combs is always entirely enclosed with a protective envelope of paper, ultimately in the

form of an inverted cone, the envelope being composed of many successive slightly separated layers, and the nests which are constructed in the open air having usually only one entrance, somewhere near the lower, pointed extremity of the envelope.

Nests of recent origin are found of only one and one-half inches entire diameter. It is probable that in enlarging such a nest, as the colony increases, this envelope must be removed and reconstructed of continually increasing diameter, until the limit is reached, and it may be that the same paper is worked over a number of times.

I have in my collection a nest of the yellow-jacket one and one-half inches in diameter, and about two inches in length, with one very irregular original comb, and a second incipient comb supported underneath by a slender pedicel. The nest is furnished with three successive concentric sheets of envelope. The innermost of these envelopes is so constructed as to enclose only a few of the cells of the first comb, the others being outside its periphery, although the cells of the first combs are covered by the outer envelope. The innermost envelope is so in the way of the extending comb, and is so irregular in its lower outline that it seems probable that the occupants intended to tear it entirely away, and then to extend the second tier of combs. (Fig. 1.)

The paper employed is weather-beaten wood fibre, torn off and worked up by the mandibles, which are admirably adapted to this purpose. The worker of our spotted hornet, *Vespa maculata* may be seen to tear off with its mandibles from the weather-beaten surface of wood in a few seconds a mass of fibre, which is continually and neatly rolled in a sphere about the size of a No. 4 shot, and held between the flexed anterior legs against the thorax to be carried to the nest.

The wood fibre is evidently moistened with some secretion answering to saliva, and is then worked out into thin, minute sheets of pulp, as these are constantly fastened in place in the construction of the nest. In the substance of the nest one can see these minute sheets in horizontal bands of varying color, showing the varying origin of the material employed.

On December 3d, 1877, at New Baltimore, N. Y., fifteen miles south of Albany, at my request a friend detached from the eaves of his residence and brought to me two nests of the yellow-jacket. These nests, of course, at that season were deserted by the owners,

hence the species was not determined, but it is probable that they both were of *Vespa germanica* Fab.

The first nest was six inches in extreme diameter; contained three tiers of combs; and hibernating within it were 159 living specimens of our common brown wasp, *Polistes metricus* Say. The second nest was eight inches in diameter, with four tiers of combs, and within were 169 living specimens of *Polistes metricus* and eleven large flies.

In the cells of these nests were found living specimens of two hymenopterous parasites, of widely separated genera, and the cocoons of a third hymenopterous parasite, which had issued before examination was made.

The first parasite. In the bottom of some of the vespa cells, which were always open at the lower extremity or entrance, and which evidently had been cleaned out by the workers to this region, was observed a firm, smooth, yellow floor; entirely filling this portion of the vespa cell; firmly adhering to its hexagonal walls; about one-third of the diameter of this floor being occupied with a central, circular, translucent film; this film affording an easy point of exit for the occupant of the otherwise hard mass; and the plane of the floor or outer surface of the yellow mass always lying at an angle of nearly 45° with the axis of the vespa cell. (Fig. 2.)

There were 16 of these yellow masses in the first nest. On extracting one of them it was found to be the cocoon of a hymenopterous parasite; entirely filling the inner portion of the vespa cell for about one-third of its depth; so closely adhering to the walls of the latter that they could not be separated without tearing, and of such unusually hard structure, especially at the outer inclined surface, as to be almost like wood under the knife. The hard yellow walls of these cocoons were formed of a coarse fibred silk, disposed in concentric sheets, slightly separated in the thicker portions of the walls, reminding one of the concentric envelopes of the vespa nest. The cavity of the cocoons was occupied by a closely fitting but easily detachable case, composed of three or four concentric layers of a transparent yellowish substance, like the most delicate mica, but showing no fibrous structure under high magnification. In several instances two of these parasitic cocoons were placed one directly upon the other in one vespa cell. In the first nest were found 16, and in the second nearly 100 of these yellow cocoons. On dissecting one of these cocoons a

perfect, living, female imago was secured, and subsequently a small number, including three males, were reared in confinement.

In the collection of the American Museum of Natural History is a nest of *Vespa maculata* thoroughly infested with this same parasite. This nest I have been permitted to examine through the kindness of the Curator, Mr. Beutenmuller. The only particular point of difference noted is the fact that, the cells of *V. maculata* being much larger than those of the yellow-jacket, the cocoons of the parasite in the museum nest are never superimposed, but very frequently three such cocoons are placed side by side, firmly compacted, in the bottom of one vespa cell.

From information afforded me by Dr. E. B. Southwick he has probably reared the same parasite from the nest of *Polistes metricus* Say.

Through the kindness of Dr. C. V. Riley and Mr. W. H. Ashmead I am informed that this parasite is a Tryphonid, evidently allied to the genus *Sphécophagus* of Westwood. It may be described as follows:

***Sphécophagus* (?) *prædator* sp. nov. (Figs. 5. 6.)**

♀.—Length 7 to 8 mm.; expanse of wings 11 mm. Head sub-quadrate from above, dull black, excepting a narrow stripe around the inner periphery of the eyes, and a triangular patch on the base of the mandibles whitish or light red. Cheeks somewhat gibbous and produced posteriorly, dark red. Mandibles rufous, bidentate, with the teeth dark. Labrum light red. Ocelli large, placed in a close triangle. Antennæ filiform, as long as four-fifths of the entire body, 28-jointed, first joint globular pyriform, third joint slightly longer than the first and second combined, concolorous, light red. Thorax dark red, minutely punctate; collar, posterior margin of the prothorax, and tegulae whitish; parapsidal grooves distinct, converging towards the posterior third of the mesothorax; scutellum prominent, light red, ob-pyriform, posteriorly rounded; postscutellum corrugated at the sides, with black patches; metathorax well produced posteriorly, carinated and areolated. Anterior wings with stigma and parastigma well developed; areolet wanting; both recurrent nervures well bent. Legs concolorous, lighter red than the thorax and abdomen; anterior tibial spine well developed; intermediate and posterior tibiae two-spined. Abdomen a little longer than the head and thorax combined, minutely punctured, lighter red than the thorax, becoming slightly darker towards the apex; first abdominal segment well bent towards the apex, rapidly widening posteriorly for three-quarters of its length, twice as long as wide.

♂.—Length 5.5 mm.; expanse of wings 10 mm. Head black, with broader whitish stripe along inner margin of the eyes; face below the insertion of the antennæ, cheeks and mandibles white. Antennæ 28-jointed, nearly as long as the entire body, under surface of the first joint whitish. Prothorax all whitish except-

ing a black central longitudinal band on each side. Sentellum, abdomen and legs all lighter red, and abdomen narrower than in the ♀.

Described from three ♀♀ and one ♂. Types in my collection.

A second parasite. In one cell of the second vespa nest, collected at New Baltimore, about one hundred pupæ in a moist mass and a few issuing imagines of another much smaller parasite were found. Three of these imagines were secured and mounted in balsam on microscopical slides. The remainder and the pupæ, in some unaccountable manner, were unfortunately lost. The three mounted specimens are all females, and, although distorted by pressure, something of the character can be seen in Fig. 7. One of these slides was submitted to Dr. Riley, who has kindly informed me that it is a Chalcid of the curious genus *Melittobia* or *Anthophorabia*, discussed by Messrs. Ashmead and Howard in Proc. Ent. Soc. Wash., Vol. 11, p. 228—32 and 244—48. The balsam has rendered the specimen somewhat translucent, so that the antennæ are seen at special advantage. The outer four joints are darker than the others, but they show in more remarkable manner than I have ever noticed elsewhere the curious sensory pits and interior lengthened sensory cavities frequently to be seen in hymenopterous antennæ. (Figs. 11, 12.)

In both the nests of *Vespa* collected at New Baltimore there were traces of a third hymenopterous parasite. In the first nest there were thirty-seven vespa cells with the rounded pupal covering still unbroken, but pierced with three or four small circular openings. Inside, corresponding with these small openings, were found soft, silky, white cocoons, undoubtedly hymenopterous, all deserted by their owners, who had evidently made their exit at the corresponding external openings. The second nest contained twenty-five of these pierced vespa cells.

At Nyack, N. Y., early in October, 1883, while examining a nest of *V. maculata*, which had been recently deserted, a small dipterous puparium dropped from one of the cells. (Fig. 13.) And at Flatbush, Long Island, on October 14th, 1892, from a decayed log was extracted a female *V. maculata*, dead and partially dried. On separating the abdominal rings of this female, from the nearly empty abdominal cavity there dropped out a dipterous puparium which is indistinguishable from Fig. 13.

EXPLANATION OF PLATE I.

Fig. 1.—Nest of *Vespa* sp. Portions of two envelopes cut away, showing the innermost envelope in such position that it must be necessarily torn away to enlarge the nest. $\frac{2}{3}$ natural size.

Fig. 2.—Yellow cocoon of the first parasite *in situ*, in a vespa cell.

Fig. 3.—Yellow cocoon extracted.

Fig. 4.—Longitudinal section of a yellow cocoon. Figs. 2—4 all natural size.

Fig. 5.—*Sphécophagus* (?) *predator*. ♀. x 5.

Fig. 6.—The same. ♂. x 5.

Figs. 7, 8, 9.—Mandible and palpi of the same from the left side. x 30.

Fig. 10.—*Melittobia* sp. ♀. x 25.

Fig. 11.—Antenna of the same of the right side. x 75.

Fig. 12.—Antennal club and succeeding joint of the same, showing the sensory hairs and lengthened sensory cavities. x 250.

Fig. 13.—Dipterous puparium from abdominal cavity and cell of *V. maculata*. x 5.



NOTE ON PSEPHENUS LECONTEI Lec.

By CHARLES W. LENG.

This beetle, which has been reported from Niagara Falls and other rocky cataracts, lives also in more placid situations and much nearer to us here in New York. I found it abundant on July 1st, 1893, at Echo or Macopin Lake near Newfoundland, a station on the N. Y., Susquehanna & W. R. R. in Sussex Co., N. J. This lake is an oval sheet of water, lying among the mountains and encircled by forest, in which red-berried elder and the flowering raspberry grow, and minks raise their families of young. The edge of the lake is thickly strewn with fairly large boulders and its clear waters admit of watching the animal life that clings to the rocks below the water line. While thus watching I discovered *Psephenus Lecontei*, slowly walking over the submerged boulders and glistening like silver from the air bubbles contained in its silky covering of hair. Sometimes the walk extended above the surface, but whether above or below the beetles were easily alarmed and made off in short flights like *Elaphrus* or *Bembidium*, demonstrating their indifference to air, rock or water.

The numbers in which they occurred were considerable and I captured perhaps a dozen in a half hour.

PRELIMINARY HAND - BOOK OF THE COLEOPTERA OF NORTH EASTERN AMERICA.

By CHARLES W. LENG & WM. BEUTENMÜLLER.

The species treated in the following pages are those enumerated in the "List of the Coleoptera of N. E. America" thus far published, with some additions made known to us by readers of the Journal. We aim to include all that are likely to be found by collectors in Philadelphia, New York, New England, Canada and westward to Illinois. We do not aim to express any opinions on the validity of the species but accept the published opinions of students of our fauna; where the species seems to us very closely allied, we have indicated the fact that the reader may be saved looking for striking differences where none exist.

It is our intention to continue the work of publishing the Hand-book, but, in view of the uncertainty of serial publication, we do not make any promises to do so.

We hope the reader will bear in mind that the work is preliminary and by correcting the errors which meet his eye, assist us in making the final pages accurate.

In describing the markings of the Cicindelidæ, the following terms are used:

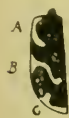


Fig. 1.

Fig. 1. when the markings are in bands

A is called humeral lunule,

B " middle band,

C " apical lunule.

Fig. 2. when the markings are in dots

1 is called basal dot,

2 " humeral dot,

3 " posthumeral dot,

4 is called marginal dot,

5 " anteapical dot,

6 is called apical dot,

7 " discal dot.



Fig. 2.

Cicindelidæ.

Tarsi all five-jointed; antennæ slender, inserted on the front above the base of the mandibles; legs slender, adapted to running; eyes prominent; habits terrestrial.

Table of genera.

3d-joint of maxillary palpi longer than the 4th	Tetracha.
3d-joint of maxillary palpi shorter than the 4th	Cicindela.

Tetracha.

T. carolina L., Fig. 1.—Light gold-green; tip of abdomen, apical lunule of elytra, legs and antennæ luteous; thorax smooth; elytra coarsely punctured, purple at the middle, margin bright green. Length, 30 mm. = .80 inch.

Habitat, So. Ill., and generally throughout the southern and southwestern states.

T. virginica L.—Dark gold-green; last ventral segment, legs and antennæ ferruginous; thorax smooth; elytra more coarsely punctured than in *carolina*, black at middle, broad lateral margin metallic green, without lunule. Length 20—24 mm. = .80—.96 inch.

Habitat, So. N. J., Pa., So. Ohio, Ind., Ky. and throughout the southern states.

These two species are nocturnal in their habits, hiding during the day under chips and stones. The larva lives in holes in the ground, at the entrance to which it lies in wait for prey.

Cicindela.*Synopsis of species.*

Humeral angles wanting, wingless.

Sericeous brown with imperfect white markings **celeripes.**

Humeral angles distinct, winged species. ^{*} ^{*} ^{*} Underside unicolorous metallic blue or green.

Thorax flattened, elytra flat.

Dull brown; underside glabrous; elytra roughly foveate and punctured with marginal dot white **unipunctata.**

Underside hairy; elytra with humeral, posthumeral and anteapical dot and reclivate nearly transverse middle band dull brown **longilabris.**

Green with humeral lunule nearly or quite complete, *var.* **perviridis.**

Thorax convex, not margined, narrowed behind, elytra convex;

Marginal markings; (scutellaris varieties).

Surface green with posthumeral marginal dots and apical lunule sometimes wanting *var.* **rugifrons.**

Surface black with same dots *var.* **modesta.**

Surface purplecupreous with same dots sometimes confluent at margin *var.* **Lecontei.**

Normal markings, the humeral often broken or wanting;

Front striate, glabrous; elytra strongly punctured;

Green with marginal apical and anteapical and sometimes a discal dot **sexguttata.**

Green with same dots also humeral and posthumeral dots and a middle band *var.* **patruela.**

- Black with same markings *var. consentanea*,
 Front striate, pilose with erect hair; elytra moderately
 punctured;
 Reddish-cupreous, oblique sinuate band and apical
 dot (sometimes antepical dot also) *purpurea*,
 Black with same marks *var. spreta*,
 Head and thorax green, elytra cupreous with short
 middle band and apical dot. *var. splendida*,
 Humeral lunule, middle band and apical lunule com-
 plete; beneath green *var. limbalis*.
 Thorax convex, not margined, subquadrate; elytra convex; palpi
 ♂ usually pale at base.
 Normal markings complete, broad, connected by white margin;
 Metallic brown, middle band deflexed *formosa var. generosa*.
 Normal markings complete, narrow, not connected; metallic brown;
 Humeral lunule long, slightly prolonged obliquely;
 Middle band rectangularly bent extending along
 margin *ancocisconensis*.
 Humeral lunule greatly prolonged;
 Middle band extended but little along margin *vulgaris*.
 Humeral lunule c-shaped, markings complete *repanda*.
 All the markings broken *var. 12-guttata*.
 Thorax convex, quadrate; thorax very hairy.
 Normal markings complete;
 Humeral lunule inflexed and bent upward at tip *hirticollis*.
 Thorax subcylindrical; front bald; elytra with row of green foveae
 near suture;
 Markings all broken except apical lunule *punctulata*.
 Markings normal, middle band confused *tortuosa*.
 Thorax broadest behind; elytra broad, depressed with tip in ♀
 angulated.
 Elytra white with irregular green markings *dorsalis*.
 Underside unicolorous, but hind ^{* * *}trochanters rufous, elytral tips
 different in sexes.
 Anus green; cupreous or bronze; markings of the normal type
 with a basal dot added.
 Outer margin, elytra entire, suture ♂ retracted *marginata*.
 Outer margin, elytra sinuate in both sexes } *cuprascens, puritana,*
 and dentate $\frac{1}{4}$ from tip in female, } *macra*.
 Anus testaceous; elytra white with a few dark lines *lepida*.
 * * *
 Underside partly rufous.
 Markings of dots sometimes connected;
 Dots minute, rarely connected *rufiventris*.
 Dots larger, usually connected at least in part *Hentzii*.
 Markings, a marginal band indented where normal markings
 should be; opaque greenish brown above *marginipennis*.
 Markings reduced to apical lunule and minute dots; black,
 shining *abdominalis*.

C. celeripes *Lec.* (Fig. 3)—Humeral angles wanting, wings aborted; underside unicolorous, brown bronze; above brown bronze with variable white markings, usually a discal dot, a marginal dot or line and a faint apical lunule; sometimes there are minute additional dots.

var. cursitans *Lec.*—The elytra are less deeply punctured and the markings are usually reduced to the apical lunule. Length, 7.5—8.5 mm. = .30—.34 inch.

Habitat, South Illinois and westward to Dakota.

C. unipunctata *Fab.* (Fig. 2)—Humeral angles distinct; underside unicolorous dark blue; above brown with marginal white dot. Head and thorax granulate; elytra rough with dispersed green foveae and irregular green punctures. Length 16—18 mm. = .64—.72 inch.

Habitat, N. Y., N. J., Pa., N. C., Ga., Mo., Ky. Very rare near N. Y. City, Da Costa, N. J., July 3. Rare at Pittsburg, not rare near the Allegheny Mts.

C. longilabris *Say.* (Fig. 6)—Humeral angles distinct, underside unicolorous, purple black or dark green; above dark brown with humeral, posthumeral and anteapical dots and a reclivate nearly transverse middle band; elytra densely punctured with a row of faint large foveae near the suture. Length, 16—18 mm. = .64—.72 inch.

Habitat, N. H., Canada, Nova Scotia, Newfoundland, throughout the northwestern part of America to Yukon River, Alaska and in the Mountains of Colorado.

var. perviridis *Schauff.* (Fig. 7)—Identical with *longilabris*, except that the color is green, the humeral lunule entire, and the elytral punctures and foveae are less distinct.

Habitat, Newfoundland, also Cal., Or. and Utah.

There are other varieties of *longilabris* which occur in Montana, Neb., Utah and Colo., but have not been reported from N. E. America and are therefore omitted.

C. scutellaris *Say.* *var. rugifrons* *Dej.* (Fig. 5)—Humeral angles distinct, underside unicolorous green; above green with posthumeral dot, marginal dot and apical lunule, sometimes wanting; head hairy, scarcely rugose; thorax finely rugose, hairy; elytra obtusely punctured; outer side of middle tibiae densely pubescent. Length, 12 mm. = .48 inch.

Habitat, Mass., R. I., N. Y., Md. In the neighborhood of N. Y. City at Jamaica, L. I., Lakewood, N. J., in Westchester Co., not common in June and September; also Nantucket, Mass.

var. modesta Dej.—Black with same markings.

Habitat, N. Y., N. J., Pa., N. Ill., Ont., Tenn. In the neighborhood of N. Y. City this variety is abundant but confined to scattered localities, e.g. Greenville, N. J., Marion, N. J., Watchogue, S. I., and Richmond Valley, S. I. It is double brooded, appearing from April to June and again from September to October in sandy fields.

var. Lecontei Dej. (Fig. 8)—Brown, humeral lunule sometimes entire, sometimes connected with apical lunule. Length, 12 mm. = .48 inch.

Habitat, Ill., Hamilton, Canada, also Ia. Abundant in sandy openings in the woods.

Other varieties of *scutellaris* occur in the southern states but are not reported further north than Georgia.

C. sexguttata Fab. (Fig. 9)—Humeral angles distinct; underside unicolorous green; above green with two to ten white dots; head bald, rugose behind; thorax slightly rugose; elytra strongly punctured. Length, 10—14 mm. = .40—.56 inch.

Habitat, N. E. Amer., abundant in the wood parts, often found hiding under loose bark. Common in the neighborhood of N. Y. City from April to August.

var. patruela Dej. (Fig. 10)—Green with the same markings and in addition a middle band, consisting of a large marginal dot and a smaller discal dot, connected by a slightly oblique narrow line.

Habitat, N. Y., Pa., Md. and Wisc. In the neighborhood of N. Y. City it has been collected at Peekskill in wood paths from June to September.

var. consentanea Dej.—Black with same markings as *patruela*.

Habitat, N. Y., Pa., Da Costa, N. J., and in Nebraska, but is rare.

C. purpurea Oliv. (Fig. 11)—Humeral angles distinct; underside unicolorous bluish green; above reddish cupreous (except in some varieties named below) with oblique sinuate middle band, apical dot and sometimes anteapical dot white; head rugose hairy; thorax granulate rugose; elytra moderately punctured. Length, 14—16 mm. = .56—.64 inch.

Habitat, N. E. America. In the neighborhood of N. Y. City this species occurs in pastures and grass-grown roads in March and June and again in September and October; probably double brooded, and *vide* Hamilton certainly hibernates.

var. limbalis Klug. (Fig. 12)—Green beneath, margins of elytra brilliant green, markings: humeral lunule, middle band and apical lunule complete.

Habitat, N. Y., Ohio, Ky., also Kans and Col.

var. spreta Lec.—Black with same markings.

Habitat, Maine.

var. splendida Hentz.—Head and thorax green or blue, elytra cupreous with short middle band, apical dot and sometimes humeral and anteapical dots also.

Habitat, N. Y., N. Ill., and more commonly in Tex, Ks., Neb., Mo. and N. C.

This species is exceedingly variable in the extent of the markings but is easily recognized by the cupreous color.

C. formosa Say. *var. generosa* Dej. (Fig. 13)—Humeral angles distinct, underside unicolorous green; above brown aeneous opaque with normal markings broad, the middle band and the apical lunule connected at the margin; head and thorax granulate rugose; elytra punctured. Length, 16.5—18 mm. = .66—.72 inch.

Habitat, Mass., N. Y., N. J., Pa. westward to Colorado and Montana.

In the neighborhood of N. Y. City this variety is abundant at Watchogue, S. I., in sandy fields and adjoining roads from April to October. It is double brooded but is found all summer long.

C. ancocisconensis Harr. (Fig. 14)—Humeral angles distinct; underside unicolorous green; above brown bronze with normal markings complete but the humeral lunule is scarcely curved, the middle band is obtusely bent and dilated at margin and the apical lunule is anteriorly inflected; head and thorax granulate; elytra punctured. Length, 15 mm. = .60 inch.

Habitat, N. H., Mass., N. Y., N. J., Ill.

C. vulgaris Say. (Fig. 15)—Humeral angles distinct, underside unicolorous green; above brown bronze with humeral lunule oblique and extraordinarily prolonged, middle band narrow, extended a

little on the margin, apical lunule normal. Length, 13—17 mm. = .52—.68 inch.

Habitat, N. E. America, and nearly every part of the United States. In the neighborhood of N. Y. City this species is double brooded, widely distributed but nowhere very abundant. It appears in April and October.

C. repanda Dej. (Fig. 16)—Humeral angles distinct, underside unicolorous, green; above brown bronze with humeral lunule c-shaped, middle band rectangularly bent, connected with a marginal line nearly but never quite reaching the lunules, apical lunule normal. Length, 12—13 mm. = .48—.52 inch.

Habitat, N. E. America, everywhere the most common of the Cicindelidæ, occurring in roads, fields etc. from April to October.

var. 12-guttata Dej. (Fig. 17)—In this form all the markings are broken into dots. Occurs with the typical form but more rarely found.

C. hirticollis Say. (Fig. 18)—Humeral angles distinct, underside unicolorous green; above brown bronze with humeral lunule inflexed and bent upwards posteriorly, middle band and apical lunule as in *repanda*. More hairy than that species. Length, 14—15.5 mm. = .56—.62 inch.

Habitat, N. E. America, common. In the vicinity of N. Y. City this species occurs on the sea-shore from June to September.

C. punctulata Oliv. (Fig. 19)—Humeral angles distinct, underside unicolorous, blue; above dark brown or black with the markings except the apical lunule all broken into minute dots; on each elytra near the suture a row of large green foveæ; legs very long and slender. Length, 12.5—15 mm. = .50—.60 inch.

Habitat, N. E. America, abundant from June to October on very dry roads and in the streets of cities at electric lights.

C. tortuosa Dej. (Fig. 25)—Humeral angles distinct, underside unicolorous green or blue; above brown or greenish bronze with slender white markings, humeral lunule terminating in a double hook, middle band very tortuous, apical lunule recurved anteriorly towards the suture. Length, 11.5—13 mm.

Habitat, Atlantic City, N. J., and southward.

C. dorsalis Say. (Fig. 4)—Humeral angles distinct, underside unicolorous bronze, densely clothed with white hair; above white with green or bronze markings, variable and sometimes lacking.

Thorax ♀ dilated posteriorly, elytra ♀ angulated behind the humeri. Length, 14.5—15 mm. = .56—.60 inch.

Habitat, Atlantic sea-shore only from N. Y. southward. In the vicinity it occurs from July to September.

C. marginata *Fab.* (Fig. 20)—Humeral angles distinct, underside green bronze, hind trochanters rufous; above brown or green bronze with basal dot, oblique humeral lunule hooked at tip, a slender long tortuous middle band bent and confused, right mandible of ♂ toothed beneath; apical lunule inflected at both ends and a white margin connecting all the markings. Sexual differences in elytral tip: ♂ elytra at tip spiniform, retracted; ♀ outer margin entire, sutural margin emarginate. Length, 13.5—14.8 mm. = .54—.60 inch.

Habitat, Atlantic sea-coast from Mass. southward, on the marshes and mudflats beyond the sea-beaches. August, September. In the vicinity of N. Y. City this species was formerly abundant near Manhattan Beach but is becoming more rare.

C. cuprascens *Lec.*—Humeral angles distinct, underside green bronze, hind trochanters rufous; above greenish bronze, white basal dot, humeral lunule hooked at tip, middle band tortuous and confused before the dilated tip, apical lunule inflected at both ends and a white margin connecting all the markings; right mandible ♂ not toothed. Sexual differences in elytral tip: ♂ outer margin sinuate, tip obtuse; ♀ outer margin strongly sinuate with a tooth one-fourth from tip; tip rounded. Length, 13—14 mm. = .52—.56 inch.

Habitat, Ohio on mudflats, N. Ill., Ky., also Mont., Mo., Kan., Neb., Dak.

C. puritana *Horn.* (Fig. 21)—Humeral angles distinct, underside metallic blue, hind trochanters rufous; above brown bronze with white basal dot, humeral lunule hooked at tip, middle band tortuous and confused before the dilated tip, apical lunule inflected at both ends and a white margin connecting all the markings; right mandible ♂ not toothed; sexual differences in elytral tip: ♂ outer margin sinuate; tip subacute; ♀ outer margin strongly sinuate with a rectangular tooth one-fourth from apex. Length, 11.5 mm. = .46 inch.

Habitat, N. Y. (?), N. H., Mass. rare.

C. macra *Lec.*—Humeral angles distinct, underside greenish bronze, hind trochanters rufous; above brown bronze with white basal dot, humeral lunule hooked at tip, middle band tortuous and confused before the dilated tip, apical lunule inflected at both ends

and a white margin connecting the markings; right mandible ♂ not toothed; sexual differences in elytral tip: ♂ outer margin sinuate; tip prolonged; ♀ outer margin strongly sinuate with a rather obtuse tooth one-fourth from tip. Length, 13—14.2 mm. = .52—.58 inch.

Habitat, Ill. westward to Mo. and Kan.

C. lepida Dej. (Fig. 22)—Humeral angles distinct, underside unicolorous green bronze, hind trochanters rufous; anus testaceous; legs antennae and palpi pale; elytra white with a few green or bronze lines; outer margin ♂ scarcely sinuate, of ♀ sinuate. Length, 11—12.5 mm. = .44—.50 inch.

Habitat, Coney Island and Rockaway Beach, N. Y., Jamesburg, N. J. (inland), Trenton, N. J., Anglesea, N. J., also in Ill., Tex., Col., Iowa, Kan., Mo.

C. rufiventris Dej. (Fig. 23)—Humeral angles distinct, bluish green beneath, abdomen rufous; above dark brown with four small white dots, humeral, marginal, two discoidal and an apical lunule: the dots always small and sometimes wanting. Length, 11.5—12 mm. = .46—.48 inch.

Habitat, abundant on the hills in Kentucky opposite Cincinnati (Dury), also D. C., Va., W. Va., Md., Ala.

C. Hentzii Dej. (Fig. 24)—Differs from the preceding by the humeral lunule being entire or nearly so; the middle band is present and reaches the margin. Length, 11.5—12 mm. = .46—.48 inch.

Habitat, Massachusetts.

C. marginipennis Dej. (Fig. 27.)—Humeral angles distinct, beneath green, abdomen rufous; above olivaceous or brown with a submarginal band reaching from humerus to apex and lobed internally, slightly indicating the normal markings. Length, 11—14 mm. = .44—.56 inch.

Habitat, Banks of Susquehanna river below Harrisburg, Pa., and of the Delaware river near Callicoon, N. Y.

C. abdominalis Fab. (Fig. 26)—Humeral angles distinct, beneath blue, abdomen red; above shining black with a sutural row of shallow bluish foveae and submarginal and discoidal dots white and a narrow apical lunule. Length, 9—11 mm. = .36—.44 inch.

Habitat, N. J. and southward in pine forest. Da Costa, N. J., in July (Wenzel).

EXPLANATION OF PLATE II.

Fig. 1. <i>Tetracha carolina</i> Linn. Nat. size.	Fig. 14. <i>Cicindela ancocisconensis</i> Harr.
" 2. <i>Cicindela unipunctata</i> Fabr. "	" 15. " <i>vulgaris</i> Say.
" 3. " <i>celeripes</i> Lac. "	" 16. " <i>repanda</i> Dej.
" 4. " <i>dorsalis</i> Say. "	" 17. " " 12. <i>guttata</i> Dej.
" 5. " <i>scutellaris</i> var. <i>rugifrons</i> Dej.	" 18. " <i>hirticollis</i> Say.
" 6. " <i>longilabris</i> Say.	" 19. " <i>punctulata</i> Oliv.
" 7. " " var. <i>perviridis</i>	" 20. " <i>marginata</i> Fabr.
" " <i>Schff.</i>	" 21. " <i>puritana</i> Horn.
" 8. " <i>scutellaris</i> var. <i>Lecontei</i> Dej.	" 22. " <i>lepida</i> Dej.
" 9. " <i>sexguttata</i> Fabr.	" 23. " <i>rufiventris</i> Dej.
" 10. " " var. <i>patruela</i> Dej.	" 24. " <i>Hentzii</i> Dej.
" 11. " <i>purpurea</i> Oliv.	" 25. " <i>tortuosa</i> Dej.
" 12. " " var. <i>limbalis</i> Klug.	" 26. " <i>abdominalis</i> Fabr.
" 13. " <i>formosa</i> var. <i>generosa</i> Dej.	" 27. " <i>marginipennis</i> Dej.

LOCAL ENTOMOLOGICAL NOTES.

Members of the New York Entomological Society and all others, are solicited to contribute to this column, their rare captures, local lists and other items of interest relating to the insect fauna of New York city and vicinity.

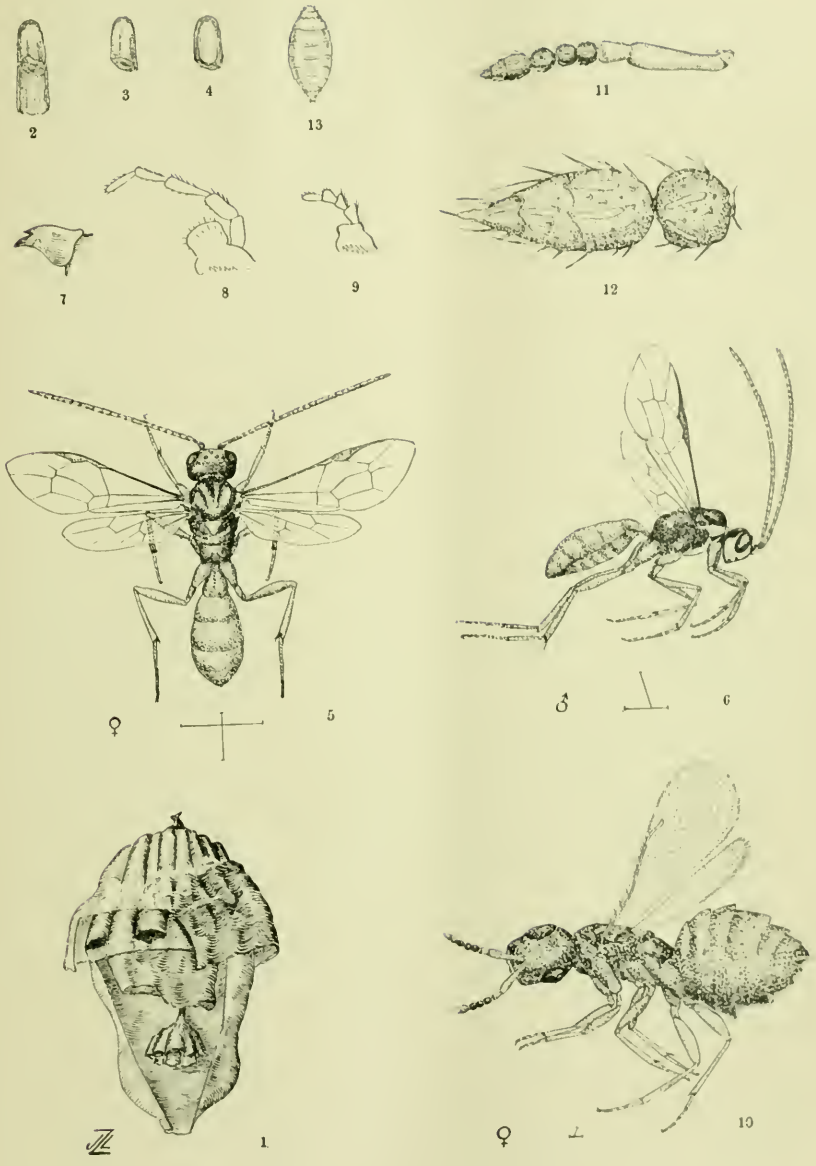
NOTE ON THE PERIODICAL CICADA.

By WM. T. DAVIS.

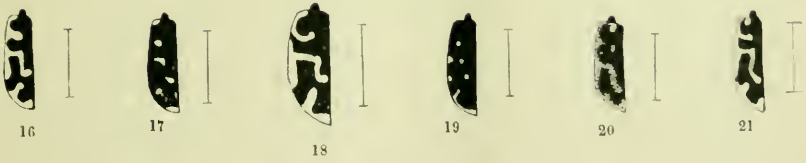
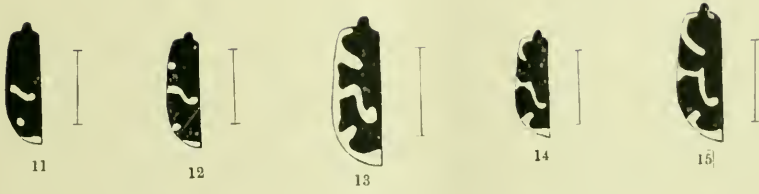
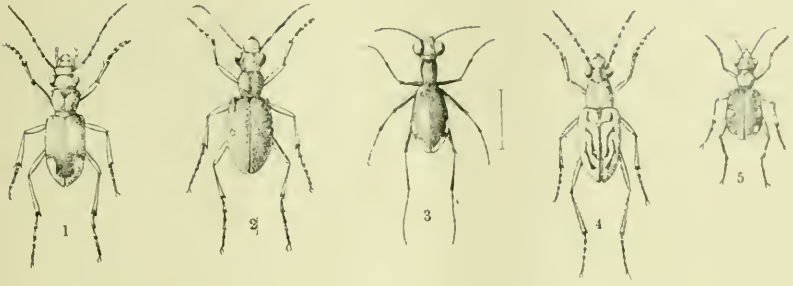
In the last number of the Journal mention was made of the various years since 1877 in which the periodical Cicada had appeared on Staten Island, and it was stated that Brood XII was expected in May and June.

Under some boards on the edge of the salt meadow at Old Place Creek on the Island, pupæ of this brood were found by Messrs. Leng, Granger and myself as early as the 8th of April. The ground was moist and the insects had erected the usual cones of mud, the boards not lying sufficiently close to the uneven ground to prevent their construction. The day was so cold that the salamanders under the same boards were stiff and inactive; they had to be held in the hand some time before they were able to walk away, but the Cicada pupæ were much more lively, and retreated down their tunnels when the day-light shown upon them. A little later in the month many pupæ were found in a garden at New Brighton, and on the 22d they were numerous in wooded districts under logs and stones as well as chips about the stumps of trees felled in the winter. Many more had no protection, and their presence was indicated by the small irregular cones of earth among the dead leaves. If these were approached silently the insects would be found at the surface within, but a heavy foot-fall in the vicinity was sufficient to frighten them into a retreat. By the time this number of the Journal is issued, the perfect insects will be in great numbers all over the Island and along the Hudson River.

In mentioning the Cicadas that appeared in 1881 on page 38 of this volume, they were referred incorrectly to Brood XVIII instead of XVII.



Some Parasites of Vespa.



Cicindelidae of N. E. America.

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No. 3.

REVISION OF THE DIPTEROUS FAMILY THEREVIDÆ.

By D. W. COQUILLET, WASHINGTON, D. C.

In Osten Sacken's Catalogue of the Diptera of North America, four Therevid genera are credited to our fauna: *Psilocephala*, *Thereva*, *Nestomyza* and *Tabuda*. The genus *Nestomyza*, however, is not at present known to occur in our fauna, the single species heretofore referred to it (*N. planiceps* Loew) differing from it in so many important characters as to necessitate erecting a new genus for its reception; the principal differences are: the much shorter proboscis; the first posterior cell bisected by a crossvein, and the widely opened fourth posterior cell. The examination of quite a large series of specimens shows these characters to be constant, and for this new genus I would propose the name of *Metaphragma*.

Our genera, including a second new one, discovered by the writer, may be tabulated as follows:

1. First posterior cell entire, never bisected by a crossvein 2
First posterior cell divided by a crossvein into two cells; first antennal joint unusually large **Metaphragma**, gen. nov.
2. Head nearly twice as broad as long, vertical diameter of eyes nearly twice their horizontal diameter 3
Head not as broad as long, vertical diameter of eyes equalling their horizontal diameter, first joint of antennæ unusually large and polished **Nebritus**, gen. nov.
3. Face hairy 4
Face bare **Psilocephala**.
4. Third joint of antennæ at least two-thirds as long as the first . . . **Thereva**.
Third joint of antennæ one-third as long as the unusually large first joint, scarcely longer than broad **Tabuda**.

Metaphragma, gen. nov.

Head nearly twice as broad as long, eyes of male separated as widely as the two posterior ocelli; first antennal joint unusually robust, nearly as long as the head, nearly three times as long as the third joint, the latter only slightly wider than the second, destitute of bristles; style apical, distinct, two jointed; face very

oblique, greatly retreating below, pilose, especially on the sides; proboscis quite slender, nearly as long as the head, labellæ rather slender and as long as the proboscis proper; two submarginal and six posterior cells, the usual first posterior cell being divided into two cells by a crossvein situated midway between apex of discal cell and the wing-margin; fourth posterior cell wide open, the anal closed; pulvilli present, empodium bristle-like. (Name from the Greek, *meta*, between, and *phragma*, a partition. Type, *Nestomyza planiceps* Loew.

Nebritus, gen. nov.

Head depressed, slightly longer than broad, front nearly horizontal, vertical diameter of eyes scarcely greater than the horizontal, eyes of male separated more than twice as wide as the two posterior ocelli; first joint of antennæ unusually robust, as long as the head, twice as long as the third joint, the latter scarcely as broad as the second; *style wholly wanting*; proboscis quite slender, projecting nearly half the length of the head beyond the oral margin, labellæ rather slender, as long as the proboscis proper; palpi slender, sub-clavate, slightly shorter than the proboscis; face bare, greatly retreating below; two submarginal and five posterior cells, all of them open, the anal closed; pulvilli present, the empodium bristle-like. (Name from the Greek, *nebritos*, like a fawn-skin.). Type, *Nebritus pellucidus*, sp. nov.

Nebritus pellucidus, sp. nov.

♂, ♀—Black, the proboscis, palpi, first antennal joint except the upperside, femora, tibiæ, base of tarsi, halteres except the extreme apex, and tip of abdomen, yellowish; in the female the middle of the sixth, seventh and eighth abdominal segments at the base are black. Front on the upper three-fourths sparse black pilose and opaque yellow pollinose, excepting a median line and an ocellar spot; lower fourth of front highly polished, sometimes yellowish below, bearing a cluster of black pile at base of each antenna; first antennal joint highly polished, sparsely beset with black pile and bristles, the third joint bearing short bristles at the base; face yellow pollinose except the upper edge, extending as a large spot each side, polished black, a similar spot on each side of the oral margin near its posterior edge; occiput yellow pollinose except in the center, where it is gray, a large polished black spot back of upper corner of each eye. Thorax opaque, somewhat bluish pollinose excepting four nearly equidistant yellow pollinose vittæ which are beset with short yellow and black pile, elsewhere the sparse pile is black. Scutellum marked with two yellow vittæ beset with yellow pile; four marginal bristles. Abdomen opaque, lightly yellowish gray pollinose, the short pile on the basal half yellowish, that on the apical half largely black. Wings hyaline, the stigma yellowish. Length, 7 to 10 mm.

Southern California. Four males and two females, in April and June.

Psilocephala and Thereva. — Our species have been so recently tabulated by the writer (Can. Ent., 1893, pages 197—198 and 223—225) that it is quite needless to reproduce the tables in this place. In working up the rich material in the National

Museum, five undescribed species were found, which, with Dr. Riley's permission, are described herewith:

Psilocephala limata, sp. nov.

♀—Black, the tibiæ, base of tarsi, and knob of halteres yellowish, narrow hind margins of the second and third abdominal segments, white. Front opaque, the upper half dark grayish-brown pollinose and black pilose, remainder of head white pollinose, lower half of front bare; pile of cheeks, occiput and abdomen (largely), white, that of the thorax and scutellum mixed black and white, scutellum bearing four bristles. First joint of antennæ scarcely wider than the second, the third nearly twice as wide as and slightly longer than the first; style one-fifth as long as the third joint. Thorax opaque grayish-black pollinose, two vittæ and the broad lateral margins light gray. Abdomen shining except the first segment, hind margins of the second, third and fourth, nearly crossing the segments on the lateral margins, and nearly the whole of the fifth and sixth segments. Wings hyaline, the stigma brown; fourth posterior cell broadly open. Length, 12 mm.

Colorado and Washington. Two females, from Dr. Riley's collection. Types in National Museum.

In my table of species referred to above this species would fall in with *morata* in couplet 4, except for the much shorter antennal style; it further differs by being nearly twice as large, by having the thorax vittate, etc.

Psilocephala placida, sp. nov.

♀—Black, the antennæ, proboscis, palpi, halteres, femora, tibiæ, base of tarsi, venter and abdomen excepting the first segment and narrow bases of the three following ones, yellowish. First joint of antennæ nearly twice as wide as the second, the third joint slightly wider and a trifle shorter than the first; style one-third as long as the third joint. Front opaque, grayish-yellow pollinose and wholly black pilose. Short depressed pile of thorax, scutellum and first four abdominal segments, yellow, the longer, erect pile and bristles black; scutellum bearing four bristles. Wings pale smoky-brown, center of the cells usually nearly hyaline, stigma dark-brown, fourth posterior cell wide open. Length, 12 mm.

Florida. A single female from Dr. Riley's collection, now in the National Museum.

In my table this species would fall in with *slossoni* and *montivaga*, from both of which it differs in having no black spots on the front, the antennæ yellow, etc.

Thereva egressus, sp. nov.

♂—Black, the tibiæ, base of tarsi, narrow hind margins of the second, third and fourth abdominal segments, and hypopygium (partly), yellowish. Head opaque, gray pollinose, pile of front and sides of face black, that in middle of face, on the cheeks, occiput, pleura, venter and the shorter pile of thorax, scutellum and abdomen largely yellowish or whitish, the longer pile of abdomen, thorax and scutellum

like the bristles of the last two, black. First joint of antennæ slender, much shorter than the head, but slightly wider than the second; third joint of nearly the same width and length as the first, tapering but slightly toward the apex; style one-sixth as long as the third joint. Thorax opaque, grayish-black pollinose, a darker median vitta, two vittæ and the lateral margins light gray. Abdomen opaque, brownish-black pollinose except the first segment and hind and lateral margins of the others, which are gray. Wings whitish hyaline, the stigma and a broad border to the veins, brown; fourth posterior cell closed. All femora provided with bristles.

♀—Same as the ♂ with these exceptions: Front near its middle marked with a transverse pair of transversely oval polished spots; no black pile on sides of face; seventh and following abdominal segments shining. Length, 10 mm.

Colorado and California. Types in National Museum.

This species would fall in with *johnsoni* in my table, but in the latter the third joint of the antennæ is only three-fourths as long as the first, the thorax is yellowish and gray pollinose, the abdomen on the first six segments uniformly gray pollinose, etc.

***Thereva diversa*, sp. nov.**

♀—Black, the second joint of antennæ and base of the third, the palpi, femora, tibiæ, base of tarsi, venter (largely) and broad hind margin of each abdominal segment except the first, yellowish; on the second segment this color occupies the last third and the lateral margins, the sixth and following segments are almost wholly yellowish. Head opaque, gray pollinose, a polished black spot in middle of front, separated from the eyes by pollen that in certain lights appears velvet-black; the polished spot is produced upward at its middle but is widely separated from the lowest ocellus; pile of front and of fourth and following abdominal segments largely black, that on the face, cheeks, occiput, thorax, scutellum and first three abdominal segments largely yellowish. First joint of antennæ scarcely wider than the second, the third equal in width and length with the first, tapering but slightly toward the apex; style one-sixth as long as the third joint. Thorax opaque, grayish-black pollinose, a median, pure black vitta, also two light-gray vittæ, the lateral margins of this same color; bristles of thorax and scutellum black. Abdomen, except the first segment, polished. Wings grayish-hyaline, stigma pale brown-veins narrowly bordered with brownish.

♂ differs from the ♀ as follows: Femora, except sometimes the apex, black; front destitute of a polished spot; pile of face sometimes partly black; abdomen sub-opaque, the yellow color less extended. Length, 9 to 11 mm.

Colorado, Montana and Florida. Four males and two females, from Dr. Riley's collection.

There appears to be no doubt that the two sexes here described belong together; the Colorado examples, two males and as many females, each bear the same kind of a label, and are pinned lower down than usual, indicating that they were taken by the same collector. In my table, the female would fall in with *flavicineta*, in which the polished frontal spot extends to the lowest ocellus and

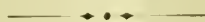
the color of the abdomen is different; the male would fall in couplet 8, and then, in conjunction with the female, would stop at *frontalis*, which has the abdomen wholly black, or at most, with a very narrow yellowish hind border to some of the segments.

***Thereva nitoris*, sp. nov.**

♀ - Black, the tips of femora and base of tibiæ, reddish, balance of tibiæ dark piceus. Front opaque, the upper two-thirds grayish-black pollinose, the remainder light gray except a triangular velvet black spot next each eye at the junction of these two colors; pile on upper two-thirds of front and on proboscis black, that on the lowest third of front, on face, cheek, palpi and occiput, white. First joint of antennæ scarcely wider than the second, of the same width and length as the third; style one-third as long as the third joint. Thorax opaque, grayish-black pollinose, two sub-median vittæ and the broad lateral margins, light gray; the pile yellowish, the bristles like the four scutellar ones, black. Abdomen polished except the first segment, hind margins of the second, third and fifth, and a spot on each side of the sixth, which are whitish pollinose; pile on first three segments whitish, that on remainder black. Wings grayish hyaline, stigma and narrow border to the veins, brown; fourth posterior cell open. Length, 10 mm.

Missouri. A single female from Dr. Riley's collection, now in the National Museum.

This species would fall in with the last one in the table, *melanura*, a Californian species unknown to me, described from a male specimen; the description by Dr. Loew, while omitting many important characters, still indicates too many differences to permit us to consider this species as being identical with the one described above.



A NEW ANTHRAX FROM CALIFORNIA.

By D. W. COQUILLET, WASHINGTON, D. C.

Since the publication of my recent paper on the Bombylidae (Trans. Am. Ent. Soc., March, 1894), I detected a new species of *Anthrax* among some specimens submitted for names by Mr. Wm. Beutenmüller. The species is a very striking one, owing to the bright, coppery color of the tomentum on the head and body. In the table of species given in the paper mentioned above (l. c., page 97) the present species would fall in with *catulina* except that the pulvilli are wanting; it further differs from the last named species by the front tibiæ being destitute of bristles, the brown of the wings filling less than one-fourth instead of nearly one-half of the fourth posterior cell, etc. Its description is as follows:

Anthrax edwardsii, sp. nov.

Black, the legs, excepting apex of tarsi, yellowish. Pile of front and face black, the tomentum coppery; face slightly retreating below, proboscis not projecting beyond the epistoma; base of third antennal joint very short sub-conical, the remaining portion slender and sub-linear; tomentum of occiput, middle of thorax and scutellum coppery; pile on sides of thorax white, that on the front end and on the pleura yellowish-white except a stripe of black pile on upper part of pleura and a narrow fringe of the same color next the head, continued across the front end of the breast, remaining pile of breast yellowish-white. Tomentum on bases of abdominal segments two to five black, that on the apices and on the whole of the sixth and following segments, coppery; the dense pile of the first segment, and on front half of the sides of the second segment, yellowish-white, that on sides of the remaining portion of the abdomen black, bordered above with yellowish-white; pile of venter white, that at the apex largely black. Legs not fringed with erect scales, yellow tomentose, the pile and bristles black; front tibiæ destitute of bristles, claws of front tarsi small; pulvilli wanting. Wings hyaline, the base brown, the outline of this color distinct, extending from apex of the auxiliary vein transversely to the second, then basally a considerable distance, then transversely to the last third or fourth of the discal cell, then basally to the small crossvein, then across the discal and fourth posterior cells slightly before the base of the third, then curving through the anal cell slightly beyond its middle and obliquely crossing the axillary cell near its first third; crossvein within the brown bordered with yellowish white. Length, 6 to 10 mm.

One specimen, Vancouver Island; five specimens, San Francisco district, California. Collected by the late Hy. Edwards. Types in American Museum of Natural History and in my collection.

**NOTES ON THE TENTHREDINID GALL OF
EUURA ORBITALIS ON SALIX AND ITS
OCCUPANTS.**

By C. H. TYLER TOWNSEND.

From July 8 to 11, 1892, there were found in the Grand Cañon, Arizona, 2500 ft. below south rim at Hance's, great numbers of elongate stem-galls on a narrow-leaved *Salix* sp., probably *S. longifolia* Muhl. These galls are simply an enlargement of the twig or stem of the willow. Many were empty at this date, with an exit hole in the side. Others were still inhabited, and contained small whitish larvae, apparently hymenopterous.

The same galls were found very plentiful in the Alameda near Las Cruces, N. M., Nov. 14, 1892, on *S. longifolia*. One gall opened contained a whitish tenthredinid larva with blackish head. Seven more of the galls opened this date contained 10 small oval pure white larvae, 3 large whitish tenthredinid larvae with brown

heads, and a blackened pupa probably of the latter. There were either two of the first in one gall, or two of the second, or else one of each, each one of the seven galls having always just two occupants. The small white larvæ are those of a hymenopterous parasite. The sawfly is the gall maker. When the larvæ of the latter occurred in the gall the channel was accordingly large and filled with much frass. The cells containing the small white parasite larvæ were much smaller. The parasite was bred and determined as *Eurytoma studiosa* Say.

These galls extremely resemble those of *Cecidomyia rigida*, O. S., galls of which species have been sent me by Mr. T. D. A. Cockerell, collected at West Cliff, Colo. (see Ckll., *Entom*, 1890, p. 278). The three galls sent me by Mr. Cockerell are of somewhat different form from the tenthredinid galls above mentioned, and were very evidently formed near terminal end of shoots. They are from 1 to $2\frac{1}{2}$ times as long as broad, one being quite rounded in outline. They measure 10 mm., 15 mm., and 20 mm. in length; and 8 mm., $7\frac{1}{2}$ mm., and 7 mm. in greatest width respectively.

The galls collected in the Grand Cañon, July 11, are not as large as those just mentioned from Las Cruces. They were more frequently near the terminal portion of the shoot. Most of them are considerably shrivelled, having been apparently made in the recent growth near terminus, and measure from 17 to 32 mm. in length, and $2\frac{1}{2}$ to $4\frac{1}{2}$ mm. in greatest width. Two others that are not shrivelled measure 22 and 24 mm. in length, and about 6 mm. each in greatest width.

The galls which I collected in the Grand Cañon, and at Las Cruces, are generally somewhat more elongate in form, and usually occurred at a considerable distance from the terminal end of the shoot, though some were observed to be more or less terminal. The measurements of 40 galls collected at Las Cruces, Nov. 14, as above referred to, are as follows: From 7 mm. in length, by 5 mm. in greatest width; to 50 mm. in length, by 8 mm. in greatest width. These are the shortest and longest. Another one which measured nearly 50 mm. long, was about $7\frac{1}{2}$ mm. wide. The narrowest measures hardly 4 mm. in width, by about 22 mm. in length. The next narrowest is $4\frac{1}{2}$ by 11 mm. There were none wider than the above mentioned longest one. Two which were same width, 8 mm., measure 19 mm. and about 23 mm. in length. The average full size of these galls is about 7 mm. in width, by from 27 to 31 mm. It will therefore be seen that they vary much

in size. Sometimes two or more galls occur in close proximity to each other on the same stem. From these 40 galls, which were placed in a glass jar Nov. 14, 1892, nothing had issued up to March 24, 1893. On April 4, 1893, from 13 galls that had been laid aside, six sawflies were found issued and dead, except one which was alive. Three more were found issued and dead from same galls, April 9, 1893. From the other 27 galls there were found issued April 9, 1893, 4 live sawflies and 12 dead ones.

The following are descriptions of the occupants of this gall.

Larva of *Euura orbitalis* Nort. —Length, 5 to 8½ mm.; width, 1 3/5 to 2 mm. Entirely pure white, except head which is pale brownish with a blackish shade. Head very round in outline from before, with a darker circular central area. Eyes darker, situated on outer anterior edge of head, consisting of a single large round raised ocellus. Antennæ apparently consisting of a single flattened basal joint, which is partially sunken in a shallow cavity in front of the eye. Mandibles strong, widened on base, a little narrowed and rather truncate on apex, 3-toothed blackish on apex. Maxillæ 3-jointed, basal two joints very stout, first longer and a little stouter than second, third joint very slender and about as long as second. Maxillary palpi 3-jointed, joints about equal, the apical joint a little smaller than the basal. Labial palpi 3-jointed, joints about equal in length, basal stout, second about one-half width of basal, terminal joint very slender. Head chitinous and thinly hairy, rest of larva fleshy and naked. Three pairs of well formed thoracic legs, apparently 4-jointed. Abdominal segments 5 to 10 each on ventral surface with a pair of short leg like prolongations of the integument. Segments very nearly equal in length. Body widest on last two thoracic segments, the prothoracic segment narrower, and head narrower still. The abdominal segments somewhat narrower than the last two thoracic, about equal except 12 and 13 which are successively narrowed.

Described from 3 specimens, extracted from galls Nov. 14. The above mentioned specimen of the pupa is unfit for description.

Larva of *Eurytoma studiosa* Say. —Length, 1 4/5 to 3 mm.; greatest width 1 1/5 to 1½ mm. Wholly pure white, except the very small brownish mouth parts. Oval in shape, thick, plump, and fleshy, apodous, consisting of 13 segments but appearing 14-jointed from an extra joint showing at anus. Segments nearly all equal in length, the body widest on segments 7 and 8, very gradually narrowing and rounded anteriorly, more rapidly narrowing to a tip posteriorly. Head situated on ventral aspect, the whole capital segment invisible from above in the natural slightly curved position of the larva. Mouth parts, so far as apparent, consisting simply of a whitish labrum and two small brownish chitinous jaws, the latter rather stout and lighter colored at base, pointed and sharp at apex and notched on outer side near base. Head plate or segment narrowed, very thinly hairy. Larva anteriorly with a few hairs, rest apparently naked.

Described from 9 specimens, taken from galls, Nov. 14

I am indebted to Mr. Wm. H. Ashmead for identifying the host and parasite.

NOTES ON A FEW BOMBYCOID MOTHS FROM
GRANT COUNTY, NEW MEXICO.

By T. D. A. COCKERELL.

In the Entomological Collection of the New Mexico Experiment Station, I find a box of specimens labelled Grant County, N. M. They were, I believe, collected by Mr. W. J. Howard, and received by the N. M. College from the Hon. W. G. Rich. The Bombycoïd moths in the box belong to four species, as named below.

Daritis thetis *Klug.*—This species was introduced to our fauna by Mr. H. Edwards in Dec. 1886, on the strength of two specimens taken in New Mexico by Mr. Wilson Howard. The locality was not precisely indicated, and the specimens were made the types of a new var. *howardi*. Mr. Dyar tells me that he has not heard of any other examples of this variety. The specimen from Grant Co. is probably best referred to var. *howardi*, having the secondaries decidedly ochre-yellow on the disc; but the bands on the primaries are white with only a faint creamy tinge.

Alypioides crescens (*Walker*) var.* Differing from the type in having the secondaries entirely without the yellow patch above, although the fringe is partly yellow. On the underside of the secondaries the yellow patch appears as an elongated mark, 2 mm. long. Expanse, 46 mm. I sent an account of this specimen to Mr. Dyar, and he informs me that he has seen none like it.

Cymbalophora proxima *Guèr.*, var.?—I had taken this for a form of *phyllira*, but Mr. Dyar, to whom I sent some account of it, urges that it must rather be *proxima*. In this he is doubtless correct, as it agrees sufficiently well with the description of that species, except that the last segment of the abdomen is by no means wholly black above, the lateral tufts being pale ochreous. The second line is wanting above the longitudinal streak, except for a small mark on the costa. The ground color of the hind wings is pale creamy. Expanse, 36 mm.

Arachnis zuni *Neum.*—One specimen, which I take to be a male, agrees with the figure in Journ. N. Y. Ent. Soc., Vol. 1, Pl. 1, f. 2. A second example, doubtless a female, differs considerably. Mr.

* This is *Alypioides bimaculata* H.-S. (= *Alypia trimaculata* Bois., Kirby's Catalogue, p. 34) from Mexico. I think this is the first record of its occurrence in the United States.

Harrison G. Dyar.

Dyar tells me that the type specimen of this species is the only one hitherto known, and consequently a description of the ♀ is desirable.

A. zuni, ♀. Expanse, 61 mm. Primaries as in ♂, but the two innermost white marks on inferior margin not confluent, and the fourth grey band leaving the costa much more obliquely, so that its distal angle with the costa is much less than a right angle. In both of this points my male agrees with the figured type, and differs from the ♀. The markings in the ♀ are also darker. Secondaries fringed with dark grey; their ground-colour pale yellowish, with three broad transverse brownish grey bands, each margined with black. The first of these bands is nearly straight; the other two sinuous, especially the second, which is twice bent about its middle. Underside much like the upper, but base of wings, especially along the costa, suffused with yellow.

Although the sexual differences are thus considerable, it would be quite unreasonable to regard the ♀ specimen as a distinct species. As Mr. Dyar remarks, similar sexual differences are known in other species of the genus.

FLORIDA FIELD NOTES.

By ANNIE TRUMBULL SLOSSON.

I was examining one of the pitcher plants (*Sarracenia variolaris*) in Jacksonville, Fla., this spring in search of insects. As I took one of the strange trumpet-shaped leaves in my fingers to tear it open, out darted a blackish *Megachile*, buzzed about my head and flew away. In the leaf I found a cell nearly completed, about half an inch in length. It was made of circular bits of the leaves of *Rhexia lutea*, quite plentiful in the vicinity. I do not remember any member of this genus or neighboring genera as being included in the various lists of insects frequenting this plant.

* * *

At Punta Gorda last winter the "baskets" of *Oiketicus abbotii* were very numerous on various trees and shrubs. Upon one "Japanese plum" tree they hung by hundreds, sometimes one small twig would hold eight or more, hanging not half an inch apart. Orange and lemon trees were sometimes completely defoliated by the larvæ. I gathered thirty or more of the cases containing living larvæ and kept them in a large paper-box with mosquito-netting over the top. They make very interesting pets, eating well in captivity and adding to the decorations of their singular cases from time to time. They even tore bits of paper from the lining of the box, and pieces of the netting, fastening them to their baskets. I secured from these many of the moths

and several specimens of the parasite *Hemiteles thyridopteryx*, both male and female.

* * *

In February I found the pretty ægeria-like *Burtia bele* Gr. quite plentiful at Punta Gorda. They were flying in the middle of the day among the marsh-grasses near the shore. Their flight is rather sluggish and wavering, and for only short distances. Then they light upon the grass-stalks and cling there. I took many females but only three or four males. I imprisoned several females and secured some eggs and several larvæ. But these last refused to eat the grass I provided and soon died.

* * *

I took several rare sphingidae in South Florida this season. At light in Punta Gorda in early March I captured a fine specimen of *Eucheryx (Pergesa) thorates* Hübner, not recorded hitherto from the United States. It is taken in the West Indies, Mexico and South America. The primaries are a rich olive green, secondaries bright yellow with dark basal patch and marginal band, a showy insect. At twilight around the blossoms of an orange tree at Lake Worth I took several specimens of the tiny sphinx *Cantethia grotei* Hy. Edwards, and also *Allopos tantalus* Linn, *Dilophonota obscura* Fab. and *D. edwardsii* Butl. I found one fine large female specimen of *Ellema coniferarum* S. & A. resting on the trunk of a pine tree in the day-time, its wings of brownish-gray mimicing the tints of the rough bark so perfectly that one could with difficulty detect the insect. *Enyo lugubris* was by far the most common sphingid at Lake Worth, coming by scores to blossoms at dusk.

* * *

At Ormond, on the Halifax river, I found in late March a colony of very handsome and striking larvæ. They were feeding upon leaves of that beautiful Florida lily, *Paneratium rotatum*. They were of velvety black marked with creamy white, head and feet of orange red. They were evidently noctuids but unlike anything I had seen. I carried home to the hotel fifteen of them and placed them in a glass-jar with earth at the bottom. They fed readily and voraciously and went into the ground a few days later. I secured thirteen pupæ. These I packed carefully and carried with me to New York. In just a month from pupation one moth emerged. It was *Euthisanotia timais* Cram, the "spanish moth". Of the other twelve pupæ not one developed. I shall write a more detailed account of larvæ and pupæ in the future.

LIFE HISTORY OF FALCARIA BILINEATA Packard.

By HARRISON G. DYAR, A. M.

The moths emerge from hibernating pupæ and deposit eggs early in June on the white birch (*Betula papyrifera*). The eggs are laid from two to four together or singly on the bark of the smaller twigs, usually in a row in line with their longest diameter. On hatching, the little larvæ separate, and each proceeds to the tip of a leaf where it takes up a position on the upper side, resting on the brown portion of the leaf which it soon produces by eating away the upper epidermis and parenchyma. Here the first molt takes place. After it, the larva eats the whole leaf, often resting on the same brown patch as it did in the first stage; but soon it sits upon the green part of the leaf or goes to a new leaf. In its usual position the head and tail are held up at an angle of 45 degrees, the larva being supported on its abdominal feet. In the final stage, when large, the larva usually rests upon a twig or branch. At maturity it forms a slight cocoon of yellow silk between some leaves and is soon transformed to a pupa covered with a white bloom. There are at least three broods annually. The egg is elliptical, flattened above and below or a little concave. The surface is marked off faintly into irregular quadrangular areas by slightly raised latticed lines and the whole thickly covered with little round regular pits, as many as 10 in each area. Dimensions, .8x.6x.4 mm. The larva throughout its five stages is of a rusty-brown color variegated with white. It becomes paler as it gets older and the mature larva is of a creamy color marked irregularly with white and brown. The surface of the body is somewhat rough at first, the tubercles rather enlarged and later tubercle I becomes distinctly enlarged, forming on joints 3 and 4 a short horn-like process subdorsally. The anal feet are wanting; but there is no long process as in *Orecta rosea*; on the end of the anal plate there is only a short upturned rounded process. In the first stage the arrangement of the tubercles is normal, except that tubercle VI is absent as in the majority of newly hatched larvæ. After the first moult several secondary setiferous tubercles appear, the most prominent being one near tubercle III, situated below tubercle III (not in line with it as in *Platypteryx arcuata*) and partly behind the spiracle. The measurements for the width of head for the five stages are: .3 mm., .6 mm., 1.05 mm., 1.5 mm., 2.0 mm. If these be compared with the calculated series, viz. .33, .60, 1.10, 2.0, ratio .55, it will be seen that an extra stage has been interpolated between the two last stages corresponding to the calculated number 1.48, derived with the ratio .74 (= the square root of .55) compare with this the condition in *Nadata* and *Edema*. (Psyche, Oct. 1892, pp. 337—338.)

PRELIMINARY REVISION OF THE BOMBYCES OF AMERICA NORTH OF MEXICO.

By B. NEUMÖGEN AND HARRISON G. DYAR.

(CONTINUED FROM PAGE 76.)

P. geminata Packard.

1864—*Packardia geminata* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 343.

Marked exactly as in *albipunctata* but with paler secondaries and the shading on primaries usually less extensive. Expanse, 26 mm.

Habitat, Northern Atlantic States. Probably not different from the following.

P. albipunctata Packard.

1864—*Packardia albipunctata* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 344.

1880—*Packardia goodellii* GROTE, Can. Ent., Vol. XII, p. 242.

var. *ocellata* Grote.

1865—*Packardia ocellata* GROTE, Proc. Ent. Soc. Phil., Vol. IV, p. 322.

Ground color white; three brown bands, the inner two oblique, parallel; the third running in a reverse direction from costa to internal angle where are two or three superposed silvery white spots. The wing is more or less obscured by ochreous and chocolate brown shadings, though the ground color appears at the apex; secondaries blackish. Expanse, 23—27 mm.

Habitat, Northern Atlantic States.

Family LAGOIDÆ.

Synopsis of genera.

Vein 1 of primaries branched.

Veins 3 and 4 of secondaries stalked **Carama.**

Veins 3 and 4 arising separately **Megalopyge.**

Vein 1 of primaries unbranched.

Antennæ longer than thorax; body robust **Eupoeya.**

Antennæ very short; primaries with accessory cell **Dalcerides.**

Genus *Carama* Walker.

1855—*Carama* WALKER, Cat. Brit. Mus., pt. IV, p. 843.

1858—*Mallatodesma* WALLENGREN, Nat. Akad. Handl., Vol. XV, p. 212.

1864—*Ulosota* GROTE, Proc. Ent. Soc. Phil., Vol. III, p. 524.

C. cretata Grote.

1864—*Ulosota cretata* GROTE, Proc. Ent. Soc. Phil., Vol. III, p. 524.

Silky milk white, immaculate, except the head which is lemon yellow between the antennæ, and blackish beneath. Antennæ pale fulvous brown, the stem white at base. Abdomen marked with fulvous on the segments; dorsal hairs white, except a large, pale, lemon yellow tuft at base. Expanse, 27 mm.

Habitat, Southern States [Grote].

Genus **Megalopyge** Hübner.

1822?—*Megalopyge* HÜBNER, Verz. bek. Schmett., p. 185.

1841—*Lagoa* HARRIS, Rep. Ins. Mass., p. 205.

1855—*Chrysopyga* HERRICH-SCHLÆFFER, Ausser. Schmett., Vol. I, p. 6.

1855—*Gasina* WALKER, Cat. Brit. Mus., pt. VI, p. 1478.

1856—*Podalia* WALKER, Cat. Brit. Mus., pt. VII, p. 1714.

1860—*Pimela* CLEMENS, Proc. Acad. Nat. Sci. Phil., Vol. XII, p. 156.

Synopsis of species.

Wings immaculate brownish ocher	pyxidifera.
Wings shaded with black and brown.	
Color ocher yellow	opercularis.
Color straw yellow	crispata.

M. pyxidifera Abbot & Smith.

1797—*Phalena pyxidifera* ABBOT & SMITH, Lep. Ins. Ga., Vol. II, pl. 54.

Immaculate brownish ocher throughout, the thorax rather darker and hind wings paler. Body woolly as also base of fore wings. Expanse, 25 mm.

Habitat, Southern Atlantic States.

M. opercularis Abbot & Smith.

1797—*Phalena opercularis* ABBOT & SMITH, Lep. Ins. Ga., Vol. II, pl. 53.

1860—*Pimela lanuginosa* CLEMENS, Proc. Acad. Nat. Sci. Phil., Vol. XII, p. 157.

1869—*Miresa* (?) *subcitrina* WALKER, Char. Lep. Het., p. 20.

Thorax brownish ocher, fore wings at apices dull yellow, secondaries straw yellow. Basal two-thirds of primaries covered with wrinkled hairs of a purplish brown color mixed with white, the purplish tint predominating on costa. Expanse, 25—38 mm.

Habitat, Southern States.

M. crispata Packard.

1864—*Lagoa crispata* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 335.

Pale straw yellow, the long wool on basal part of fore wing much wrinkled, purplish black along the costa and brown over the

discal area, leaving a broad terminal space of the ground color.
Expanse, 25—30 mm.

Habitat, Northern Atlantic States.

Genus **Eupoeya** Packard.

1893—*Eupoeya* PACKARD, Ent. News, Vol. IV, p. 167.

E. slossoniæ Packard.

1893—*Eupoeya slossoniæ* PACKARD, Ent. News, Vol. IV, p. 169.

Pure white with no markings; pectinations of antennæ dusky.

Expanse, 22 mm.

Habitat, Florida.

Genus **Dalcerides** Neumegen & Dyar.

1893—*Dalcerides* NEUMEGEN & DYAR, Can. Ent., Vol. XXV, p. 121.

D. ingenita Hy. Edwards.

1882—*Artaxa ingenita* HY. EDWARDS, Papilio, Vol. II, p. 12; 1893—NEUMEGEN & DYAR, Can. Ent., Vol. XXV, p. 121.

Thorax and fore wings dark ochereous, abdomen and hind wings reddish ochereous, immaculate. Wings broad, rounded, antennæ not as long as the thorax. Expanse, 35 mm.

Habitat, Arizona.

Family DIOPTIDÆ.

Genus **Phryganidia** Packard.

1864—*Phryganidia* PACKARD, Proc. Ent. Soc. Phil., Vol. IV, p. 348.

P. californica Packard.

1864—*Phryganidia californica* PACKARD, Proc. Ent. Soc. Phil., Vol. IV, p. 349.

Uniform pale brown, translucent, veins showing prominently; collar tinged with yellow. In the ♂ a pale yellow, diffuse cloud beyond the end of cell. Expanse, 30—35 mm.

Habitat, California.

According to Kirby's Catalogue, the following species occurs in North America. It is unknown to us:—

Dioptis megæra Fabricius.

1787—*Bombyx megæra* FABRICIUS, Mant. Ins., Vol. II, p. 109, n. 12.

Fore wings light bluish spotted with white. Hind wings white in the middle, bluish at apex with waved reddish bands. (Linné Syst. Nat. (5), 2404, n. 467).

Family NOTODONTIDÆ.*

Synopsis of subfamilies and genera.

- Outer margin of primaries excavate below apex; accessory cell on a long stalk **Apatelodinæ.**
- Outer margin entire, or at most moderately excavate between the termination of the nervules.
- Antennæ of ♂ bipectinated to the tip or simple **Notodontinæ.**
- Antennæ of ♂ with distinct pectinations.
- Primaries with an accessory cell.
- A tufted tooth on internal margin of primaries **Notodonta.**
- Internal margin entire.
- Pectinations of antennæ long.
- Thorax with large central tuft **Nadata.**
- Thorax untufted **Hyparpax.**
- Pectinations moderate or short.
- Costa of primaries straight, apex rectangular **Symmerista.**
- Costa convex, apex rounded **Nerice.**
- Primaries without accessory cell. (Rarely a small one in one *Cerura*.)
- Internal margin entire.
- Vein 5 of secondaries distinct **Cerura.**
- Vein 5 of secondaries weak or absent.
- Tip of abdomen with a brush-like tuft **Melalopha.**
- Tip of abdomen simple.
- Size small **Gluphisia.**
- Size larger **Eumelia.**
- A tufted tooth on internal margin of primaries **Pheosia.**
- Antennæ of ♂ simple, without distinct pectinations.
- A tufted tooth on internal margin of primaries.
- Accessory cell absent **Lophodonta.**
- Accessory cell present **Lophopteryx.**
- Internal margin entire.
- Accessory cell present **Datana.**
- Accessory cell absent **Nystalea.**
- Antennæ of ♂ pectinated for basal two-thirds or more, the tips bare **Heterocampinæ.**
- A slight tooth on internal margin of primaries **Ianassa.**
- Internal margin entire.
- Accessory cell present.
- Antennæ of ♀ simple.
- Antennæ of ♂ pectinated for basal three-fourths or less.
- A vertical tuft on the head; black spots above internal angle of primaries **Dasylophia.**
- Head without a distinct erect tuft.
- Terminal abdominal hairs gathered into a more or less conspicuously bifid tuft **Schizura.**

* For a fuller treatment of this family see Trans. Am. Ent. Soc., Vol. XXI, pp. 179-208.

Anal tuft not normally bifid.	
Accessory cell moderately long	Euhyparpax.
Accessory cell reaching half-way to apex of wing.	
Wings elongate, more than twice as long as broad	Heterocampa.
Wings shorter, twice as long as broad or less	Cecrita.
Antennæ of ♂ pectinated nearly to tip	Misogada.
Antennæ of ♀ pectinated	Litodonta.
Accessory cell absent; veins 6—10 stalked.	
Head moderately prominent	Macrurocampa.
Head sunken in the thorax	Ellida.

Subfamily APATELODINÆ.

Genus **Apatelodes** *Packard.**Synopsis of species.*

Outer margin entire below vein 5	torrefacta.
Outer margin deeply excavate between the terminations of veins	angelica.

Subfamily NOTODONTINÆ.

Genus **Notodonta** *Ochsenheimer.**Synopsis of species.*

Size large; external margin of primaries excavate between the veins	elegans.
Size smaller; external margin entire.	
Fore wings shaded with ocher and brown along internal and external margins.	
Thorax dark ash-gray	stragula
Thorax blackish gray	pacifica.
Fore wing without ocherous brown marks, but with longitudinal black dashes before internal angle.	
Primaries yellowish at base and disk	georgica.
Primaries uniform stone-gray	tortuosa.

Genus **Nadata** *Walker.**Synopsis of forms.*

Color buff or orange buff to red.	
General color buff.	
Excavations on external margin filled in with white	gibbosa.
Fringe uniformly ocherous	var. doubledayi.
Color deep orange red	race rubipennis.
Color straw yellow.	
Wings without black shades	race oregonensis.
A black shade at end of cell	var. behrensi.

Genus *Hyparpax* *Hübner*.*Synopsis of species.*

- Median space clear yellow **aurora.**
 Median space irrorate or covered by reddish scales.
 Fore wing pink, with only a line of yellow **venus.**
 Fore wing pale, dull ochereous with lines and irrorations of brownish
 red **perophoroides.**

Genus *Symmerista* *Hübner*.*Synopsis of species.*

- A white costal edging **albifrons.**
 No white edging **packardii.**

Genus *Nerice* *Walker*.**N. bidentata** *Walker*.Genus *Cerura* *Schrank*.*Synopsis of species.*

- Primaries crossed by about eight angularly undulate black lines.
 Secondaries black **multiscripta.**
 Secondaries white **scitiscipta.**
 Primaries crossed at basal third by a broad gray band, sometimes absent.
 One or more transverse dentate lines on discal area before the sub-
 terminal shade.
 Transverse band gray, pulverulent, bordered by black and orange scales.
 Fore wings pale cinereous **occidentalis.**
 Fore wings white.
 Transverse band broad **scolopendrina.**
 Transverse band narrow or broken *var.* **albicoma.**
 Band even blackish, without distinct borders **modesta.**
 A double row of venular dots, forming an ellipse, sometimes
 obsoletely connected **borealis.**
 A single row of venular dots, preceded by a rigid shade line, or
 discal area immaculate.
 Fore wings dark cinereous **cinerea.**
 Fore wings pale cinereous *var.* **cinereoides.**
 Fore wings nearly white.
 Transverse gray band distinct *var.* **placida.**
 This band very obscure or absent *var.* **nivea.**

Genus *Melalopha* *Hübner*.*Synopsis of species.*

- Lines on primaries not anastomosing, free.
 Size large with a distinct large brown apical shade **albosigma.**
 Size smaller; apical region not distinctly discolored.

Wing uniform in tint	alethe.
Wing shaded with darker blotches.	
Pale, the blotches contrasting	brucei.
Dark, more uniformly obscured	multnoma.
Lines anastomosing, the second joining the third.	
Lines uneven, the basal toothed.	
Subapical patch pale, yellowish, the s.-t. dots preceded by streaks	strigosa.
Patch yellowish to rusty-brown, without streaks.	
Size moderate; thoracic mark present	apicalis.
Larger; no thoracic mark	inornata.
Lines nearly even, the basal one dislocated, but not toothed.	
4th line white on costa	inclusa.
4th line not distinctly white	jocosa.

Genus **Gluphisia** *Boisduval.*

Synopsis of species.

With a yellow (or black) central band on primaries more or less distinct.	
Markings distinct	septentrionalis.
Markings confused and irrorate	formosa.
Pale, with no distinct yellowish markings	albofascia.



Genus **Eumelia** *Neumegen.*

Synopsis of species.

A yellow angular discal dot	severa.
No discal dot	liatneri.

Genus **Pheosia** *Hübner.*

Synopsis of species.

A silvery white line at base of vein 1.	
Central part of fore wing white	dimidiata.
Wing centrally smoky black	portlandia.
Without silvery white mark.	
Uniform blackish gray with black discal dot	simplaria.
Primaries brown at base; no discal dot	basitriens.

Genus **Lophodonta** *Packard.*

Synopsis of species.

Primaries partly shaded with ferruginous brown	ferruginea.
Primaries with scattered ocher-yellow marks	angulosa.

Genus **Lophopteryx** *Stephens.*

L. capucina *Linnaeus.*

Genus *Datana* Walker.*Synopsis of species.*

- Outer margin of primaries distinctly excavate between the veins.
 Color entirely smoky or blackish brown **angusii.**
 Color yellowish brown or paler.
 Discal spots faint or absent, size medium.
 Color yellow brown **ministra.**
 Color testaceous **californica.**
 Discal spots distinct, size large **drexelii.**
- Outer margin indistinctly excavate, nearly entire in the ♂.
 Color tawny-brown or purplish.
 Tawny-brown, discal spots distinct, size large **major.**
 More or less purplish, discal spots indistinct, size medium.
 Thoracic patch reddish brown.
 Fore wings dull whitish lilac, more or less covered with
 cinnamon-brown scales **palmii.**
 Fore wings dark brown with a purplish flush **floridana.**
 Thoracic patch ochereous **modesta.**
- Color yellowish buff.
 Thoracic patch tawny-brown **perspicua.**
 Thoracic patch as pale as thorax **robusta.**
- Outer margin of primaries entire or a little wavy in the ♀.
 Primaries dark reddish-brown, lines and fringe concolorous, **integerrima.**
 Primaries luteous-tawny, lines and fringe not concolorous **contracta.**

Genus *Nystalea* Guenée.*N. indiana* Grote.

Subfamily HETEROCAMPINÆ.

Genus *Ianassa* Walker.*Synopsis of species.*

- Yellowish or sordid cinereous **lignicolor.**
 Bright bluish cinereous **coloradensis.**

Genus *Dasylophia* Packard.*Synopsis of species.*

- T.-p. line on primaries distinct, arcuate, even **anguina.**
 T.-p. line obsolete superiorly; markings streaked longitudinally, **thyatiroides.**

Genus *Schizura* Doubleday.*Synopsis of species.*

- Transverse bands largely absent.
 Size small (36 mm. or less), the brown shade along internal margin
 of primaries, distinct **concinna.**
 Size larger (40 mm. or more), this shade less distinct or absent.
 Yellowish cinereous at apex, reddish shade moderately distinct, **eximia.**

Bright cinereous at apex; shade along internal margin yellowish
or absent

perangulata.

Transverse bands normally present.

Discal dot surrounded by a light cinereous space.

Scarcely any black shading on primaries **ipomææ.**

Two long black dashes **var. telifer.**

Whole middle of wing black to outer margin **cinereofrons.**

Discal dot on the ground color.

Primaries pale green at extreme base **unicornis.**

Without green tints.

Discal dot lunate; size small.

Transverse lines distinct, black, coarsely undulate **apicalis.**

Lines faint, reddish, finely undulate **nitida.**

Discal dot round; size larger **leptinoides.**

Genus **Euhyparpax** *Beutenmüller.*

E. rosea *Beutenmüller.*

Genus **Heterocampa** *Doubleday.*

Synopsis of species.

Size large (Expanse, 40 mm. or more.)

Discal streak lunate.

Wings varied with whitish, especially sub-apically.

With conspicuous greenish-gray shades **astarte.**

More uniformly cinereous **obliqua.**

A large brown patch beyond cell **var. trouvelotii.**

Wings very uniformly dark-gray **lunata.**

Wings without distinct white sub-apical shade, sub-basal field

dark **umbrata.**

Discal mark ovate or reniform **manteo.**

Size small (Expanse, 35 mm. or less.)

Wings greenish or gray with white sub-apical shade **subrotata.**

Wings evenly gray without any white shade **belfragei.**

Genus **Cecrita** *Walker.*

Synopsis of species.

Dull greenish; transverse lines purplish brown, geminate, lunulate **biundata.**

Whitish, clouded with black; transverse lines faint **guttivitta.**

Cinereous, with black, geminate, angular, transverse lines **bilineata.**

Genus **Misogada** *Walker.*

M. cinerea *Packard.*

Genus **Litodonta** *Harvey.*

L. hydromeli *Harvey.*

Genus **Macrurocampa** *Dyar.*

M. marthesia *Cramer.*

Genus **Ellida** *Grote.*

E. caniplaga *Walker.*

Family BOMBYCIDÆ.

Genus *Bombyx* *Linnaeus*.1758—*Bombyx* LINNÆUS, Syst. Nat., Vol. I, p. 499.**B. mori** *Linnaeus*.1758—*Bombyx mori* LINNÆUS, Syst. Nat., Vol. I, p. 499, n. 18; 1891—SMITH, List. Lep., No. 1413.

Entirely white, with very faint brown t. a., median and t. p. bands and discal dot. This is the well known "silk-worm" moth, and is cultivated in various parts of this country.

Family PSYCHIDÆ.*

Synopsis of genera.

Vein 1b of primaries sending a branch to internal margin.

Wings elongate, narrow.

Hind wings triangular, apex acuminate **Oiketicus.**Hind wings rounded, apex obtuse **Thyridopteryx.**Wings broader; size small **Psyche.**Vein 6 present on fore wing, absent on hind wing, *group* **Platœceticus.**Vein 6 absent on both wings *group* **Eurycyttarus.**Vein 1b free from inner margin, without a branch **Chalia.**Genus *Oiketicus* *Guilding*.1837—*Oiketicus* GUILDING, Trans. Linn. Soc. Lond., Vol. XV, p. 375.**O. abbotii** *Grote*.

1880—GROTE, N. Am. Ent., Vol. I, p. 52.

♂ Sable brown with a vitreous bar at the extremity of the cell of the primaries. The narrow external edging of the wings is pale. A blackish streak at base on vein 1, and a broad shade from cell outward to external margin. Expanse, 30 mm.

Habitat, Florida.Genus *Thyridopteryx* *Stephens*.1834—*Thyridopteryx* STEPHENS, Ill. Brit. Ent. Haust., Vol. IV, p. 387.1865—*Hymenopsyche* GROTE, Proc. Ent. Soc. Phil., Vol. V, p. 248.*Synopsis of species.*Veins of wings brown **ephemeræformis.**Veins of wings pale orange **meadii.****T. ephemeræformis** *Haworth*.1803—*Sphinx ephemeræformis* HAWORTH, Lep. Brit., p. 72.1864—*Ecleticus confifarum* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 351.

* The wingless females of all the species in this family are not very characteristic, and descriptions of them are omitted.

♂ Body black, wings hyaline, the veins brown. Along costa and internal margin of secondaries a few black scales. Expanse, 25 mm

Habitat, Southern States to New York.

T. meadii *Hy. Edwards.*

1881—*Thyridopteryx meadii*, Papilio, Vol. I, p. 116.

Wings hyaline, without black scales at abdominal margin of secondaries; veins pale orange. Expanse, 25 mm.

Habitat, Mohave Desert, California.

Genus **Psyche** *Schrank.*

1802—*Psyche* SCHRANK, Fauna Boica, Vol. II (2), p. 87.

Group **Platœcticus** *Packard.*

1869—*Platœcticus* PACKARD, Guide Study Ins., p. 291; 1887—PACKARD, Ent. Amer., Vol. III, p. 51.

1893—*Heyleytsia* HAMPSON, Moths of India, Vol. I, p. 298.

P. gloverii *Packard.*

1869—*Platœcticus gloverii* PACKARD, Guide Study Ins., p. 291, f. 223.

1884—*Mauntha edwardsii* HEYLAERTS, C. R. Soc. Ent. Belg., Vol. XXVIII, p. 101.

Dark brown throughout. Veins 5—6 arise from the discal cross vein. Expanse, 20—22 mm.

Habitat, Southern States.

Group **Eurycyttarus** *Hampson.*

1891—*Eurycyttarus* HAMPSON, Ill. Het. B. M., Vol. VIII, p. 66; 1893—HAMPSON, Moths of India, Vol. I, p. 299.

Synopsis of species.

Small, wings blackish	confederata.
Larger, wings brownish gray	carbonaria.

P. confederata *Grote & Robinson.*

1868—*Psyche confederata* GROTE & ROBINSON, Trans. Am. Ent. Soc., Vol. II, p. 191.

Uniformly blackish; wings opaque. Wings broad, apex of primaries nearly square. Expanse, 16—19 mm.

Habitat, Southern States to New York and westward.

P. carbonaria *Packard.*

1887—*Psyche carbonaria* PACKARD, Ent. Amer., Vol. III, p. 51.

Uniform brownish black, wings sub-translucent. Wings broad, well rounded; body black, hairy. Expanse, 21—22 mm.

Habitat, Texas.

Genus **Chalia** Moore.1877—*Chalia* MOORE, Ann. Nat. Hist. (4), Vol. XX, p. 345.**C. rileyi** Heylaerts.1884—*Chalia rileyi* HEYLAERTS, Ann. Soc. Ent. Belg., Vol. XXVIII, p. 208.

Yellowish gray, densely hairy; head yellowish brown, thorax brownish gray. Wings concolorous, with narrow brownish edge. Expanse, 12 mm. (?)

Habitat, Missouri [Heylaerts].

[For remarks on *Psyche fragmentella* Hy. Edw. and *Oiketicus davidsonii* Hy. Edw. see a paper by Mr. Dyar, Ent. News, Vol. IV, p. 320. These names have been applied to certain larval cases found in California and the moths have never been described.]

Family LACOSOMIDÆ.

Synopsis of genera.

Primaries falcate	Ciccinnus.
Margins of both wings uneven, excavate between the veins	Lacosoma.

Genus **Ciccinnus** Blanchard.1852—*Ciccinnus* BLANCHARD, Gay's Hist. Chile. Zool., Vol. VII, p. 66.1841—*Perophora* HARRIS, Rep. Ins. Mass., p. 290.1841—*Saccophora* HARRIS, Entom., Vol. I, p. 99.**C. melsheimeri** Harris.1841—*Perophora melsheimeri* HARRIS, Rep. Ins. Mass., p. 290.1866—*Arhodia egenaria* WALKER, Cat. Brit. Mus., pt. XXXV, p. 1575.

Cinereous gray, darker along the margins of the wings, the reddish brown of the wing membrane appearing by transparency. Sparsely sprinkled with black atoms. A blackish discal dot and straight t. p. line, the latter present on both wings and arcuate at costa of fore pair. Expanse, 30 mm.

Habitat, Atlantic States.

Genus **Lacosoma** Grote.1864—*Lacosoma* GROTE, Proc. Ent. Soc. Phil., Vol. III, p. 77.**L. chiridota** Grote.1864—*Lacosoma chiridota* GROTE, Proc. Ent. Soc. Phil., Vol. III, p. 78.

Brownish ocher, the fringe marked with black on the veins. On both wings, a black discal dot and broad, diffuse, undulate, smoky brown t. p. band. Expanse, 25 mm.

Habitat, Atlantic States westward.

Family SATURNIIDÆ.

Synopsis of subfamilies.

- Antennæ bipectinate doubly, at least in the ♂ **Attaciinæ.**
 Antennæ never bipectinate doubly **Lemoniinæ.**

Synopsis of genera.

Secondaries with one distinct internal vein.

Discal cells open.

Abdomen tufted **Philosamia.**

Abdomen untufted.

Antennæ of both sexes equally doubly bipectinated.

Wings produced at apices and elongate; secondaries
 greatly exceeding abdomen, discal spots
 hyaline **Attacus.**

Wings less elongate, more rounded, spots opaque . . . **Samia.**

Pectinations of ♀ antennæ with the upper branch the
 shorter **Callosamia.**

Discal cells closed.

Antennæ pectinated in both sexes.

Antennæ of ♀ doubly bipectinated.

Both branches equal in length in ♀ **Agapema.**

The upper branch shorter than the lower in ♀.

Secondaries tailed **Tropæa.**

Secondaries angulated at apex and middle of outer
 margin **Telea.**

Antennæ of ♀ singly bipectinated, the upper branches reduced
 to serrations **Saturnia.**

Antennæ of ♀ serrate or simple.

Secondaries ocellate **Automeris.**

Secondaries not ocellate **Thauma.**

Secondaries with two internal veins.

Antennæ of ♂ doubly bipectinated **Coloradia.**

Antennæ of ♂ singly bipectinated.

Vein 5 from the discal cross vein **Lemonia.***

Vein 5 from apex of cell on both wings.

Antennæ of ♀ pectinated **Hemileuca.**

Antennæ of ♀ serrate or very shortly pectinated . . . **Pseudohazis.**

Subfamily **Attaciinæ.**Genus **Philosamia Grote.**

1874—GROTE. Proc. Am. Phil. Soc., Vol. XIV, p. 258.

P. cynthia Drury.

1773—*Attacus cynthia* DRURY, Ill. Ex. Ent., Vol. II, pl. 6, f. 2.

1787—? *Bombyx anrotus* FABRICIUS, Mant. Ins., Vol. II, p. 108.

1862—*Saturnia insularis* VOLLENHOVEN. Rev. Zool. (2), Vol. XIV, p. 338.

* A European genus. Type *Bombyx dumi* Linn.

Yellowish olive-brown, densely irrorate with black except along the border of wings. Abdomen with three rows of white tufts. Transverse lines white, bordered on one side with black, the outer line shading outwardly into a light purplish tint. Discal marks narrowly lunate, hyaline, with a yellow shade on the concave side. A sub-apical black ocellus with white crescent, below a large apical purplish shade. Expanse, 120 mm.

Habitat, Vicinity of several Atlantic coast cities; introduced from the East Indies.

Genus *Attacus* *Linnaeus*.

1767—*Attacus* LINNÆUS, Syst. Nat., Vol. I (2), p. 809.

1841—*Hyalophora* DUNCAN, Nat. Libr. Ex. moths, p. 124.

Synopsis of species.

Color rather light-brown, collar only partly white **erycina.**
 Dark blackish-brown, collar white **lorulla.**

A. erycina *Shaw*.

1797—*Attacus erycina* SHAW, Nat. Misc., Vol. VII, p. 230.

1805?—*Phalœna splendidus* BEAUVOIS, Ins. Afr. Amér., p. 133.

Discal spots trigonate, large, hyaline, fused into the outer band. Color pale russet-brown, clay-colored on margins, with the usual markings. T. a. band arcuate, white, both t. a. and t. p. bordered towards each other by black. Beyond the crenate t. p. band a shade composed of brick-red, black, pink and white scales. Sub-median space irrorate with black. Sub-terminal marks moderately prominent. Sub-apical ocellus reduced to a black spot surmounted by the lower part of the narrow white sub-apical line.

Habitat, South America to Mexico, Texas?

A. lorulla *Westwood*.

1853—*Saturnia lorulla* WESTWOOD, Proc. Zool. Soc. Lond., p. 159, pl. XXXII, f. 1.

1883—*Attacus cinctus* TEPPER, Bull. Brook. Ent. Soc., Vol. V, p. 65.

Deep blackish umber-brown, the wings less falcate than in *erycina*. Discal spots rounded triangular, hyaline; not reaching or but touching outer band. Otherwise resembles *erycina* except that the collar is white. The transverse white band at base of abdomen is present in both. Expanse, 110—125 mm.

Habitat, Mexico, Arizona.

Genus *Samia* *Hübner*.1822?—*Samia* HÜBNER, Verz. bek. Schmettl., p. 156.1865—*Platysamia* GROTE, Proc. Ent. Soc. Phil., Vol. V, p. 229.*Synopsis of species.*

General color grizzled-gray.

Size large, discal spots moderately produced.

Outer band of wings bright red **cecropia.**Outer band dull purplish, obscure **gloveri,**Size small, discal spots rounded, slightly produced **columbi.**General color reddish, scarcely gray **rubr.****S. cecropia** *Linnaeus*.1758—*Bombyx cecropia* LINNÆUS, Syst. Nat., Vol. I, p. 447.

Blackish, irrorate with white on costal part of primaries. Thorax red, collar white. Abdomen banded with black, white and red. Transverse bands white, the inner faint and absent on secondaries, the outer succeeded by a broad red band. Discal spots white bordered with red and black. Outer margins broadly clay-colored, paler sub-terminally with a narrow sinuate sub-terminal black line on primaries. A series of large black spots in the interspaces between veins 2—5. A large oval black ocellus between veins 6—7, succeeded above by a purplish shade and zigzag whitish line. On secondaries, a series of sub-terminal black spots and a line. Expanse, 120—150 mm.

Habitat, Atlantic States.**S. gloveri** *Strecker*.1872—*Platysamia gloveri* STRECKER, Lep. Roph. et. Het., Vol. I.var. **reducta** *Neumägen*.1891—*Platysamia gloveri* var. *reducta* NEUMGEGEN, Ent. News, Vol. II, p. 152.

Exactly like *columbia*, but as large as *cecropia*. The discal dots are produced as in *cecropia*, but lack the red edge. T. a. band arcuate as in *columbia*. There is a purplish shade beyond the white band, not present in *columbia*. Expanse, 125 mm.

Habitat, Arizona to the Rocky Mountains and Montana.

var. *reducta*. Smaller than the typical form with the discal spot of primaries touching the p. t. band. Expanse, 83—85 mm.

Habitat, Mountains of Colorado, 11,000 feet.**S. columbia** *Smith*.1865—*Samia columbia* SMITH, Proc. Bost. Soc. Nat. Hist., Vol. IX, p. 343.

Smaller than *cecropia*; the discal dots without red edges and the transverse outer band white with no red. Abdomen brown and white banded. Thorax and basal half of fore wings deep red, collar white. Discal spots rounded, triangular, only slightly produced. T. a. line arcuate, not angulated on median vein. Expanse, 90—100 mm.

Habitat, Northeastern States, Canada to Michigan.

S. rubra Behr.

1855—BEHR, Proc. Cal. Acad. Sci., Vol. I, p. 46.

1855—*Samia coryalus* BOISDUVAL, Ann. Soc. Ent. Fr., (2), Vol. III, p. 32 (no desc.); 1875—STRECKER, Lep. Roph. et Het., p. 102.

1865—*Platysamia californica* GROPE, Proc. Ent. Soc. Phil., Vol. V, p. 229 (note).

1868—*Saturnia ceanothi* BEHR, Proc. Cal. Acad. Sci., Vol. III, p. 296.

Of a color approaching venetian red but darker, uniform, not irrorate; outer margin clay-colored, with the markings faint, brownish. Transverse lines white, narrow, with black edging, but with no red shade. Discal spots white, edged with black, the one on primaries small, that on secondaries produced outward nearly to, or through the transverse band. Thorax red; collar, base and outer bands of abdomen white. Expanse, 95—115 mm.

Habitat, California to Pacific Northwest.

Genus **Callosamia** Packard.

1864—*Callosamia* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 379.

Synopsis of species.

A whitish band on collar and base of thorax	calleta.
Collar concolorous with abdomen.	
♂ without discal spots, or with very faint ones	promethea.
♂ with discal spots as in the ♀	angulifera.

C. calleta Westwood.

1853—*Saturnia calleta* WESTWOOD, Proc. Zool. Soc. Lond., p. 166.

1886—*Attacus calleta* SMITH, Proc. U. S. Nat. Mus., p. 422.

1882—*Platysamia polysommata* TEPPER, Bull. Brook. Ent. Soc., Vol. V, p. 66.

Dull black or smoky; a pale stigmatal band on abdomen, enclosing darker spots. A white basal band or none. T. a. band of primaries white. Outer band of both wings white, edged with ferruginous and dotted with black. Discal spots angular, small, white, without edging. Terminal space mouse-gray, much ornamented with a black line and sub-triangular spots centered with bluish scales; the most prominent of these between veins 6—7

and is outwardly surrounded by a halo of russet brown reaching toward apex of wing. A zigzag, light blue sub-apical line. Expanse, 80—130 mm.

Habitat, Mexico, Southern Arizona.

C. promethea *Drury*.

1773—*Attacus promethea* DRURY, Ill. Ex. Ent., Vol. II, pl. 11, f. 1, 2.

♂ Black, outer margin clay colored, lines nearly lost; marginal marks and sub-apical ocellus normal. ♀ Reddish brown, discal spot on primaries nearly lost, that on secondaries consisting of a bar, dilated at the ends. Outer transverse line pale, distinct, bordered inwardly with black. Marginal marks as in ♂, but reddish. Expanse, 75—80 mm.

Habitat, Atlantic States westward.

C. angulifera *Walker*.

1855—*Samia angulifera* WALKER, Cat. Brit. Mus., pt. V, p. 1224.

1886—*Attacus angulifera* SMITH, Proc. U. S. Nat. Mus., p. 424.

Larger than *promethia*; sexes similar in wing form and marking. ♂ darker in color than the ♀, blackish, but marked essentially the same. Discal mark on primaries large white, angular, on secondaries, a dilated bar. Expanse, 85—100 mm.

Habitat, Atlantic States.

Genus **Agapema** *Neumegen & Dyar*.

1886—*Saturnia*† SMITH, Proc. U. S. Nat. Mus., p. 430.

A. galbina *Clemens*

1860—*Saturnia galbina* CLEMENS, Proc. Acad. Nat. Sci. Phil., p. 156.

Blackish; transverse lines white, the basal, angular and produced on the veins in the ♂, faint in ♀; on secondaries, the basal two-thirds is washed with white in the ♂. A sub-terminal white band on both wings; apex of primaries marked with black and crimson. Discal spots round, hyaline centrally, edged with yellow and black, with a bluish crescent inwardly. Body parts blackish with a few long whitish hairs. Expanse, 50—60 mm.

Habitat, Mexico to Arizona and Texas.

Genus **Tropæa** *Hübner*.

1822—*Tropæa* HÜBNER, Verz. bek. Schmett., p. 152.

T. luna *Linnaeus*.

1758—*Bombyx luna* LINNÆUS, Syst. Nat., Vol. 1, p. 496.

var. rossi Ross.

1872—*Actias rossi* ROSS, Cat. Lep. Can., p. 5, (note).

Body white, thorax tinged with yellow with a broad purple band behind the collar. Wings pale green, the color inhering in the wing membrane and not in the vestiture, which is white. A broad costal purple band on primaries throwing out a short discal band. Discal spots rounded, hyaline centrally, narrowly edged with white, crimson and yellow and with black and blue inwardly. Fringe tinged with crimson and yellow. The *var. rossi* lacks the green tint. Expanse, 100—125 mm.; length of tails, 35—40 mm.

Habitat, Atlantic States southwestward to Texas.

Genus *Telea* Hübner.

1822—*Telea* HÜBNER, Verz. bek. Schmett., p. 154.

T. polyphemus Cramer.

1775—*Attacus polyphemus* CRAMER, Pap. Exot., Vol. I, pl. 5, figs. A. B.

1764—*Bombyx pophia* LINNÆUS, Mus. Ulr., p. 369.

1811—*Phalena fenestra* PERRY, Arcana.

1883—*Telea polyphemus* var. *oculea* NEUMÖGEN, Pap., Vol. III, p. 71.

Ocherous brown either pale or dark and reddish. Costa of primaries and collar gray. Basal line on primaries reddish, dislocated on median vein. Outer line gray, bordered with white with a duplicate black costal streak bordered anteriorly with pink. Discal mark round hyaline edged with a yellow and a black line. Secondaries without basal line, the outer line broad. Discal mark as on primaries, but situated in the outer part of a large, oval, black ocellus, sprinkled with blue scales. Expanse, 110—120 mm.

Habitat, North America throughout.

Genus *Saturnia* Schrank.

1822—*Saturnia* SCHRANK, Fauna Boica, Vol. II (1), p. 149.

1806—*Heræa* HÜBNER, Tentamen, p. 1.

1822?—*Pavonia* HÜBNER, Verz. bek. Schmett., p. 157.

1886—*Calosaturnia* SMITH, Proc. U. S. Nat. Mus., Vol. IX, p. 432.

S. mendocino Behrens.

1876—*Saturnia mendocino* BEHRENS, Can. Ent., Vol. VIII, p. 149.

Fore wings reddish brown with blackish costa, and an apical carmine shade, becoming black inwardly and centered with white. Secondaries orange ochraceous shaded with black with an outer diffuse black band. Discal spots round, black, containing an orange ring and blue crescentic mark. Thorax reddish, collar

white with black border on front part of thorax; abdomen smoky black. Expanse, 50—60 mm.

Habitat, Northern coast region of California.

Genus *Automeris* *Hübner*.

1822?—*Automeris* HÜBNER, *Veiz. bek. Schmett.*, p. 154.

1875—*Id* BOISDUVAL, *Ann. Ent. Soc. Belg.*, Vol. XVIII, p. 188.

Synopsis of species.

T. p. line straight.

Size very large; secondaries without yellow **zelleri.**

Size moderate; secondaries largely yellow,

Olivaceous or russet brown; t. p. line pale yellow **pamina.**

Blackish brown; t. p. line broad, white **zephyria.**

T. p. line composed of a series of lunules, sexes dissimilar **io.**

Wings suffused with reddish *var.* **lilith.**

Abdominal border of secondaries without red shade *var.* **argus.**

A. zelleri *Grote & Robinson.*

1868—*Hyperchiria zelleri* GROTE & ROBINSON, *Trans. Am. Ent. Soc.*, Vol. II, p. 193.

Reddish brown, basal space and costa darker; a small triangular white discal dot in a large quadrate dark discal patch, dentate on the exterior side. T. p. line purplish, straight, followed by a dark brownish shade which extends to the obsolete sub-terminal line. Secondaries reddish along abdominal margin, a large black ocellus with central black ring around which the color is pale; two blackish bands between ocellus and margin. Expanse, 130 mm.

Habitat, Texas.

A. pamina *Neumegen.*

1822—*Hyperchiria pamina* NEUMEGEN, *Pap.*, Vol. II, p. 60.

var. aurosea *Neumegen.*

1882—*Hyperchiria pamina var. aurosea* NEUMEGEN, *Pap.*, Vol. II, p. 61.

Fore wings uniform pale ochraceous or russet brown, (*var. aurosea*) with white scales at base. T. a. line barely discernible. T. p. line distinct, narrow, oblique, pale yellow, bordered outwardly with dark brown. Discal mark obscure. Abdomen red banded dorsally; secondaries yellow centrally around the large black, white centred ocellus. An outer black and a pale pinkish curved band, abdominal edge pinkish. Expanse, 60—70 mm.

Habitat, Arizona.

A. zephyria *Grote.*

1882—*Hyperchiria zephyria* GROTE, *Can. Ent.*, Vol. XIV, p. 215.

Thorax and primaries brown-black. A black discal annulus with linear white center; scales at base of wing and oblique slightly curved, broad t. p. band, white. Abdomen pale brown, broadly dark red dorsally. Secondaries ocher yellow centrally around the large black ocellus with white linear centre and blue scales; bordered by a black line outwardly. A sub-terminal darker brown shade band, the base pinkish. Expanse, 55—70 mm.

Habitat, New Mexico.

A. io *Fabricius*.

1775—*Bombyx io* FABRICIUS, Syst. Ent., p. 560.

1810—*Phalena corollaria* PERRY, Arcana.

1855—*Hyperchiria varia* WALKER, Cat. Brit. Mus., pt. VI, p. 1278.

1875—*Io fabricii* BOISDUVAL, Ann. Ent. Soc. Belg., Vol. XVIII, p. 223.

var. lilith *Strecker*.

1878—*Hyperchiria lilith* STRECKER, Lep. Roph. et Het., p. 139.

var. argus *Neumøgen & Dyar*.

1893—NEUMØGEN & DYAR, Can. Ent., Vol. XXV, p. 123.

Body and primaries of ♂ yellow, lines purplish. T. a. line rectangularly produced inwardly; t. p. evenly lunulate. Discal mark linear surrounded by two rows of dots which are produced longitudinally. A sinuate row of large sub-terminal dots ending on costa and margin in a purplish shade. Thorax and primaries of ♀ a purplish brown, the marks as in the ♂, but obscure, indicated in whitish. Secondaries yellow centrally, red along abdominal margin. A large black ocellus with blue scales and central white dash. Beyond it, a black median and red sub-marginal line. Expanse, 60—80 mm.

Habitat, Atlantic States westward.

Genus **Thauma** *Hy. Edwards*.

1875—*Thauma* HY. EDWARDS, Proc. Cal. Acad. Sci., Vol. V, p. 265.

T. socialis *Feisthhamel*.

1839—*Ormiscodes socialis* FEISTHHAMEL, Mag. Zool., pl. 20, f. 1.

1853—*Dirphia angulifera* WALKER, Cat. Brit. Mus., pt. VI, p. 1363.

1875—*Thauma ribis* HY. EDWARDS, Proc. Acad. Nat. Sci., Vol. V, p. 265.

Dark cinnamon brown. Costal margin near base, angular discal spot and costal half of t. p. line white. Lower half of t. p. line and outer line of secondaries blackish. Expanse, 50 mm.

Habitat, Peru, Chile; Vancouver Island, B. C.

Genus *Coloradia* Blake.1863—*Coloradia* BLAKE, Proc. Ent. Soc. Phil., Vol. II, p. 279.**C. pandora** Blake.1863—*Coloradia pandora* BLAKE, Proc. Ent. Soc. Phil., Vol. II, p. 279.

Grayish black, thinly scaled. T. a. and t. p. lines black sub-lunulate bordered with white on costa. Discal spot round, black. Sub-terminal line whitish, undulate. Secondaries sub-hyaline, grayish, tinged with pink along abdominal margin. Expanse, 70 mm.

Habitat, Rocky Mountains to Cascade Range.

↳ Subfamily **Lemoniinae**.Genus *Hemileuca* Walker.1855—*Hemileuca* WALKER, Cat. Brit. Mus., Vol. VI, p. 1317.1864—*Euchromia* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 382.1872—*Euleucophaeus* PACKARD, Rep. Peab. Acad., Vol. IV, p. 88.1882—*Agyrangles* GROTE, Can. Ent., Vol. XIV, p. 215.*Synopsis of species.*

Prevailing color of wing black, secondaries also partly or largely black.

Secondaries red with black border and discal dot or largely overspread

with black **electra.**

Secondaries without any red.

A broad, translucent, pale yellow band on secondaries.

This band narrow **maia.**

This band broad.

Discal dots slightly bent, thorax blackish . . . *var.* **nevadensis.**

Discal dots lunate, thorax largely yellowish, *race* **californica.**

Secondaries black with a broken white band often obsolete and not translucent.

White marks on primaries divided by the veins . . . **juno.**

White marks often broken, but not by the veins . . . **grotei.**

Prevailing color white or some pale shade; secondaries either immaculate

or but slightly marked with black.

Snow-white with black t. a. and t. p. lines . . . **neumogeni.**

Fore wings blackish gray with white bands . . . **tricolor.**

All the wings uniform, pale, sordid pink.

Fore wings with two transverse white lines . . . **sororius.**

Fore wings immaculate **hualapai.**

H. electra Wright.1884—*Hemileuca electra* WRIGHT, Pap., Vol. IV, p. 19.

* Described by Hy. Edwards (Papilio, Vol. I, p. 100) from Lower California, Mexico, and not yet known from U. S., unless *sororius* and *hualapai* be only forms of one species.

Fore wings black, sub-translucent with white or pinkish triangular discal dot. Basally, centrally and sub-terminally, the black is more or less replaced by pulverulent white, not segregated into well defined marks. Abdomen and secondaries orange red with black border and round discal spot, in the ♂ overspread with black, but not enough to entirely obscure the colors. Thorax black, mixed with pale yellowish hairs. Expanse, 45--50 mm.

Habitat, Southern California.

H. maia *Drury*.

1773—*Attacus maia* DRURY, Ill. Exot. Ent., Vol. II, pl. 24, f. 3.

1775—*Bombyx proserpina* FABRICIUS, Syst. Ent., p. 561.

var. nevadensis *Stretch*.

1872—*Hemileuca nevadensis* STRETCH, Zyg. & Bomb. N. A., Vol. I, p. 108.

1886—*Hemileuca maia* var. *lucina* HY. EDWARDS, Ent. Amer., Vol. I, p. 108

race californica *Wright*.

1833—*Hemileuca californica* WRIGHT, Can. Ent., Vol. XX, p. 31.

1893—*Hemileuca artemis* PACKARD, Proc. Am. Phil. Soc., Vol. XXXI, p. 172.

Sub-translucent black, with a pale yellowish band on both wings partly or wholly enclosing a black discal spot which contains a yellowish sub-hyaline streak or lunule, less distinct on secondaries. Thorax black, with yellowish hairs on collar and red hairs at end of thorax, or thorax entirely yellowish to the red hairs. Abdomen tipped with red in ♂, yellowish in ♀. The band varies in width, being usually narrow in specimens from the Eastern States, broader in those from the West. Californian specimens are distinguished as indicated in the table. Expanse, 45—70 mm.

Habitat, North America.

H junio *Packard*.

1871—*Hemileuca junio* PACKARD, Rep. Peab. Aca., Vol. IV, p. 87.

1881—*Hemileuca yavapai* NEUMEGEN, Pap., Vol. I, p. 172.

Black, collar pale yellow and pale hairs on thorax mixed with black. Tip of abdomen red, in the ♂, this color extending more or less up the dorsum even to base of thorax. On primaries a white band divided by the veins opaque, broadest near costa, which it does not reach. A yellowish irregular triangular discal dot surrounded by black, projecting into the white band. A similar band on secondaries but much reduced, pulverulent, often absent. Rarely traces of a discal dot.

Habitat, Mexico to Arizona.

H. grotei *Hopffer*.

1868—*Hemileuca grotei* GROTE & ROBINSON, Trans. Am. Ent. Soc., Vol. II, p. 192.

1873—*Hemileuca diana* PACKARD, Hayden Surv. Terr., p. 557.

Black; collar white, thorax reddish behind. An outer white band on both wings, narrow, not reaching costa or margin, and on primaries continuous or separated into three patches, the costal one lunate, the median, a sub-triangular discal dot, and the third an elongate spot constricted centrally. Expanse, 45—51 mm.

Habitat, Texas to Colorado.

H. neumægeni *Hy. Edwards*.

1881—*Euleucopheus neumægeni* HY. EDWARDS, Pap., Vol. I, p. 171.

Snow white; abdomen, legs and central band on thorax brownish red, in the ♀, abdomen white at the end. Antennæ testaceous brown. Fore wings with band gently undulate, t. a. and t. p. lines black, reniform and elongate orbicular yellowish subhyaline spots bordered with black, and fused to the lower side of the former is a black dash. Secondaries with similar discal spot and outer black band. Expanse, 50—60 mm.

Habitat, Arizona.

H. tricolor *Packard*.

1872—*Euleucopheus tricolor* PACKARD, Rep. Peab. Acad., Vol. IV, p. 89.

Fore wings black, irrorate with white, with broad white arcuate t. a. and straight t. p. band; fringes also white. Discal dot lunate, yellowish, bordered with black. Secondaries immaculate sordid white. Thorax and body with reddish tint intermixed. Expanse, 50 mm.

Habitat, New Mexico.

H. hualapai *Neumægen*.

1883—*Euleucopheus hualapai* NEUMÆGEN, Pap., Vol. III, p. 138.

Immaculate uniform pale pinkish cream color, the costal edge dark ochereous. Below a brighter pink, as also the shorter hairs on thorax and abdomen; giving the appearance of a pink underground. Antennæ testaceous brown. Expanse, 65 mm.

Habitat, Arizona.

Genus Pseudohazis *Grote & Robinson*.

1860—*Pseudohazis* GROTE & ROBINSON, Ann. Lyc. Nat. Hist. N. Y., Vol. VIII, p. 377.

Synopsis of species.

Hind wings deep yellow.

Fore wings flesh color or carneous white.

Abdomen black banded **eglanterina**

Black bands obsolete dorsally *var.* **nuttalli**.

Fore wings deep yellow, more or less shaded with light purple.

Black markings distinct, heavy **shastænsis**.

Black marks faint or obsolete *var.* **denudata**.

Hind wings white, or very pale yellow.

Terminal black dashes on secondaries **hera**.

No terminal black dashes on secondaries *var.* **marcata**.

P. eglanterina *Boisduval*.

1852—*Saturnia eglanterina* BOISDUVAL, Ann. Ent. Soc. Fr., (2), Vol. X, p. 323.

1877—*P. hera* *var. arizonensis* STRECKER, Lep. Roph. et Het., p. 137.

var. nuttalli *Strecker*.

1875—*Pseudohasis nuttalli* STRECKER, Lep. Roph. et Het., p. 107.

Colored as indicated in the synopsis. The black marks on the wings consist of a basal dash on fore wings, a t. a. and t. p. curved bands, a large rounded discal spot (with or without a narrow white crescent) and terminal wedge-shaped spots on the veins. Expanse, 50—60 mm.

Habitat, from the Rocky Mount. to the Sierra Nev. and Arizona.

P. shastænsis *Behrens*.

1880—*P. eglanterina* *var. shastænsis* BEHRENS, No. Am. Ent., Vol. I, p. 62.

var. denudata *Neumogen*.

1891—*H. eglanterina* *var. denudata* NEUMÖGEN, Can. Ent., Vol. XXIII, p. 145.

Fore wings purplish, with a streak of indian yellow between veins 4 and 5, or partly overspread with indian yellow, with black marks as in *eglanterina*, or largely suffused by black (from *shastænsis*). Or the black marks may become pulverulent and obscure or largely lost (*var. denudata*).

Habitat, Coast region of California to the Sierra Nevada and northward.

P. hera *Harris*.

1841—*Saturnia hera* HARRIS, Rep. Ins. Mass., p. 286.

1855—*Hemileuca pica* WALKER, Cat. Brit. Mus., pt. VI, p. 1318.

var. marcata *Neumogen*.

1891—*Hemileuca hera* *var. marcata* NEUMÖGEN, Can. Ent., Vol. XXIII, p. 146.

Wings yellowish white, head, collar, narrow terminal segmentary bands on abdomen and anal tuft indian yellow. Black marks as in *eglanterina* or the terminal cuneiform marks of secondaries absent (*var. marcata*). Expanse, 55—70 mm.

Habitat, Rocky Mountain region, Eastern Oregon.

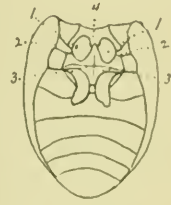
(TO BE CONTINUED.)

PRELIMINARY HAND - BOOK OF THE
COLEOPTERA OF NORTH EASTERN AMERICA.

By CHARLES W. LENG & WM. BEUTENMÜLLER.

(CONTINUED FROM PAGE 96.)

In the present part of the Hand-Book no attempt has been made to give detailed descriptions of the genera under consideration, only the essential characters of each genus being given. For further information regarding the Carabidæ, the student is referred to Dr. Geo. H. Horn's invaluable paper on the genera of Carabidæ, published in the Transactions of the American Entomological Society, 1881, Vol. IX, pp. 91—196. The plate was kindly drawn by Mr. L. H. Joutel.



1. Coxal cavities.
2. Epimeron.
3. Mesosterna.
4. Metasterna.

CARABIDÆ.

The Carabidæ are divided into three sub-families, viz.: Carabinae, Harpalinae and Pseudomorphinae; they may be separated as follows:

- Middle coxal cavities not entirely enclosed by the sterna, the epimeron of the mesosternum attaining the coxa **Carabinae.**
- Middle coxal cavities entirely enclosed by the sterna; the epimeron not attaining the coxa **Harpalinae.**
- Head with distinct antennal grooves **Pseudomorphinae.**

CARABINÆ.

Omophron Lat.

Oval, convex, scutellum concealed; prosternum prolonged and covering the mesosternum.

The members of this genus live in holes in sandy places along the banks of streams, rivers and ponds.

Synopsis of species.

- Elytral striæ obliterated both at sides and apex.
Dark brown or black, margin testaceous **labiatum.**
- Elytral striæ obliterated at apex only.
Metallic green, with testaceous border **nitidum.**
- Elytra striæ indistinct at apex: 14 striate.
Testaceous, with transverse broken metallic green markings **robustum.**
- Elytral striæ distinct: 15 striate.

Metallic green or bronze with testaceous border and markings; the testaceous color sometimes predominating.

Usually more bronze than testaceous; thorax with side margins only testaceous **americanum.**

Thorax with anterior margin as well as sides testaceous **tessellatum.**

O. labiatum *Fabr.*—Dark brown or black; thorax and elytra with pale testaceous border; striæ and punctures of elytra becoming obliterated at sides and apex; thorax with scattered, coarse punctures. Underside pitchy, apex of abdomen paler. Length, .24 inch = 6 mm.

Habitat, Middle and Southern States.

O. nitidum *Lec.*—Allied to the preceding, but is distinctly punctured at the sides and is metallic green with the testaceous border of the elytra broader. Length, .20—.24 inch. = 5—6 mm.

Habitat, Illinois to Texas.

O. robustum *Horn.*—Pale testaceous; elytra with broken green transverse markings; thorax has a narrow transverse metallic green band, extending forward and backward at the middle, and an oval spot on each side between the band and the margin; elytra with striæ of coarse distant punctures. Underside testaceous. Length, .26 inch. = 6.5 mm.

Habitat, Nova Scotia, Ohio and Michigan.

O. americanum *Dej.*—Bronzy or greenish black; punctures of striæ rather fine; markings of elytra more or less confluent; margin testaceous; thorax with lateral margins pale and very narrow. Underside pitchy, apex of abdomen paler. Length, .24—.28 inch. = 6—7 mm.

Habitat, N. E. America, southward and westward.

O. tessellatum *Say.* (Plate III, Fig. 1.)—Pale testaceous; markings metallic green; striæ with punctures distinct, more closely placed on disc than at apex; thorax with coarse punctures, disc and lateral regions with but few punctures; discal spot rather small, with a narrow process along the median line, extending to the front and hind margins. Underside pale ferruginous. Length, .26 inch. = 6.5 mm.

Habitat, N. E. America.

Cychnus *Fabr.*

Head long and slender; labrum bifurcate; posterior coxæ

separated; four basal joints of antennæ smooth; thorax more or less reflexed at sides.

Live in woods under leaves, stones in moist places; they feed principally upon snails, their long head being well adapted for extracting the animal from the shell.

Synopsis of species.

Sub-genus Spheroderus.

- Anterior tarsi of male broadly dilated; anterior tarsi female not dilated, slender.
- Basal impressions of thorax broad, deep, with coarse deep punctures.
 - Deep violaceous; granulate elytral striæ broken and assuming shining elevations **nitidicollis.**
 - Deep violet; elytral striæ entire at base, interrupted at sides and apex *var.* **Brevoorti.**
- Basal impressions of thorax linear, with a few distinct punctures, hind angles obtuse.
 - Violaceous; elytral striæ interrupted only at apex **stenostomus.**
 - Violaceous; elytral striæ entire at base and interrupted behind the middle *var.* **Lecontei.**
 - Violaceous; elytral striæ entire at base interrupted from middle to apex; the 4th and 12th striæ elevated to carinæ, *var.* **bicarinatus.**
- Basal impressions of thorax linear, with a few distant punctures; hind angles rectangular.
 - Violaceous; elytral striæ entire at base, interrupted at sides and apex **canadensis.**

Sub-genus Scaphinotus.

- Anterior tarsi of male narrowly dilated.
- Hind angles of thorax prolonged backwards.
 - Thorax nearly as wide as elytra much elevated at sides; violaceous or cupreous **elevatus.**
 - Black instead of violaceous *var.* **unicolor.**
 - Very large and robust, violaceous *var.* **heros.**
- Hind angles not prolonged backwards.
 - Robust; violaceous, thorax much narrower than the elytra moderately reflexed **viduus.**
 - Slender, thorax longer than broad, slightly margined; not angulated at sides, thorax punctured at sides on top **Andrewsii.**
 - Violaceous; smaller; thorax smooth **Ridingsii.**
 - Brassy; sides of thorax distinctly angulated at sides **Guyotii.**

C. nitidicollis Chev.—Deep violaceous, elytra obovate, with numerous small granules, striæ more or less broken and forming shining elevations; thorax with basal impressions broad and with deep, coarse confluent punctures. Length, .48—.64 inch. = 12—16 mm.

var. Brevoorti Lec.—Has the base of the elytra deeply striate; intervals at sides and apex broken into granules and tubercles.

Habitat, Hudson's Bay region to Northern Virginia.

The sculpture of the elytra of this species, is subject to considerable variation, from striate to tuberculate.

C. stenostomus Web. (Plate III, Fig. 2.)—Violaceous; basal impressions of thorax linear, with only a few distant punctures; elytra deeply striate, with closely placed punctures; intervals entire on disc, sometimes interrupted in the apical region. Length, .48—.60 inch. = 12—15 mm.

var. Lecontei Dej.—Intervals interrupted from the middle to the apex and assuming the form of tubercles.

var. bicarinatus Lec.—Intervals interrupted, except at basal region; intervals four and eight elevated, the twelfth forming an elongate carina.

Habitat, N. E. America.

C. canadensis Chaud.—Violaceous, margin blue; somewhat elongate; hind angles of thorax distinct, basal transverse impressions feeble or absent, longitudinal impressions sharply defined, with a few punctures; elytra deeply striate, punctured; intervals convex, broken at sides and apex. Length, .44—.48 inch. = 11—12 mm.

Habitat, Canada to Maryland; not found near N. Y. City.

C. elevatus Fabr. (Plate III, Fig. 3.)—Violaceous or cupreous; thorax with margins considerably elevated, hind angles prolonged over the elytra, finely punctured, disc sometimes wrinkled; elytra broadly oval, margins reflexed gradually narrowing towards the apex, surface striate finely punctured, intervals convex. Length, .60—1.12 inch. = 15—28 mm.

var. unicolor Fabr.—This form is blackish instead of violaceous.

var. heros Harr.—More robust and much larger than the typical *elevatus*.

Habitat, Middle States to Colorado.

C. viduus Dej. (Plate III, Fig. 4.)—Violaceous; thorax much narrower than the elytra, as long as wide; arcuate in front oblique behind, margins moderately wide, reflexed, disc nearly smooth, at

sides and margin punctate; elytra narrowly reflexed, surface deeply striate and punctured. Length, .70—1.16 inch. = 18—29 mm.

Habitat, N. Y., N. J., Pa., Va., Indiana.

C. Andrewsii *Harris*. (Plate III, Fig. 5.)—Violaceous above black beneath; thorax much narrower than the elytra, longer than wide, sides rounded in front, oblique behind, hind angles obtuse, disc almost smooth; sides punctate, margins slightly reflexed; elytra oval, striate, punctured. Length, .74—.86 inch. = 19—22 mm.

Habitat, Pa. to N. C., Ohio.

C. Ridingsii *Bland*.—Resembles the preceding species but is smaller. Thorax shining not punctured, impressions moderate, margin narrow; elytra oval, surface striate, punctured. Length, .50 inch. = 12.5 mm.

Habitat, Pa. to Va.

C. Guyotii *Lec*.—Differs from *Andrewsii* by the more coarse punctures of the base of the thorax, also by the labrum being less elongate, the lobes less slender, the emargination more broadly rounded and not extending so near to the base as in that species; sides of thorax distinctly angulated near the middle. Length, .27 mm. = 1. inch.

Habitat, North Carolina.

Nomaretus *Lec*.

Allied to *Cychrus*; but has only two basal joints of the antennae smooth.

Synopsis of species.

Sides of thorax oblique, hind angles obtusely rounded behind, elytra striate.

Disc of thorax not punctured.

Violaceous; striæ distinct, punctures fine and close together . . . **bilobus**.

Violaceous; striæ feeble, punctures coarse and distant . . . **fissicollis**.

Black; elytra with four imperfect striæ on each . . . **imperfectus**.

Disc of thorax coarsely punctured; violaceous . . . **cavicollis**.

Sides of thorax sinuate; hind angles rectangular; elytra striate, black . . . **debilis**.

N. bilobus *Say*.—Violaceous; beneath black; thorax polished on disc, basal impressions strongly punctured; elytra with eleven striæ, deeply punctured. Length, .52 inch. = 13 mm.

Habitat, Lake Superior, Ohio, Mich. (also Mo.)

N. fissicollis *Lec*.—Resembles the preceding but distinguished by the thorax being impunctured, and by the punctures of the

striae of the elytra being longer and less close; the thorax is also narrowed behind. Length, .42 inch. = 10.5 mm.

Habitat, Illinois, Kansas.

N. cavicollis *Lec.* (Plate III, Fig. 6.)—Differs of *bilobus* and *fissicollis* by the anterior half of the thorax being covered with scattered punctures and the posterior half being broadly concave, and deeply punctured. Length, .45 inch. = 11.25 mm.

Habitat, Buffalo, N. Y., (also Mo., Ia. to Texas).

N. imperfectus *Lec.*—Black, smooth and glossy; thorax with basal impressions slightly transverse, and rather deep; elytra with four punctate, imperfect striae on each; the striae form an oblong space, which is slightly flattened, sides of elytra smooth and glossy. Length, .40 inch. = 10 mm.

Habitat, Pa., Va., N. C. (mountainous districts).

N. debilis *Lec.*—Black, glossy; thorax with basal impressions long and deep; sides sinuate, hind angles rectangular; elytra with striae deeply punctured, palpi and antennae rufous. Length, .38 inch. = 9.5 mm.

Habitat, Roan Mts., N. C., Ga (mountainous districts).

. **Carabus** *Linn.*

Large sized species allied to *Calosoma*; third joint of the antennae cylindrical; labrum not bifurcate, posterior coxae touching; spurs of anterior tibiae terminal.

Synopsis of species.

Thorax punctate beneath.

Brassy-bronze; elytra finely granulate with broken and continuous elevations **mæander.**

Thorax not punctured beneath.

Hind angles of thorax hardly produced.

Jet black; elytral striae much broken **chamissonis.**

Hind angles of thorax prolonged, rounded

Elytra with impressed spots.

Black, with blue margin; elytral striae very fine . . . **sylvosus.**

Cupreous with metallic purple or red margin . . . **nemoralis.**

Elytra catenate; serrate near humeri.

Black with blue margin **serratus.**

Elytra not serrate near humeri, striae and intervals equal, distinct.

Black with blue margin **limbatus.**

Elytra, bronzed, catenate, four intervals forming slender

costae **vinctus.**

C. mæander *Fisch.*—Bronze; head and thorax thickly covered with coarse confluent punctures; elytra finely granulate, each with three rows of smooth shining elevations and an elevated line between each row. Length, 20 mm. = .80 inch.

Habitat, Canada, Hudson Bay region, Michigan to L. Superior region, N. Illinois to Minn. to Alaska, through Kamschatka to Siberia.

C. chamissonis *Fisch.*—Jet black; head and thorax finely punctate; elytra with the striae and intervals much broken. Length, .80 inch. = 20 mm.

Habitat, White Mountains, N. H., Labrador, Greenland and Alaska.

C. nemoralis *Muls.*—Copper-colored, somewhat metallic, with a metallic purple border; head and thorax rugose; elytra finely rugose, with the three rows of impressed spots distinct. Length, 1 inch. = 25 mm.

Habitat, Maine.—A European species.

C. sylvosus *Say.*—Black; thorax broader than long, slightly punctured, margins violet blue, reflexed; elytra elongate oval, striae and punctures very fine and faint, thus giving the insect a somewhat smooth appearance, margins violet blue, each elytra with three rows of distinct impressions. Length, 1.—1.20 inch = 27—30 mm.

Habitat, Canada to Texas.

C. limbatus *Say.*—Black with bluish margins, elytra deeply striate punctures distinct and regular, intervals distinct and convex, the fourth, eighth and twelfth broken into elongate pieces, the interruptions smooth and flat, humeral angle rounded. Length, 1.—1.12 inch. = 25—28 mm.

Habitat, N. E. America.

C. serratus *Say.*—Black with decided violet margins; thorax broad, disc smooth, margins punctured and very slightly reflexed; elytra elongate, sides almost parallel, humeral angles rather sharply produced; serrated near the humeri, striae with distant deep punctures; intervals flat and connected transversely, fourth, eighth and twelfth intervals broken, long and broad. Length, .80 to 1. inch. = 20—25 mm.

Habitat, N. E. America.

C. vinctus *Web.* (Plate III, Fig. 7.)—Bronze; thorax with a greenish tinge at borders; elytra distinctly catenate, with the intervals forming four elevated ridges. Length, 1. to 1.20 inch. = 25—30 mm.

Habitat, N. E. America.

Calosoma *Web.*

Closely allied to *Carabus*, but the third joint of the antennæ compressed instead of cylindrical.

Synopsis of species.

Elytra with three rows of golden or metallic green impressed spots.

Black; anterior tarsi of male with four joints hairy beneath; striæ and intervals fine **frigidum.**

Black; anterior tarsi of male with two joints hairy beneath; striæ and intervals coarse; metallic spots more numerous **Sayi.**

Black; spots golden; anterior tarsi of male with three joints hairy beneath **calidum.**

Elytra without rows of metallic spots.

Black, elongate, elytra with blue border **externum.**

Metallic green with red margin; large size **scrutator.**

Metallic green with red border; small size **Wilcoxi.**

C. frigidum *Kby.*—Black above; greenish-black below; elytra and thorax with narrow green margins, the former with fine striæ, punctured and with three rows of small green, impressed spots, thorax and head rugosely punctate. Length, .80 inch. = 20 mm.

Habitat, Northern States and Canada.

C. Sayi *Dej.*—Larger and more elongate than the preceding species with the striæ and punctures much coarser and the intervals broader and more convex. The green impressed spots are more numerous in each row and are larger and more distinct. The thorax is also less punctured. Length, 1. inch. = 25 mm.

C. externum *Say.* (Plate III, Fig. 8.)—Body elongate, sides of elytra slightly convex, almost parallel. Thorax and elytra with violet margin, the latter striate with distinct punctures, intervals convex; thorax with sides rounded, hind angles obtusely rounded. Length, 1.20 inch. = 30 mm.

Habitat, N. E. America, southward and westward.

C. scrutator *Fabr.* (Plate III, Fig. 9.)—Large and robust; thorax very short and broad, sides and hind angle well rounded,

metallic-blue or green with margin golden-red; elytra striate, punctured metallic-green, margin golden-red; legs blue, underside green and golden-red. Length, 1.26 inch. = 30 mm.

Habitat, N. E. America, southward and westward.

C. Wilcoxi *Lec.*.—Allied to the preceding, but is considerably smaller and the thorax much narrower. Color similar. Length, .72 inch. = 18 mm.

Habitat, Canada, Atlantic States and westward.

C. calidum *Fabr.*.—Black above and below; elytra with three rows of large impressed golden spots, striæ distinct, punctured; thorax and head finely rugose, the former with broad basal impressions. Length, .88 inch. = 22 mm.

Habitat, N. E. America, southward and westward.

(TO BE CONTINUED.)

EXPLANATION OF PLATE III.

- | | |
|--|---|
| 1. <i>Omopron tessellatum</i> <i>Say.</i> | 7. <i>Carabus vinetus</i> <i>Web.</i> |
| 2. <i>Cychrus stenostomus</i> <i>Web.</i> | 8. <i>Calosoma externum</i> <i>Say.</i> |
| 3. " <i>elevatus</i> <i>Fabr.</i> | 9. " <i>scrutator</i> <i>Fabr.</i> |
| 4. " <i>viduus</i> <i>Harr.</i> | 10. <i>Elaphrus ruscarius</i> <i>Say.</i> |
| 5. " <i>andrewsii</i> <i>Harr.</i> | 11. <i>Blethisa quadricollis</i> <i>Hald.</i> |
| 6. <i>Nomaretus cavicollis</i> <i>Lec.</i> | 12. <i>Notiophilus æneus</i> <i>Hbst.</i> |

Mr. W. Danby writes that *Papilio ajax* mentioned by him in his list of Vancouver Lepidoptera, in the January number of the Journal, should be omitted and that *Papilio rutulus* should be *P. curymedon*.

The habitat of *macrops schauppii*, described in volume I, p. 12, of the Journal, should be Cypress Mills, Texas.

LOCAL ENTOMOLOGICAL NOTES.

Members of the New York Entomological Society and all others, are solicited to contribute to this column, their rare captures, local lists and other items of interest relating to the insect fauna of New York city and vicinity.

EASTERN VARIETIES OF CICINDELA
SCUTELLARIS.

FRANK HOLMES JOHNSON.

C. rugifrons and *C. modesta*, and with them the immaculate varieties, *C. unicolor* and *C. nigrior*, occur on Long Island to the south of Woodhaven. *C. unicolor* is found abundantly in Florida, while *C. rugifrons* is not reported so far south, but this is the first recorded instance of the former variety occurring in the Middle States. I have taken ten of *C. unicolor* to about two hundred of *C. rugifrons*, and three of *C. nigrior* to about ninety of *C. modesta*. Almost every gradation occurs in the color and markings of the Long Island specimens. The most highly marked specimens of *C. rugifrons* and *C. modesta* have on the margin a post-humeral dot, a medial triangular spot and an apical lunule. As we approach *C. unicolor* and *C. nigrior* the humeral dot disappears, the medial becomes small, orbicular or crescent-shaped, and the apical lunule becomes two separate spots (the markings now resemble those of *C. sexguttata*). The medial and apical dots as they grow smaller become separated from the margin, and finally disappear, first the medial, and then the apical dots. The ground color in *C. rugifrons* varies from blue to green, in one of my specimens it is brassy-green; two specimens exhibit a color which is neither black nor green, but may be described as intermediate between the green of *C. rugifrons*, the black of *C. modesta*, and the purple brown of *C. Lecontei*. *C. modesta* seems to vary less in markings and color than *C. rugifrons*.

May 19th, 1894, at Curtis Bay, Md. (near Baltimore), I found a ♂ of *C. modesta* and a ♀ of *C. rugifrons* in coitu. Nothing could better demonstrate the intimate relations of the two varieties.

The greater variation occurs in the fall brood, which, on Long Island, appears before September first, and lasts to beyond the middle of the month. The spring brood is less numerous; it

appears about June first, and I have taken *C. modesta* of this brood as late as July fourth. At Curtis Bay, Md., *C. rugifrons* appeared as early as March twenty-second. My last specimens of this brood were taken May nineteenth, when it was less plentiful than in April. When I visited the place again on June ninth, I could find no trace of either variety.

At the Maryland locality *C. modesta* greatly predominates, while on Long Island I have taken more of *C. rugifrons* than of the black variety. Mr. Beutenmüller informs me that, on Staten Island, *C. modesta* occurs alone, and is not subject to much variation.

These varieties seem to prefer sandy ground, where the grass and weeds are sparse, but do not frequent bare sand hills. They fly swiftly, and are rather difficult to catch, especially *C. modesta*, which is inconspicuous by reason of its dark color.

NOTES ON BRYAXIS ABDOMINALIS *Aubé*.

By CHARLES W. LENG.

This beetle lives on Staten Island under boards, chips etc. cast upon the borders of the salt meadow by tides of unusual height. It is abundant in March and April and occurs also as early as February and as late as May; but the females always outnumber the males. The latter are distinguished by the sculptured dorsal segments.

I found this beetle first about three years ago under bits of bark lying on the banks of the salt meadow creek which runs beside the railroad trestle west of Arlington station.—The operations of the railroad company have deepened and elongated a branch of the creek and thereby thrown upon its banks much soil, which lies high and dry above the surrounding moist salt meadow, and affords a lodgement to the bits of refuse and a consequent shelter to the beetles. — While this locality still remains the best, further search has led to the discovery of the species at several other points.

It is always accompanied by two other species *Rhyphobius marinus* and *Scydmaenus salinator* (?).

NOTE ON SPHARAGEMON SAXATILE *Morse*.

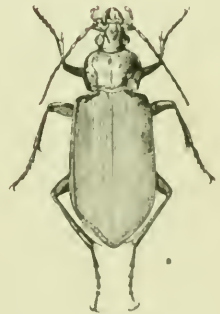
By WM. BEUTENMÜLLER.

This species was recently described by Mr. Albert P. Morse (Proc. Bost. Soc. Nat. Hist., Vol. XXVI, 1894, p. 229) from specimens collected in various parts of Massachusetts and Connecticut. On September 1st Mr. Wm. T. Davis captured several examples of this insect on Bearfort Mt., Passaic Co., north of New Foundland, New Jersey, which is a new locality for the species.

It is blackish fuscous in spots and bands on an ash gray ground color; the abdomen is somewhat yellowish as also the face; on the pronotum is an ash gray X shaped mark on the disk; the wing covers are crossed by three obscure blackish bands; the hind femora are ash gray sprinkled with black outside and yellowish inside, with four black transverse bands, which are indistinct outside; the hind tibiae are coral red with a white ring near the base which is black. The hind wings are sulphur yellow somewhat semitransparent, with an arcuate median, black band. The apical third of the wing is transparent, apex more (male) or less (female) blackish. Length of body about .80 to 1 inch. = 20 to 25 mm.

This species has been named *saxatile* by Mr. Morse for the reason that it seems to find life most to its taste in unsettled, somewhat wooded districts of a rocky, often elevated character. Here it finds a congenial home and may be seen during the latter half of the season crawling actively about over the lichened ledges, whose tints harmonize with its own, or flying from one to another, stridulating loudly as it goes. Mr. Morse says it vividly recalls the cool gray of the rocks, the glory of the golden-rod, and the tints of reddened stems of trailing vines. So well do the colors of its body match those of its chosen haunts, -- the pale greenish gray and ashy of the paler rock-constituents and their lichen coverings, the brown and black of other lichens and the darker elements hornblend and mica or iron-stained disintegrated particles, -- that it is quite difficult to distinguished when at rest, and being an extremely alert insect some strategy is required to capture it.

The specimens lately captured by Mr. Davis, were taken on a rocky ledge, Bearfort Mt. been a locality in every respect similarly to that described as the favorite haunts of the species.



Carabidæ of N. E. America.



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NOTES ON PHALANGIDÆ.

By NATHAN BANKS.

Trachyrhinus favosus *Wood* is found in Colorado, (C. F. Baker). Some males are wholly black.

Trachyrhinus marmoratus, nov. sp.

Length ♂ 5. mm.; width 4. mm.; femur I 6. mm.; femur IV 9. mm. Above pale brown mottled with darker brown, generally outlining the vase-mark, and some scattered whitish dots; a pale line from eye-tubercle to anterior margin, and each side a brown line; behind eye-tubercle a short transverse brown line; eye-tubercle whitish above. Mandibles white with brown patches, palpi similar; sternum, venter, coxæ, and trochanters white, mottled with dark brown patches much the largest on the coxæ; femora pale, brownish toward tip; patella brown with a narrow white line above; tibia brownish, with a white patch at tip; metatarsus pale; tarsus darker, nearly black at tip. Having the same general structure as *T. favosus*, the deeply pitted dorsum, granulate coxæ, and projection to patella of palpus. The eye-tubercle is less spinose (with two rows of five spinules), the legs are longer and thinner, the spinules white and those on the coxæ rounded, so as to appear more like granules.

Several males from Santa Fé, New Mexico (alt. 7000 ft.); T. D. A. Cockrell, collector.

Liobunum townsendi *Weed* occurs at Brownwood, Tex.

Liobunum longipes *Weed* is found at Washington, D. C.

Liobunum bicolor *Wood*. A variety of this species occurs at Kissimmee, Florida; there are a few spinules at each posterior corner of the large raised patch; and there are two pale diverging lines in front of the eye-tubercle; the legs are longer than in typical *L. bicolor*.

Liobunum formosum *Wood*. I consider this a very good species, and not the young of *L. ventricosum* *Wood*. *Wood* described both from females. His specimens could not have been very young, since he does not mention the projections to the tibia and patella

of the palpus, and the size was .3 of an inch. I have from Long Island, N. Y., and Washington, D. C., adult males and females of *L. formosum*, extremely similiar to the young, but little larger than Wood's specimen, and as large as *L. ventricosum*. They agree with the description throughout, black trochanters, dark bands on the legs, and in the ♂ the tibia wholly dark; a prominent vase-mark in the ♀, in the ♂ indistinct; the legs are shorter and much thicker than in *L. ventricosum*, and the ♂ abdomen is not near as conical.

Liobunum ventricosum Wood. This has the trochanters no darker than the dorsum, the vase-mark obscure, and the legs unbanded. The legs are much more delicate than in *L. formosum*. I have it from New Hampshire (Mrs. Slosson) and Long Island, N. Y.

Leptobunus grande Say. Prof. Weed (Ohio Phalangidæ) thinks *L. maculosum* Wood may be the young of Say's species; but Wood described the genitalia of his species so it cannot be young.

NOTE ON THE DEVELOPMENT OF DELTOCEPHALUS INIMICUS Say.

By F. M. WEBSTER.

Several years ago, on November 11, a number of adults were placed on young wheat plants that had been reared indoors, and hence were free from affection by insect attack. The females began at once to oviposit in the tissue of the leaves, and the young could be observed developing within the eggs, especially after they had become well advanced. Young were especially noticeable just prior to their emerging by their eyes being jet black. The young moulted a few days after hatching, and, so far as I could observe, but twice afterwards. December 22, one of the first individuals to appear moulted for the last time, and on the following day adults were out in numbers. It will be observed that 41 days were required for the development of the insect from egg to adult. It is not unlikely that the species hibernates in the egg state in the leaves of grass, though it would seem possible that it may also live over as adults. My wheat plants were kept growing in glass tubes, probably an inch and a half in diameter, and in a temperature of probably not far from 70° Fah.

Material, kept for description, has been spoiled by age and it is now impossible to describe the earlier stages from it, else such would be included in this note.

PRELIMINARY REVISION OF THE BOMBYCES OF AMERICA NORTH OF MEXICO.

By B. NEUMEGEN AND HARRISON G. DYAR.

(CONTINUED FROM PAGE 132.)

Family CERATOCAMPIDÆ.

Synopsis of genera.

- Vein II, arising from a stalk with veins 6-8.
 Exterior margin of primaries nearly straight, longer than internal margin **Anisota.**
 Exterior margin convex, shorter than interior margin **Sphingicampa.**
 Vein II from the sub-costal, before apex of discal cell; size very large
 Wings elongate, rather narrow; abdomen exceeding secondaries, **Citheronia.**
 Wings broader, apices rectangular; abdomen scarcely exceeding secondaries **Basilona.**

Genus *Anisota* Hübner.

1822?—*Anisota* HÜBNER, Verz. bek. Schmett., p. 193.

1841—*Dryocampa* HARRIS, Rep. Ins. Mass., p. 289.

Synopsis of species.

- Colors various shades of brown; a discal dot.
 ♂ similar to ♀, wings opaque **stigma.**
 ♂ dissimilar, wings translucent centrally.
 Primaries of ♂ translucent centrally, ♀ with black dots **senatoria.**
 Primaries ♂ hyaline centrally, ♀ without black dots **virginiensis.**
 Colors pink and yellow or white; no discal dot **rubicunda.**

A. stigma Fabricius.

1775—*Bombyx stigma* FABRICIUS, Syst. Ent., p. 563.

♂ ♀ Bright ochereous brown, with many black strigose dots, especially on primaries. T. a. and t. p. bands purplish, the former faint. A white discal dot. On secondaries, a median purplish band. The ♂ is a little smaller and darker than the ♀, but closely similar to it. Expanse, 40—50 mm.

Habitat, Atlantic States westward.

A. senatoria Abbot & Smith.

1797—*Phalena senatoria* ABBOT & SMITH, Lep. Ins. Ga., pl. 57.

♂ Ochereous brown, primaries purplish at base and apex, nearly hyaline centrally. Secondaries produced at anal angle almost

square. Lines obsolete, but white discal spot very distinct. Expanse, 30—37 mm.

♀ Very dissimilar to ♂. It is exactly like the ♀ of *stigma*, but usually slightly less dotted with blackish. Expanse, 53—55 mm.

Habitat, Atlantic States westward.

A. *virginiensis* Drury.

1773—*Bombyx virginensis* DRURY, Ill. Exot. Ent., Vol. II, pl. 13, f. 2.

1789—*Bombyx astynone* OLIVER, Encycl. Meth., Vol. V, p. 43.

1797—*Phalena pellucida* ABBOT & SMITH, Lep. Ins. Ga., pl. 58.

♂ Like *senatoria*, but darker colored, and center of primaries hyaline. ♀ Purplish brown, especially purplish in marginal space. Wings sub-translucent, lines faint, discal dot distinct. No dots on the wings.

Habitat, Atlantic States westward.

A. *rubicunda* Fabricius.

1793—*Bombyx rubicunda* FABRICIUS, Ent. Syst., Vol. III (1), p. 429.

race *alba* Grote.

1874—*Dryocampa rubicunda* var. *alba* GROTE, Bull. Buff. Soc., Vol. II, p. 183.

1875—*Dryocampa pallida* BOWLES, Can. Ent., Vol. VII, p. 108.

Light yellow. Basal and marginal spaces on primaries, and a diffused and faint sub-marginal line on secondaries rose pink. Expanse, ♂ 40—45 mm., ♀ 50—55 mm.

Habitat, Atlantic States.

The race *alba* is entirely creamy white above.

Habitat, Mississippi Valley to Canada.

Genus *Sphingicampa* Walsh.

1864—WALSH, Proc. Bost. Soc. Nat. Hist., Vol. IX, p. 290.

Synopsis of species.

Secondaries without discal dot.

Primaries usually heavily irrorate, t. p. line diffuse.

T. a. line faint or absent, discal dots usually present **bicolor.**

T. a. line as distinct as t. p. line; no discal dots **quadrilineata.**

Primaries slightly irrorate; t. p. line distinct, straight, **bisecta.**

Secondaries with large round black discal dot.

A dark obscure transverse line on primaries **heiligbrodti.**

Transverse lines of primaries white **albineata.**

S. *bicolor* Harris.

1841—*Dryocampa bicolor* HARRIS, Rep. Ins. Mass., p. 203.

1864—*Sphingicampa distigma* WALSH, Proc. Bost. Soc. Nat. Hist., Vol. IX, p. 290.

var. suprema Neumagen.1885—*Sphingicampa bicolor* var. *suprema* NEUMOEGEN, Ent. Amer., Vol. I, p. 94.*var. immaculata* Jewett.1882—*Adelocephala bicolor* var. *immaculata* JEWETT, Pap., Vol. II, p. 144.

Primaries ochereous brown, shading into dark flesh pink along external and internal margins, nearly covered with strigose slate gray dots. Two white discal dots and a diffuse slate gray t. p. band. The rest of the body and hind wings dark pink except base of secondaries and a median band, which are carmine red. Expanse, 45--50 mm.

The *var. suprema* is entirely sordid cinereous instead of pinkish, secondaries carmine except the outer border.

The *var. immaculata* lacks the dots on the wings.

Habitat, Mississippi Valley.

S. quadrilineata Grote & Robinson.1867—*Adelocephala quadrilineata* GROTE & ROBINSON, Trans. Am. Ent. Soc., Vol. I, p. 11.

Closely resembling *bicolor* but the primaries less covered with strigæ and those that are present more clouded. T. a. and t. p. lines smoky blackish, equally distinct. A faint discal cloud without white dots. Secondaries rose color from base to near margin, but yellowish at the edge. ♀ Antennæ simple. Expanse, 70 mm.

Habitat, Mexico.

S. bisecta Lintner.1879—*Anisota bisecta* LINTNER, Can. Ent., Vol. XI, p. 10.*var. nebulosa* Neumagen.1890—*Sphingicampa bisecta* var. *nebulosa* NEUMOEGEN, Ent. Amer., Vol. VI, p. 63.

Ochereous brown. On primaries, a t. a. angulate and t. p. straight oblique well defined purplish black lines, the wing faintly covered with purplish strigæ, or almost without them. A faint discal cloud. Secondaries more or less covered by carmine hairs. In the *var. nebulosa*, the whole fore wing is thickly covered by diffuse smoky black strigæ. Expanse, 65—70 mm.

Habitat, Texas.

S. heiligbrodti Harvey.1877—*Anisota heiligbrodti* HARVEY, Can. Ent., Vol. IX, p. 110.

Primaries iron gray, white and black scales mixed. T. a. line faint. T. p. line crenate. Two white discal dots, the upper fainter or absent. Secondaries and abdomen red, slightly shaded with gray. A large round black discal spot. Outer mesial band faint. Edge of wing iron gray. Antennæ testaceous. Expanse, 65 mm.

Habitat, Arizona.

S. albolineata *Grote & Robinson.*

1866—*Adeloccephala albolineata* GROTE & ROBINSON, Proc. Ent. Soc. Phil., Vol. VI, p. 7.

1872—*Adeloccephala raspa* BOISDUVAL, Ann. Soc. Ent. Belg., Vol. XV, p. 93.

Thorax and abdomen above, and primaries bright yellow, the latter finely mixed with dark scales. T. a. and t. p. lines white, t. a. line bent in to base of wing, not reaching the internal margin; t. p. line very oblique. A white discal spot. Secondaries deep pink; a black discal spot and white sub-marginal stripe. Costal and external margin dull whitish. Expanse, 65 mm.

Habitat, Mexico.

Genus **Citheronia** *Hübner.*

1822?—*Citheronia* HÜBNER, Verz. bek. Schmett., p. 153.

1822?—*Eacles* HÜBNER, Verz. bek. Schmett., p. 153.

1834—*Ceratocampa* HARRIS, Cat. Ins. Mass., p. 591.

1841—*Dorycampa* DUNCAN, Nat. Lib. Ex. Moths, p. 158.

Synopsis of species.

Large, veins lined with red or yellow.

Body and markings on wings partly yellow, partly red	regalis.
Body and markings entirely red	var. infernalis.
Body and markings entirely yellow	var. sængeri.
Smaller, dark smoky brown	sepulchralis.

C. regalis *Fabricius.*

1793—*Bombyx regalis* FABRICIUS, Ent. Syst., Vol. III (1), p. 436.

1797—*Phalena regia* ABBOT & SMITH, Lep. Ins. Ga., Vol. II, pl. 61.

var. **infernalis** *Strecker.*

1884—*Citheronia infernalis* STRECKER, Pap. Vol. IV, p. 73.

var. **sængeri** *Neumögen.*

1891—*C. regalis* var. *sængeri* NEUMÖGEN, Ent. News, Vol. II, p. 151.

Bright red above; a double line on collar; two divergent bands on thorax and anterior edges of abdominal segments, light yellow.

Primaries slate gray, the veins broadly lined with red. A basal, discal and outer row of ovate yellow spots. The outer row consists of about seven intervenular spots of varying size, the costal ones largest; sometimes traces of a median lunulate, diffuse, yellow band. Secondaries largely red, yellow at base and centrally along costa, the gray color appearing faintly between the veins toward outer margin. Expanse, 115—145 mm.

Habitat, Atlantic States.

C. sepulchralis Grote & Robinson.

1865—*Citheronia sepulchralis* GROTE & ROBINSON, Proc. Ent. Soc. Phil., Vol. IV, p. 222.

Even, dark, smoky, purplish brown; basal half of secondaries pinkish. On both wings obscure discal spots and outer waved, darker, smoky band. Antennæ testaceous. Expanse, 75—80 mm.

Habitat, Southern States.

Genus **Basilona** Boisduval.

1868—*Basilona* BOISDUVAL, Ann. Ent. Soc. Fr. (4), Vol. VIII, p. 317.

Synopsis of races.

Ground color yellow.

Wing sparsely covered with blackish brown strigose dots . . . **imperialis.**

Wing heavily covered with such dots . . . , var. **punctatissima.**

Ground color deep russet race **nobilis.**

B. imperialis Drury.

1773—*Attacus imperialis* DRURY, Ill. Ex. Ent., Vol. I, pl. 9, ff. 1, 2.

1797—*Phalena imperatoria* ABBOT & SMITH, Lep. Ins. Ga., Vol. II, pl. 55.

1805—*Bombyx didyma* BEAUVOIS, Ins. Afr. Amér., p. 52, pl. 20.

var. **punctatissima** Neumagen.

1891—*Eacles imperialis* var. *punctatissima* NEUMEGEN, Ent. News, Vol. II, p. 150.

race **nobilis** Neumagen.

1891—*E. imperialis* var. *nobilis* NEUMEGEN, Ent. News, Vol. II, p. 150.

Light yellow with the following marks in brownish purple. Diffuse strigæ on primaries, and outer part of secondaries; tibiæ, patagia, center of thorax, two lateral posterior patches on the thorax and a dorsal band on abdomen, absent on the edges of the segments and containing a row of yellow dorsal spots. On primaries a broad undulate t. a. line, two discal spots and outer transverse line running to apex. In the ♂ the t. a. line is further

from the base than in the ♀, and the basal space and part of the marginal space is shaded with purple. On secondaries, the same markings, but less distinct, and only one discal spot. Éxpance, 115—135 mm.

Habitat, Atlantic States westward; of *race nobilis*, Texas.

Family LASIOCAMPIDÆ.

Synopsis of sub-families and genera.

- Vein 2 of primaries arising remote from base of wing . . . [see Drepanidæ].
 Vein 2 of primaries arising near base of wing.
 Vein 8 of secondaries outwardly united to sub-costal vein by a
 cross vein, forming a large cell . . . **Gastropachinæ.**
 Fore wings with a notch at internal angle . . . **Phyllodesma.**
 Fore wings entire . . . **Heteropacha.**
 Vein 8 of secondaries free outwardly; intercostal cell small, **Lasiocampinæ.**
 Vein 7 of secondaries arising from sub-costal toward apex of cell.
 Vein 8 of primaries arising before apex of cell, free or
 on a stalk with 9 and 10 . . . **Clisiocampa.**
 Vein 8 arising beyond end of cell, on a stalk with 6 and 7.
 Thorax hairy, normal.
 Antennæ long and slender . . . **Hypopacha.**
 Antennæ shorter, the pectinations decreasing in
 length toward the tip . . . **Artace.**
 Thorax with a patch of curled, scale-like hairs . . . **Tolype.**
 Vein 7 of secondaries arising with vein 8 from intercostal cell.
 Vein 8 of primaries arising before apex of cell, free or
 on stalk with vein 7 . . . **Dendrolimus.**
 Vein 8 arising beyond end of cell, on a stalk with 6
 and 7 . . . **Edwardsimemna.***

Sub-family GASTROPACHINÆ.

Genus *Phyllodesma* Hübner.

1822? - *Phyllodesma* HÜBNER, Verz. bek. Schmett., p. 190.

1866—*Epicnaptera* RAMBUR, Cat. Lep. And., p. 344.

1869—*Ammatocampa* WALLENGREN, Skand. Het., Vol. II, p. 113.

* *Edwardsimemna* gen. n. (type *Gloveria jalapæ* Hy. Edw.) Fore wings a in *Dendrolimus* except that veins 6 to 8 are on a long stalk; stalk of 9 and 10 equally long; hind wings vein 6 from apex of cell, veins 7 and 8 together from the end of the short, rounded intercostal cell; humeral veins feeble. ♀ antennæ serrate. Palpi surpassing the front, projecting, dependent, hairy. Wings rounded-outer margin crenulate.

Synopsis of species.

Color rusty brown or gray.	
Primaries with white shades	americana.
Wings largely or wholly gray	<i>rac.</i> californica.
Wings brown, without white shades.	
Sexes concolorous or nearly so	<i>var.</i> ferruginea.
♀ more luteous than ♂	<i>rac.</i> roseata.
Color contrasting yellow and brown	dyari.

P. americana *Harris.*

1841—*Gastropacha americana* HARRIS, Rep. Ins. Mass., p. 273.

1855—*Gastropacha occidentis* WALKER, Cat. Brit. Mus., Vol. VI, p. 1392.

1868—*Lasiocampa carpinifolia* BOISDUVAL, Ann. Ent. Soc. Belg., Vol. XII, p. 83.

var. ferruginea *Packard.*

1864—*Gastropacha ferruginea* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 386.

race roseata *Stretch.*

1872—*Gastropacha roseata* STRETCH, Zyg. & Bomb. N. A., pl. 4, f. 12.

1872—*Gastropacha mildei* STRETCH, Zyg. & Bomb. N. A., p. 113.

race californica *Packard.*

1872—*Gastropacha californica* PACKARD, Rep. Peab. Acad., Vol. IV, p. 91.

Ferruginous brown, frosted with white scales. T. a. and t. p. lines slender, lunulate, blackish. A slight discal dot. S. t. line reddish, bordered by a white shade. A mesial line and discal dot on secondaries followed by a white shade and obscure sub-marginal band. The race *californica* is gray, more or less tinged with brown. Expanse, 27—35 mm.

Habitat, Atlantic States to Canada and Pacific Northwest; of race *californica*, Rocky Mountains to Southern California; of race *roseata*, California.

P. dyari *Rivers.*

1893—*Phyllodesma dyari* RIVERS, Can. Ent., Vol. XXV, p. 144.

♂ Pale yellowish ocher; outer part of fore wings rosy brown, the color extending to the middle one of three lines of dusky spots which cross the disc. A pale mesial band on hind wings. ♀ Paler than the ♂ with distinct emarginations between the terminations of the venules. Expanse, 38—55 mm.

Habitat, Western Texas, Mexico (?).

Genus **Heteropacha** *Harvey.*

1874—*Heteropacha* HARVEY, Bull. Buff. Soc., Vol. I, p. 262.

H. rileyana *Harvey*.1874—*Heteropacha rileyana* HARVEY, Bull. Buff. Soc., Vol. I, p. 262.

Gray; median space blackish, secondaries brownish. T. a. and t. p. lines obscure, whitish, sub-dentate, defined by blackish scales. A sub-terminal row of venular dots; fringe black spotted. Expanse, 27—32 mm.

Habitat, Mississippi Valley.

[The description by Harvey of the venation of secondaries is erroneous.]



Sub-family LASIOCAMPINÆ.

Genus **Clisiocampa** *Curtis*.

1828—*Clisiocampa* CURTIS, Brit. Ent., Vol. V, pl. 229.

Synopsis of species.

Sexes concolorous or nearly so; wings crossed by a pair of darker lines, rarely obsolete, not dentate, or by a broad brown band,

disstria *rare* **erosa**.

Sexes concolorous or not; the wings crossed by paler lines except when the ground color is pale.

Sexes alike; wings chocolate brown with straight white bands, **americana**.

Sexes alike or the ♂ pale; wings gray or chocolate brown, rarely luteous; bands often denticulate **fragilis**.

Sexes discolorous, the ♀ normally paler than the ♂, but ♂ sometimes also pale; lines dark in the pale forms. more or less denticulate **pluvialis, californica, ambisimilis**.

Sexes discolorous; ♂ very pale, ♀ dark, but both with darker lines on fore wings **constricta**.

C. disstria *Hübner*.1822?—*Malacosoma disstria* HÜBNER, Verz. bek. Schmett., p. 122.1868—*Bombyx drupacearum* BOISDUVAL, Ann. Ent. Soc. Belg., Vol. XII, p. 82.*var. sylvatica* *Harris*.1841—*Clisiocampa sylvatica* HARRIS, Rep. Ins. Mass., p. 271.*var. thoracicoides* *Neumagen & Dyar*.1893—*Clisiocampa disstria* var. *thoracicoides* NEUMAGEN & DYAR, Journ. N. Y. Ent. Soc., Vol. I, p. 30.

Light yellowish brown, the ♀ paler; fore wings crossed by two dark brown bands. In the *var. sylvatica*, the space between these bands is uniformly filled in with brown, and in the *var. thoracicoides*, the bands are very obscure. A form with irrorate wings and dark secondaries occurs in Texas. Expanse, 18—40 mm.

Habitat, Atlantic States to Mississippi Valley.

race erosa Stretch.1881—*Clisiocampa erosa* STRETCH, Pap., Vol. I, p. 64.*var. sylvaticoides* Neumägen & Dyar.1893—*Clisiocampa erosa* var. *sylvaticoides* NEUMEGEN & DYAR, Journ. N. Y. Ent. Soc., Vol. I, p. 30.*var. thoracica* Stretch.1881—*Clisiocampa thoracica* STRETCH, Pap., Vol. I, p. 68.*var. perversa* Neumägen & Dyar.1893—*Clisiocampa erosa* var. *perversa* NEUMEGEN & DYAR, Journ. N. Y. Ent. Soc., Vol. I, p. 30.

Race *erosa*: yellowish brown, the ♀ exactly like ♀ *disstris*, the ♂ usually darker than ♂ *disstris*. In the *var. sylvaticoides*, the space between the lines is partially filled in with dark brown; the *var. thoracica* has the lines obscure, and the *var. perversa* has basal and marginal spaces shaded with brown. Expanse, 19—35 mm.

Habitat, California and Pacific northwest.

C. americana Fabricius.1793—*Bombyx americana* FABRICIUS, Ent. Syst., Vol. III, p. 4331855—*Clisiocampa decipiens* WALKER, Cat. Brit. Mus., pt. VI, p. 1483.1868—*Bombyx frutetorum* BOISDUVAL, Ann. Ent. Soc. Belg., Vol. XII, p. 82.

♂ ♀ Walnut brown (Ridgway, III, 7), the thorax often grayish. Two parallel oblique white lines on primaries, either approximate or remote, the space between them often heavily dusted with white. In some males, the ground color is irregularly defined beyond the outer line. Secondaries immaculate. Fringe of both wings irregularly white spotted.

Habitat, Atlantic States westward; Canada to Florida and Texas.

C. fragilis Stretch.1881—*C. fragilis* STRETCH, Papilio, Vol. I, p. 64.1882—*C. incurva* HY. EDWARDS, Papilio, Vol. II, p. 125.1893—*C. mus* var. *discolorata* NEUMEGEN, Can. Ent., Vol. XXV, p. 4.*var. mus* Neumägen.1893—*C. mus* NEUMEGEN, Can. Ent., Vol. XXV, p. 4.*var. constrictina* Neumägen & Dyar.1893—*C. incurva* var. *constrictina* NEUMEGEN & DYAR, Journ. N. Y. Ent. Soc., Vol. I, p. 30.1893—*C. fragilis* var. *lutescens* NEUMEGEN & DYAR, Journ. N. Y. Ent. Soc., Vol. I, p. 31.

var. perlutea Neumegen & Dyar.

1893—*C. fragilis* var. *perlutea* NEUMEGEN & DYAR, Journ. N.Y. Ent. Soc., Vol. I, p. 31.

Soft chocolate brown to walnut brown, gray brown or blackish, the lines pale, often markedly denticulate. In the ♂ the pale luteous color of the lines may spread and predominate (*var. constrictina*) or cover the whole wing (*var. perlutea*). A very variable species.

Habitat, Rocky Mountains from their eastern slope to the Sierras; Canada to Mexico. The peculiar gray form (*var. mus*) occurs in Utah.

C. pluvialis Dyar.*

1893—*Clisiocampa pluvialis* DYAR, Can. Ent., Vol. XXV, p. 42.

Greatly resembling *californica*. The ♂ tends to be darker in color than either *californica* or *fragilis*, though the character is not of diagnostic value. No luteous males have been observed; otherwise the description of *californica* will apply. Separated on larval characters.

Habitat, the Pacific northwest.

C. californica Packard.*

1864—*Clisiocampa californica* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 387.

1868—*Bombyx pseudoneustria* BOISDUVAL, Ann. Ent. Soc. Belg., Vol. XII, p. 82.

♂ Dark chocolate brown with a faint pale band on secondaries. Lines on fore wings luteous yellow, gently curved, sharply limited towards center of wing, but spreading toward base and outer margin, the outer line sub-crenulate. This pale color may spread till the whole wing is luteous yellow, crossed by two brown lines.

♀ Paler than the male, the ground color consequently normally luteous yellow, dusted with brown and crossed by two brown lines, the outer crenulate. The brown scales may predominate, giving a form somewhat closely resembling the male. Secondaries pale or dark. Expanse, 25—35 mm.

Habitat, Coast region of California

C. ambisimilis Dyar.*

1893—*Clisiocampa ambisimilis* DYAR, Can. Ent., Vol. XXV, p. 40.

* Lava: A dorsal pale line, sometimes obsolete.

Lateral region heavily blue shaded	ambisimilis.
Lateral region with no blue shade	californica.
A dorsal row of elliptical blue spots	pluvialis.

Like *californica* in markings, so far as observed. Separated on larval characters.

Habitat, Coast region of California.

C. constricta *Stretch*.

1881—*Clisiocampa constricta* STRETCH, Papilio, Vol. I, p. 65.

1881 - *Clisiocampa strigosa* STRETCH, Papilio, Vol. I, p. 67.

1865—*Clisiocampa* || *californica* WALKER, Cat. Brit. Mus., Vol. XXXII, p. 572.

♂ Creamy buff with two brown lines on primaries. ♀ Walnut brown mixed with whitish, with two dark brown lines on primaries, the space between them rather darker than the rest of the wing. Both sexes very uniform and strongly contrasting. Expanse, 25—35 mm.

Habitat, Hilly and Mountainous parts of California.

Genus **Hypopacha** *Neumegen & Dyar*.

1893—*Hypopacha* NEUMEGEN & DYAR, Journ. N.Y. Ent. Soc., Vol. I, p. 29.

H. grisea *Neumegen*.

1882—*Cnethocampa grisea* NEUMEGEN, Papilio, Vol. II, p. 134.

Dark gray with waved pale t. a. and t. p. lines bordered on both sides by faint black shades. S. t. line blackish, arcuate, retracted at veins 4—6. Secondaries immaculate paler gray. Expanse, 27 mm.

Habitat, Arizona.

Genus **Artace** *Walker*.

1855 *Artace* WALKER, Cat. Brit. Mus., pt. VI, p. 1491.

A. punctistriga *Walker*.

1855 *Artace punctistriga* WALKER, Cat. Brit. Mus., Vol. VI, p. 1491.

1874 *Titya rubripalpis* FEIDER, Reise d. Novara Lep., Vol. IV, pl. 84 f. 5.

White, with black venular dots on primaries. These are arranged in six rows; the sub-basal of two dots only, the t. a., median, and t. p. distinct, with two dots at end of cell; s. t. row smoky, faint; terminal row small. Expanse, 22—30 mm.

Habitat, Southern States to Mississippi Valley, to New York.

Genus **Tolyte** *Hübner*.

1822?—*Tolyte* HÜBNER, Verz. bek. Schmett., p. 189

1856 *Planosa* FITCH, Rep. Ins. N. Y., Vol. II, p. 268.

Synopsis of species.

Thorax of ♂ white	velleda.
Thorax of ♂ black or gray.	
♀ Similar to ♂, slightly paler; size midium	distincta.
♀ Very dissimilar to ♂; ♂ dark, ♀ very pale; size smaller	laricis.

T. vellea *Stoll.*1791—*Bombyx vellea* STOLL, Suppl. Cramer, pl. 41, f. 4.

Thorax white, central tuft blackish brown, abdomen pale gray banded with darker gray. Fore wings light gray, shading into blackish in median and sub-terminal spaces. Base of wings white; t. a. line narrow, white; t. p. line double, sinuate; s. t. line distinct, even, white, sinuate, forming a large curve from apex to vein 6; terminal lines and outer part of fringe on both wings white. Secondaries pale gray with whitish mesial and s. t. lines. Expanse, 30—50 mm.

Habitat, Atlantic States westward.**T. distincta** *French.*1890 *Tolype distincta* FRENCH, Can. Ent., Vol. XXII, p. 45.

Of a slaty gray, the thorax gray in the ♂, partly white only in ♀. Lines as in *velleda*, but narrower, almost linear, defined by dark gray shades. The sexes are similar as in *velleda*, the ♀ slightly paler. Expanse, 35 mm.

Habitat, Colorado.**T. laricis** *Fitch.*1856 *Planosa laricis* FITCH, Rep. Ins. N. Y., Vol. II, p. 262.1863—*Gastropacha vellea* var. *minuta* GROTE, Proc. Ent. Soc. Phil., Vol. II, p. 433.

♀ Thorax and primaries pure white, except the brown crest, and the sub-terminal and terminal part of the normal brown markings of primaries. Secondaries and abdomen very pale gray.

♂ Black; wings dark blackish gray, with three paler bands which correspond to mesial, t. p. and s. t. lines, the two outer undulate. Expanse, 25—30 mm.

Habitat, Atlantic States westward.Genus **Dendrolimus** *Germer.*1824—*Dendrolimus* GERMER, Syst. Prodr., p. 48.1872—*Gloveria* PACKARD, Rep. Peab. Acad., Vol. IV, p. 89.1881 *Quadrina* GROTE, Papilio, Vol. I, p. 75; 1886—SMITH, Ent. Amer., Vol. II, p. 124.*Synopsis of species.*

Intercostal cell of secondaries short, reaching half way to end of discal cell.

Vein 6 of primaries free or on a short stalk with vein 8; vein 8 free
or more often, on a stalk with vein 7 when 6 is free. **dolores.**

Veins 6 and 7 on a stalk, usually long, rarely none; vein 8 free.

Gray, sub-terminal line sharply and evenly angled, **arizonensis.**Brown gray, sub-terminal lines obscure, **gargamelle.**Intercostal cell reaching nearly to apex of discal cell, **diazoma.**

D. dolores *Neumegen & Dyar.*1893 - *Dendrolimus dolores* NEUMEGEN & DYAR, Ent. News, Vol. IV, p. 27.

♀ Similar to *D. arizonensis*, but the transverse lines are more obscure, and the sub-terminal is roundedly undulate, not dentate, the outer angles of the dentations of *arizonensis* being lost. In the interspace between veins 3 and 4 there is a larger projection of the line than elsewhere. ♂ unknown.

Habitat, Colorado.

D. arizonensis *Packard.*1872—*Gloveria arizonensis* PACKARD, Rep. Peab. Acad., Vol. IV, p. 90.1884—*Gloveria dentata* HY. EDWARDS, Papilio, Vol. IV, p. 107.

♀ Gray, overspread with whitish except in terminal space; secondaries and abdomen brownish. On primaries a white discal dot; t. a. and t. p. lines dark, straight, the t. p. line bent deeply inwards opposite cell; sub-terminal line very distinct, sharply and evenly dentate. Expanse, 95 mm. ♂ unknown.

Habitat, Arizona, Mexico.

D. gargamelle *Strecker.*1885—*Lasiocampa gargamelle* STRECKER, Proc. Acad. Nat. Sci. Phil., 1884, p. 286.1884—*Gloveria arizonensis* ♂ HY. EDWARDS, Papilio, Vol. IV, p. 107.

♀ Dark brown, the fore wings grizzled with white hairs; very uniform in tint the sub-terminal line undulate and somewhat irregular, dark, bordered inwardly by pale scales. A round white discal dot. Hind wings brown, darker than in the ♀, with no trace of any paler band. Abdomen dark brown. Expanse, 85 mm.

♂ Brown; fore wings brown with white hairs intermixed, the basal third and outer margin darker, more brownish; median space somewhat ashen. Transverse lines faint; the sub-terminal irregular as in the ♀. Secondaries brown, with a paler, somewhat ochraceous mesial band; fringe white. Expanse, 57 mm.

Habitat, Arizona.

[Our ♀ specimens do not exactly agree with Dr. Strecker's description.]

D. diazoma *Grote.**1881—*Quadrina diazoma* GROTE, Papilio, Vol. I, p. 75.1884—*Gloveria? diazoma* HY. EDWARDS, Papilio, Vol. IV, p. 109.

♀ Wings nearly concolorous, brownish, brighter at base. A curved, even, dark, extra mesial shade line on primaries; an un-

* Through the courtesy of Prof. J. H. Comstock, we have been able to examine a photograph of the venation of this species.

even, broken sub-terminal line. Hind wings with a reddish shade, which obtains slightly on apex of primaries. Expanse, 95 mm.

Habitat, New Mexico [Gröte.]

Family COSSIDÆ.

Synopsis of sub-families and genera.

Vein 8 of secondaries united to sub-costal by a cross-vein.	
Antennæ of ♂ pectinated for the basal half; frenulum distinct,	Zeuzerinæ. ✓
Antennæ of ♂ pectinated to the tip; frenulum rudimentary,	Cossinæ. ✓
Sexes approximate in size	Cossus.
Sexes disproportionate and differently marked	Prionoxystus.
Vein 8 of secondaries free from the base	Hypoptinæ. ✓
Vein 11 of primaries arising from the accessory cell	Cossula.
Vein 11 from the discal cell	Hypopta.

Subfamily ZEUZERINÆ.

Genus **Zeuzera** Latreille.

1804—*Zeuzera* LATREILLE, Nouv. Dict. d'Hist. Nat., Vol. XXIV, p. 186.

1822?—*Latagia* HUEBNER, Verz. bek. Schmett., p. 196.

Synopsis of species.

Fore wings covered with round blackish spots	pyrina.
Fore wings with blackish strigæ	canadensis.

C. pyrina Linnaeus.

1761 *Noctua pyrina* LINNÆUS, Faun. Suec., p. 306.

1751—*Phalena hypocastani* PODA, Mus. Grace, p. 88.

1767—*Noctua æsculi* LINNÆUS, Syst. Nat., Vol. I (2), p. 833.

1785—*Phalena hilaris* FOUCROY, Ent. Paris, Vol. II, p. 306.

1892—*Zeuzera decipiens* KIRBY, Cat. Lep. Het., Vol. I, p. 871.

White, thorax with six round black spots, the two anterior sometimes united; abdomen black banded with two black spots at base above. Primaries thickly covered with rounded intervenular black spots. Secondaries with smaller and less distinct spots, absent at anal angle. Expanse, 45—60 mm.

Habitat, Europe; vicinity of New York City.

Z. canadensis Herrich-Schäffer.

1854—*Zeuzera canadensis* HERRICH-SCHLEFFER, Auser. Schmett., Vol. I, f. 168.

Thorax ochraceous, abdomen paler, more whitish; primaries white, heavily covered over the basal half below median vein and outwardly centrally almost to margin with a blackish shade; costa tinged with brown. All the wings thickly covered with partly

confluent, short, transverse black strigæ. Secondaries white with a very few strigæ at outer margin, otherwise immaculate. Expanse about 30 mm.

Habitat, Canada. [Herrich-Schäffer.]

Sub-family COSSINÆ.

Genus *Cossus* Fabricius.

1794—*Cossus* FABRICIUS, Ent. Syst., Vol. III (2), p. 8.

1810?—|| *Teredo* HUEBNER, Tentatmen, p. 1.

1866—*Trypanus* RAMBUR, Cat. Lep. And., Vol. II, p. 326.

Synopsis of species.

Size large, expanse at least 45 mm.

Dark colored; collar black **centerensis**

Paler, collar gray or white.

Collar nearly white, primaries with very distinct transverse black lines **undosus.**

Collar yellowish gray; clouded along costa.

Indistinctly reticulated, with prominent median line . . . **populi.**

Distinctly reticulated with black; mottled **orc.**

Size smaller, expanse not more than 40 mm.

Pale, with distinct transverse lines **perplexus.**

Darker, shaded, with no evident lines **mucidus.**

C. centerensis *Lintner.*

1879—*Cossus centerensis* LINTNER, Can. Ent., Vol. IX, p. 129.

Fore wings heavily reticulated, some transverse lines more prominent than others; the markings black on a sordid white ground which is also powdered with black; basal half obscured. Secondaries translucent with merest trace of reticulations. Abdomen blackish, obscurely banded with pale. Expanse, 50—65 mm.

Habitat, Atlantic States.

C. undosus *Lintner.*

1878—*Cossus undosus* LINTNER, Rep. N. Y. State Mus., Vol. XXX, p. 243.

1899—*Cossus brucei* FRENCH, Can. Ent., Vol. XXII, p. 44.

Pale gray, the reticulations much as in *C. centerensis*, but the transverse lines are more strongly marked, especially a median, and sub-terminal one, and the white ground is less obscured by brown powderings. Secondaries opaque white, finely and densely reticulated. Expanse, 60—75 mm.

Habitat, Rocky Mountain region.

C. populi *Walker.*1856—*Cossus populi* WALKER, Cat. Brit. Mus., pt. VII, p. 1515.1882—*Cossus angrezi* BAILEY, Papilio, Vol. II, p. 93.

Collar and head yellowish gray, thorax partly black. Fore wings with nearly white ground shaded with blackish, with black and reticulated lines, those crossing the center of the wings most distinct. Hind wings yellowish gray, mottled with blackish outwardly. Expanse, 60—80 mm.

Habitat, Nevada, Hudsons Bay.

C. orc *Strecker.*1893—*Cossus orc* STRECKER, Proc. Acad. Nat. Sci. Phil., p. 282.

Closely similar to *C. populi* but the lines more reticulated, less strigose, giving the fore wing a mottled appearance. Otherwise the species are alike. Expanse, 55—75 mm.

Habitat, The Pacific northwest.

C. perplexus *Neumægen & Dyar.*1893—*Trypanus perplexus* NEUMÆGEN & DYAR, Journ. N. Y. Ent. Soc., Vol. I, p. 31.

Ash gray; reticulations becoming obsolete, irregular and branched; median and sub-terminal lines remain. Secondaries unicolorous, pale cinereous, sub-translucent. Expanse, 33 mm.

Habitat, Colorado.

C. mucidus *Hy. Edwards.*1882—*Cossus mucidus* HY. EDWARDS, Papilio, Vol. II, p. 126.

Reticulations converted into dense transverse strigæ, the fore wings all obscured by blackish shading except the basal costal half where ground color appears, sordid white. Secondaries sordid white, minutely strigose, appearing pulverulent. Expanse, 36—40 mm.

Habitat, Arizona.

Genus **Prionoxystus** *Grote.*1882—*Prionoxystus* GROTE, New Check-list, p. 63.1874—*Xystus* GROTE, Proc. Amer. Phil. Soc., Vol. XIV, p. 262.*Synopsis of species.*

Wings opaque, secondaries of ♂ partly orange	robiniaë.
Secondaries of ♀ also orange tinted	var. quercus.
Wings sub-hyaline, no orange	macmurtrei.

P. robiniae Peck.1818—*Cossus robiniae* PECK, Mass. Agric. Rep. Journ., Vol. V, p. 67.1856—*Cossus plagiatus* WALKER, Cat. Brit. Mus., pt. VII, p. 1515.1864—*Xyleutes crepera* GROTE, Proc. Ent. Soc. Phil., Vol. III, p. 388.1878—*Cossus reticulatus* LINTNER, Rep. N. Y. Mus., Vol. XXX, p. 242.*var. quercus* Ehrmann.1893—*Prionoxystus robiniae* var. *quercus* EHRMANN, Can. Ent., Vol. XXV, p. 257.

♂ Dull cinereous, patagia and collar bordered with black. Primaries densely reticulated with black, forming a broad diffuse band of black from internal margin to apex, running also on to discal cell. Secondaries golden yellow, black on basal half, costal and internal margins and narrow outer edge. Expanse, 50—55 mm.

♀ Paler, almost white; reticulations less dense so that the black band is broken up into several isolated and variable patches. Secondaries blackish, the reticulations of under side appearing by transparency. Expanse, 55—70 mm.

Habitat, Atlantic States westward.

P. macmurtrei Guérin.1829—*Cossus macmurtrei* GUÉRIN, Icon. R. Anim. Ins., pl. 85, f. 2.1858—*Cossus querciperda* FITCH, Rep. Ins. N. Y., Vol. V, p. 10.

♂ Very small, wings hyaline with traces of the black transverse reticulations; secondaries hyaline with narrow black border, broader on internal margin.

♀ With very large abdomen; wings whitish hyaline, the reticulations mostly transverse, recalling *C. undosus*. Secondaries subhyaline, immaculate above. Expanse, 60 mm.

Habitat, Atlantic States.

Sub-family HYPOPTINÆ.

Genus **Cossula** Bailey.1882—*Cossula* BAILEY, Papilio, Vol. II, p. 93.1888—*Inguromorpha* HY. EDWARDS, Ent. Amer., Vol. III, p. 182.**C. basalis** Walker.1856—*Cossus basalis* WALKER, Cat. Brit. Mus., pt. VII, p. 1523.1876—*Cymatophora magnifica* STRECKER, Proc. Acad. Nat. Sci. Phil., p. 151.1882—*Cossus magnifica* BAILEY, Papilio, Vol. II, p. 93.1888—*Inguromorpha slossonii* HY. EDWARDS, Ent. Amer., Vol. III, p. 183.

♂ Pale gray. At base of primaries, a deep black transverse band; at internal angle and apex are distinct lines forming circles,

the enclosed spaces dotted with brownish scales; several other irregular black marks. Expanse, 32 mm.

♀ Pale ash color, secondaries darker. Primaries with diffuse dark brown strigæ. Outer border (one-fifth of wing) dull ochereous, defined inwardly and on the fringe by dark brown, and also in a spot at middle of outer margin. Expanse, 36 mm.

Habitat, Florida.

Genus *Hypopta* Hübner.

1822—*Hypopta* HUEBNER, Verz. bek. Schmett., p. 195.

Synopsis of species.

- Wings nearly uniformly white; pectinations of antennæ brown . . . **manfredi.**
 Wings more or less mottled or irrorate with dark shades; pectinations of antennæ blackish.
- With blackish marks at end of median vein.
 Terminal half of wing thickly covered with intervenular purplish confluent spots **theodori.**
 Dark marking extending only from origin of vein 2 to cross vein or further; fringe of secondaries almost entirely white **bertholdi.**
 Dark marks confined to origin of veins 3—4; fringe of secondaries distinctly black spotted **ethela.**
- Without any blackish discal marks.
 Wings largely marbled with pale brown, the white ground reduced to a series of confluent spots **henrici.**
 A brown spot on middle of interior margin only **cornelia.**
 Without any brown markings on fore wings, white, irrorate with black scales **edwardi.**
 Wings gray, reticulated with black lines **nanus.**

H. manfredi Neumægen.

1884—*Hypopta manfredi* NEUMÆGEN, Papilio, Vol. III, Vol. 139.

White, obscurely irrorate with brown scales on primaries, becoming defined on the cell into a rather distinct shade. Antennæ brown. Expanse, 30 mm.

Habitat, Arizona.

H. theodori Dyar.

1893—*Hypopta theodori* DYAR, Can. Ent., Vol. XXV, p. 220.

White, terminal half of both wings nearly covered by confluent intervenular purplish spots, which become smaller towards margin and on primaries form a continuous blackish shade beyond cell from origin of vein 2 to sub-costal vein. Expanse, 30 mm.

Habitat, New Mexico.

H. bertholdi Grote.

1880—*Hypopta bertholdi* GROTE, Bull. Brook. Ent. Soc. Vol. III, p. 45.

Pale gray, veins of primaries black. Costa and central area of primaries white, cut by the black veins, the white spreading diffusely into the gray; at veins 2—5 at base, the black spreads between the veins. Expanse, 35 mm.

Habitat, Colorado.

H. ethela Neumøgen & Dyar.

1893—*Hypopta ethela* NEUMEGEN & DYAR, Journ. N. Y. Ent. Soc. Vol. I, p. 32.

Gray; primaries blackish, the white ground heavily irrorate with black scales. A small spot at end of cell without irrorations, and just below it an elongated black spot. Secondaries nearly black centrally. Expanse, 28 mm.

Habitat, Colorado.

H. henrici Grote.

1882—*Hypopta henrici* GROTE, Papilio, Vol. II, p. 131.

White, with a grayish cast, ♀ darker. Pale yellowish gray rounded confluent spots in a sub-terminal band and one through cell and sub-median interspace, break up the ground into a series of more or less confluent spots, but leave the costa white. Secondaries of ♀ gray, abdomen white. Expanse, 35 mm.

Habitat, Arizona.

H. cornelia Neumøgen & Dyar.

1893 *Hypopta cornelia* NEUMEGEN & DYAR, Journ. N. Y. Ent. Soc., Vol. I, p. 32.

White; a faint brownish tinge on primaries, which becomes marked beyond the cell, forming two obscure, parallel transverse lines; along internal margin a patch of brownish black and pale ochereous scales, broken up obscurely by the ground color. Secondaries light gray. Expanse, 27 mm.

Habitat, Colorado.

H. edwardi Neumøgen & Dyar.

1893—*Hypopta edwardi* NEUMEGEN & DYAR, Journ. N. Y. Ent. Soc., Vol. I, p. 32.

Gray; primaries white, irrorate with black scales, less thickly over the cell. A faint brownish discoloration in the interspaces at base of veins 2—5 at end of cell. Secondaries brownish gray. Expanse, 40 mm.

Habitat, Colorado.

H. nanus *Strecker*.*

1876—*Cossus nanus* STRECKER, Proc. Acad. Nat. Sci. Phil., p. 151.

“Expands $1\frac{1}{8}$ inch. Has the appearance of a miniature *Cossus ligniperda*, is gray, of lighter and darker shades and reticulated with black lines which are most noticeable across the disk and on the terminal part of wing. Secondaries uniform grayish. Beneath grayish, faintly reticulated,

Habitat, Colorado.”

Family HEPIALIDÆ.

Synopsis of genera.

Size large; apices of primaries rectangular, sub-falcate **Sthenopis.**
 Size smaller; apices rounded **Hepialus.**

Genus **Sthenopis** *Packard*.

1864—*Sthenopis* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 390.

Synopsis of species.

General color silvery smoky gray.
 Two silvery spots near base of discal cell.
 Color smoky gray **argenteomaculatus.**
 Ground color silvery purple *var.* **purpurascens.**
 One silvery spot near base and another sub-apical *var.* **los.**
 No silver dots on primaries *var.* **perdita.**
 General color pale salmon **quadriguttatus.**
 General color white **thule.**
 General color dull lilac, gold tinted **auratus.**

S. argenteomaculatus *Harris*.

1841—*Hepialus argenteomaculatus* HARRIS, Rep. Ins. Mass., p. 295.
 1864—*Sthenopis argentatus* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 292.
 1885—*Cossus alni* KELLICOTT, Ent. Amer., Vol. I, p. 175.

var. **purpuracens** *Packard*.

1863—*Gorgopis purpurascens* PACKARD, Bost. Journ. Nat. Hist., Vol. VII, p. 598.

var. **los** *Strecker*.

1893—*Hepialus los* STRECKER, Proc. Acad. Nat. Sci. Phil., p. 282.

var. **perdita** *Dyar*.

1893—*Sthenopis argenteomaculatus var. perdita* DYAR, Can. Ent., Vol. XXV, p. 327.

Sable brown with a silvery tint, with several large dark brown marks bordered by a bright shade; outer margin dark, broadly so at internal angle, with or without two silvery spots near the base

* We are indebted to Dr. Strecker for a sketch of the venation of this species.

of the wing. Secondaries uniformly sub-translucent, brown, with an apical slightly silvery mark. Expanse, 65—105 mm.

Habitat, Northern Atlantic States northward.

S. quadriguttatus Grote.

1864—*Gorgopis quadriguttatus* GROTE, Proc. Ent. Soc. Phil., Vol. III, p. 73.

1893—*Sthenopis argenteomaculatus* var. *semiauratus* NEUMEGEN & DYAR, Can. Ent., Vol. XXV, p. 124; 1893—GROTE, Can. Ent., Vol. XXV, p. 186; 1893—STRECKER, Proc. Acad. Nat. Sci. Phil., p. 283.

Of a pale salmon color with olivaceous golden brown bands arranged as in *argenteomaculatus*, consisting of oblique basal, abbreviated discal and sub-apical; two costal spots and terminal band, the latter wide at internal angle and inclosing a paler shade. Near base of cell on primaries two silvery spots, ringed with black.

Habitat, Mountains of New England northward.

S. thule Strecker.

1875—*Hepialus thule* STRECKER, Lep. Roph. & Het., pt. 105, pl. 12, f. 6.

Yellowish white, the costal third of wing as far as end of cell, densely mottled with cinnamon brown. A few irregular small brown spots scattered over the wing. Near base of cell two white spots, and at upper angle of cell two others, all black ringed. Secondaries white, with a few brown marks on the costal edge. Expanse, 65 mm.

Habitat, Canada, Wisconsin.

S. auratus Grote.

1878—*Hepialus auratus* GROTE, Can. Ent., Vol. X, p. 18.

Yellowish brown with a brassy lustre and whitish ill defined marks appearing most strongly on two parallel bands (t. p. and s. t.), the latter marked with two or three silvery white triangular spots sub-apically. Expanse, 48 mm.

Habitat, New York, New Hampshire.

Genus **Hepialus** Fabricius.

1775—*Hepialus* FABRICIUS, Syst. Ent., p. 589.

1852—*Epialus* LEDERER, Verh. Zool. Bot. Ges. Wien, Vol. II, p. 73.

Synopsis of species.

An oblique band from near internal angle to base of wing.

Silvery white or whitish markings on wing.

Wing opaque, markings silvery **ganna.**

Wings sub-translucent, markings faintly silvery or white.

Size 30 mm. or less	mustelinus.
Size more than 30 mm.	gracilis.
No white marks, bands smoky	roseicaput.
No such oblique band.	
Transverse rows of whitish spots, dusky bordered	lembertii.
Transverse bands partly silvery white.	
Silver spots well fused, especially in outer band	sequoiolus.
Silver spots smaller, nearly separate or reduced	behrensi.
No silvery marks on wings.	
Size rather large (35—55 mm.)	montanus.
Size small (less than 30 mm.)	
No red marks; color ochereous or partly stone color	hectoïdes.
With traces of transverse bands marked with bright red	<i>var.</i> lenzi.

H. ganna *Hübner.*

1804?—*Bombyx ganna* HUEBNER, Eur. Schmett. Bomb., f. 215.

1884—*Hepialus confusus* HY. EDWARDS, Papilio, Vol. IV, p. 122.

1886—*Hepialus mc-glashani* HV. EDWARDS, Ent. Amer., Vol. II, p. 14.

var. **hyperboreus** *Müschler.*

1862—*Epialus hyperboreus* MOESCHLER, Wien. Ent. Mon., Vol. VI, p. 129.

1864—*Hepialus pulcher* GROTE, Proc. Ent. Soc. Phil., Vol. III, p. 522.

var. **matthewi** *Hy. Edwards.*

1874—*Hepialus matthewi* HY. EDWARDS, Proc. Cal. Acad., Vol. V, p. 265.

Ground color yellowish brown, dark brown (*hyperboreus*) or pale yellowish brown with orange tints (*matthewi*), with irregular silvery bands on primaries. These consist of a band which starts at base, runs to costal third, then to internal margin before internal angle and thence to apex; it is angular and furnished with irregular projections, sometimes broken into spots or partly absent. A discal spot, one on basal third of internal margin and some marks on middle of outer margin, all of which may be more or less reduced or absent. Secondaries blackish, paler along costa and outer margin. Expanse, 25 - 35 mm.

Habitat, Arctic and mountainous regions of Europe and North America.

H. mustelinus *Packard.*

1864—*Hepialus mustelinus* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 393.

1864—*Hepialus labradoriensis* PACKARD, Proc. Ent. Soc. Phil., Vol. III, p. 394.

Brown; primaries faintly mottled with paler brown with a whitish somewhat irregularly outlined band along internal margin and reaching from before internal angle to apex; above it, along the margin, a black shade. Expanse, 27 mm.

Habitat, Labrador.

H. gracilis Grote.

1864—*Hepialus gracilis* GROTE, Proc. Ent. Soc. Phil., Vol. III, p. 522.

1884—*Hepialus furcatus* GROTE, Can. Ent., Vol. XV, p. 30.

Sub-translucent obscure gray. A pale white band from apex to internal margin, running thence to base, rather broad but indented. The rest of the wing obscurely clouded with black and brownish scales, without distinct marks. Outer margin white, fringe black spotted. Expanse, 33—40 mm.

Larger than *mustelinus* and paler in the specimens before us, but with the same markings; probably not specifically distinct.

Habitat, Northern Atlantic States to Canada.

H. roseicaput Neumogen & Dyar.

1893—*Hepialus roseicaput* NEUMGREN & DYAR, Can. Ent., Vol. XXV, p. 125.

Primaries salmon brown, with obscure smoky black bands arranged after the pattern of *gamma*. Secondaries blackish. Expanse, 33 mm.

Habitat, British Columbia.

H. lembertii Dyar.

1894—*Hepialus lembertii* DYAR, Ent. News, Vol. V, p. 25.

Ocherous with the bands broken up into a series of dusky bordered, sub-hyaline, whitish spots, varying considerably in size and distinctness. Certain of them may be absent or confluent with others. Secondaries blackish. Expanse, 30—35 mm.

Habitat, High Sierras of California.

H. sequoiolus Behrens.

1876—*Hepialus sequoiolus* BEHRENS, Can. Ent., Vol. VIII, p. 174.

1876—*Hepialus mendocinolus* BEHRENS, Can. Ent., Vol. VIII, p. 174.

Dark brown with a salmon tint along costa. Two oblique silvery bands composed of spots from internal margin to sub-costal vein, bordered outwardly by a narrow red line. A sub-terminal pale band. Secondaries blackish. Expanse, 32—40 mm.

Habitat, California and Pacific Northwest.

H. behrensii Stretch.

1872—*Sthenopis behrensii* STRETCH, Zyg. & Bomb. N. A., p. 105.

1874—*Epidalus tacome* HY. EDWARDS, Proc. Cal. Acad. Sci., Vol. V, p. 365.

Salmon brown, wings nearly immaculate. Three paler transverse parallel bands can be made out, the t. a. and t. p. marked

with silver on lower third. Outer band (3rd) often absent. Expanse, 55 mm. Probably not different from the preceding.

Habitat, California and Pacific Northwest.

H. montanus *Stretch*.

1872—*Hepialus montanus* STRETCH, Zyg. & Bomb. N. A., p. 105.

1875—*Hepialus desolatus* STRECKER, Lep. Roph. & Het., p. 107.

1876—*Hepialus baroni* BEHRENS, Can. Ent., Vol. VIII, p. 175.

1881—*Hepialus anceps* HY. EDWARDS, Papilio, Vol. I, p. 36.

1881—*Hepialus rectus* HY. EDWARDS, Papilio, Vol. I, p. 36.

Dark brown or yellowish brown. Three maculate paler bands (t. a., t. p. and s. t.) defined by darker edges. A terminal series of similar spots. Markings obscure but evident. Secondaries concolorous or darker. Expanse, 55 mm. or less.

Habitat, California and the Pacific Northwest.

H. hectoides *Boisduval*.

1868—*Hepialus hectoides* BOISDUVAL, Ann. Soc. Ent. Fr., Vol. XII, p. 85.

1875—*Hepialus modestus* HY. EDWARDS, Proc. Cal. Acad. Sci., Vol. V, p. 112.

1881—*Hepialus inutilis* HY. EDWARDS, Papilio, Vol. I, p. 36.

var. lenzi *Behrens*.

1876—*Hepialus lenzi* BEHRENS, Can. Ent., Vol. VIII, p. 175.

1878—*Hepialus sangaris* STRECKER, Lep. Roph. & Het., Vol. I, p. 136.

Stone color with two oblique parallel pale yellowish bands narrowly marked with vermillion. This color may be lacking, or the bands, or all the stone colored shade, leaving the wings pale yellowish. Expanse, 16—20 mm.

Habitat, California, Arizona.

We have not been able to recognize the following:

Hepialus californicus *Boisduval*.

1868—*Hepialus californicus* BOISDUVAL, Ann. Ent. Soc. Belg., Vol. XII, p. 85.

It has the appearance and form of *carnus* of the Alps. Fore wings obscure gray, showing in a certain light towards the extremity some whitish parallel rays enclosing little rounded patches of a more obscure color. Hind wings blackish gray.

ADDITIONS AND CORRECTIONS.

Family **Euchromiidae**. For *Lycomorpha fulgens* Hy. Edw. read *L. equalis* Walk. and remove the name from the list of North American species. Add *L. fulgens* as a synonym of *L. grotci*.

Family **Lithosiidae**, genus *Pagara*. Add *P. endora* Dyar, 1894, Ent. News, Vol. V, p. 198. Like *P. simplex* but white instead of gray. *Habitat*, Southern States.

Genus *Clemensia*. Add *C. lactea* Stretch, 1885 *Cisthene lactea* Stretch, Ent. Amer., Vol. I, p. 103. White with about six small black spots. *Habitat*, California.

Omit the sub-family Eudulinae (= Geometrids).

Family **Arctiidae**. Add to *Scirarctia echo* as a synonym *Spilosoma niobe* Strecker, Proc. Acad. Nat. Sci., 1884, p. 284. Add to *Estigmene acrea* as a synonym *Leucarctia acrea* var. *klagesii* Ehrmann, Can. Ent., Vol. XXVI, p. 292 (1894).

Genus *Paruchates*. For *P. cadaverosa* Grt. read *P. insulata* Walker, 1855, Cat. Brit. Mus., pt. III, p. 734.—Beutenmüller, 1894, Bull. Am. Mus. N. H., Vol. VI, p. 368, and place *cadaverosa* as a synonym.

Page 153 erase the genus *Coscinia* (not American).

For genus *Haploa* read:

Vein 5 of secondaries arising close to 4	Haploa.
Vein 5 of secondaries from near middle of cell	Doa.
Doa gen. n.	

Differs from *Coscinia* in the broader trigonate wings, the presence of vein 5 on secondaries and the greater coalescence of 8 with sub-costal, nearly reaching tip of cell. On fore wings veins 7-8 and 9-10 arise from a pair of separate stalks from the cell, while in *Coscinia* the stalks are fused into one at basal half, so that 7-10 are on a single stalk. Ocelli present, front smooth, head prominent, tongue moderate. Type *Doa dora* Neum. & Dyar.

Synopsis of species.

Fore wings gray, without borders	dora.
Fore wings white, edged with a narrow black line on costa and outer margin	ampla.

D. dora sp. n.

♀ Fore wings carneau gray crossed before the middle and again beyond the cell by a broad, diffuse, dark gray band; terminally the wing is scarcely darker than elsewhere. Six black dots arranged exactly as in *D. ampla* Grt. Costal edge and fringe concolorous. Secondaries, underside and abdomen dark blackish gray, uniform, immaculate, except for a small discal dot on both wings below. Thorax apparently concolorous with fore wings, but injured. Antennae black. Expanse, 38 mm.

Habitat, Guadalajara, Mexico.

Page 155 for *Cosciniã ampla* Grote, read *Doa ampla* Grote.

Genus *Kodiosoma*. Reduce all the four species to one, being varieties of *K. fulva*.

Family **Agaristidæ**—The only character to separate this family from the Noctuidæ is the swollen antennæ. Therefore we would suggest that all the genera here enumerated, except *Alypia*, be transferred to the Noctuidæ.

Place Genus *Seudyra* Stretch as a synonym of *Zalissa* Walker, 1865 Cat. Brit. Mus., pt XXXIII, p. 936; 1894 Hampson, Moths of India, Vol. II, p. 155.

Genus *Alypiodes* (not *Alypioides*) add *A. bimaculata* H.-S. Like *A. crescens* but without a yellow spot on secondaries above. *Habitat*, New Mexico.

Family **Lagoidæ**—Add to genus *Carama* the following:—*C. pura* Butler (1878, Trans. Ent. Soc. Lond., p. 64). Like *C. cretata* but the whole head is pale lemon yellow except the front which is blackish. *Habitat*, Southern States, (♂ Washington, D. C.)

Family **Pyromorphidæ**—Substitute the following synopsis of genera for the one given on page 63:

Veins 8—9 stalked, or all veins free (from cell) when 8 is absent.

Primaries elongate, narrow, apex acute; vein 8 absent . . . **Acoloitus.**

Primaries broader, apex rounded; vein 8 usually present.

Costa of primaries convex **Pyromorpha.**

Costa straight **Tripocris.**

Veins 8—10 stalked, or 9—10 stalked when 8 is absent . . . **Harrisina.**

Genus *Tripocris*. Add *T. lustrans* Beutenmüller. 1894, Bull. Am. Mus. Nat. Hist., Vol. VI, p. 367. Black, with metallic blue lustre; expanse, 31 mm. *Habitat*, Colorado.

Family **Limacodidæ**—Erase *Limacodes viridus* Reak. as a synonym of *Euclca indetermina* Bd. and place it as a synonym of *Parasa chloris* H.-S.

Family **Notodontidæ**—Insert *Heterocampa chapmani* Grote. It is unknown to us, but presumably a good species.

Family **Saturniidæ**—Change the synopsis of sub-families to read:

Antennæ doubly bipectinated in the ♀ **Attaciinæ.**

Antennæ simply bipectinated or simple in the ♀ . . . **Hemileuciniæ.**

Erase "sub-family Lemoniinæ" on p. 129 and insert sub-family Hemileuciniæ before genus *Automeris* on page 127.

LIST OF UNRECOGNIZED NAMES.

Lycomorpha desertus HV. EDW., Papilio, Vol. I, p. 81 (1881).
Type lost; family and generic location uncertain.

Edema plagiata WALKER, Cat. Brit. Mus., pt. XXXII, p. 427
(1865). Type lost, description unrecognizable.

Rhagois bicolor WALKER, Trans. Ent. Soc. Lond., (3), Vol. I,
p. 270 (1862). Type lost, description unrecognizable.

APPENDIX.

We have refrained from changing any of the family names during the publication of the foregoing revision; but certain changes seem desirable. It would appear proper to alter the name of a family when the genus from which it was taken becomes a synonym.* On this account, principally, the following changes are suggested:—

(1) *Euchromiidae*. We took this name from Kirby's Catalogue (*Euchromiinae*, p. 117); but as *Syntomidae* has been used previously and is adopted by Hampson, it would seem preferable to use it. However, according to Kirby, *Syntomis* is a synonym of *Zygana*, and hence the family should be called *Zyganidae*. We have felt unwilling to make this change, as the name has been commonly associated with such different insects (*Anthroceridae*, type *A. filipendula* L.).

(2) *Liparidae*. Kirby and Hampson agree in suppressing the genus *Liparis*. The name will be changed to *Lymantriidae*, following Hampson (*Moths of India*, Vol. I, p. 432).

(3) *Drepanulidae*. Mr. Grote has suggested to us that this should be *Platypterygidae*. However, as the name stands, it is uniform with Kirby and Hampson. We would make it *Drepanidae*.

(4) *Limacodidae*. Both the genera *Limacodes* and *Cochlidion* have become synonyms. In correspondence with Prof. Comstock we have concluded to call the family *Eucleidae*.

(5) *Lagoideae*. This should be changed to *Megalopygidae* not only because *Lagoa* has become a synonym, but also in recognition of the work of Carlos Berg (*Ann. Soc. Cient. Argentina*, Vols. XIII—XIV).

* See rules of nomenclature adopted by the international zoological congress held in Moscow, 1892.

(6) *Saturniidae*. It may be advantageous to recognize the two sub-families as of family rank, i. e. *Saturniidae* (*Attacinae*) and *Hemileucidae*.

(7) *Ceratocampidae* should be changed to *Citheroniidae* as *Ceratocampa* is a synonym.

Finally we would arrange the families here treated of in systematic order, following the classification into sub-orders founded by Prof. Comstock and the super-families of the *Frenatae* suggested by Mr. Dyar.

Type **Arthropoda**, Class **Hexapoda-Insecta**, Order **Lepidoptera**.

Sub-order **Jugatae**.

Family *Hepialidae*.

Sub-order **Frenatae**.

Super-family **Cossina** (*Microlepidoptera*).

Families *Cossidae*.

Psychidae.

Lacosomidae.

Super-family **Anthrocerina**.

Families *Pyromorphidae*.

Megalopygidae.

Eucleidae.

Super-family **Saturnina** (*Bombycina*).

Families *Citheroniidae*.

Hemileucidae.

Saturniidae.

Bombycidae.

Super-family **Noctuina**.

Families *Notodontidae*.

Lithosiidae.

Dioptidae.

Arctiidae.

Drepanidae.

Euchromiidae (*Zygænidæ*).

Agaristidae.

Lymantriidae.

Pericopidae.

Super-family **Lasiocampina** (?)

Family *Lasiocampidae*.

PRELIMINARY HAND-BOOK OF THE
COLEOPTERA OF NORTH EASTERN AMERICA.

BY CHARLES W. LENG & WM. BEUTENMÜLLER.

(CONTINUED FROM PAGE 141.)

Elaphrus *Fabr.*

Elytra with variolate foveæ, not striate, head wider than the thorax (except in *E. viridis*); eyes large and prominent; thorax without lateral seta; mentum tooth large, nearly as long as the lateral lobes, emarginate. The species of this genus may be found running on mud flats near streams or ponds during sunshine; they somewhat resemble *Cicindela* in shape and *Bembidium* in habit.

Anterior tarsi of male with four joints dilated.

Elytra smooth, not punctured.

Thorax coarsely and sparsely punctate beneath **Clairvillei.**

Thorax finely and more densely punctate beneath.

Legs piceous **lævigatus.**

Legs pale **olivaceus.**

Elytra and thorax sparsely and coarsely punctate **cicatricosus.**

Elytra punctate at sides, disc smooth **fuliginosus.**

Anterior tarsi of male with three joints dilated.

Thorax and elytra very closely and finely punctate.

Thorax cordate finely and closely punctate beneath **riparius.**

Thorax coarsely punctate beneath, shining **ruscarius.**

E. Clairvillei *Kirby*.—Bronzy black, foveæ purplish; shining, head with very fine minute green punctures; thorax very sparsely and finely punctured at the sides, disc smooth, impressions deep; underside metallic bronze, thorax sparsely but coarsely punctate. Length, .32 inch = 8 mm.

Habitat, Can., N. Y. and westward.

E. lævigatus *Lec.*—Bronze, shining, legs piceous, thorax finely and densely punctate beneath; elytra not punctured, foveæ purplish. Length, .28—.32 inch = 7—8 mm.

Habitat, Michigan to California.

E. olivaceus *Lec.*—This species, is of rather less slender form than *lævigatus*, and the sculpture of the upper surface re-

sembles it very closely. The under surface of the thorax is very densely punctulate, more so than the majority of specimens of *riparius*; it also differs by having fine golden punctures which cover the head, thorax, sides and tips of the elytra. The legs are pale. Length, .26 inch = 6.5 mm.

Habitat, N. Y. (Catskills).

E. fuliginosus Say.—Brassy-black; head and thorax punctulate; elytra as sides punctate, disc smooth; beneath metallic green. Length, .32 inch = 8 mm.

Habitat, Can., N. Y. and westward.

E. cicatricosus Lec.—Dull brassy, subelongate; thorax and elytra with sparsely and coarsely punctured, foveæ purplish, interspaces of elytra polished, scarcely punctured. Length, .28 inch = 7 mm.

Habitat, Northern N. Y., Canada.

E. riparius Linn.—Closely allied to *E. ruscarius*, but is somewhat more elongate in form, and the thorax is densely and finely punctate beneath. Length, .28 inch = 7 mm.

Habitat, Canada, westward to California and Alaska, also Asia and Europe.

E. ruscarius Say. (Plate III, Fig. 10.)—Dull brassy above, metallic beneath; foveæ on elytra purplish; head, thorax and elytra finely punctured, the latter with a few polished elevations; thorax coarsely punctate beneath. Length, .24 inch = 6 mm.

Habitat, N. E. America.

Blethisa Bon.

Related to *Elaphrus*; mentum tooth short, bifid at tip; thorax with lateral setigerous puncture; head with deep lateral grooves; elytra striate with interstitial foveæ.

Synopsis of species.

Thorax punctate above	Julii.
Thorax smooth above, quadrate	quadricollis.
Thorax subcordate, punctate beneath	multipunctata.

B. Julii Lec.—Coppery black above; thorax punctate, not broad; sides rounded, hind angles obtusely pointed; elytra broader than thorax striate, intervals 3 with five foveæ, interval 5 with three foveæ and the seventh interval more elevated than the adjoining ones, but not interrupted; body black beneath. Length, .45—.47 inch = 11—12 mm.

Habitat, Nova Scotia,

B. quadricollis *Hald.* Plate III, Fig. 11.—Blackish brassy, black beneath, legs deep steel blue, thorax smooth, basal impressions punctate, subtruncate, slightly rounded at the sides anteriorly, hind angles rounded; elytra striate, punctured, interval 3 with five foveæ, interval 5 with three foveæ and interval 7 with two foveæ, one near the humeri and the other near the apex. Length, .60 inch = 15 mm.

Habitat, Canada, Illinois, N. Y., N. J., also Minn.

B. multipunctata *Lin.*—Bronzy-black above, underside black; thorax subcordate, smooth above, finely and densely punctate beneath, hind angles rather sharply pointed; elytral markings like *B. quadricollis*. Length, .48 inch = 12 mm.

Habitat, North U. S., Canada, Ill., Mich., Wis., also Siberia and Europe.

Diachila *Mots.*

Allied to *Bicthisa*; head not sulcate, elytra with feeble striae and punctures; anterior tarsi of the male with four dilated and spongy joints.

D. subpolaris *Lec.*—Dull brassy above, black beneath; head and thorax moderately punctured, median fovea in front slightly impressed; thorax broad, sides rounded in front, sinuate behind; hind angles rectangular, carinated, base deeply impressed; elytra elongate, thorax a little broader; striae and punctures not impressed; interval 3 with three punctures. Length, .36 inch = 9 mm.

Habitat, Hudson's Bay Terr.

Lonicera *Lat.*

First joint of antennæ very long, joints 2–6 furnished with long diverging bristles; elytra striate, with a single or double series of foveolæ; thorax narrower than the elytra.

L. cærulescens *Lin.* Plate IV, Fig. 1.—Bronzy black, shining with a single series of foveolæ on the elytra, which are striate; sides of thorax rounded, somewhat oblique posteriorly, with the hind angles not prominent, tibiae and tarsi testaceous, femora piceous. Length, .33 inch = 8.75 mm.

Habitat, Br. Col., Lake Superior region, Can., Nova Scotia, also Siberia and Europe.

Notiophilus *Dum.*

Size small; head horizontal triangular, as broad as the thorax, eyes prominent, front with many fine grooves, elytra almost parallel, slightly broader than the thorax; anterior tibiæ obliquely truncate.

Live in damp sunny places under fallen leaves, especially at the base of trees.

Synopsis of species.

Legs wholly testaceous	æneus.
Femora black, tibiæ dark ferruginous.	
Sides of elytra testaceous	sylvaticus.
Elytra metallic bronze.	
Striæ closely placed	semistriatus.
Striæ distant, effaced at apex	sibiricus.
Legs entirely black	Hardyi.

N. æneus *Hbst.* Plate III, Fig. 12.—Metallic bronze, shining; thorax punctured, disc smooth; elytral punctures deep at the base, becoming indistinct beyond the middle. Legs testaceous. Length, .20 inch = 5 mm.

Habitat, N. Y., N. J., Pa., North. U. S.

N. semistriatus *Say.*—Metallic bronze, femora black, tibiæ dark ferruginous; elytra with striæ finely punctured, and closely placed. Length, .20 inch = 5 mm.

Habitat, New Hampshire, Canada and westward to California.

N. sibiricus *Mots.*—Metallic bronze; thorax punctured, disc on each side smooth, median line finely punctured; elytral striæ deeply punctured, effaced at the apex, intervals smooth, distinct; femora and tarsi black, tibiæ ferruginous. Length, .18 inch = 4.5 mm.

Habitat, N. E. America, westward to Siberia.

N. Hardyi *Putz.*—Metallic bronze, glossy; thorax finely punctate, disc smooth; elytra striate at sides, striæ regularly and distinctly punctured, suture with one punctured stria on each side, intervening space smooth; under side of body and legs black. Length, .16 inch = 4 mm.

Habitat, Newfoundland to New York.

N. sylvaticus *Esch.*—Metallic bronze; head with the usual series of fine grooves; thorax thickly punctured on all sides, disc with very minute punctures; elytra with a broad testaceous lateral

stripe on which are placed the punctured striae; femora dark; tibiae ferruginous. Length, .20 inch = 5 mm.

Habitat, White Mts., N. H., (also Vancouver Island to Alaska).

Opisthius Kirby.

Head deflexed; head and thorax much narrower than the elytra; thorax somewhat broader than long, elytra much flattened, broadly oval, foveolate, not striate.

Opisthius Richardsons Kirby. Plate IV, Fig. 2.—Dark brassy, subopaque; elytra with three rows of large foveae, and a row of smaller foveae, along the outer margins; under side of body black; legs brassy. Length, .40 inch = 10 mm.

Habitat, Hudson's Bay region and westward.

Nebria Latreille.

Anterior tarsus of male moderately or feebly dilated; antennae slender, joints all cylindrical, equaling in length two-thirds or more the length of the body; scutellar stria of elytra always distinct.

Synopsis of species.

Humeral angle distinct.

Sides of elytra subparallel.

Sides of thorax not sinuate near base.

Black; third elytral stria with at least four punctures, **suturalis.**

Sides of thorax sinuate at base; hind angles rectangular.

Hind angles distinctly rectangular; dorsal punctures distinct **Sahlbergi.**

Hind angles scarcely rectangular; dorsal punctures faint **hudsonica.**

Sides of elytra strongly rounded.

Black, legs pale yellow; sides of thorax oblique; hind angles not rectangular; elytral striae very distinct **pallipes.**

N. suturalis Lec.—Black, sometimes shining, depressed; sides of thorax oblique; elytra with subparallel, feebly rounded sides; surface moderately deeply striate, striae distinctly but irregularly punctured, intervals flat; third striae with four distinct large punctures. Length, .40—.46 inch = 10—11.5 mm.

Habitat, Lake Superior region to New Hampshire.

N. Sahlbergi Fisch.—Black, legs piceous or castaneous, with the tibiae sometimes paler; head smooth, frontal impression shallow; thorax one-half broader than long, sides strongly rounded in

front, sinuate behind, hind angles distinctly rectangular, sides moderately reflexed and with a few punctures within; basal impression moderately deep, sparsely punctured; elytra subparallel faintly striate, striæ punctured, third striæ with four or five distinct large punctures, intervals flat. Length, .40 inch = 10 mm.

Habitat, New Hampshire, westward to Oregon and Sitka.

N. hudsonica Lec.—Allied to *Sahlbergi*, but differs in its more depressed form and by the hind angles of the thorax being scarcely rectangular. The sides of the thorax are less rounded in front and feebly sinuate behind. The sides of the elytra are nearly parallel and the surface faintly striate, the striæ scarcely punctured, the third with four large punctures, rather vaguely defined. Length, .40—.42 inch = 10—10.5 mm.

Habitat, Hudson's Bay Territory.

N. pallipes Say. Plate IV, Fig. 3.—Jet black, shining, legs and antennæ pale yellowish; thorax very broad, with sides rounded, oblique behind, hind angles obtuse not rectangular; elytra deeply striate, striæ punctured, the third with five distinctly impressed large punctures, intervals convex. Length, .40—.46 inch = 10—11.5 mm.

Habitat, N. E. America.

***Pelophila* Dejean.**

Anterior tarsi of male broadly dilated; antennæ stout, shorter than half the length of body, joints 3—4 thicker at tip, joints 3—11 distinctly flattened; scutellar stria obliterated; body robust, in form like *Blethisa*.

P. ulkei Horn.—Brownish æneous, shining; head with moderately deep frontal impressions, wrinkled longitudinally, strigose behind the apex; thorax nearly twice as broad as long, slightly narrower at base, sides moderately rounded in front, slightly sinuate behind, basal angles rectangular, median and apical impressions faint, the latter sparsely punctured; elytra oblong, sides feebly rounded, slightly broader behind the middle, striæ faint, punctures obsolete, intervals nearly flat, the third with four and the fifth with two large punctures, margins of elytra green; body beneath black, tibiae brownish, femora rufous. Length, .35 inch = 9 mm.

Habitat, Hudson's Bay Territory.

Pasimachus *Bon.*

Large, robust species; antennæ inserted under frontal plate; anterior tibiæ palmate; thorax broad, hind angles distinct; elytra rounded or subacute at the apex; humeral carina of variable length; maxillæ very obtuse at tip.

Found under stones or logs in sandy places.

Synopsis of species.

Elytra obtusely rounded behind, spine of middle tibiæ compressed, obtuse at apex.

Elytra feebly sulcate; hind angles of thorax obtuse, not prominent **sublævis**.

Elytra subacute behind; spine of middle tibiæ slender, acute.

Thorax more or less constricted at base, hind angles prominent.

Hind tibiæ of male not densely pubescent on inner side.

Broad; hind tarsi very long; labrum broadly and feebly trilobed; elytra smooth **depressus**.

Hind tibiæ densely pubescent on the inner side near the tip.

Form elongate; humeral carina long, curved outwardly **elongatus**.

Form elongate, larger than *elongatus*; elytra with pairs of punctures, (sometimes wanting) **punctulatus**.

P. sublævis *Bon.* Plate IV, Fig. 4.—Black with blue margin; thorax rounded at sides, suddenly narrowed near the base, but not constricted; elytra parallel at sides, convex, obtusely rounded behind; surface feebly sulcate, sometimes nearly smooth. Length, .83—1.1 inch = 21—28 mm.

Habitat, New York, southward and westward.

P. depressus *Fabr.*—Black with blue margin or entirely black (var *moris* Lee.); thorax and elytra broad, the latter subacute behind; hind tarsi long and slender; labrum feebly trilobed; mandibles feebly or not at all striate. Length, .96—1.2 inch = 24—30 mm.

Habitat, New York, southward and westward.

P. punctulatus *Hald.*—Allied to *depressus*, but differs by the hind tibiæ and tarsi being less slender and less elongate, the former in the male is densely pubescent near the tip on the inner side. The labrum is feebly and broadly trilobed, with the middle lobe wider, scarcely separated from the side lobes; on most specimens rows of punctures, slightly approximate by pairs, may be seen on the elytra. Length, 1.12—1.2 inch = 28—30 mm.

Habitat, Illinois to Texas.

P. elongatus Lec.—Form elongate, not as broad as *P. depressus*; black with blue margin; humeral carina rather long, and curved outwards in front; hind tibiæ and tarsi less slender than in *depressus*, the former in the male are densely pubescent on the inner side near the tip. Length, .92—1.1 inch = 23—26 mm.

Habitat, New Jersey, southward and westward.

Scarites Fabr.

Form narrow; sides of elytra parallel, rounded behind; hind angles of thorax wanting; elytra without carina; maxillæ slightly hooked at tip.

S. subterraneus Fabr. Plate IV, Fig. 5.—Wholly black, shining; elytra striate; the striæ are more or less distinct. Length, .60—.80 inch = 15—20 mm.

Habitat, N. E. America, southward and westward.

var. **substriatus** Hald.—Differs from *subterraneus* by being much larger. Length, 1—1.20 inch = 25—30 mm.

Habitat, Ohio, Wisc. (Western and Southern States).

Dyschirius Bon.

Size small; thorax globular; palpi dissimilar in the sexes, the terminal joint more dilated in the male, excavate beneath with a large sensitive space; tarsi slender in both sexes; mandibles flat and arcuate.

Live in wet sandy places, where they dig holes; they may be dislodged by pouring water over their burrows or may be readily captured towards evening when they leave their hiding places.

Synopsis of species.

Elytra with three striæ or interspace tripunctate.

Epistoma broadly marginate, bidentate; basal striæ of elytra absent.

Front with slight transverse impression.

Elytral striæ posteriorly distinct.

Thorax globose, legs black **nigripes.**

Front with deep transverse impression.

Elytral striæ extending to base, obliterated behind. Thorax globose.

Elytral striæ feeble; antennæ and legs black **æneolus.**

Elytral striæ stronger; base of antennæ and legs rufous, **longulus.**

Thorax transversely ovate; legs and antennæ rufous, **globulosus.**

Elytral striæ abbreviated anteriorly; antennæ and tip of elytra, and legs rufous.

Thorax transverse, ovate, elytral striæ strongly punctate **hæmorrhoidalis.**

Thorax quadrate globose; elytral striæ feebly punctate **terminatus.**

Elytra with third interspace bipunctate or impunctate, not margined at base.

Anterior tibiæ not or scarcely dentate at the outer side.

Bronzed, head smooth, shining; legs rufous.

Apical spur of front tibiæ very short; epistoma truncate.

Elytral striæ coarsely punctured, obliterated behind. **brevispinus.**

Apical spur of front tibiæ long.

Elytral striæ deep, entire, clypeus bisinuate, tridentate.

sphæricollis.

Elytral striæ partly abbreviated at base.

Clypeus truncate, thorax ovate transverse . . . **truncatus**

Clypeus truncate, thorax oval not transverse, **erythrocerus.**

Testaceous or rufous; head rugose, opaque, elytra pale, usually with a dark spot.

Thorax not longer than wide.

Angles of epistoma prominent . . . **sellatus.**

Angles of epistoma less prominent; body smaller, and more slender . . . **pallipennis.**

Anterior tibiæ dentate at the outer side; 5th stria distinct at tip.

Elytral striæ abbreviated in front; black bronzed, legs rufous.

Elytral striæ not obliterated behind; very elongate; clypeus sharply bidentate . . . **filiformis.**

Elytral striæ obliterated behind.

Thorax ovate; clypeus truncate . . . **æneus.**

Elytra with interspaces 3, 5 and 7 furnished with single rows of setigerous punctures.

Thorax short, ovate; elytral striæ faintly impressed, obliterated behind . . . **setosus.**

Thorax globular and longer; elytral striæ more coarsely punctured, **hispidus.**

D. nigripes Lec.—Black, shining, sub-elongate; clypeus bidentate; thorax oval, scarcely longer than wide, very slightly narrowed in front; elytra a little wider than the thorax, sides scarcely rounded, marginal stria shortened at the humeri, striæ punctured before the middle, 2nd, 7th and 8th striæ deep at the apex; interspaces flattened, 3rd tripunctate; base of antennæ and palpi reddish. Length, .12 inch = 3 mm.

Habitat, Canada, Lake Superior.

D. æneolus Lec.—Black, shining, legs and antennæ also black; thorax sub-globose, not narrowed in front, sides slightly rounded anteriorly; elytra almost parallel, rounded at apex; striæ punctate, punctures obliterated externally, sutural stria distinct at apex, the two others shorter and deep, the outer one longer, marginal stria bent at humeri; third interspace tripunctate. Length, .15 inch = 3.75 mm.

Habitat, Canada, Lake Superior region (also Col., Br. Col. and Calif.).

D. longulus *Lee.*—Allied to *globulosus*; but the thorax is sub-globose, and not narrowed in front; the elytra are more elongate, the striae are deeper, and can be traced to the apex, although the points vanish at the middle; the 3rd interspace is tripunctate, the 8th stria profound at apex; antennae fuscous at apex; internal spine of anterior tibiae 3—4 as long as the outer one on the outer margin, the lower denticle acute, the upper one obsolete. Length, .11 inch = 5.5 mm.

Habitat, Canada, Lake Superior region, Ohio.

D. globulosus *Say.*—Black, shining, legs and antennae rufous; thorax ovate, transverse; elytral striae distinct, punctate, extending to base; obliterated behind and at sides. Length, .09—.12 incl = 2.25—3 mm.

Habitat, N. E. America.

D. haemorrhoidalis *Dej.*—Bronzed, antennae, legs and tips of elytra rufous, thorax ovate, transverse; elytral striae abbreviated at base, strongly punctate, obsolete behind. Length, .13 inch = 3.35 mm.

Habitat, Ohio, also Kansas.

D. terminatus *Lee.*—Elongate, black, obscurely red at apex, polished; antennae and palpi red; abdomen beneath and legs pitchy red; front obliquely and profoundly striated on each side; thorax sub-globose, convex; elytra as wide as thorax, striae slightly punctate, obsolete behind, first stria incurved at apex; third interspace with three impressed spots. Length, .13 inch = 3.25 mm.

Habitat, N. Y., N. J., and probably also westward,

D. brevispinus *Lee.*—Shining black, feebly bronzed, robust, antennae and legs rufous; thorax longer than wide, oval, a little wider behind; elytra oval, as wide as thorax, brownish at the tip, base not margined, striae abbreviated in front, very closely punctured, obliterated a little behind the middle, 8th striae grooved at the tip; scutellar punctures large, dorsal punctures two, one on the 3rd interspace near the base, the 2nd near the 2nd stria about the middle anterior; tibiae not toothed on the outer edge, spur not longer than the first joint of the tarsus. Length, .135 inch = 3.4 mm.

Habitat, Michigan (Lake Superior), Ohio.

D. erythrocerus *Le.*—Black, shining, antennae, palpi and legs rufous; clypeus hardly truncate, angles a little prominent; thorax longer than broad, sub-ovate, elytra with impressed striae, abbreviated at base, strongly punctate anteriorly, eighth stria obsolete, but grooved at the apex; intervals almost level. Length, .20 inch = 5 mm.

Habitat, N. Y., N. J., Pa., Ohio.

D. sphaericollis *Sqr.*—Bronzed, antennae and legs dark rufous; thorax ovate; elytra deeply striate, the striae running to the apex, punctures distinct, indistinct behind; apical spur of front tibiae long, clypeus tridentate. Length, .22 inch = 5.5 mm.

Habitat, N. E. America.

D. truncatus *Le.*—Blackish bronze, shining; legs red; head with deep frontal impressions, transverse line not profound; clypeus almost squarely truncate, with the angles rounded; antennae rufo-piceous, base reddish; palpi and mouth reddish; thorax broader than long, ovate, narrowed in front, dorsal impression deep; elytra not wider than thorax, striae impressed, entire, the 3rd, 4th and 5th begin at the declivity of the base, the others are shorter, and the 8th is obsolete; the punctures are moderately large and extend beyond the middle. Length, .22 inch = 5.5 mm.

Habitat, Illinois, also Mo.

D. sellatus *Le.*—Pale testaceous; head rugose; clypeus broadly emarginate, acutely bidentate; thorax ovate, convex; elytra cylindrical, convex, pale and obscured by a few darker patches; distinctly striate, punctures indistinct. Length, .18 inch = 4.5 mm.

Habitat, N. Y., N. J., near the seacoast, also Mo.

D. pallipennis *Sqr.*—Reddish, brown, black beneath; thorax globose, somewhat truncate before, rounded behind; elytral striae distant with obsolete punctures, an obsolete oblique spot at the base, another at the tip and a still less distinct one behind the middle. Length, .16 inch = 4 mm.

Habitat, N. Y., to Fla.

D. filiformis *Le.*—Brassy black, shining; slender; head with clypeus broadly emarginate and acutely bidentate; antennae

testaceous; mouth reddish; thorax sub-quadrate, ovate, not wider than long; elytra not wider than thorax, striæ strongly but distantly punctured to the middle, the inner striæ are deeper and impunctured to the tip, where they are less deep, but at the extreme tip they are again deep; interspaces convex, 3rd not punctured; outer striæ less deep, the eighth almost effaced; abdomen rufous, paler at tip, legs testaceous. Length, .14 inch. = 3.5 mm.

Habitat, N. Y., N. J. (in salt marshes).

D. æneus *Dej.*—Elongate, black, shining; antennæ and legs ferruginous; thorax slightly broader than long, narrowed in front, very much rounded behind; elytra hardly wider than the thorax, cylindrical, convex, striæ seven upon each, which are tolerably deep at base, but very fine at apex, punctures large, and extend to about the middle; the marginal stria ceases at the shoulder; the four internal striæ abbreviated at base; anterior tibiæ armed externally with a strong tooth near the apex. Length, .14 inch. = 3.5 mm.

Habitat, N. Y. to Fla.

D. setosus *Lec.*—Black, shining, antennæ and legs testaceous; thorax ovate; elytral striæ with large punctures, striæ obliterated at the apex, and only the seventh is deep; interspaces with rows of four punctures, each with a long erect hair, other hairs are also seen at the margin of the thorax. Length, .12 inch. = 3 mm.

Habitat, Mass., N. Y., N. J. (in salt marshes).

D. hispidus *Lcc.*—Brassy black, shining; clypeus emarginate, bidentate; forehead with transverse impression; thorax shorter than broad, ovate; elytra convex, coarsely punctate anteriorly, obliterated behind; alternate interspaces marked with minute setigerous punctures in a single series; antennæ and feet testaceous; anterior tibiæ with an inferior acute tooth and a very obsolete superior one. Length, .12 inch. = 4 mm.

Habitat, Canada and westward.

Clivina.

Allied to *Dyschirius*. Thorax more or less quadrate; palpi similar in both sexes, not dilated nor excavated in the male.

Live in damp situations, like *Dyschirius*, and may be dislodged by throwing water over their burrows.

Synopsis of species.

- Middle tibiæ with a spur near outer tip, clypeus with lateral lobes.
 Anterior femora dentate near tip, paronychium very elongated . . . **dentipes**.
 Anterior tibiæ not dentate, thickened, paronychium elongate.
 Vertex sulcate.
 Head smooth, punctured behind, vertical groove deep and long; entirely rufous **impressifrons**.
 Vertex not sulcate, head and thorax smooth.
 Vertex foveate, basal angle of thorax dentate, rufous depressed **rubicunda**.
 Vertex not foveate; basal angle of thorax simple, fusco-rufous **pallida**.
 Clypeus with lateral lobes, anterior femora beneath deeply sinuate near tip, paronychium elongate, front foveate.
 Elytral striæ entire, finely punctulate.
 Entirely rufous **rufa**.
 Rufous with black suture **collaris**.
 Black, legs rufo-piceus, antennæ rufous **americana**.
 Elytral striæ obliterated behind; black, antennæ rufous.
 Thorax sub-quadrate, narrower in front; sparsely punctulate, paronychium shorter or absent, **striatopunctata**.
 Thorax ovate, elytral striæ scarcely obliterated behind, **cordata**.
 Clypeus rounded at sides; anterior femora thickened, not sinuate beneath, paronychium shorter or absent.
 Vertex longitudinally sulcate; rufous; thorax elongate **ferrea**.
 Vertex not or faintly sulcate.
 Anterior tibiæ with one lateral tooth, the terminal tooth rectangularly bent.
 Black, elytra maculate, thorax vaguely punctate, paronychium slender **convexa**.
 Anterior tibiæ with two lateral teeth; the terminal gradually bent.
 Black, elytra maculate; thorax nearly smooth, paronychium wanting **bipustulata**.
 Black; elytra maculate; thorax punctate, paronychium short **postica**.
C. dentipes Dej. Plate IV, Fig. 7.—Black, thorax polished, smooth, legs piceous; elytra distinctly striate, punctured. Length, .30—.32 inch. = 7.5—8.5 mm.
Habitat, N. Y., southward and westward.
C. impressifrons Lec.— Entirely rufous; head punctured behind, vertex deeply grooved; elytral striæ distinct. Length, .24 inch. = 6 mm.
Habitat, Canada, N. Y., N. J., Pa., Ohio, also Kans.

C. rubicunda *Lec.*.—Rufous; head smooth, vertex foveate; basal angle of thorax dentate. Length, .26 inch. = 5.25 mm.

Habitat, N. Y. to La.

C. rufa *Lec.*.—Rufous; striæ entire, finely punctate; front foveate; anterior femora sinuate beneath near the tip. Length, .20 inch. = 5 mm.

Habitat, Ill. to La.

C. collaris *Hbst.*.—Rufous with a rather broad black suture; elytral striæ entire, finely punctulate. Length .20 inch. = 5 mm.

Habitat, Mass., Ohio, also Europe.

C. americana *Dej.*.—Black; legs, antennæ and extreme outer margins of thorax and elytra rufo-piceous; elytral striæ entire, finely punctulate. Length, .20 inch. = 5 mm.

Habitat, N. E. America.

C. striatopunctata *Dej.*.—Black, antennæ rufous; thorax subquadrate, narrower in front, sparsely punctate; elytral striæ obliterated behind. Length, .20 inch. = 5 mm.

Habitat, N. Y. to La.

C. ferrea *Lec.*.—Rufous; thorax elongate; vertex longitudinally sulcate; clypeus rounded at sides; anterior femora thickened, not sinuate beneath. Length, .21 inch. = 5.25 mm.

Habitat, Ill. to Texas.

C. convexa *Lec.*.—Black, elytra maculate; vertex faintly sulcate; thorax vaguely punctate; anterior tibiæ with one lateral tooth, the terminal tooth rectangularly bent. Length, .20 inch. = 5 mm.

Habitat, N. J. to La.

C. bipustulata *Fabr.*.—Black, with two large red spots at the base of the elytra and two near the apex; thorax smooth, legs and antennæ rufous. Length, .24— .38 inch. = 6—7.5 mm.

Habitat, N. Y., southward and westward.

C. postica *Lec.*.—Black, elytra maculate, thorax punctate; anterior tibiæ with two lateral teeth, the terminal one gradually curved. Length, .21 inch. = 5.25 mm.

Habitat, Ohio, also La. and Kau.

Schizogenius *Putz.*

Allied to *Clivina*: anterior tarsi more or less dilated in both sexes; mentum feebly emarginate; head with numerous longitudinal grooves.

Live in damp sandy places.

Synopsis of species.

Mentum toothed at middle; lobes obliquely emarginate; 5th interspace of elytra punctured.

Elytral striae punctate.

- Blackish brown; elytra somewhat depressed, striae deep, densely punctate **lineolatus.**
- Rufous; elytral striae feebly punctate; strongly depressed. **planulatus.**
- Rufous; elytra cylindrical, striae punctate **ferrugineous.**
- Rufous; elytra strongly depressed; thoracic angles prominent before the base **amphibius.**

S. lineolatus Say.—Blackish, legs and antennae rufous; elytra somewhat depressed, striae deep, and densely punctured. Length, .16 inch. = 4 mm.

Habitat, N. E. America.

S. planulatus Lec.—Rufous or purplish; strongly depressed; elytra striae feebly punctate. Length, .20 inch. = 5 mm.

Habitat, New York.

S. ferrugineus Putz.—Rufous; elytra cylindrical, striae deep, punctures feeble. Length, .12 inch. = 3 mm.

Habitat, N. E. America.

S. amphibius Hald.—Rufous, elytra strongly depressed, striae deep, punctures distinct; thoracic angles prominent before the base. Length, .12 inch. = 3 mm.

Habitat, N. Y. and westward.

Ardistomis Putz.

Small species; thorax rounded, considerably narrower than elytra; margin of elytra interrupted posteriorly and with an internal plica (fold along the suture); mandibles slender prolonged and not arcuate as in other genera of *Clicine*.

Lives in damp sandy places like *Dyschirius*, along banks of streams and ponds.

Synopsis of species.

Black, smooth; elytra striate.

Striae not punctured.

Antennae and legs piceous; 3rd interval of elytra with four to six punctures **Schaumii**.*

Antennae, legs and apical spot of elytra rufous **obliquata.**

Striae punctured in front, obliterated behind **morio.**

Green or greenish black; elytra with a series of setigerous punctures

Thorax punctured only at the margin **viridis.**

Thoracic disc with a few punctures **puncticollis.**

* A southern species, not found northward.

A. obliquata Putz.—Black, shining; elytra striated, not punctured; legs, antennæ and apical spot of elytra rufous. Length, .28 inch. = 7 mm.

Habitat, N. J. southward.

A. morio Dej.—Black, shining; striæ punctured in front, obliterated behind, legs and antennæ rufous. Length, .32 inch. = 8 mm.

Habitat, N. J., southward.

A. viridis Say. Plate IV, Fig. 8. —Green or greenish black; legs and antennæ rufous; elytra with series of punctures each bearing a short hair; thorax punctured at the margin only. Length, .20 inch. = 5 mm.

Habitat, N. E. America to Texas.

A. puncticollis Putz.—Similar to *viridis*, but has the thorax sparsely punctured on the disc. Length, .20 inch. = 5 mm.

Habitat, Ohio, also the Southern States.

(To be continued.)

EXPLANATION OF PLATE IV.

Fig. 1. *Lonicera cærulescens* Linn.
 " 2. *Opisthius Richardsoni* Kly.
 " 3. *Nebria pallipes* Say.
 " 4. *Pasimachus sublevis* Beauv.

Fig. 5. *Scarites subterraneus* Fabr.
 " 6. *Dyschirius erythrocerus* Lec.
 " 7. *Clivina dentipes* Dej.
 " 8. *Ardistomis viridis* Say.



ON THE USE OF BISULPHIDE.

By ALBERT P. MORSE.

In connection with the use of this agent as a fumigator for killing insects in stored grain, destroying museum pests in natural history collections, furs, carpets, etc., attention should be called to the fact that its vapor is decidedly heavier than the air: consequently, in order to get the full benefit of the amount used the pans containing it should be placed *high up* in the cases or bins treated, *never on the floor*. This fact has been quite marked in personal experience, where the odor of the chemical was much more noticeable on the floor of the house below that on which it was used. Reference to this peculiarity may have been made before but if so it has escaped my notice.

LOCAL ENTOMOLOGICAL NOTES.

Members of the New York Entomological Society and all others, are solicited to contribute to this column, their rare captures, local lists and other items of interest relating to the insect fauna of New York and vicinity.

AN EXODUS OF WATER BEETLES.

By WM. T. DAVIS.

On the borders of the salt meadow, not far from New Springville, on Staten Island, there is a little pond that receives an abundant supply of water from a perennial spring. Masses of *Spirogyra* are festooned from the submerged sticks that lie in extremely clear water, and there is also in season some *Hydrodictyon* and much floating *Lemna*. From this pond, on the 22nd of last September, a bright sunny day, many hundred water beetles were taking flight, some of them alighting on its surface again but the majority flying westward over the salt meadow. The wind was blowing gently from the south, so it had nothing to do with the direction of their flight. All that were examined proved to be *Hydrophilus nimbatus*, and their constant flying up from the surface of the water, reminded one of that steady departure of winged ants that so often takes place from the grass stems in a field.

NOTE ON XIPHIDIUM NEMORALE *Scudder.*

By WM. BEUFENMÜLLER.

This grasshopper is found in abundance along the eastern slope of the Palisades, from August until frost. It inhabits the borders of dry up hill woods and road sides, resting on low shrubs and bushes. It is greenish brown, with an indistinct reddish longitudinal stripe on the top of the head and the pronotum, margined with a very narrow white line on each side; the wing covers are greenish with prominent cross veins and the front margin is blackish; the legs are greenish covered with many red dots. Length about 14 mm. The insect was first described from Iowa.

GEORGE DEXTER BRADFORD, the Corresponding Secretary of the New York Entomological Society, died November 24th, 1894, of typhoid fever, at his home No. 21 Washington Place, New York City. He was born in N. Y. City May 14th, 1873.

In him we have lost an earnest devotee to science and those who knew him have lost a generous and sympathizing friend.

In this place we desire to do no more than record our loss and to fulfill a duty we have laid down for ourselves of noticing the departure of all who have in any way belonged to our Society. Mr. Bradford was early nominated an active member of our Society in which he took a warm interest and was one of the main supporters of our Journal. His loss will be deeply felt and will leave a gap difficult to fill. As an entomologist, Mr. Bradford was full of promise and hopes for future good work; though yet young, he had considerable knowledge, having gained much experience, in his travels to North Carolina, Yellowstone Park, British Columbia, Vancouver Island, Alaska, Egypt and Turkey.

He leaves quite a large collection of insects comprising many thousand specimens which he collected during his travels and obtained through other sources.

WM. BEUFENMÜLLER.



L. JOUTEL

Carabidae of N. E. America.

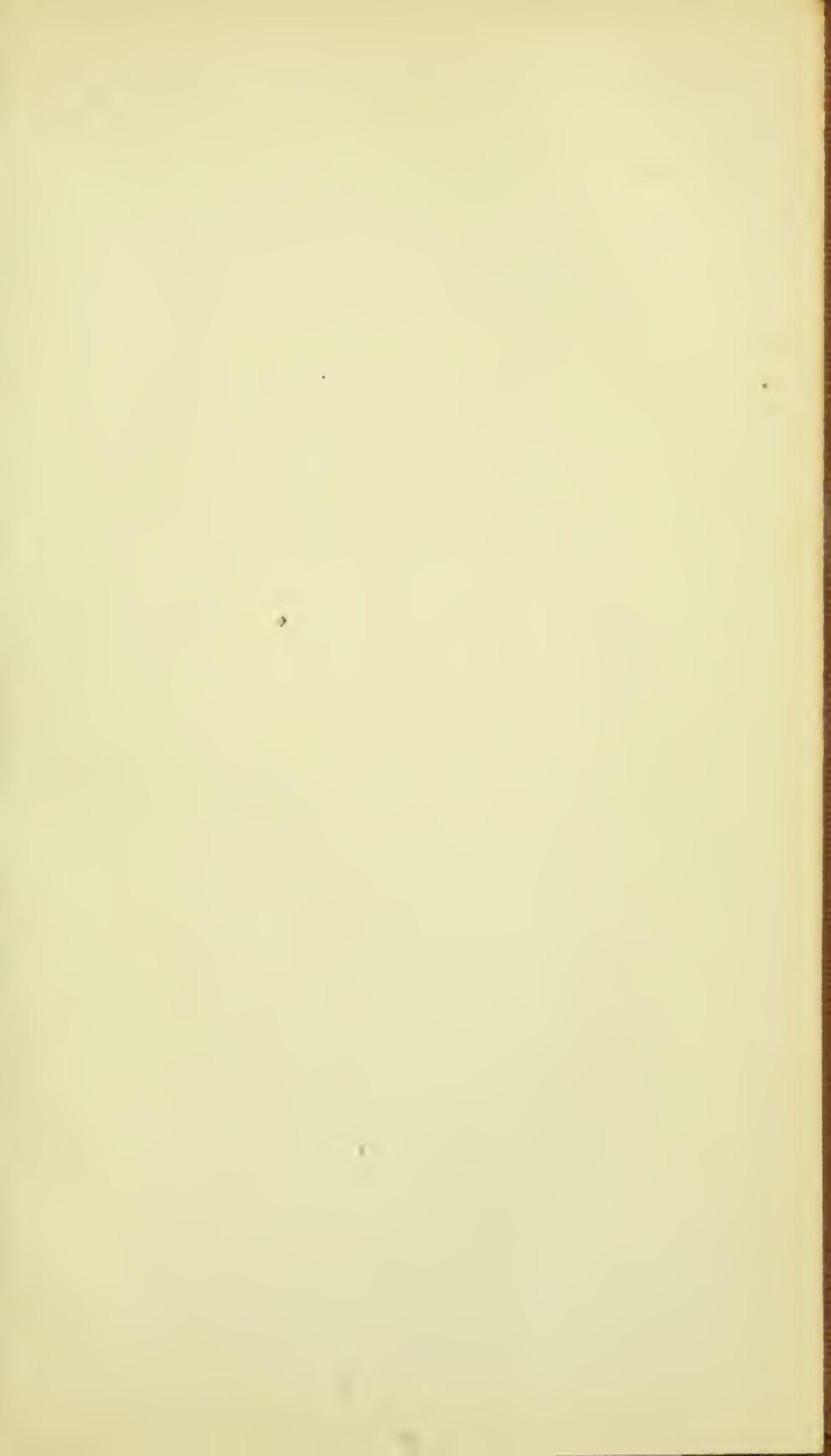
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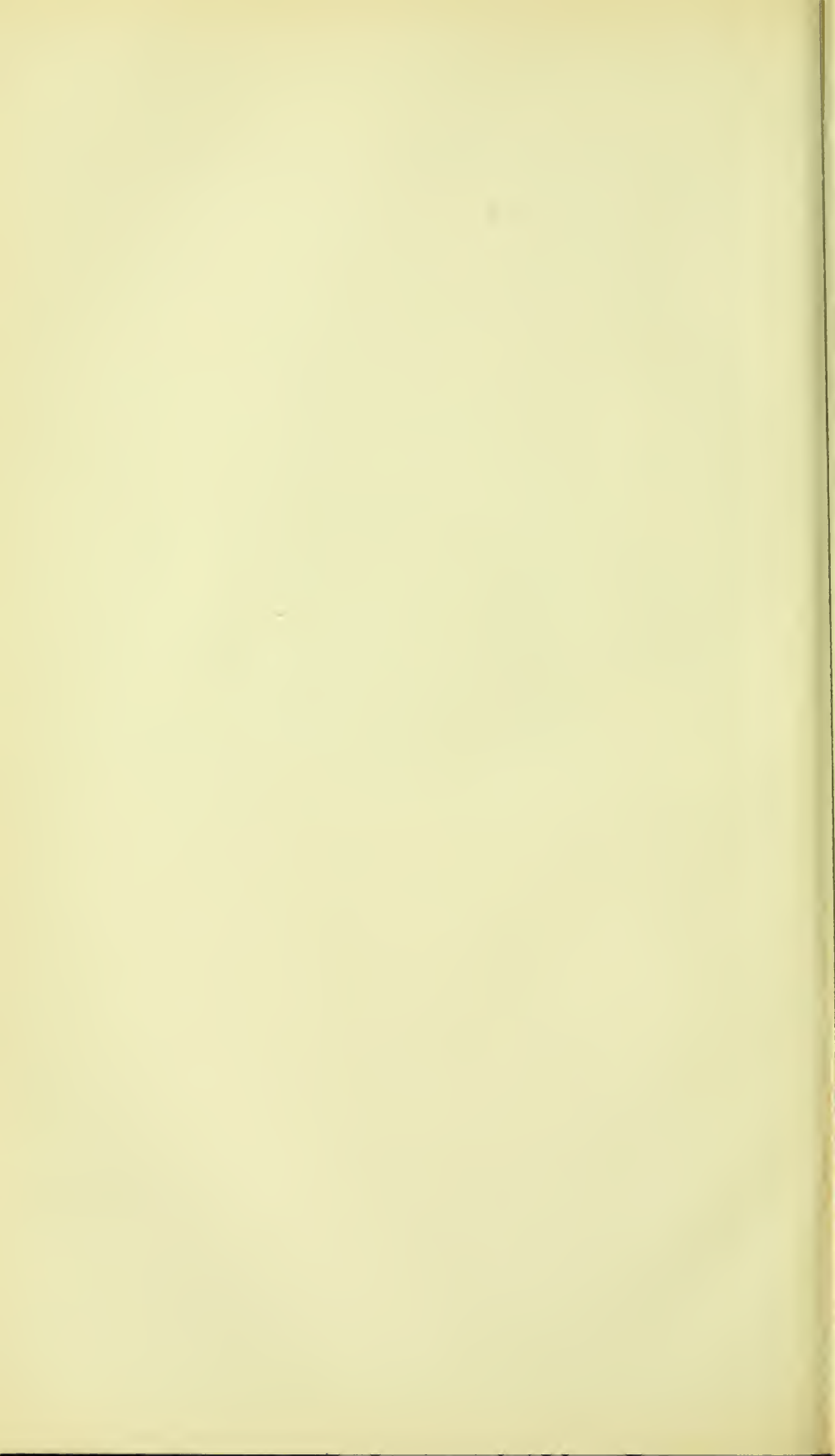
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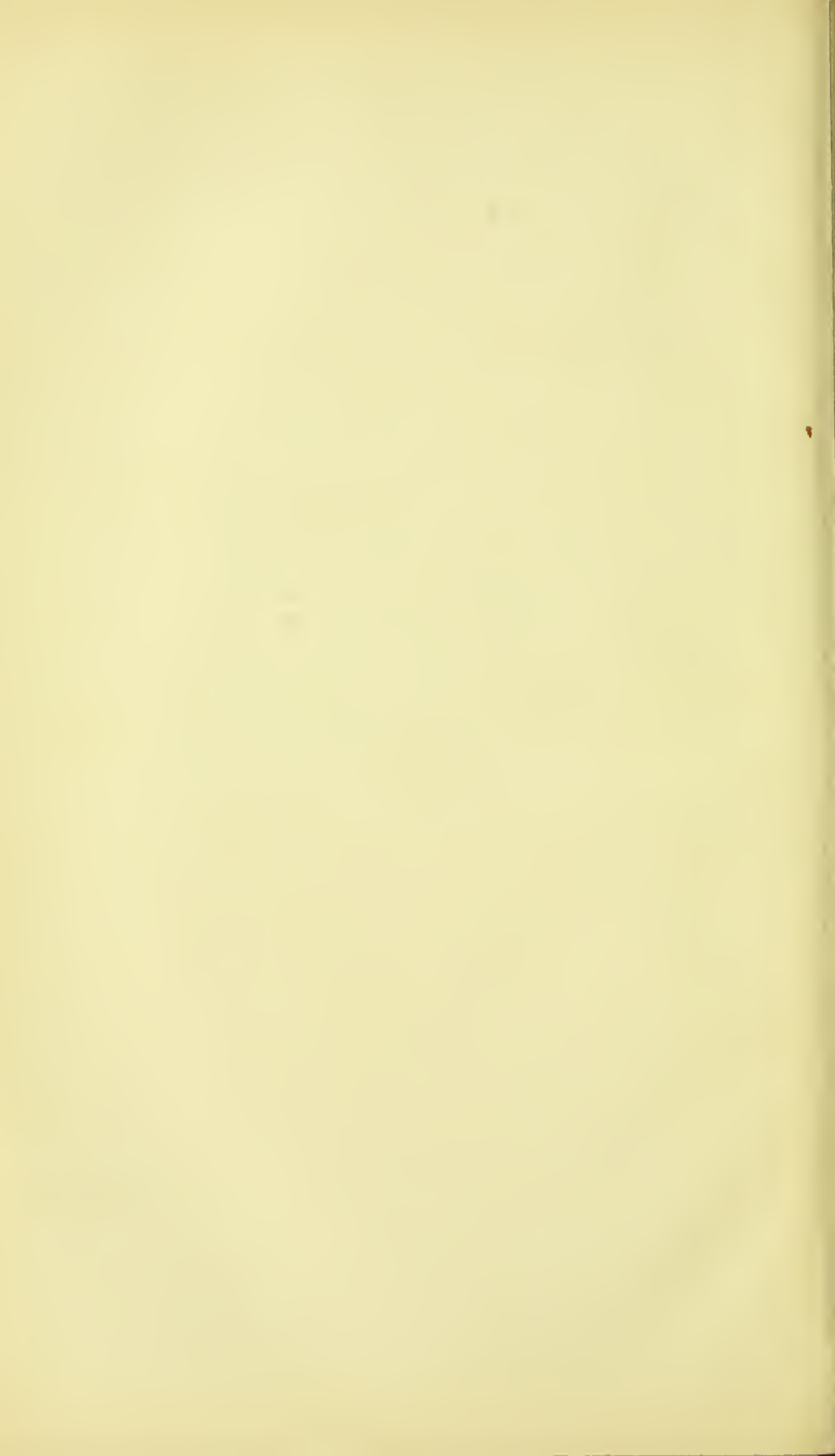
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