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NEW TINEIDÆ, WITH LIFE-HISTORIES.

BY MARY E. MURTFELDT, KIRKWOOD, MO.

Laverna argentimaculella, n. sp.

Imago: *Antennæ* dark brown, slightly paler on under side. *Palpi* pale silvery, terminal joint in strong light appearing minutely ringed with dark blue. *Head* and face smooth, the former dark blue above, face pale golden-metallic, in the ♂ usually darker than in the ♀, in the latter often with bluish tinge. *Thorax* dark blue with metallic reflections. *Fore wings* with a generally "shaggy" appearance, beautifully variegated in dark and light blue and rich bronzy brown, with more or less conspicuous, irregular, appressed, silvery spots, that, at the base of the apical third, form an irregularly margined fascia, broader and more brilliant in the ♂ than in the ♀. Upon the cell, especially of the ♂, are two prominent tufts, bluish silvery at base, shading to brown, and near the outer margin two still larger tufts, almost connected, forming a ridge across the wing. Just before the fringes is an indefinitely angular, silvery streak, the apex directed outward. The pattern of coloration is so variable that it is difficult to exactly characterize it. *Hind wings* and *abdomen* rich bronzy brown, the former with pale brown fringes. *Legs* brown, annulate on tibiæ with two broad and on tarsi with three narrow white bands. *Alar expanse*, 8 mm.; length, 4 mm. A beautiful species and probably rare.

Larva: Length 5 mm., diameter 1.5 mm., tapering slightly in both directions from middle. Form sub-depressed with deep incisions; pale green, at maturity showing on dorsum three more or less distinct pink stripes. Thoracic legs well developed, but pro-legs minute.

Mines leaves of *Oenothera biennis*. The mine begins in a winding track, which crosses back and forth, often becoming confluent. The dark, granular frass forms a rather definite line through the middle.

When ready to transform, the larva deserts the mine and incloses itself in a dense, oval, white silk cocoon formed against the midrib or in a wrinkle of the leaf. *Pupa* dark brown, not especially characteristic. Imago appears in nine or ten days.

The mines of this species were discovered about the middle of August, 1895, for the first and, so far, only time, on a small and ragged plant of wild Evening Primrose, and although other plants of the same species, as well as some cultivated varieties, were growing in close proximity, not a mined leaf could be discovered on any of these, nor has the insect, in this locality at least, reappeared since that date.

Less than a dozen moths were reared, of which one or more examples were sent to Lord Walsingham, Dr. Fernald, and the National Museum.

Epermenia pimpinella, n. sp.

Antennae slender, rather more than one-half the length of the wings, dark cinereous, with short, dense, whitish pubescence, basal joint thickly scaled. *Palpi* rather coarsely scaled, second joint twice the length of apical, dark brownish-gray sparsely sprinkled with buff. *Head* and *thorax* gray brown with slight purplish iridescence in certain lights. *Patagia* oval, silvery, semi-erect. *Fore wings* varying in general colour from dark slate-gray to brownish, with an intermingling of dingy white scales and having a generally "smudged" appearance, when fresh displaying purplish reflections. The three rounded dorsal tufts are of spatulate stalked scales overlying a fine paler fringe. *Hind wings* narrowly lanceolate, with long fine silky fringes. *Abdomen* slender, dark silvery gray, with indistinct whitish annulations, most pronounced laterally. *Legs* gray with dingy white mottlings and with long bristle-like ciliae at each joint. *Alar expanse* 12 to 14 mm., length of body 5 to 6 mm.

Eggs (obtained by placing fresh leaves in jar in which several moths of both sexes had emerged) scattered along the edges of the leaves, very minute, 0.25 mm. in length and less than half that in diameter, oblong in form, colour greenish-white with sculpturing visible only under the microscope, barely discernible by Tolles lens. On July 2nd by close examination found them on several leaves of the plant out

of doors. On July 6th they could not be seen, but the leaves were speckled with transparent spots, on the under side, showing black grains, probably the dried sap, and upon holding the leaves against the light the tiny larvæ were revealed, either still on the surface or having just cut their way between the two cuticles.

Mature larva.—8 mm. long, very slender, dull olive green or brownish in colour, with conspicuous darker tubercles each giving rise to several long, rather bristly hairs. Head large, smooth, pale brown with black trophi. Cervical collar semicircular, in colour and texture resembling the head. Full complement of legs and pro-legs, the latter unusually long. These larvæ are not confined to a single mine, but often leave one to excavate another and are therefore often seen crawling on the surface of the leaves. *Pupa*, slender, very pointed posteriorly, pale brown, inclosed in frail, open-meshed cocoon on under side of leaf or in angles of leaf-stalks. Imago appears in from 8 to 10 days in summer, and there are at least two successive broods.

This insect feeds by forming a puffy mine on *Pimpinella (Zizia) integerrima*, in this locality a not very common Umbellifer. I first bred it many years ago, and took it with me when visiting the family of Dr. Fernald, and the latter traced it to the genus *Chauliodus*, Tr., but, as at that time I did not know that it was new and had not its complete life-history, did not attempt a description. Since then I have learned from Lord Walsingham and Mr. Durrant that *Chauliodus*, Treit., is pre-occupied by *Epermenia*, Hüb., and also that the species was probably new to science.

Eucatoptus striatella, n. sp.

Antennæ long, dull ochreous, inclining to brown; basal joint comparatively large, especially in the ♂. *Palpi* with second and terminal joints about equal in length, second joint densely but closely tufted, pale buff or cinereous with indistinct leaden dots and shadings. *Head* and *thorax* pale buff, faintly striped with leaden gray. *Patagia* of the paler colour. *Fore wings* light brown or brownish-ochreous, sparsely speckled with black. A subcostal black, longitudinal line extends from base to apex, curving upward slightly and intensifying at the latter; beneath this, two more or less definite blackish striations, the one on inner margin being quite broad and diffused, while the discal streak is variable, not continuous, often consisting of two or three dashes. *Hind wings* silken, ashy white, shading to cinereous at tips. ♂ with pencil of spreading hairs from base

of costa. *Cilia* long, fine, concolorous with wing, with leaden tinge, on fore wings crossed with black line. *Legs* shining pale buff, more or less conspicuously mottled with leaden gray; hind tibiae clothed with long silken hairs, in some specimens marked with a dash or spot of gray on outer side; tarsi annulate. *Alar expanse* 11 to 13 mm. Feeds in the berries of Nightshade (*Solanum nigrum*), eating the pulp and preventing the seeds from maturing.

Larva: 8 mm. long by 2 mm. in diameter, being rather stout. Cylindrical, incisions shallow, slightly larger at posterior end, where it terminates somewhat bluntly. Colour pale, translucent, greenish yellow, with five interrupted, irregularly margined, longitudinal, crimson stripes, lateral one composed of a row of small spots. Head small, cordate, only little more than one-half the width of the abdominal segments, very dark shining brown. Cervical shield almost covering the narrow first joint, of same colour as the head. On dorsum of eighth joint is a broad, purplish, subcutaneous spot. Thoracic legs minute, pro-legs also short, corresponding in colour to general surface. One annual brood, often found in two-thirds of the berries. *Pupa*, very slightly inclosed or merely attached within fold of leaf or in the berry cluster, rather stout, oblong, bright golden-brown, with short wing-sheaths, and has somewhat the appearance of dipterous pupæ. Imago in ten days—often not appearing until the last of October or early in November, suggesting the probability of an earlier brood in some other fruit or substance.

The genus *Eucatoptus* of the Gelechiadæ, characterized by Lord Walsingham in his work on WEST INDIAN MICRO-LEPIDOPTERA, is said to be "closely allied to *Aristotelia*, Hüb. (*Ergatis*, Hein.), from which it is distinguished by the costal hair pencil of the ♂." Under this genus His Lordship describes three new species and includes *Gelechia rubidella* Clem. (*G. rubensella*, Cham.). I am indebted to Lord Walsingham and his Entomological assistant, Mr. Durrant, for the generic determination of all the species described, as well as for much kind assistance on other forms.

Gelechia persicælla, Murt.

In this connection I wish to transcribe the description of a new Tineid of economic importance, of which an account was published in a paper on "Some Insects of the Year," in the Report of the State Agricultural College of Michigan for 1899, by Prof. R. H. Pettit, Assistant

Entomologist. The species was sent to me for determination, and learning that it was not represented in the Collection of the National Museum, nor in any other American collection, so far as I was able to ascertain, at the desire of Professor Pettit, I characterized it as new, under the genus *Depressaria*, with which, in palpal and some other points of structure, it quite closely corresponds. Recently Dr. Dietz, of Hazelton, Pa., and Mr. Busek, of the National Museum, have called my attention to the fact that its venation and other wing characters indicate that it is a *Celetechia*, to which I had, myself, at first assigned it. To bring it more generally to the attention of economic entomologists, as well as to correct the generic placing and some minor inaccuracies in the description, I copy as follows: *Imago*—*Antennae* dark fuscous, indistinctly pectinate and banded on the under side with pale buff. Palpi long, exceeding the vertex. Basal joint short, pale; second joint one-third longer than apical. Brush quite dense, distinctly divided, dark fuscous overlaid with cream-coloured scales, palest on inner side. Apical joint dark, very slender, with extreme tip cream white, most conspicuously so in ♂. Tongue long, sparsely scaled. *Vertex* dark brown. *Face* cream white. *Thorax* and *tegulae* purplish-brown. *Fore wings* almost black, with rich purplish gloss, and sparsely sprinkled with white scales. On the costa back of the apex is a small, irregularly triangular, cream white spot, and a few scattered scales of the same colour form an obscure outer border. In the cell near its upper margin are two somewhat indefinite, cream-coloured dots in line, with a third one below and slightly back of the one nearest the base. *Cilia* fuscous, shading outward to gray. *Lower wings* shining silky, cinereous, almost silvery. Abdomen pale brown, terminal segment banded with buff at posterior margin. Lateral tufts buff, inconspicuous; anal tuft reddish-brown. Under surface speckled with brown and cream. *Legs* brown, annulate with cream white at the joints and middle of the tibiae.

Alar expanse from 16 to 17 mm.

Prof. Pettit thus describes the larva and its habits:

"The larva, when full grown, is three-eighths of an inch in length, and quite slender. Its colour is dirty yellowish-white, with back and sides marked by six reddish-brown, longitudinal stripes, all of which extend the entire length from the thoracic shield to the caudal extremity, except the pair on dorsum, which unite on last segment and terminate there. Last

segment bordered caudally with fuscous, and base of anal pro-legs coloured the same. Venter marked along the middle with a stripe like those on dorsum and sides, which are about equidistant from each other and of about the same width as the spaces between them, colour reddish-brown. Some of the spaces (yellowish-white) have dark points in them. Head and thoracic shield yellowish-brown. Feet fuscous and dirty yellow. Four pairs of pro-legs besides anal pair, which are of the same colour as the ground colour of the body. Base of anal pair black.

"A number of these worms working in peach leaves were received from Mr. T. D. Atkinson, of Holland, Michigan, in September, 1898, and were said to be very troublesome. The same species was received on July 3rd, 1899, from Monroe, Michigan. One or two complaints were made from other places, though no specimens were sent.

"The larvæ are very restive, wriggling violently when disturbed. They bind together the leaves of the peach with fine white silk, forming nests of loosely-bound leaves, in which they live and where they change to pupæ. The finding of the larvæ on July 3rd, and also on September 17th, would seem a good indication that the insect is two-brooded. Specimens of the larvæ from Holland were placed in suitable cages, and the moth, a nearly black insect, spreading about five-eighths of an inch, was obtained the following spring. The adults commenced to appear about April 14th and continued to emerge till the middle of May. Of course this is much earlier than would happen if the insects were out of doors."

Prof. Pettit's article was accompanied by excellent enlarged illustrations of the larva and pupa.

CONDEMNABLE PRACTICES IN GENERIC REVISIONS.

SIR,—Permit me to call the attention of your readers to a faulty method of citing species names, which is, unfortunately, extremely common in America. I refer to the omission of the genus name or its reduction to a mere initial. In many cases this is, of course, a proceeding that is attended with no serious evil effects. A working zoologist may be expected to know what *P. machaon* stands for, bibliographers would know that a paper on Abnormal Antennæ of *Ajax* had nothing to do with the Bird genus, *Ajax*, LESS., but referred to *Papilio ajax*. In many cases, however, authors seem to endeavor to render their work inaccessible to all save specialists working on their particular group. To make this clear

it is necessary to cite an example, and I take the first one at hand, remarking at the same time that these cases are very numerous, and that it is unjust to single out a particular person for condemnation.

In a paper published in Vol. 30 of the CANADIAN ENTOMOLOGIST, some 33 new genera of Phytophaga are proposed in consequence of the rearrangement of this group. In all cases, save one, the author is careful to state the species that served as types for the new genera, but in every case the old genus is represented by its initial merely, so that neither the direct statements of the author nor the context give the slightest clue to the name. Let us take a specific illustration. On pp. 286-287 is given a table of the genera of Hemichroinae, of which three are recognized: "*Hemichroa*, CURTIS; *Opisthoneura*, ASHM., n. g. (type *O. crevecoeuri*, ASHM.); *Marlattia*, ASHM., n. g. (type *H. laricis*, MARL.)." What, pray, is *O. crevecoeuri*? It can not be *Opisthoneura*, for that is a new genus, and the species *crevecoeuri* is not new. What does *H. laricis* mean? It is true that in this case the bibliographer can, by comparing species by species with DALE TORRE'S catalogue, ascertain with great probability what these initials mean; but this involves many hours of study, and the Hymenoptera form the only group for which this would be at all practicable. Indeed, the recorder of the Zoological Record did not take such pains, so that in his report the initials have been allowed to stand quite out of connection with the original grouping, so that the confusion is still further increased.

But why should a scientific writer impose such burdens upon his readers? I refuse to believe that motives of economy force editors to print H. for *Hemichroa*, or that a man of science begrudges the few extra strokes of the pen necessary to make his published work intelligible. No, it is a mere matter of thoughtless habit, which needs only to be pointed out to be corrected.

HERBERT HAVILAND FIELD.

Zurich, Switzerland.

A NEW GENUS OF APHELININÆ FROM CHILE.

BY L. O. HOWARD, WASHINGTON, D. C.

Since the publication of the writer's "Revision of the Aphelininæ of North America" (Bulletin 1, Technical Series, U. S. Department of Agriculture, Division of Entomology, 1895), the discovery of new forms,

and especially of new genera, has been of very infrequent occurrence. Species have been received from all parts of the world, owing to the extraordinary and world-wide development of interest in scale insects, which are the principal hosts of the Aphelininae, yet nearly all of the forms thus received have been species already described, which have been carried with their hosts upon live plants to many different regions. It is, therefore, interesting to discover a new genus, even from a country like Chile, whose parasitic Hymenoptera are so little known. A most interesting feature of the discovery is that the new genus was reared from *Aspidiotus hederæ (nerii)* together with three of the cosmopolitan forms, namely, *Aspidiotiphagus citrinus* (Craw); *Coccophagus immaculatus*, How., and *Prospalta aurantii*, How. The writer is indebted to Mr. Edwyn C. Reed, of Rancagua, Chile, for this sending, as well as for many other favours.

APHYTIS.—New Genus.

Female.—Resembles *Aphelinus* in the oblique hairless line extending from the stigmal vein transversely to base of wing. It differs principally from *Aphelinus* in the antennæ, which are only 5-jointed, the first ring-joint apparently being absent. The pedicel is nearly cylindrical; the first funicle joint cubical; the second funicle joint long = oval, wider than the first and more than twice as long; club long, elliptical, longer than pedicel and funicle together. The mesonotal sclerites resemble those of *Aphelinus*, but the ovipositor is exerted to about one-third the length of the abdomen, as with *Centrodora*; hind thighs somewhat swollen; stigmal vein is short and knobbed and the post-marginal vein is absent; the mandibles are tridentate; the ocelli large and placed in the form of an oblique angled triangle.

Aphytis Chilensis, n. sp.

Female.—Length to tip of ovipositor 0.94 mm.; expanse 1.8 mm.; greatest width of fore wing 0.18 mm. General colour pale yellow, with slight dusky tinge on the dorsum of the thorax; the lateral margins of the abdominal segments with dusky transverse stripes; antennæ fuscous; wings with a faint dusky cloud below stigmal vein.

Described from 1 female, reared by Edwyn C. Reed, from *Aspidiotus hederæ*, on ivy (presumably *Hedera helix*), Rancagua, Chile.

U. S. N. M., type No. 4968.

SOME NEW GENERA AND SPECIES OF PHYCITINÆ

BY GEO. D. HULST, BROOKLYN, N. Y.

Tetralopha formosella, n. sp.

Expands 18 mm. Head nearly pure white; thorax white with black scales intermixed; fore wings pure white, sometimes intermixed with black, and with black spot on costa to basal line; basal line black, with three long black teeth on outer side; middle field whitish, costa towards base black; along inner margin and reaching half way across wing, dull brick red, broken by median cross scale ridge, which is of intermingled black and white; outer line white, edged on both sides with blackish; outer field grayish, mixed with black, much darker along costa to apex; hind wings fuscous, much darker along outer edge; beneath fuscous on all wings, an outer lighter cross line showing on all wings.

Texas. National Museum type number is 4703.

Mineola scitulella, n. sp.

Of the size and much the appearance of *A. tricolorella*, Grt. It differs in the much more vivid colouring, being thus a much more showy insect, and especially in having the outer cross line edged outwardly with dull red.

Colorado.

Mineola rubescentella, n. sp.

Expands 24-26 mm. Fore wings a smooth reddish gray, the reddish a little more pronounced along costa and about the outer line; a faint reddish spot at middle of base along inner margin; a broad dark red basal cross line, reaching from subcostal vein to inner margin, narrowing towards the latter; discal spots faint, geminate, superimposed; hind wings shining fuscous, marginal line much darker; beneath an even light fuscous.

Tennessee. In appearance very considerably like *Acrobasis rubri-fasciella*, Pack. National Museum type number is 4707.

Acrocaula, n. gen.

Palpi of ♂ erect, recurved, rather slender, somewhat long; maxillary palpi small; tongue strong; antennæ with tooth on inner side of basal member as in *Acrobasis*, then bent over basal member, with a slight scale ridge in the bend, the segments beyond this evenly ciliated with hairs on the under side; thorax untufted; abdomen tufted at end; fore wings 11

veins, 4 and 5 separate; hind wings 8 veins, 2 far from angle, 3 separate from 4, 4 and 5 short stemmed, 7 and 8 stemmed. Type *comacornella*, Hulst.

Acrocaula comacornella, n. sp.

Expands 16 mm. Head and antennæ fuscous; thorax smooth, shining fuscous; abdomen fuscous, the segments edged posteriorly with whitish; fore wings dark fuscous, with a broad lighter basal cross band, most distinct at costa, and with a narrow lighter costal patch from discal spot, which it just encloses, to outer line; outer line very faint; hind wings transparent fuscous.

Central Texas.

Nephoptyx modestella, n. sp.

Expands 26 mm. Head and palpi light gray, the latter fuscous at tip; thorax light fuscous; abdomen whitish, with segments fuscous in front; fore wings light fuscous gray, with fuscous markings; the basal and middle field more grayish or whitish, the latter broad at costa, running to a point on inner margin; a broad fuscous basal band with a faint reddish tinge; outer field fuscous gray, the outer line whitish dentate, preceded by blackish near costa; hind wings fuscous, darker outwardly.

Mass.

Salebria Slossonella, n. sp.

Expands 16 mm. Palpi and thorax fuscous; thorax smooth fuscous; abdomen dark fuscous, the segments lighter posteriorly; fore wings gray, consisting of white ground colour, with black scales heavily overlying; a basal deep red scale ridge followed by a dull rusty yellow band, and this by a black edging; costa half way of middle field from scale ridge narrowly reddish; outer line light, not very distinct, close to margin; hind wings transparent, outwardly fuscous.

Miami, Fla.; Feb., Mar. From Mrs. Annie Trumbull Slosson, in whose honour the specific name is given. I have the ♀ only, and consequently the generic reference may not be correct.

Salebria afflictella, n. sp.

Expands 14-18 mm. Palpi, front and thorax blackish fuscous; abdomen fuscous, the end orange ochreous; fore wings blackish, a purple spot, quite large, along inner border on basal space; basal cross line broad, whitish, oblique, straight; middle field in centre, whitish; outer line fine, whitish, rather strongly bent, dentate; discal spots geminate, superimposed, black, prominent; hind wings dark fuscous.

Elizabeth, N. J.; from Mr. Kemp. I have another specimen, a male, from Mr. Kearfott, from Montclair, N. J., which seems to be the same species, but the extremity of the abdomen is fuscous in colour. Both specimens were taken in August, the one from Mr. Kearfott at light.

Salebria nigricans, n. sp.

Expands 20 mm. Palpi and front blackish; thorax in front fuscous, with a purple tinge, blackish gray behind; abdomen light whitish fuscous, with intermingled black scales; fore wings with a white base, heavily overlaid with black scales, giving a clear dark gray appearance; an ochreous tinted spot at middle of basal field; basal line whitish, well out to discal spots; middle field more whitish, owing to fewer black scales; outer line whitish, bent, edged rather broadly with black near costa; hind wings fuscous.

Phoenix, Ariz.; June 1st; from Dr. Kunze. I have the female only, and the generic reference is provisional.

Salebria lacteella, n. sp.

Expands 18 mm. Palpi light ochre fuscous; front white, slightly fuscous stained; thorax light ochre fuscous; abdomen light fuscous, nearly white on two anterior segments; fore wings light gray, stained with reddish ochre along inner margin, in basal field just outside of basal line, and just within outer line, the stain reaching nearly one-half across the wing; basal line blackish, well out, oblique; outer line whitish, bent, with considerable blackish broadly on both sides over middle space; hind wings dull whitish, with a narrow fuscous marginal edging.

Central Texas; female only.

Passadena, n. gen.

Labial palpi horizontal, moderately long, second member heavy, third member small, deflected; antennæ of ♂ bent above base, with a furrow in the bend; fore wings 11 veins, 4 and 5 short stemmed; hind wings 8 veins, cell rather short, 2 at angle, 3, 4 and 5 stemmed, 4 and 5 almost to end. Type *constantella*, Hulst.

Passadena constantella, n. sp.

Expands 16-18 mm. Palpi whitish gray, black on end; front and thorax clear gray; abdomen fuscous to fuscous ochre; fore wings clear white, with black scales more or less thickly intermixed, giving a clear bright gray appearance; basal lines black, geminate, inclosing ground

colour, bent and almost dentate at middle; outer line very oblique, black, heaviest towards costa and beginning well towards apex; with a deep sinus inwardly, then a strongly projecting tooth outwardly at vein 5, then a long reach inwardly, and two teeth before reaching inner margin; hind wings clear white, a fuscous marginal stain, the fringes somewhat fuscous.

Southern California. The insect has considerably the appearance of *Salebria bifasciella*, Hulst, and in some respects is structurally very like *Getulia flavidorsella*, Rag. The genus *Getulia* was founded upon the female only, and *G. institella*, Rag., a West African species, is the type; whether *flavidorsella* or *constantella* are congeneric can not be told till the male is found, but it is almost a certainty that *constantella* at least is not. National Museum type No. is 4704.

Megasis cinctella, n. sp.

Expands 15 mm. Palpi and head fuscous; thorax fuscous, with ochre tint; abdomen ochre fuscous, more fuscous above and lower part of sides; fore wings gray, the veins somewhat broadly and loosely whitish gray; basal line indicated by a dark spot at costa and another at middle of wing; outer line blackish, fine, angled outward at vein 5, then dentate, angled back again at vein 3, edged outwardly with whitish; hind wings transparent, with fuscous margin.

Argus Mts., Cal.; taken by Mr. Koebele, May 31; with the venation of *Megasis*, but while the palpi seem to be as in that genus, there has been distortion of them, and I have the female only; the generic reference is therefore provisional. The National Museum type number is 4705.

Sarata cinereella, n. sp.

Expands: ♂ 32-34 mm., ♀ 26 mm. ♂, palpi long, slender, black towards tip, gray basally; front dull white to gray; thorax light fuscous to blackish gray; abdomen fuscous; fore wings of an even clear light gray, made by a sprinkling of black scales upon a white field; inner line very faintly suggested by a darkening of colour; outer line suggested very faintly by a shade of whitish; hind wings light fuscous, with dark fuscous marginal shading.

♀, palpi blackish; front white; thorax gray, with white and black scales; abdomen fuscous; fore wings dark clear even gray, with two

distinct white cross lines, the basal straight, oblique, heavily edged with black outwardly, the black broadest at costa, the second line scarcely bent, broadly edged inwardly with black; hind wings dark fuscous.

Colorado. Easily distinguished from its congeners by the even colour of the fore wings of the ♂. The ♀ is rather difficult to separate from the other species.

Melitara junctolincella, n. sp.

Of the size and general appearance of *M. dentata*, Grt., and of the same colour; the outer dentation of the basal line is very much extended, as is the inner dentation of the outer line, so that they meet and join at the centre of the middle field.

Colorado, Texas.

Zophodia epischnioides, n. sp.

Expands about 26 mm. Labial palpi porrect, end member long, somewhat deflexed, middle member heavy, curved, long, sordid gray in colour, white at tip; front strongly cone tufted; antennæ ciliate, subdentate; maxillary palpi small; fore wings rather long, subparallel, rounded at apex, the anterior half gray cervinous, more whitish along costa, the posterior half dull ochre reddish fuscous basally, gradually fading at middle into the colour of the anterior part of the wing; hind wings dark fuscous, broad; beneath, dull fuscous on all wings.

Decidedly like *Epischnia* in appearance, but near *Zophodia*, though not strictly congeneric. The antennæ of the ♂ are flattened and subdentate; veins 4 and 5 of the fore wings are separate, not stemmed as in *Zophodia*, and the tongue is short and stout.

Zophodia fuscatella, n. sp.

Expands about 25 mm. Palpi, front and thorax even dark fuscous gray; antennæ of the male simple, fringed with tufts of hairs, two on each segment; fore wings even fuscous mouse gray, the lines scarcely, if at all, evident; hind wings fuscous, slightly darker on the margin.

Los Angeles, Cal. The National Museum type No. is 4706. The insect differs from the typical *Zophodia* in the structure of the antennæ and in the position of vein 2 of the hind wings.

Euzophera inornatella, n. sp.

Expands 24 mm. Palpi and front fuscous; thorax whitish in front, fuscous behind; fore wings gray, composed of scattered black scales on

a white ground, the white colour being clearer on subcostal vein; two superimposed black spots are just within half the distance out of the wings, one on median, the other on vein 1; outer line suggested by three or four small diffuse blackish spots; marginal line of black dots; hind wings fuscous, marginal line dark fuscous.

Anglesea, N. J.; from Dr. John B. Smith.

Psorosa Texanella, n. sp.

Expands 18 mm. Palpi ochreous; front, thorax and abdomen violet ochre; fore wings ochre, overlaid with blackish fuscous, more prominent along costa, less so in posterior portion; basal space rust red; basal line a broad indeterminate blackish fuscous band; this is followed by a large reddish spot along inner margin, outer line near margin blackish, indeterminate.

Central Texas.

Canarsia gracilella, n. sp.

About the expanse of *C. ulmiarrosorella*, Clem.; the wings are narrower than in that species; the ground colour is less clear and darker, and is uniform over the wings; the basal line is obsolete, the outer line faintly evident; discal spots alone are strong, black, coalescent.

Montclair, N. J.; from Mr. Kearfott; taken at light in July and August. This insect appears quite different from *C. ulmiarrosorella* as above, and is a more slender insect.

Selagia australella, n. sp.

Expands 18 mm. Palpi long, slender, fuscous white at end of second and base of third segments; thorax bluish gray; abdomen fuscous gray, darker above; fore wings light gray, composed of white mixed with some black scales, lighter at base and beyond basal lines along inner margin; basal field limited by a fine black line, obsolete at costa, broken dentate, this edged within at middle of wings with white, and followed at middle by a rusty red spot; beyond this two lines, blackish, enclosing white at middle, subparallel, distinctly and quite strongly dentate, reaching across wing; discal spots two, black, superimposed; outer line black, fine, bent and dentate, edged outwardly with white; an interrupted black marginal line; hind wings whitish, margin fine, blackish.

Central Texas. I have the ♀ only.

Honora fumosella, n. sp.

Expands 15 mm. Palpi, front, thorax and abdomen very dark

fuscous, almost a dull black; fore wings almost or quite as dark, with two fine whitish cross lines, the basal straight or nearly so, slanting obliquely outward to inner margin; outer line straight, also slanting outward towards inner margin; a faint whitish cross line on basal area, and a large dull reddish spot between this and the basal line, just posterior to cell; middle space behind cell faintly reddish, hind wings dark fuscous, darker outwardly.

Newark, N. J.; from Mr. Kemp; taken at light, July 23.

Eurythmia Coloradella, n. sp.

Expands 14 mm. Palpi and front blackish fuscous; thorax dark fuscous; abdomen fuscous, lighter coloured towards end, the extreme tip being ochre coloured; front wings dark fuscous, more tinted on posterior part behind cell, and somewhat more strongly on outer field; cross lines very faint and indeterminate; veins on outer field more darkened; hind wings smoky fuscous, darker at margin.

Colorado.

Peoria albidella, n. sp.

Expands about 26 mm. Palpi white, a little fuscous stained; front white; thorax dull fuscous white; abdomen white; fore wings pure white, slightly tinged with fuscous, and with a few scattered dark scales; hind wings the same colour or a little lighter.

Death Valley, Cal.; taken by Mr. Koebele, in April. The type number of the National Museum is 4709.

Urula, n. gen.

Palpi long, crambid-like, porrect or drooping; maxillary palpi small; tongue nearly obsolete; antennæ of ♂ not bent above base, dentate, with tufts of hairs on each segment; antennæ of ♀ simple; front with a strong conical tubercle, horizontally edged at apex; fore wings 11 veins, 4 and 5 separate, 10 from cell; hind wings 7 veins, 2 distant from angle of cell, 3 and 4 from a point, 8 short stemmed with 7. Type *incongruella*, Hulst.

Urula incongruella, n. sp.

Expands 18-21 mm. Palpi ochre to whitish; thorax whitish to ochre fuscous; abdomen fuscous to gray, ochre tinted on two anterior segments; fore wings ochre to light gray, strongly mixed with dark scales from subcostal to vein 1, and reaching from base to outer line; inner line whitish, rather broad, rounded; outer line whitish or ochreous, oblique, sinuous, the wings being darkest just before it; outer field grayish to

russet ochre; a black spot along costa, just beyond outer line; margin blackish; discal spots faint, joined by a circular russet ochre spot; hind wings light fuscous, marginal line dark fuscous; all fringes ochre to gray, interlined with dark fuscous.

Argus Mountains, Cal.; taken by Mr. Koebele, in April.

Phoenix, Ariz.; taken early in June. National Museum type number is 4708. The insect has very strongly the appearance of *Lipographis leoninella*, Pack.

Aurora nigrocinerella, n. sp.

Expands 17-19 mm. Palpi, front and thorax clear blackish gray; abdomen fuscous; fore wings broad, clear light gray, overlaid more or less with black scales, but the whitish showing as edges of basal line, also within outer line, becoming very broad at costa, also as outer edge of outer line, and on submarginal space; lines black, fine, rather clear; basal strongly angulate wavy; outer angulate sinuous; marginal line of blackish spots; hind wings smoky white, with dark margin.

Texas; taken July 7. The type number of the National Museum specimen is 4710.

Maricopa albocostella, n. sp.

Expands 16-18 mm. Palpi blackish; thorax smooth bluish gray; abdomen ochre fuscous; fore wings, anterior one-third whitish with a vinous tint, somewhat mixed with dark scales, the rest of the wing wine fuscous, the vinous colour being strongest close to inner margin; discal spots large, black; hind wings fuscous, margin blackish.

Anglesea, N. J.; from Dr. John B. Smith; taken Aug. 21 to 24.

Myelois dulciella, n. sp.

Expands 14 mm. Palpi and front dark fuscous; thorax light fuscous; abdomen fuscous, interlined with light fuscous, the first two segments gray fuscous; fore wings of a clear light blue-gray colour; lines fine, black, distinct, the basal rounded, bent, reaching well out on inner margin, broken at subcostal vein; within this line, nearer inner margin, is a large rounded reddish spot, and this is edged basally, and rather heavily, with black; outer line heaviest at costa, strong, bent, angulate; outer field with a reddish band next to outer line; marginal line of black dots; discal spots black, distinct, superimposed; hind wings light smoky colour, veins and margin somewhat darker.

Hastings, Fla.; from Mr. Kearfott; taken Oct. 26.

TENTHREDO—NEW SPECIES.*

BY ALEX. D. MACGILLIVRAY, ITHACA, N. Y.

1. Antennæ black. 2.

Antennæ rufous :

Black, with the following parts rufous : the antennæ, a spot on the cheeks, the tegulæ, the wings, especially at base, and the front and middle femora, on the femora shading to blackish ; with the following parts yellow : the clypeus, the labrum, the mandibles except at apex, the scutellum, the trochanters, the tibiæ, except the apices of the posterior pair which are brownish, the tarsi, the sides and a narrow margin to the basal plates, and a spot above the posterior coxæ ; the clypeus broadly emarginate ; the third segment of the antennæ twice as long as the fourth ; the front flat between the antennæ. Length, 11 mm. Habitat—Amherst, Massachusetts (Prof. C. H. Fernald). *Fernaldii*, n. sp.

2. Head more or less yellow above the base of the antennæ. 3.

Head black above the base of the antennæ. 4.

3. Posterior femora black above :

Greenish-white, with the following parts black : the antennæ, a five-lobed spot on the vertex, three of the lobes being above the base of the antennæ and another at each meso-caudal angle of the eye, the back of the head, a transverse band on the pronotum, the median lobe of the mesonotum except the V-spot, the lateral lobes except a minute dash on their cephalic half, the metathorax except its scutellum and the posterior part, an oblique band on the suture between the mesopleura and the metapleura, a four-lobed spot on the disc of the basal plates, a fuscous spot on each side of the meson of the first tergal segment, the caudal margin of the metapleura, the bases of the coxæ, and the middle and posterior femora above ; the wings are very slightly fuscous, the apex of the stigma and the veins black, the costa yellowish and distad of the stigma greenish ; the clypeus squarely emarginate ; the third segment of the antennæ one-third longer than the fourth ; the posterior legs beyond the femora and the abdomen beyond the third segment

*See Journ. N. Y. Ent. Soc., V., 1897, 103-108, where the remaining species that I have described are arranged analytically.

rufous. Length, 11 mm. Habitat—Ithaca, New York (R. L. Junghanns). *causatus*, n. sp.

Posterior femora rufous:

Yellowish, with the following parts black: the antennæ, a spot on the vertex with narrow lateral dilations along the caudal margin of the head, the apices of the mandibles, two narrow parallel dorso-ventral lines on the caudal aspect of the head, a transverse band on the pronotum, a spot on the median and lateral lobes of the mesonotum, the suture between the mesonotum and metanotum, a lobate spot on the disc of the basal plates, a spot on each side of the meson of the first abdominal segment, a dot at the base of the middle femora, a spot on the posterior coxæ and each segment of the posterior trochanters and another at the base of posterior femora; the abdomen and the middle and posterior legs rufous; the wings hyaline, the veins and the stigma black except the base of the stigma and the costa, which are pale; the clypeus squarely truncate; the third segment of the antennæ one-third longer than the fourth. Length, 12 mm. Habitat—Ithaca, New York (R. L. Junghanns). . . *rubripes*, n. sp.

- | | |
|--|-----|
| 4. Abdomen in part pale. | 5. |
| Abdomen wholly black | 16. |
| 5. Pleura with a light spot. | 6. |
| Pleura not with a light spot, black. | 8. |
| 6. Pectus pale | 7. |
| Pectus black: | |

Black, with the following parts yellowish: the clypeus, the labrum, the mandibles except at apex, the cheeks, the tegulæ, the collar, the ventral margin of the pronotum, a line on the pleura, a spot above the posterior coxæ, the basal plates except at middle, the suture between the mesopleura and metapleura, the front and middle legs except a black line above which reaches to the apices of the tibiæ, the posterior coxæ except a black spot above and beneath, the posterior trochanters except above, the posterior femora and tibiæ except above, and with the black greatly dilated at the apices of each of the segments; the posterior tarsi black except the apical segment; the abdomen rufous except the first tergal segment; the wings slightly

infuscated; the veins, including the costa and the stigma, black; the clypeus widely emarginate; the third segment of the antennæ about one-fourth longer than the fourth. Length, 12 mm. Habitat—Ithaca, New York (R. L. Junghanns).....
 *Junghansii*, n. sp.

7. Posterior tibiæ in great part and tarsi, black:

Black, with the following parts yellowish: the clypeus, the labrum, the mandibles except at apex, the cheeks, the collar, the tegulæ, the ventral portion of the pleura, the pectus, a spot above the posterior coxæ, the coxæ and trochanters except a black line above, the anterior femora and tibiæ except a narrow black line above, and the anterior tarsi; the following parts rufous: the middle and posterior femora except a black line above, the middle tibiæ except an elongate spot above at apex, the middle tarsi except a black line above, the posterior femora except a black line above, the posterior tibiæ except the apical three-fourths, the sternal abdominal segments as far as the seventh, and the tergal segments two to five; the wings are very slightly infuscated; the veins brownish; the stigma and costa black; the clypeus squarely truncate; the third segment of the antennæ one-third longer than the fourth. Length, 11 mm. Habitat—Franconia, New Hampshire (Mrs. Annie Trumbull Slosson)..... *Slossonii*, n. sp.

Posterior tarsi and tibiæ rufous:

Black, with the following parts yellowish: the clypeus, the labrum, the mandibles except at apex, the cheeks, the sides of the basal plates, and a spot above the posterior coxæ; the following parts rufous: the collar, the tegulæ, the pleura, the pectus, the legs except a black line above on the coxæ, trochanters, and femora, and the abdomen, including the venter; the wings are hyaline; the veins, including the costa and the stigma, luteous; the clypeus roundly emarginate; the third and fourth segments of the antennæ subequal in length. Length, 10 mm. Habitat—Washington (Prof. C. V. Piper)..... *sicatus*, n. sp.

8. Pectus pale..... *rufostigmus*, MacG.
 Pectus black..... 9.
 9. Posterior femora wholly pale..... 10.
 Posterior femora wholly or in great part black..... 13.

10. Cheeks marked with white. 11.
 Cheeks black. *atravenus*, MacG.
11. Scutellum and legs yellow :
- Black, with the following parts yellowish-white : the clypeus, the labrum, the mandibles except at apex, the cheeks, the palpi, the tegulæ, a large spot on the collar, a spot above both the anterior and posterior coxæ, the apices of the coxæ, the legs beyond the coxæ (some of the tarsal segments are slightly rufous), the scutellum, the basal membrane, the basal plates, tergal segments one to four except a black line on their middle at base, the sides of segments five and six, and a narrow margin on the sides of those ventral segments whose tergums are wholly or in part pale ; the clypeus squarely emarginate ; the third segment of the antennæ one-third longer than the fourth ; the wings hyaline, yellowish ; the veins brown ; the costa and the stigma at base, luteous. Length, 12 mm. Habitat—Olympia, Washington (Trevor Kincaid). *olivatifpes*, n. sp.
- Scutellum black, the legs rufous. 12.
12. Tegulæ yellowish-white ; abdomen rufous beyond the third tergal segment. *aequalis*, MacG.
- Tegulæ rufous ; abdomen rufous beyond the first segment :
- Black, with the following parts yellowish : the clypeus, the labrum, the mandibles except at apex, a lunate mark on the cheeks, a triangular spot between the antennæ sometimes absent, the collar, and a spot above the posterior coxæ ; the following parts rufous : the tegulæ, the legs except the bases of the coxæ and the sutures of the trochanters, the venter of the abdomen except the sheaths of the ovipositor, and the tergal abdominal segments beyond the first ; the wings infuscated, the veins and stigma black, the costa rufous ; the clypeus squarely emarginate ; the third segment of the antennæ one-third longer than the fourth. Length, 12 mm. Habitat—Olympia, Washington (Trevor Kincaid). *lunatus*, n. sp.
13. Posterior tibiæ in part pale. 15.
 Posterior tibiæ black. 14.
14. Posterior femora wholly black. *remotus*, MacG.
 Posterior femora rufous, with a black line above :

Black, with the following parts yellow: the labrum, the clypeus, the mandibles except at apex, a spot on the cheeks, a spot on the collar, the tegulae, a spot above the posterior coxæ, the anterior legs, including the coxæ, before, the middle coxæ and trochanters beneath, the knees of the middle legs beneath, and the middle tibiæ and tarsi beneath; the following parts rufous: the middle femora beneath, the posterior femora except a spot at the base and apex above, the posterior tarsi, and the abdomen beyond the third segment; the third segment of the antennæ one-third longer than the fourth; the clypeus deeply emarginate; the wings hyaline, yellowish; the veins black; the costa reddish; the stigma luteous at base. Length, 10 mm. Habitat—Grangeville and Lewiston, Idaho (Prof. J. M. Aldrich).....*rubrisomnus*, n. sp.

15. Spot above the posterior coxæ and the sides of the basal plates yellow.....**terminatus*, MacG.

Spot above the posterior coxæ wanting and the sides of the basal plates black:

Black, with the following parts rufous: the front femora except a black line above interrupted at middle, the middle and posterior except a black line above, the tibiæ except a black spot on the apex of the posterior pair, more pronounced beneath, the front tarsi, the apical two-thirds of the first abdominal segment except a black line at apex, abdominal segments two to five, a diamond-shaped mark on the middle of the sixth tergal segment, and the ventral abdominal segments two to five; the clypeus squarely emarginate; the third segment of the antennæ one-third longer than the fourth; the mandibles yellowish-white except at apex; the wings fuliginous; the veins, including the costa and the stigma, black. Length, 11 mm. Habitat—Olympia, Washington (Trevor Kincaid)...*nigricoxi*, n. sp.

16. Legs black varied with white or yellow.....17.
 Legs rufous varied with black.....20.
 17. Posterior tibiæ black.....18.

*A specimen received from Prof. C. V. Piper, and collected at Pullman, Washington, was given the manuscript name *terminoides*, but on more careful study it does not seem to differ from *terminatus*.

- Posterior tibiæ wholly or in part pale 19.
 18. Tegulæ and sides of basal plates black *pallipunctus*, MacG.

Tegulæ and sides of basal plates pale :

Black, with the following parts yellow: the clypeus, the labrum, the mandibles except at apex, a triangular spot each side of the collar, a spot on the tegulæ, a spot above the posterior coxæ, the sides of the basal plates, the under side of the anterior femora, tibiæ and tarsi, and the under side of the middle tibiæ and metatarsi; the clypeus squarely emarginate; the third segment of the antennæ twice as long as the fourth; the wings infuscated; the veins brownish, the stigma and costa black. Length, 13 mm. Habitat—Olympia, Washington (Trevor Kincaid) *alphius*, n. sp.

19. Posterior tibiæ wholly pale :

Black, with the following parts yellow: the clypeus, the labrum, the mandibles except at apex, the palpi, a spot on the collar, the tegulæ, the basal membrane, the sides of the basal plates, a spot above the posterior coxæ, and all the legs beyond the coxæ (the legs become flavescent at apex) except a spot on the apex of the middle and posterior femora above; the clypeus squarely emarginate; the third segment of the antennæ twice as long as the fourth; the wings hyaline, flavescent at base; the costa and the base and the apex of the stigma flavescent; the stigma at middle and the veins brown. Length, 14 mm. Habitat—Vancouver Island (Carl F. Baker) *subcoerulea*, Es.

Posterior tibiæ black above, pale beneath :

Black, with the following parts whitish: the clypeus, the labrum, the mandibles except at apex, a spot on the cheeks, a line on the collar, the tegulæ, a spot above the posterior coxæ, the front legs beneath, including the coxæ, the middle legs beneath beyond the trochanters except the tarsi beyond the metatarsi, a line on the apex of the posterior femora beneath, the posterior tibiæ beneath, the basal segment of the posterior tarsi beneath, a spot on the apex of the middle and the posterior coxæ, and a spot on the sides of the basal plates; the third segment of the antennæ one-fourth longer than the fourth; the clypeus squarely emarginate; the wings hyaline; the veins, including the costa and the

stigma, black. Length, 9 mm. Habitat—Juliaetta and Craig's Mt., Idaho (Prof. J. M. Aldrich) *atracosus*, n. sp.

20. Posterior femora in part black:

Black, with the following parts yellow: the clypeus, the labrum, the mandibles except at apex, a small spot on the cheeks, a line on the collar, the tegulæ, a spot above the posterior coxæ, the front legs beneath, the knees of the middle and posterior legs beneath, and the middle and posterior tibiæ beneath; the following parts rufous: the front femora behind and at middle, the middle femora beneath and at middle above, and the posterior femora except a linear spot on the base and apex above; the third segment of the antennæ one-fourth longer than the fourth; the clypeus broadly emarginate; the wings hyaline; the veins, including the costa and the stigma, black. Length, 8 mm. Habitat—Juliaetta, Idaho (Prof. J. M. Aldrich)
 *Aldrichii*, n. sp.

Posterior femora rufous 21.

21. Tegulæ and collar black 22.

Tegulæ and collar pale 23.

22. Yellow spot above the posterior coxæ *nigrisommus*, Harrg.

Yellow spot above the posterior coxæ wanting *erythromerus*, Prov.

23. All the tibiæ rufous *ruficollis*, Harrg.

Anterior tibiæ black above 24.

24. Posterior tibiæ wholly rufous:

Black, with the following parts yellowish-white: the clypeus, the labrum, the mandibles except at apex, a small spot on the cheeks, a spot on the upper posterior angles of the prothorax, the tegulæ, a spot on the ventral margin of the pronotum, a spot above the posterior coxæ, a spot on the sides of the basal plates, a fine line on the posterior margin of the basal plates, a spot on the anterior coxæ beneath, a small spot on the posterior coxæ above near the apex, and the front and middle legs beneath (in some specimens the middle femora are wholly rufous and in some the coxæ are pale at apex); the legs beyond the trochanters rufous except a black line above on the anterior and middle tibiæ (in one specimen the black line on the middle

tibiæ is only represented by a black dash), and the middle and posterior tarsi above (in one specimen there is a triangular shaped black spot on the anterior tibiæ above); the clypeus deeply and roundly emarginate; the third segment of the antennæ one third longer than the fourth; the wings hyaline; the costa and the stigma fuscous, the former paler at base. Length, 12 mm. Habitat—Olympia, Washington (Trevor Kincaid).....*nigrifascia*, n. sp.

Posterior tibiæ rufous, with a black line above:

Black, with the following parts yellow: the clypeus, the labrum, the mandibles except at apex, a spot on the collar, the tegulæ, the tibiæ beneath, and a spot above the posterior coxæ; the remainder of the legs rufous except the following: a black spot on the base and apex of the femora (more pronounced on the anterior pair), a black line on the front and middle tibiæ and tarsi above, the posterior tibiæ above, and the posterior tarsi entirely; the clypeus emarginate; the third segment of the antennæ one-third longer than the fourth; the wings hyaline; the veins, including the costa and the stigma, black. Length, 9 mm. Named after Mr. William Allen Savage. Habitat—Julietta, Idaho (Prof. J. M. Aldrich).....*Savagei*, n. sp.

The University of Illinois has fallen heir to the Bolter Collection of Insects, numbering approximately fifteen thousand species, represented by about seventy thousand specimens, besides thirty thousand duplicates not in the systematic collection. This collection, accumulated during the last fifty years by the late Andreas Bolter, a business man of Chicago, is remarkable for the excellence of the material and for the exquisite care with which it has been prepared and arranged. It represents all orders of insects and North America in general, and contains also a considerable amount of exotic material. The gift was made by the executors of Mr. Bolter, in accordance with the terms of his will, conditional upon its maintenance as a unit, under the name of the "Bolter Collection of Insects," and in a fireproof building.

The Entomological Society of Ontario has been placed under obligation to Mr. C. T. Ramsden, of Santiago de Cuba, for the gift to its collection of a specimen of the strange genus *Ascalaphus*, in the *Myrmelconidae*, which is in itself a great curiosity, as well as being scientifically valuable.

J. ALSTON MOFFAT, Curator.

CLASSIFICATION OF THE FOSSORIAL, PREDACEOUS AND
PARASITIC WASPS, OR THE SUPERFAMILY
VESPOIDEA.

BY WILLIAM H. ASHMEAD, ASSISTANT CURATOR, DIVISION OF INSECTS,
U. S. NATIONAL MUSEUM.

(Paper No. 2.—Continued from page 155.)

SUBFAMILY I.—Pepsinæ.

To this subfamily belong the giants of the family, although many species in it are of moderate or insignificant size. Here belong the "Tarantula Killers," or Pompilids, belonging to the genus *Pepsis*, large, brilliantly-coloured species, often with fiery red wings, or blue or black wings marked with white or red, etc., that prey upon the genuine Tarantulas and other large species of spiders.

The species belonging to this group are at once distinguished from all others, except the *Ageniina*, by the second ventral segment in both sexes being traversed by a transverse grooved line, impression or emargination. This transverse grooved line, or emargination, is present in no other group, except in the females belonging to the *Ageniina*, but these are readily distinguished by their smooth hind tibiæ, which are always simple, without teeth or spines and without a longitudinal ridge. In the Pepsinæ the hind tibiæ in the females are most frequently toothed or serrate, as well as distinctly spinous; but very rarely simple, without teeth or spines, but in the few genera without these characteristic features the hind tibiæ have a longitudinal ridge or carina, not possessed by the *Ageniina*.

Table of Genera.

- Second cubital cell receiving the first recurrent nervure *much before* the middle, or near its basal angle. 2.
- Second cubital cell receiving the first recurrent nervure, *at or beyond* the middle, very rarely *a little* before the middle. 3.
2. Wings ample, extending far beyond the tip of the abdomen; second cubital cell larger than the third
- *q* Hind tibiæ in ♀ strongly serrated; ocelli placed in an obtuse triangle; mandibles bidentate; maxillæ normal; hind tibiæ in ♂ simple, *not* serrate, the tarsi compressed, flat, the basal joint usually curved or bent; fourth or fifth ventral segments with long bristles, often in two groups; claws with a tooth before middle. (1) *Pepsis*, Fabr.
- (Type *P. ruficornis*, Fabr.)

- Hind tibiae in ♀ smooth or nearly; ocelli triangularly arranged; mandibles 4-dentate; maxillae at base with two long divergent brushes of pale hairs; claws with a median tooth beneath.....(2) *Dipogon*, Fox.
(Type *D. populator*, Fox.)
- Wings much abbreviated, *not* extending to tip of abdomen; second cubital cell smaller than the third; submedian cell longer than the median; cubitus in hind wings originating beyond the transverse median nervure; claws with one tooth beneath..... (3) *Sphictostethus*, Kohl.
(Type *P. Gravesii*, Hal.)
3. Submedian cell in front wings *not* longer than the median or *clearly* shorter, the transverse median nervure interstitial with the basal nervure, or uniting with the median vein *before* the origin of the basal nervure.....9.
- Submedian cell in front wings distinctly *longer* than the median, the transverse median nervure uniting with the median vein *beyond* the origin of the basal nervure.
- Marginal cell pointed at apex; claws *not* cleft, but with one tooth beneath; inner angle of first discoidal cell *without* a glabrous spot at base, or only faintly indicated.....7.
- Marginal cell broadly rounded, or squarely or obliquely truncate at apex; inner angle of first discoidal cell *with* a distinct glabrous spot at base (rarely wanting).....4.
4. All claws cleft, or *with* one or more teeth beneath.....5.
- Front claws alone cleft, the others with a tooth beneath.....(4) *Heteronyx*, Sauss.
5. Marginal cell scarcely thrice as long as wide, the first recurrent nervure received by the second cubital cell beyond the middle or towards apex, but considerably *before* the second transverse cubitus; claws cleft.....6.
- Marginal cell very long, four times, or nearly, longer than wide; first recurrent nervure interstitial, or *very nearly*, with the second transverse cubitus; inner angle of first discoidal cell usually with a glabrous spot; cubitus in hind wings originating before the transverse median nervure (rarely interstitial).
- Claws with *one* tooth beneath; outer ridge on hind tibiae in ♀ distinctly serrate, the face with short, stiff bristles.....(5) *Mygnimia*, Shuckard.
(Type *M. flava*, Fabr.)

- Claws with *two* teeth beneath in ♂ cleft; metanotum with a tubercle on each side of the spiracles, otherwise as in *Mygnumia* (6) *Hemipepsis*, Dahlb. (Type *H. capensis*, Dahlb.)
- Claws with *four* teeth beneath and closely and longly combed with bristles; outer ridge on hind tibiæ in ♀ simple, not at all serrate (Africa) (7) *Tetraodontonyx*, Ashm., n. g. (Type *T. rufipes*, Ashm., n. s.)
6. Front tibiæ spined above, the front tarsi with a long comb, consisting of 7 or 8 long spines; hind tibiæ and tarsi armed with large spines. Second and third cubital cells small, the third the smaller of the two (8) *Schiztonyx*, Sauss. Front tibiæ not spined above, the front tarsi armed with short spines; hind tibiæ and tarsi armed with small spines arranged in rows; second and third cubital cells large, the third the larger of the two (9) *Cyphononyx*, Dahlb.
7. First recurrent nervure received by the second cubital cell *at*, near, or a little beyond the middle, but rarely as far as its apical third, the second recurrent nervure received by the third cubital cell before its middle 8. First recurrent nervure received by the second cubital cell *near* its apex, or at or beyond the apical third; submedian cell much longer than the median; wings ferruginous, margined with black; cubitus in hind wings interstitial with the transverse median nervure (10) *Pallosoma*, Lepel. (Type *P. barbara*, Lepel.)
8. Cubitus in hind wings *interstitial* or originating a little before the transverse median nervure; eyes *not*, or only slightly, convergent above; clypeus with the anterior margin more or less distinctly sinuate medially (rarely truncate), the labrum slightly exposed. Front tarsi *with* a comb; hind tibiæ in ♀ strongly serrate, in ♂ with short, indistinct spines; second cubital cell receiving the first recurrent nervure near its apical third (11) *Salius* Fabricius. = *Priocnemis*, Schiödte (pars). = *Priocnemoides*, Sauss. Front tarsi *without* a comb; hind tibiæ in ♀ *not* serrate, or with only slight traces of teeth, but with some short, stout spines, in ♂ *without* or at most with very short, feeble

- spines; second cubital cell receiving the first recurrent nervure at or only a little beyond its middle.....(12) *Calopompilus*, Ashm., n. g.
(Type *P. maculipennis*, Smith.)
- Cubitus in hind wings originating *beyond* the transverse median nervure, or at least somewhat beyond it, never interstitial; clypeus squarely truncate anteriorly; second cubital cell receiving the first recurrent nervure *at* or a *little before* its middle.....(13) *Hemipogonius*, Sauss.
(Type *H. venustipennis*, Sauss.)
9. Submedian and median cells in front wings equal the transverse median nervure, *interstitial* with the basal nervure.
Pronotum as long or longer than the mesonotum11.
Pronotum distinctly shorter than the mesonotum.....10.
10. Eyes convergent above; pronotum anteriorly abruptly truncate; first recurrent nervure joining the second cubital cell a little beyond the middle; claws with a tooth beneath; cubitus in hind wings interstitial.....(14) *Calicurgus*, Lepel.
(Type *C. fasciatellus*, Lep.)
11. First recurrent nervure received by the second cubital cell *at* or *near* its middle; cubitus in hind wings interstitial, or nearly, with the transverse median nervure....(15) *Ferreolomorpha*, Ashm, n. g.
(Type *Prionemis pedestris*, Smith.)

THE GENUS CATOCAIA.

BY G. H. FRENCH, CARBONDALE, ILL.

It is 16 years since the Rev. G. D. Hulst undertook a revision of this genus along the lines of "Structural Characters." As a new Check List of the moths is to be published soon, it seems proper that another arrangement of the genus be made. The structure of the genitalia as a basis of the separation of the species has been regarded by many eminent lepidopterists as of doubtful value. It is certain that in this genus its use was not warranted by larval characters or field observation. For these reasons the last revision has not been satisfactory to those who were familiar with many species in their native haunts, or who had bred them. The writer does not say, however, that the present revision will be faultless, for as yet too few of the species are known in their adolescent stages

to make this much of an aid in classification. It is now a question whether certain forms are valid species or mere varieties, and this can be settled only by further observation or breeding. Many species have a wide range of variation, such as *Lacrymosa*, but the intergrades and varieties in this species are all well known, and the characters are so strongly marked in all the forms that we need not hesitate with this species. Other species, as *Epione* and *Sappho*, are remarkably uniform in their markings, even when from widely-separated localities. Of the validity of these species there is no question, even without breeding. Of some of the others, it seems better to retain their names as species till they are proven otherwise. The closet naturalist is not always able to judge in such cases. Even so good a botanist as Dr. Asa Gray was led astray in at least one instance known to the writer by not knowing his plant in the field.

In regard to sequence, there seems to be no reason why the smaller species should be regarded as the highest. If activity counts for anything, then *Epione* certainly stands at the head of the list. Unless we change the usual generic description, *Allotria Elonympha*, *Andrewsia Belfragiana* and *Parthenos Nubilis* are not *Catocalæ*.

In the December number of the CANADIAN ENTOMOLOGIST for 1892, page 308 of Vol. 24, it was shown that too little was known of the larvæ to use them as a basis of classification in this genus. As a rule they are striped longitudinally, but one species, *Illecta*, has its larva striped transversely. Generally there is a lateral fringe along the sides of the larvæ, but three species, *Obscura*, *Innubens* and *Illecta*, were known not to have this fringe, 15 species having it. As these differed widely in size, colour and markings of the imagines, this character would be of little value in classification. For this and other reasons it seems best to follow the general practice and take the colour of the hind wings as the basis of division of the genus into groups. In this paper the writer will consider only the black-winged species.

As to the two species, *Viduata* and *Vidua*, we see no good reason for relegating the former to synonymy. There are numerous instances where names in the same genus in our catalogues are the same except for a slight difference in the termination. From Kirby's Catalogue of the Diurnal Lepidoptera we have *Anthocaris Ausonia* and *Ausonides*, and *Papilio Xuthus* and *Xuthulus*, and a number of others might be cited. In his Catalogue of the Heterocera, Vol. 1, published in 1892, we find Kirby

following the same practice: as *Amorpha Populi* and *Populeti*, *Miltochrista Rosaria* and *Rosacea*, etc. It is also not a very uncommon thing to see the same name used in a family in related genera without any change. As an instance of this, in Dr. Skinner's new catalogue of "North American Rhopalocera," 1898, we find *Diadema Misippus*, and in the next genus *Limnitis Misippus*. In these species the female of the first is coloured and marked so much like the second in both sexes that they might easily be mistaken for each other by an amateur. Yet the writer has seen no criticism on Dr. Skinner's course in the use of these names. The same thing was found in a catalogue of Star Fishes, where the specific name *Miliaris* was used in two related genera of the same family. However much we may regret that names with only a slight difference in termination have been used, or the same name for two species in related genera of a family, when the names have been published and used it seems best to the writer to let them alone. Indeed, I do not believe any one has a right to change them. In the case before us there is no danger of confounding *Viduata* and *Vidua*, for the two insects are very different.

In regard to the two names, *Judith*, Strecker, and *Levettei*, Grote, the dates of the published papers in which the descriptions occur give Strecker's name the priority. We have decided to take the "face of the returns" as evidence in this case without taking up the differences of the two authors.

In looking over the collection of Dr. William Barnes, of Decatur, Ill., a new species was found which the Doctor kindly placed at my disposal. In the description that follows, the writer has dedicated the species to its owner by the use of his name for the species.

Catocala Barnesii, nov. spec.

Expanse, 2.63 inches. General or ground colour of the fore wings rather dark olive gray, not so dark as that of *Obscura*, but between that species and the colour of *Robinsonii*, the lines faint and much the same as they are in the latter species, the insect in general reminding one of *Robinsonii*, but it is smaller and darker, standing in size between *Robinsonii* and *Judith*. Comparing the markings with those of *Robinsonii*, the t. a. line is oblique, reaching the posterior margin close to the t. p. line as in *Robinsonii*, but the costal portion is heavier; the shade over the reniform is rather heavy; the reniform with only the inner part of its ring visible. This portion black, the rest concolorous, while in *Robinsonii* the reniform is brown; subreniform whitish, closed or nearly so, in colour paler than in *Robinsonii*, and in that species it is wide open; t. p. line

with its two extra-discal teeth about half as acuminate as in *Robinsonii*, in the latter the anterior often extends across the subterminal space; s. t. line scarcely discernible, much less brown in the s. t. space than in its ally, almost concolorous. The ground colour of *Robinsonii* is pale gray with a slight bluish sheen as seen in its side light, that of *Barnesii* has a slight purplish sheen in a side light.

Hind wings black, fringe white with a slight ochraceous tinge at base, black at the ends of the veins. The under side as in *Robinsonii*, but more smoky in tinge.

Described from two examples from San Antonio, Texas; in the cabinet of Dr. Wm. Barnes, Decatur, Ill.

The writer would arrange the black-winged species of the *Catocalæ* of the United States as follows :

- | | |
|-------------------------|--------------------------------|
| Catocala, Schrank. | 10. Flebilis, Grote. |
| 1. Epione, Drury. | 11. Robinsonii, Grote. |
| 2. Sappho, Strecker. | var. Curvata, French. |
| 3. Agrippina, Strecker. | 12. Barnesii, French, nov. sp. |
| 4. Subviridis, Harvey. | 13. Obscura, Strecker. |
| 5. Lacrymosa, Guenée. | var. Simulatilis, Grote. |
| var. Ulalume, Strecker. | 14. Residua, Grote. |
| var. Paulina, Hy. Edw. | 15. Insolabilis, Guenée. |
| var. Emilia, Hy. Edw. | 16. Angusi, Grote. |
| var. Evelina, French. | var. Lucetta, Hy. Edw. |
| var. Zelica, French. | 17. Judith, Strecker. |
| 6. Viduata, Guenée. | Levettei, Grote. |
| Maestosa, Hulst. | var. Miranda, Hy. Edw. |
| 7. Vidua, A.-S. | 18. Tristis, Edw. |
| Desperata, Guenée. | 19. Elda, Behrens. |
| 8. Dejecta, Strecker. | 20. Relicta, Walker. |
| 9. Retecta, Grote. | var. Bianca, Hy. Edw. |
| var. Luctuosa, Hulst. | var. Phrynia, Hy. Edw. |

A NEW CATOCALA FROM TEXAS.

BY A. RADCLIFFE GROTE, ROEMER MUSEUM, HILDESHEIM, GERMANY.

Catocala moderna, n. sp.

Allied to *C. viduata*, Guenée, but very much smaller, and at once distinguished by the pale angulated band of the under surface of hind wings reflecting through on upper surface, where it appears as a faintly yellowish mesial shade, distinctly outlined. Fore wings like *C. viduata*, of the same pale gray, with the black oblique shading running from costa at centre of median space outwardly to below apices, less marked than

in its ally. Subreniform paler, more yellowish. Else the lines and markings copy in miniature its ally. Fringe to secondaries white. Collar darker, with black line; thorax pale gray.

Expanse 70 mil. *Hab.*—Dolores, Texas.

Accompanying the fresh type are examples of *C. viduata*, Guen. (= *maestosa*, Hulst. Guenée considered his name sufficiently distinct from *vidua*, and adopted it for that reason), which expand 95–98 mil. I know of no black-winged *Catocala* in which the mesial band shows so plainly.

In this same collection is a fresh ♀ example of *Eacles imperialis*, var. *nobilis*, Neum., with the wings all suffused with russet; also one of var. *didyma*, Beauv., not recorded by Dyar. Yellow, with both wings terminally entirely russet, outside of the undulate pale purple band. My recollection of the work of De Beauvois is that he figures this form. The antennæ in the figure are incorrect; from having been broken off his type, the author was induced to effect a restoration in his figure not agreeing with reality. There is also a larva of a *Citheronia*, which does not well agree with alcoholic specimens of *C. regalis*, and may be *C. Mexicana*.

BOOK NOTICE.

STORIES OF INSECT LIFE (Second Series).—By Mary E. Murtfeldt and Clarence M. Weed. Ginn & Co., pp. 72, 1899.

Reliable books about insects, written so that children can understand them and will be interested, are few in number. The little work now under consideration fulfils its purpose admirably, and will doubtless be very useful in fostering a taste among children for insect life. The information given is accurate and well selected. Moreover, it is presented in an earnest, attractive manner, which will create a desire for more knowledge, and, with that desire, an inclination to seek for it where best it can be found, in the open field, by personal observation. The present booklet is intended as a companion to a similar publication of 54 pages, which appeared last year. Both are well and freely illustrated. The insects chosen for description are common objects of the country, just such as a child would wish to know about. The aim of the authors was well conceived, and has been well carried out. They say: "This little book is designed for use as a reading book, which shall lead the pupil to fuller observation upon the insects about him. It is not essential that the articles be read consecutively; but it is highly desirable that the pupils actually see as many as possible of the insects discussed." "The study of living insects should always have the first place in school work. The aim of the teacher should be, not to foster the collecting spirit so much as to develop the perceptive faculties in such a way that the pupil will not only notice the things about him, but will be on the alert for the significance of their structure, their colour or their habits of life." J. F.

Mailed May 31st, 1900.