

The Canadian Entomologist.

VOL. XL.

LONDON, MARCH, 1908.

No. 3.

DESCRIPTIONS OF SOME NEW SPECIES OF AMERICAN NOCTUIDÆ.

BY HARRISON G. DYAR, WASHINGTON, D. C.

Gortyna ochroptena, n. sp.—Pale stramineous, only slightly tinted with brown, the lines faint and obscure, arranged as in *rutila*, Guen., and allies. Ordinary spots white, claviform and orbicular forming an oblique row of three spots, the middle one smallest; reniform with white central line, all the surrounding spots white; subterminal shade purplish, defining a yellow apical patch. Hind wings whitish. Expanse, 33 mm.

One ♂, Denver, Colorado (collection of Wm. Schaus).

Type, No. 11411, U. S. National Museum.

A Western species of the *rutila* series, distinguished by its very pale colour. The colour is much the same as in *furcata*, Smith, but without the expanded spots of that species.

Gortyna nepheleptena, n. sp.—Fore wing very heavily shaded with brown down to and including the submedian fold, the space between that and the inner margin as far out as the outer line clear yellowish, irrorated with red-brown; an apical yellow patch, from which the subterminal line is clearly indicated as a series of little scallops to the anal angle; ordinary lines lost in the dark colour; basal spots yellow in the dark ground, two near the costal edge, followed by a very narrow yellow line; orbicular and claviform forming three rounded white spots, nearly equal, the middle one eroded on the inner side; orbicular a slender curved yellow line, surrounded by the full complement of spots, all white, none large. Hind wing tinged with fuscous to the outer margin, which is somewhat broadly and contrastingly pale. Expanse, 33 mm.

One ♀, New York [exact locality unknown], (collection U. S. National Museum).

Type, No. 11412, U. S. National Museum.

The specimen was identified by Prof. J. B. Smith as "*Hydræcia appassionata*, Harv.," at some date, apparently many years ago, for it has nothing to do with that pretty and now well-known species. It belongs to the *rutila* series, but it is much more heavily dark-shaded than any described form. It is perhaps nearest to *Merrucata*, Bird, but that has the brown shading powdered and diffused, not obscuring the ordinary lines.

Gortyna marginidens, Gueneé.—A specimen before me was compared with Gueneé's type by Mr. Schaus, and a reading of Gueneé's description appears to me to entirely confirm the determination. The species is, however, not the one identified as *marginidens* by Prof. J. B. Smith and by Mr. H. Bird, but the "dark form" of *circumlucens*, Smith, referred to by Mr. Bird as forming galls in the stems of hop (CAN. ENT., XXXIX, 137, 1907). The types of *circumlucens*, while similar in markings, are considerably darker in colour than the *marginidens*, and, considering how closely the species of *Gortyna* are allied, I am inclined to retain *circumlucens*, for the present at least, as a distinct species, the larva being still undiscovered. The species heretofore known as *marginidens* will require a new name, and may be known as

Gortyna Birdi, n. sp.—Of the same pattern and coloration as *marginidens*, Guen., but the colours more diversified, the median space more contrastingly lighter below; at the base of the wing, beside the single white speck, two spots, a waved line and a dot; reniform spot larger, more expanded, similarly formed; orbicular with a central brown dot, not solid; apical pale patch somewhat more diffused.

Eight specimens before me, the one selected as type being a male in fine condition, bred by Mr. Bird at Rye, New York.

Type, No. 11410, U. S. National Museum.

Gortyna nephrasyntheta, n. sp.—Similar to *Birdi*, Dyar, and as large as the largest female of that species before me. The fore wing is much the same, but the colour is less bright, and the shadings less contrasted, being of a dull tan brown. The markings are all the same, the principal difference residing in the reniform stigma, which is very large and almost solidly white, the centre line being white instead of yellow as in *Birdi*, and closely fused to its large surrounding spots, their separations forming narrow hair-lines. Apical blotch large, pale. Expanse, 47 mm.

One ♀, Plummer's Island, Maryland, Sept. 27, 1904 (E. A. Schwarz).

Type, No. 11413, U. S. National Museum.

I have had this specimen under the label *marginidens*, Guen. (= *Birdi*, Dyar), for several years, but now that Mr. Bird has shown how closely these species run, it is impossible to longer hold it in that association.

Gortyna anargyrea, n. sp.—Fore wing light buff, sprinkled with brown atoms; inner line faint, double, brown, powdery; median shade powdery, angled on the median vein; outer line distinct, purplish, slightly curved at its upper fourth, followed by a lighter purple shade, that is pointedly produced on the veins without, quadrately incised near the apex, followed by a narrow space comparatively devoid of the brown powdering, which obtains again terminally; spots yellow, without any white, basal spots and narrow subbasal line shown, claviform obliquely elliptical, cut by the submedian fold; orbicular small, rounded, cut by a brown dot on its outer side; reniform a narrow yellow line, surrounded by small yellow spots. Hind wing shaded with fuscous except on the margin. Expanse, 34 mm.

One ♂, Colorado [exact locality unknown], (collection of Wm. Schaus).

Type, No. 11414, U. S. National Museum.

The specimen bears Mr. Schaus's label, "*Hydræcia purpurifascia*, G. and R.," but it differs from that species in its lighter appearance, caused by the reduction of the terminal shading and the total absence of the white spots. It may be considered as a Western representative of *purpurifascia*, specifically distinct, I have no doubt.

Gortyna triorthia, n. sp.—Fore wing light yellow, heavily shaded with brown in the middle, leaving the costal and inner edges and the space between median and outer lines clear yellow; inner line faint, double, brown, forming an outcurve below vein 1; median line shaded distinct, bent where it touches the reniform below; outer line very straight, purple, followed by a purple shade, which is dentate on the veins without; subterminal line indicated by a narrow, clear yellow space; red powderings terminally; claviform and orbicular in a rigid, oblique line, white, full, nearly fused, the claviform dumb-bell-shaped, the orbicular elliptical; reniform a yellow arc, surrounded by spots, a narrow white one at the upper and lower corners within, four without, of which the second from the top is rather strongly shaded with yellow. Hind wing testaceous, faintly shaded with brown subterminally. Expanse, 36 mm.

Type, one ♀, Holderness, New Hampshire, Sept. 21, 1883 (collection of C. V. Riley). I also associate a ♀, Centre, N. Y., Aug. 30, 1877 (W. W. Hill); a ♀ marked "391"; a ♀, Rhinebeck, N. Y., Sept. 13, 1888 (Miss Grace Asher); a ♂, Kittery Point, Me., Sept. 10, 1881 (R. Thaxter); and a ♂, Colorado (D. Bruce, collection of Wm. Schaus).

Type, No. 11415, U. S. National Museum.

Allied to *purpurifascia*, but distinguished by the straightness and confluence of the inner spots and the median shading. Less closely allied to *Harrisii*, Grt. All the specimens were labelled "*purpurifascia*," Mr. Schaus's specimen being marked "*purpurifascia*, Grt., comp. B. M.;" but these species are so much alike that any comparison might easily err, and I prefer to retain Mr. Bird's identification of *purpurifascia*, which I think is correct.

Chabuata rectinubila, n. sp.—♀. Head and thorax brown, very thickly irrorated with white; abdomen gray-brown, irrorated with gray. Fore wing dull brown, very thickly irrorated with white; faint traces of the antemedial line; reniform indicated by a faint pale discoloration; postmedial line very faint, bent outwards below costa, excurved to vein 4, then incurved, faint traces of the subterminal line, preceded by an oblique straight pale shade from costa before apex to inner margin before tornus. Hind wing brownish shaded, the veins darker, the marginal areas broadly suffused with brown; the under side white, irrorated with brown, a discoidal point and indistinct curved postmedial line.

♂.—Similar to the female. Anal tuft somewhat ochreous.

Eight specimens, Orizaba, Mexico (collection of Wm. Schaus).

Type, No. 11318, U. S. National Museum.

Allied to *C. mutina*, Schaus, with which it was confused in the Schaus collection.

THIRD SUPPLEMENT TO THE "CATALOGUE OF APHIDÆ."

BY G. W. KIRKALDY, HONOLULU, H. ISL.

In enumerating the synonyms of *Chaitophorus* (CAN. ENT., XXXVII, 1905, p. 417), I was able to give seven, of which, however, five had been inaccessible to me. I am in no better plight now, except that apparently accurate references to some of these are given in a paper by Ritsema (cf. A. M. N. H. (4), VI, 93, 1870). The following are probably correct:

||† *Phyllophorus*, Thornton, 1852, Proc. E. S. London,

N. S., II, 78.....t. *testudinatus*.

||† *Chelymorphia*, Lane Clarke, 1858, Objects for the

Microscope.....(London), p. ? t. *phyllophora*.

The correct citation of *Rhizaphis* (CAN. ENT., XXXVIII, 1906, p. 10) is apparently "Planchon, 1867, C. R. Paris, xlvi, 588, t. *vastatrix*."

DR. DYAR'S CRITICISM OF "MOSQUITO LIFE."

BY D. W. COQUILLET, WASHINGTON, D. C.

Dr. Dyar's criticism of "Mosquito Life" in the February number of the CANADIAN ENTOMOLOGIST (it cannot possibly be called a review—the author informs me that no copy of the book was sent to Dr. Dyar) calls for a reply, that the many false statements may be corrected. To define my own position in the case, it may be stated that when Miss E. G. Mitchell, the author, began work on the drawings for the Carnegie Monograph, she was assigned a desk in Dr. Dyar's office at the National Museum, and he was given general supervision of her work. Instead of giving her a specimen to draw, he handed her two trays containing about 35 slides of larval skins, bidding her compare them critically and ascertain if more than one species was in the lot. How well she did her work may be gleaned from the first paragraph of an article in the Journal of the N. Y. Ent. Soc., Vol. XIII., p. 107, under the title "Brief Notes on Mosquitoes," by Harrison G. Dyar, A. M., Ph. D., and which runs as follows:

"Distribution of *Theobaldia absobrinus*, Felt.—In re-examining my series of *Theobaldia incidens* from British Columbia (Proc. Ent. Soc., Wash., VI., 38, 1904), I find it to contain a mixture of a second species which I am able to identify with *T. absobrinus*, Felt."

Not one word in the entire article to indicate that the work had been done by any other person than himself! The lady continued her work for several weeks, then informed me that she would prefer to resign rather than continue working under the unpleasant existing conditions. She was therefore given desk-room in my office in the National Museum, where she continued her work on the drawings under my general supervision, and so matters stood until the cessation of her work about a year later.

I will now take up the more flagrant of Dr. Dyar's false statements in the order in which he gives them:

1. "In the title the species of the United States are said to be treated of, but in reality, only those of the Atlantic coast region are dealt with." Only a casual glance through the book is necessary to reveal the fact that *Franciscanus*, *incidens*, *varipalpus*, *Curriei*, *pullatus*, *Fletcheri*, *Spenceri*, etc., all western or Pacific Coast forms, are dealt with.

2. "The illustrations show the effects of Mr. F. Knab's expert artistic criticism." Without wishing in the least to detract from Mr. Knab's ability as a critic or artist, I am in a position to know that he never saw any of the drawings of the adults, and an incident which he himself related to

me indicates that the author herself was the real critic. At her first visit to his office, he showed her one of his wash-ink drawings of a larva. Although she did not know the species, she told him that she was sure, from those she did know, that he had omitted two hairs, indicating on the figure where they ought to be. Mr. Knab vehemently denied the omission, protesting that he had been extremely careful not to overlook a single hair. She asked to see the specimen on which the figure was founded, and upon examining it, the hairs were found, and Mr. Knab was manly enough to acknowledge himself in the wrong!

3. "Mr. Coquillett only receives some, though inadequate, recognition. His name might have better assisted in gracing the title page." By this it is evidently intended to imply that I wrote part of "Mosquito Life." As a matter of fact, the MSS. of that book were written by Miss Mitchell at her home in East Orange, N. J., and sent to the publishers before she returned to Washington. I was in Washington all this time, as the records of the Bureau of Entomology show, and neither wrote nor dictated any part of the book.

4. "A certain obtuseness of scientific conscience is, we think, responsible for this condition, and it has further led our author to publish her work independently, although she was employed to assist in the publication of the much-delayed Carnegie Institution Monograph, and had in her hands for study the material collected for that work." She was not employed to assist in the preparation of the *text* of the Monograph, and at no time did she have in her hands the Carnegie material *for study*; during all the time she was at work on the Monograph I had charge of the adults, while Dr. Dyar had control of the early stages. All she was employed to do was to make drawings of some of the early stages and details of the same, besides copying in charcoal some of the line drawings she had previously made for Dr. Dupree, and which he had generously loaned her for that purpose. During the period when she was drawing for the Monograph, she devoted her spare time to completing a series of keys to the North American mosquitoes, begun in Louisiana, intending to use them as a thesis for the degree of M. S. in the George Washington University. No secret was made of this, and, as a student of the above University and as a citizen, she had right of access to the study-collection of the Museum. The chaotic condition of the larva collection at that time caused her unwittingly to incorporate in the keys a few species belonging to the Carnegie collection. These species were not new at the time, and Dr. Dyar's keys containing all of these and many other species were pub-

lished before the book was even written. However, even on this score, no objection can possibly be applied to her book, since her keys were entirely reconstructed from non-Carnegie material.

5. "Her action in copyrighting drawings which she had been paid to prepare for the Carnegie Institution Monograph is certainly indefensible." Not one of these drawings was published in "Mosquito Life," and as Dr. Dupree had already given the Carnegie people permission to publish such of them as were copied from his own, and the author was merely acting in his place, the publication of the originals in "Mosquito Life" in no way affected this permission.

The above is, I believe, sufficient to show the utter falsity of Dr. Dyar's charges. The writer regrets that, as a matter of justice as well as of record, the occasion necessitates the preparation and publication of the present reply. The author's well-known scientific probity should have precluded the possibility of any personal attack.

A FURTHER NOTE ON SYNELYS ENUCLEATA.

BY I. W. SWETT, MALDEN, MASS.

In the December CAN. ENT., Vol. XXXIX, p. 412, Mr. Prout has added some very interesting material to what I had found out. He seemed puzzled about two things: first, why I thought the original description or typical form was drawn up from one specimen. In the last line of Gueneé's description he says "(♀ semblable)"; this Mr. Prout must have overlooked, as he says it was drawn up from "6 examples," and the typical form was the one without blotches, but, as can be seen, it was from one specimen that he drew the description, and Mr. Prout is mistaken. Gueneé certainly knew all the forms, and the "6 examples" refers to the other two forms under variety A with blotches on both wings and on the fore wings only. Secondly, Mr. Prout wonders why I believed the form with blotches on both wings to be *enucleata*. Well, simply because I found them so labelled in Packard's collection and figured in the Monograph, and because I knew that Gueneé's types were known to Packard, and that they corresponded, I formed this conclusion. I found on reading the description that the two did not agree, but accepted Packard's judgment in preference to my own in this case. I have no doubt that Mr. Prout is correct, and shall accept his judgment regarding my correction, as being in Europe with the Walker types and

notes, he is better fitted to pass judgment than I, and I wish to thank him for giving me further information on the subject. Packard, on the whole, made very few mistakes, considering the great amount of work that he did, but on difficult groups like *Eois* and *Eupithecia*, one wonders how he could put so many different species under one name, on which I shall comment at another time, and in the case of *enucleata*, this may have been one of his errors.

NOTE ON THE BROWN CRYPTOLECHIA (*CRYPTOLECHIA QUERCICELLA*, CLEMENS).

BY ARTHUR GIBSON, CENTRAL EXPERIMENTAL FARM, OTTAWA.

On several occasions we have observed the leaves of Aspen Poplar tied together by a small yellowish-green caterpillar, but it was not till 1907 that we succeeded in rearing the perfect insect and finding out its name. On August 25th, 1906, I collected a number of these larvæ on *Populus tremuloides* in the Arboretum of the Central Experimental Farm, and was rewarded on June 10th, 1907, by finding that one of the moths had emerged. Soon after that date Mr. W. D. Kearfott, of Montclair, N. J., visited Ottawa, and on submitting the specimen to him, he identified it as *Cryptolechia quercicella*, Clemens. My note taken on Aug. 25th, 1906, reads as follows:

Larva, 12 mm. long. Head shining jet black, wedge-shaped, roughened; clypeus reaching about two-thirds to vertex; mouth-parts brownish. Body pale yellowish green, with a pulsating dorsal vessel. Thoracic shield blackish, brown in centre of dorsum. Tubercles indistinct, setæ, pale. Spiracles round and black. Anal shield blackish. Segment 11 has a few blotches of crimson above spiracles. Feet pale brownish. The larva lives in a tent, which is made by sewing two or three leaves together. These tents are conspicuous on the trees.

In Packard's "Forest Insects," the Brown *Cryptolechia* is treated of under Insects Injuring Oak Leaves, but Aspen Poplar is also mentioned as a food-plant. The description of the larva there given differs in some respects from that given above of the specimens which I had under observation.

ERRATA.—February number, page 53, last line of second paragraph, for "presence" read "absence"; page 54, 9th line, for "female" read "femora."

March, 1908

PRACTICAL AND POPULAR ENTOMOLOGY.—No. 25.

OVIPOSITION OF EPIDEMIA EPIXANTHE.

BY J. H. COOK AND F. E. WATSON.

A desire to observe the larva of *Incisalia polios* in the field, and to secure a few for breeding, took us to Lakewood, N. J., toward the end of the last week in June, 1907. For forty-eight hours we were compelled to work under the disadvantages incident to a steady rain, succeeded by a series of showers, mists and infrequent periods of half-hearted sunshine. Though no butterflies appeared, such weather was—except for the discomfort entailed—the best possible for caterpillar hunting, and by evening of the second day we had collected a number of *irus*, *niphon* and *polios*, sufficient to warrant us in turning our attention to something else.

A golden sunset gave promise of clearing skies on the morrow, and in casting about for some butterfly problem which might profitably occupy our time, we chanced to think of *Epidemia epixanthe*. It was as yet a little too early to expect the species to be flying in numbers, and our hopes of learning anything of its life-history were correspondingly moderate; nevertheless we made ready for a day's work in the cranberry bogs.

July the first dawned cloudless and serene, and following the less agreeable weather, it seemed doubly pleasant to see the land flooded with light, and to feel the warmth of the morning sun on our hands and faces. We set out betimes along a little-travelled road, which runs through the negro quarter of the village, and on towards the coast. The sandy highway had dried during the night, and walking was slow and somewhat fatiguing, though we made no pretence of haste, stopping occasionally to gather a few *irus* caterpillars from the *Baptisia*,* or to look over the small pines for *niphon*. Further on the road was bordered on either side by thickets of laurel, crowned with magnificent masses of pink and white blossoms, and we paused to admire their luxuriance and beauty, and to enjoy the rich fragrance with which the air was laden. Out in the open, however, we plodded on in full realization that it was a typical, torrid, glorious summer's day.

By reason of slow progress and numerous delays, we did not reach the marsh for which we had headed until well on toward eleven o'clock ;

*Two weeks before we had discovered a female *irus* ovipositing on *Baptisia tinctoria*, and further investigation has led us to believe that this is the preferred, if not the only, larval food-plant in New Jersey and for some distance southward. Neither eggs nor larvæ were found on lupine (*Lupinus perennis*) either at South Lakewood or Newfoundland, N. J., though they were common enough on the False Indigo wherever *irus* occurred.

but at last the trees thinned on the left, and we crossed a bridge spanning the stream which fed the bog.

The bog began near the road, and for a little distance was on one side overgrown with thick shrubbery, and on the other by small scattering junipers; below this it was clear, save for the cranberry vines, and followed the broad, shallow trough of its sluggish stream until hidden by a turn to the right.

We made for the quaggy ground and separated. Here and there within the radius of vision flashed silvery-gray spots, which when approached resolved themselves into *epixanthe* butterflies, members of a species which for many a year had kept the details of its earlier life a profound secret. Dr. Wm. Saunders had suggested *Menyanthes trifoliata* as the food of the larva, but though the name had remained in mind the plant was not among our vegetable acquaintances. *Rumex verticillatus* had also been mentioned as a possibility by Scudder, apparently because *hypophleas* and *thoe* fed upon plants of that genus. Cranberry, the most obvious supposition (since *epixanthe* is found only in cranberry bogs), seemed almost out of the reckoning by reason of the repeated failure of those who had sought the larva thereon. Still, failures are not conclusive evidence, and to the cranberry we pinned most of our hopes and all of our females. There were not many of these, though males were quite abundant, and at noon we had but four under gauze.

It was nearly half-past one when the next female was sighted at the edge of the juniper growth. After flitting about for a few minutes, she hesitated above a clump of *Sphagnum*, and fluttered down into the tangle of cranberry vines growing from the moss. Here flight was impossible, and though her wings continued to vibrate rapidly, the motion was evidently indulged in as a means of balancing, progress up and down the young stalks being accomplished entirely with her legs. At length she came to rest so deep among the vines that her position was made out with difficulty; with half-spread wings she remained for a moment motionless, then buzzed rapidly upward into the net-bag held to receive her.

The egg was soon discovered on the under surface of a new leaf of *Vaccinium macrocarpus* (larger cranberry), about an inch from the end of the branch. As far as we could judge, it did not differ in size, shape or ornamentation from the egg of *Chrysophanus thoe*, though direct comparison was impossible at the time.

The female was confined over cranberry, and within three minutes oviposited twice. The eggs were placed as in the former instance, upon

the under surface of leaves, near the apex of the new shoots, but the branches selected were higher up on the plant, and quite above the *Sphagnum*. Having more confidence in results obtained under natural conditions, we removed the gauze and set the insect at liberty. She flew but a few feet, then settled almost out of sight among the vines, and practically repeated her first performance. Thereupon the lady basely violated the confidence reposed in her by flying for the trees, dodging around one of them, and disappearing most mysteriously. Some time was spent in an endeavour to pick up the lost trail, but without success.

We did not remain at the bog long after this, but returned to Lakewood with our four captive females, and immediately confined them over cranberry arranged as naturally as possible, and put them in a sunny window.

The next day was spent in a small swampy stretch along the railroad track just south of the village. *Epixanthe* was quite abundant, and a dozen or more females were observed, though no eggs were secured. However, a pair were found *in coitu*, and watched for eighteen minutes, when they separated. They were easily taken, and the impregnated female went to join her sisters in prison. We returned to the house about two o'clock, and found one of the insects brought in the day before busily ovipositing on the cranberry. This continued all the afternoon, even on the train bearing us back to New York. Several eggs would be laid at intervals of a few seconds; then a period of rest would ensue, and again a number of eggs. The last oviposition observed was at 5.30 p. m. The other females taken on July first died without yielding ova.

The female taken just after coitus began to oviposit about ten o'clock on the morning of July 5th, and had extruded all of her eggs by four o'clock in the afternoon. The ova were placed as follows:

	Upper surface.	Under surface.	Calyx.
♀ No. 1, terminal leaf	1	1	1
lower leaves	5	32	
Total			40
	Upper surface.	Under surface.	
♀ No. 2, lower leaves	3	39	
Total			42

Nine leaves had received 2 eggs, six leaves held 3 each, and one held 4. This placing of a second, third or fourth egg on the same leaf is to be regarded as accidental, as is probably the position selected on the flower. None of the eggs were placed more than three inches from the end of the stem, and none were laid on the stem itself.

On the 14th the junior author was at Lakehurst, N. J., and was fortunate enough to again observe a ♀ *epixanthe* ovipositing in nature on the large cranberry. The act was performed in a manner similar to that already described. Other females taken on the same date, when confined in glass jars laid a few eggs, placing them in the ordinary position on the under side of leaves within a short distance from the end of the shoot.

We expected the eggs to hatch any day, but when July and August passed without any sign from the hundred-odd examples, it became evident that the insects would winter in this stage.

It is not an easy matter to carry living eggs through the period of hibernation under the most favourable circumstances, and despite such precautions as have been taken, our total ignorance of the conditions necessary to ensure the well-being of the tiny larvæ still within the shell, may be responsible for the loss of the entire lot. We were, therefore, glad to avail ourselves of the assistance of Mr. C. A. Frost. There is a bog about a mile from his home, at South Framingham, Mass., in which he sought for eggs on the cranberry vines, as we had found them, and met with exceptional success. On October 5th we received twelve eggs collected by him in two and a half hours. One of these was on a piece of dried fern, but all others were in the usual position on the leaves. At our suggestion Mr. Frost located more eggs, marking the plants so that it would be possible to find them again in the spring. Under date of Oct. 27th, 1907, he wrote :

"I have to-day located ten eggs on the bog, and marked them as you explained to me. They were all on leaves one inch or less from the top of the stems. One was located where there was a growth of *Sphagnum* moss, but it was as high as the rest. All the eggs so far have been near or on the edge of the bog; I have not looked very much toward the centre."

Should the eggs now hibernating under artificial conditions fail to hatch, we rely on those "marked for future reference" to give their larvæ normally; and with Mr. Frost's able assistance we may be so fortunate as to work out the rest of the life-history of this interesting species before another egg-laying season arrives.

A NEW GALL ON ASTER.

BY T. D. A. COCKERELL, BOULDER, COLO.

Early in October, 1907, I collected a quantity of *Aster crassulus*, Rydberg, in Boulder, for the use of the biology class of the preparatory school. A student, Milton Bergheim, observed that it carried galls, which I had inexcusably overlooked. Once noticed, it was easy to find more; in fact, the plants swarmed with them. On opening them the flies were found to be in the pupa stage, and so were easily bred out a few days later. The species is undescribed.

Cecidomyia crassulina, n. sp.

♂.—Length, $1\frac{2}{3}$ mm.; of wing, $1\frac{2}{3}$ mm.; middle legs a little over 3 mm.; head small, transverse diameter about $357\ \mu$, eyes meeting on vertex. Reddish-brown, the abdomen paler and grayer, the sides of the thorax orange; legs and antennæ pale gray-brown; halteres orange. Antennæ moniliform, with 19 (2 + 17) joints, these with whorls of hairs about $204\ \mu$ long. Wings very hairy; hairs on lower margin about $170\ \mu$ long; first vein (R_1) about $1360\ \mu$ long; second (R_{2+3}) reaching tip of wing; third (cubitus) distinct only as far as the fork, which is almost exactly half way between base and apex of wing. Claws strongly curved, simple. Claspers with apical joint finger-like, strongly curved, obtuse, thickened at end.

Measurements of legs in μ :

Anterior legs: femur, 1088; tibia, 1207.

Middle legs: femur, 1088; tibia, 1071; tarsal joints, (1) 85; (2) 867; (3) 374; (4) 204; (5) 102.

The antennæ are much like those of *Dasyneura pseudacaciæ*, except as to the number of joints, but the venation is quite different, the second longitudinal being curved and ending much lower down. The terminal joint of the claspers is something like that of *C. salicis-batatas* (Ckll., Entomologist, 1890, p. 278), but much more curved and thickened at end. It is more like that of *Diplosis violicola*, Coq. The flies emerged October 11.

The galls are sessile on the branches, often two placed side by side. They are short-oval, about 7 mm. long, densely covered with white hair, looking something like small green peaches.

March, 1908

FOSSIL CHRYSOPIDÆ.

BY T. D. A. COCKERELL, BOULDER, COLO.

Only six species of Chrysopidæ (Lace-wing Flies) are known in the fossil state. Two of these, from Europe, have only been vaguely reported as *Chrysopa* sp.; the other four, named by Scudder, are all from the Miocene shales of Florissant, Colorado. It is even probable that the Florissant species represent all that is known of extinct Chrysopidæ; because the two European forms, according to Scudder and Hagen, are of an extremely dubious character, and very likely not Chrysopidæ at all.

Scudder refers the Florissant species to two extinct genera, and it is very interesting to find that both of these belong to the *Nothochrysa* section, with the third cubital cell divided longitudinally into two sub-equal parts. The genus *Nothochrysa*, McLachlan, is to-day represented in this country by a single species, *N. Californica*, Banks, found in California. Of the same section, but with the colours of *Chrysopa*, is the genus *Allochrysa*, Banks, with two or three species of the States bordering the Atlantic. These forms seem to give way to-day to the dominant *Chrysopa*; but in Miocene times they evidently prospered, and it is likely that *Chrysopa* had either not been evolved, or had not reached this country. A specimen found by my wife at Station 14, Florissant, is referable to *Tribochrysa vetuscula*, Scudder, and shows the apical half of the wings, which was missing in Scudder's type. It is evident from the more complete material that this species cannot go in *Tribochrysa* (the type of which is *T. inequalis*, Scudd.), but allowing for the inaccuracy of Scudder's figure of *Paleochrysa*, as explained in the text (Tertiary Ins. N. Am., p. 167), I think it may fairly be referred to the latter genus, not without a shadow of a suspicion that it is even conspecific with *P. stricta*, Scudd.

The following details supplement Scudder's description:

Paleochrysa vetuscula (Scudder).

Anterior wing, $13\frac{1}{2}$ mm. long; veins dark, as in *Nothochrysa*; the subcosta does not terminate on the margin, as Scudder describes for *Paleochrysa*, but runs through the stigma, as in *Mantispa*; 14 costal cells, not counting a series of minute ones at the apical end; 10 cells between media and radial sector, counting the two long basal ones; 20 cells between radial sector and radius (in Scudder's figure of *vetuscula* the first cross-nervure is omitted); 11 cells between media and cubitus, after the double cell; six branched nervures from cubitus to lower margin, all in apical part of wing. The media has a direct course, without the bend of *Tribochrysa*.

March, 1908

In the table given by Mr. N. Banks (Trans. Am. Ent. Soc., 1903, p. 142), the genus comes in as follows :

- Venation dark I.
- Venation mainly green ; veinlets on outer and posterior margins of wings forked ; third cubital cell (double cubital of Scudder) with normally two branches to hind margin *Allochrysa*, Banks.
1. Veinlets on outer and posterior margins of wings mostly simple ; third cubital cell with only one branch to hind margin *Nothochrysa*, McLach.
- Veinlets on outer and posterior margins of wings largely forked ; third cubital cell with two veins running to hind margin *Palæochrysa*, Scudder.

NOTES ON COLEOPTERA.

BY W. KNAUS, MC PHERSON, KANSAS.

Cotalpa subcibrata, Wick., was fairly common the last two weeks in May and the first half of June, 1907. On willows in the sand hills near Medora, Kansas, in Reno County. During the day they were found clinging to twigs and foliage of scrub willows. I have seen this species, or subspecies, from Central Kansas west, from western Nebraska, and from Colorado, near Fort Collins.

Anthaxia viridicornis, Say, I took for the first time in twenty-five years' collecting in Kansas last June on willows near Medora. Three specimens only were taken.

A new *Charistena* near *ariadne*, Newm., but markedly distinct from that species in the shape of the thorax and other characters, was beaten from willows near Medora the first week in June, 1907. Three specimens were taken. I had never seen the species before, although the same ground had been collected over by me for the past twenty years.

Glareis inducta, Horn, was taken at light one evening in July, 1907, in McPherson ; but one specimen was secured differing slightly from typical specimens of the species. This record extends the range of the species much to the northward, the previous northern record having been near Fedor, Texas.

Specimens of *Cicindela marginata*, Fab., and *togata*, Laf., were received during the past season from Mr. H. P. Loding, taken near Mobile, Alabama ; this is a new locality for this species.

March, 1908

A fine male specimen of *Xylophilus (Emmelinus) Ashmeadi*, Csy., taken near Mobile, was also sent to me by Mr. Loding. The species was described from Florida.

Nathicus virginæ, Csy., is a pretty Anthicid recently sent me by Mr. Loding, from near Mobile. The type was described from Fortress Monroe, Va.

While collecting in the Sacramento Mountains, near Cloudcroft, N. M., last June, I secured a number of specimens of an undescribed species of Pselaphidæ belonging to the genus *Euplectus*. They were found on the inner surface of pine bark stripped from stumps. The specimens are of the same colour as the inner bark, and are difficult to detect when collecting. I also secured a single specimen of an *Actium*, also undescribed. It was found in a Scolytid burrow under pine bark.

A flowering shrub with long catkins of pink and white flowers near Cloudcroft attracted hundreds of specimens of an Aleocharinid last June. The species is near *Platandria mormonica*, Csy., but Maj. Casey pronounces it a new species differing chiefly in sexual characters. Hundreds of specimens could be taken by inserting the catkins carefully in the cyanide bottle, when a slight shake would send the beetles to the bottom of the jar.

On three collecting trips to the Sacramento Mountains of N. M., near Cloudcroft, previous to my trip of last June to the same region, I had taken one or two specimens of that curious little Pselaphid recently described by Mr. Charles Schæffer, of the Brooklyn Museum, as *Fustiger Knausii*. The past season, however, I was more fortunate, and secured a fine series of this rare species. They occurred in the nests of a rather small, dark-coloured ant, of the genus *Lasius*, probably *americanus*, although one or two were found in the nest of a similar coloured but smaller ant. These nests were on the summit, at an elevation of nine thousand feet, and were found under stones. Only a small per cent. of the ant colonies were inhabited by *Fustiger*. Occasionally one, more often two, three or four, were found. My best catch was eighteen specimens with one colony of *Lasius*. The light reddish colour and slow movements of *Fustiger* allow them to be seen and taken easily. When disturbed the colony of ants pays no attention to the beetles, but at once begins to carry away the larvæ and pupæ. Only in one instance was an ant seen to seize a *Fustiger*. On being captured it refused to release its victim, was transferred to the cyanide bottle, and after death it was necessary to sever the thorax of the *Fustiger* to release it from the mandibles of the ant.

NOTE ON GABRIOLA DYARI, TAYLOR.

BY GEO. W. TAYLOR, WELLINGTON, B. C.

This species was described by me¹ from a male specimen only, and no females have yet been discovered.

Dr. Dyar, after examining the Hulst collection, expressed the opinion² that the single type of *Nacophora minima*, Hulst, in that collection was conspecific with the male *Dyari*, and that therefore my species would fall.

Lately³ Mr. Grossbeck has expressed the same opinion.

A short time ago, however, I had the pleasure of seeing the type specimen of *N. minima* myself, and noted some differences; and subsequently on going through the fine collection in the U. S. National Museum, I was pleased to find two male specimens which agreed exactly with my note of *minima*, and showed clearly the validity of *G. Dyari*.

This species will therefore stand, and Hulst's species, which is not a *Nacophora* (as it lacks the tongue that should be present in that genus), must be known as *Gabriola minima*.

The two males just mentioned are labelled respectively "Arangie, Idaho," and "Glenwood Springs, Colo., Aug. 1-7," agreeing in locality with *G. minima*.

G. minima may be distinguished from *G. Dyari* by the very straight intradiscal line, that line in *Dyari* being well rounded out. The prevailing tint in *Dyari* is a warm brown, while in *minima* it is dull gray, and the white blotch at the anal angle of the fore wing, so conspicuous in *Dyari*, is absent.

A REPLY TO DR. DYAR.

BY EVELYN GROESBEECK MITCHELL, WASHINGTON, D. C.

I have been deeply gratified at the many favourable reviews and comments which my work, "Mosquito Life," has received. In Dr. Dyar's review, he not only seems unable to say anything against it, but, on the other hand, to so admire it, that he has become possessed of the strange idea that he is actually the author of some portion of it, since he says that he has to turn to the title page to ascertain whether or not it is his own. This, as well as other deplorable notions, he has seen fit to set forth in print. I shall endeavour to dissipate these vagaries in the order in which he has expressed them :

1. CAN. ENT., XXXVI, 255.

2. Proc. Ent. Soc. Wash., VI, 226.

3. Ent. News, XVIII, 151.

1. I have had no help whatever from Dr. Dyar in the preparation of my book, or in that of my thesis, except in the one instance regarding the latter, acknowledged below.

2. As for Mr. Coquillett, if Dr. Dyar intends to say that that gentleman wrote or dictated any portion of my book, Dr. Dyar is stating what he knows to be an absolute untruth. The book was written at my home in New Jersey, and Mr. Coquillett never saw it until I had everything settled with the publishers. If I have not given sufficient credit to any one, it is to Dr. H. A. Morgan, who, when I asked him exactly what part he had taken in the work at Baton Rouge before I came, answered, with his characteristic modesty, that he would prefer to remain unmentioned rather than risk detracting in any way from the credit due Dr. Dupree. In fact, one of the readers of the manuscript remarked that I gave more credit than necessary.

3. If my book "reads like a second edition of Dr. Howard's," the latter would have to be entirely rewritten and largely extended. At present, beyond treating of the same general subject, I fail to see any comparison in plan, style or text. In fact, I purposely passed lightly over some subjects, such as the experiments in Cuba, because they were fully enough treated in Dr. Howard's book, and said so (*Mosquito Life*, p. 105). I have certainly credited him wherever I quote him and have referred to his book as "admirable." I found no necessity for quoting any biological notes from Dr. Dyar, though I have quoted Mr. Knab. I do not agree with Dr. Dyar's systematic work, and devised my keys after my own plan. I adhere to Mr. Coquillett's classification because I preferred to adopt one that is sane, scientific and likely to remain permanent.

4. I treated of the biology of all United States species so far as known up to the time of my receiving galley proof.

Other species whose habits were unknown, I mentioned by name and distribution. The western species are mostly thus treated; naturally, this was unavoidable. Species founded on larvæ only, I purposely omitted.

5. There are no descriptions of larvæ in the text. There are a few general references to superficial appearances, from which alone it would be absolutely impossible to identify the larva with certainty. These references may correspond to Dr. Dyar's idea of a proper description, although they are, as should be plain to the reader, not so intended. Possibly he refers to the keys. I submit here my "description" of *pipiens*, the common house mosquito, as an example, for comparison with that which he gives of the same species in his article on Culicid larvæ as independent organisms (*Journ. N. Y. Ent. Soc.*, Dec., 1906, p. 206). To ensure entire comparison, I begin with his generic key. I do not need to quote from mine, as my larva-table runs to specific and generic names combined;

DR. DYAR.—GENERIC KEY.

Couplet 1. Mouth brush vibratile, diffusely folded inward.

4. Air tube long [how long is a piece of string?], the hairs in scattered tufts or absent, the antennæ usually with the tuft beyond the middle away from a notch.

5. Anal segment without hairs before the barred area.

6. Lateral comb of the eighth segment of many scales in a triangular patch.

SPECIFIC KEY.

1. Antennæ with the tufts outwardly placed, the part beyond slender.

5. Air tubes four times as long as wide or over.

7. Anal appendages 4, normal.

8. Air tube with 4 paired tufts posteriorly outwardly, sometimes increased by additional ones basally, the subapical one moved laterad; out of line, usually situated at the outer third of the tube.

14. Air tube less than five times as long as wide, the sides curved, tapering rather rapidly after the middle, subfusiform.

17. Air tube 5×1 [N.B. The tube seems to grow between 14 and 17!], pecten teeth about 15, subdorsal hairs of abdominal segments 3 and 4 double.

MY LARVA KEY.

1. Tube well developed, tube-like. *Long thoracic tufts present.*

9. Chitin of head not produced laterally, *posterior portion of mandible never produced or visible from above.*

10. *Anal gills never three times as long as tube, never with more than four distinct constrictions.*

11. Mouth brushes of slender hairs, directed forward. *Antennæ situated far forward.*

17. Tube with more than two tufts.

18. Antennal tuft in notch and *having 10-30 hairs, usually over 15.* Pecten extending less than half way up tube, not more than two teeth separated.

19. Body and head with no noticeable pilosity.

20. Scales of comb in more than two rows. Tufts of tube not plumose.

22. Antennal tuft beyond middle, tube with tufts.

23. *Group of hairs nearest meson in thoracic row, one of three long single hairs.* Tufts of tube mostly of two to four hairs.

24. Tufts on tube 4, the penultimate one more laterad, tube tapering decidedly on the last half. *Terminal spines of antennæ not very long, not over one-half length of antennæ. Head tufts not projecting much, if at all, beyond forward margin of head. Tips of antennæ and spines of but slightly heavier chitin than base of antennæ.*

The other "descriptions" will be found to vary quite as widely from Dr. Dyar's. Length, as compared to width of tube, appears to be one of his favourite characters, and is absolutely undependable in skins, especially when such a close distinction as that between 5×1 and 4×1 must be drawn. Against this I protest in my book, as also against a too extensive use of another of his favourite characters, the number of comb scales (pp. 16 and 17). The italicised characters in my "description" he *never* uses. I have made large use of the number of hairs in certain tufts on the head, while he rarely notices the tufts at all.

6. Mr. Knab (who is certainly a fine artist) must have conveyed his criticisms to me by telepathy, with the additional obstacle of our being unaware of each other's existence. All my drawings, save *O. bimaculatus*, plate III, the mouth-parts of some of the *Uranoteniis* and the egg of *L. squamiger* were made in Louisiana long before I came to Washington. The exceptions mentioned were made in Washington from specimens sent by Dr. Dupree for that purpose, save the *bimaculatus*, which I made in pencil for a nature-study article from a specimen given me by Dr. Dupree, who also gave me permission to publish as I pleased. I made a somewhat similar wash-drawing of this species for the Monograph. At no time has Mr. Knab supervised or corrected my drawings.

7. I fail to see how I could have "absorbed a large amount of information" from the Museum (not Carnegie) collection of larvæ, on which I was at first set to work.

I have worked on very few of the species belonging to the actual Carnegie collection. Be it observed, that my work, outside the keys, is wholly biological as contrasted with Dr. Dyar's "systematic" work, and could not possibly be derived from dead specimens. At no time have I had access to any of Dr. Dyar's or Mr. Knab's notes, and I have never even seen any except as they appeared in print.

8. As to the keys themselves. When I began drawing I had, as stated in my Introduction, keys covering the Louisiana forms. I was encouraged to extend these, and no objection was made to my using them as a thesis, which I plainly said I expected to publish. When I wished to do so, however, opposition was made on the ground that "everything in the larva key outside the Louisiana species was Carnegie." Now, some had been collected in the District of Columbia and in New Jersey by myself, some sent to me, and for the rest I had been careful to use only what I was informed was the Museum study collection, to which, as a George Washington University student, I had right of access, except in

the case of *D. cancer* and *O. Mitchellae*, which Dr. Dyar most magnanimously and generously loaned me for the purpose. I made acknowledgment to the Museum in my thesis.

Five United States species out of 26 northern species (which include my own material as mentioned above), proved to be Carnegie, and two were doubtful. Some West India species proved to be thus classed, and I have omitted all West India or other extralimital forms entirely. I was informed that "if I reworked my keys from other specimens there would be no objection," but that "I might find some difficulty in so doing." I therefore went to the New Jersey and New York State collections, entirely reworked and radically changed my keys, and had the advantage of better series of specimens, also several species not found at all in the National Museum collection, as well as those which were in the latter collections. Please note, Dr. Dyar's keys, including all the Museum and the Carnegie species said to be in my keys, were published long before I began to rework my keys; that I publish no new species at all, and "describe" no larvæ not already published by Dr. Dyar or some one else. My only crime seems to be that I have founded keys mainly on characters of which he makes little or no use, and presume to differ from his ideas and evolve a few of my own. This is the first time I am aware that I was supposed to have any connection with the Monograph beyond drawing for it. Although Dr. Dyar did occasionally request me to differentiate species when he could not, I never made agreement to do such work. One would naturally suppose that such work would be done by the "expert" himself, inasmuch as he assumes the credit for it.

9. As for "redrawing figures after office hours," I have already stated where and when my figures were drawn. Further, Dr. Dupree neither sold nor gave the drawings made for him to the Carnegie Institute, but merely lent them, with the understanding that I should copy them for the Monograph and be paid for my time. He reserved the right of first publication. He never took a cent from the Institute, because he wished to publish independently. I have not copyrighted any drawings made for the Monograph, only the originals made for Dr. Dupree from his specimens. The fact that drawings are copyrighted of which copies were made for the Monograph does not hinder Dr. Dyar from the publication of these copies. To be sure that it would not, I have plainly indicated in my Introduction that I expected them to be published in the Monograph (p. XIX.). I have no doubt that Dr. Dyar would have liked to prevent the publication of my book, but evidently could not. He certainly knew that I was at work on one, since I am told that the Duprees were requested, shortly after the

Doctor's death, to turn over his notes for the Monograph and refused on the ground that the material was already promised to me. Mrs. Dupree wrote to me: "In regard to getting out the book, I don't think anybody could do it as well as yourself." Since Col. Boyd, President of the Louisiana State University, and Prof. H. A. Morgan advised her to send the notes to me, I think there can be no question as to how I "acquired" them.

I feel rather flattered at the comparison to *Psorophora*, since this insect is large, beautiful, not a frequent nuisance, but an exterminator of common and pestiferous "Ædids." However, I must admit that when it bites, it bites hard.

I deeply regret the departure from facts upon Dr. Dyar's part, which has necessitated this reply. Since personalities are not science and have no place in scientific publications, I have, although sometimes under great provocation, hitherto passed over all personal attacks. This time I do not see how I can honourably remain silent.

NOTES ON THE LEPIDOPTERA OF KASLO, B. C., WITH DESCRIPTIONS OF SEVEN NEW SPECIES.

BY GEO. W. TAYLOR, WELLINGTON, B. C.

(Continued from page 60.)

7. *Sciagraphia purcellata*, n. sp.—It is a dangerous proceeding, I am afraid, in the present stage of our knowledge, to describe a new species of *Sciagraphia*, but as I cannot find any published description to fit the present form, and as it comes from a locality possessing many peculiar species, I have, after comparing it with long series of its nearest allies, ventured to give to it a distinct name.

Mr. Cockle has shown me three specimens, which I have labelled as types. They were all taken by him in the neighbourhood of Kaslo, and are dated 7th July, '07; 3rd August, '02, and 15th August, '01. The first and last named, which are both females, are in my own cabinet, the other one remains with Mr. Cockle.

Mr. Cockle tells me that a similar specimen taken much earlier in the year was named for him at different times as *S. nubiculata*, *S. puncto-lineararia* and *S. subacuta* (see Lep. Koot., p. 906), but I am of opinion that all these determinations are erroneous, and that these names should all be removed from our list. *S. purcellata* may be described as follows:

Expanse, 25 mm.

March, 1908

The ground colour of the wings and abdomen is like that of *S. granitata*, and I think that I should probably have passed over *purcellata* as a small race of *granitata* but for the fact that the last named is a very common insect at Kaslo, normally very large and dark, and not appearing to intergrade in any way with the species under discussion.

The head and collar in *purcellata* are tinged with ochreous, the abdomen is grayish, with faint brown twin spots dorsally, and by this last character *purcellata* can be distinguished readily from the species of the *helioidata* or *californiata* groups, all of which have the abdomen unspotted.

The fore wing is crossed by the usual three lines, but they are firmer and less wavy than is usually the case in *granitata*; this is especially noticeable in the extra-discal line.

Beyond the extra-discal line is a broad and distinct dark shade, which includes and obscures the dark blotch between veins 3 and 5.

The dark shade is followed outwardly by a rather distinct white line. The marginal line of blackish spots, generally so well marked in *granitata*, is hardly visible.

The hind wing is heavily speckled with darker gray, and an irregular line is traceable as in *granitata*.

The discal spots on the fore wings are obsolete, and on the hind wings are very small and faint.

Beneath, all the wings are speckled and mottled with ochreous, and on the fore wing there is a median line and an extra-discal band of the same colour, each bordered outwardly by a broken white line.

On the hind wings there are also two lines, median and submarginal, quite distinct. The discal dots on all the wings are minute.

It will be seen that *purcellata* is most nearly allied to *granitata*, but I think that the small size, the plainer and more regular markings, and the other slight differences noted above, will serve to distinguish it.

In order to make this paper more complete as a supplement to the Geometrid portion of Dr. Dyar's excellent "Lepidoptera of the Kootenai District of British Columbia" (Proc. U. S. Nat. Mus., XXVII, 779-938, 1904), I append a list of the corrections and alterations, which, after the study of more abundant material than Dr. Dyar possessed, I think should be made in the nomenclature of the species noticed in that paper.

It must not be thought that all these are cases of misidentification on the part of Dr. Dyar, for in many instances they are simply restorations of older names brought to light since the publication of his paper.

- Tephroclystis laquæaria*, H. Sch., should be *Eupithecia albicapitata*, Packard.
- T. absinthiata*, Clerck, should be *E. coagulata*, Gueneé.
- T. satyrata*, Hubner, should be *E. perfusca*, Hulst.
- T. laricata*, Freyer, should be *E. perbrunneata*, Taylor.
- T. multistrigata*, Hulst, should be *E. Dyarata*, Taylor.
- Eucymatoge grandis*, Hulst, should be *Eucymatoge Græfii*, Hulst.
- E. linariata*, Fab., should be *E. tenuata*, Hulst.
- Venusia 12-lineata*, Pack, should be *Euchaeca Pearsalli*, Dyar.
- Eustroma populata*, Linn., should be *Eustroma propulsata*, Walker.
- Mesoleuca cæsiata*, D. and Schif., should be *Eutephria multivagata*, Hulst.
- M. albolineata*, Packard, equals *M. silacea*, Hubner.
- Hydriomena tæniata*, Stephens, should be *Hy. basaliata*, Walker.
- Triphosa progressata*, Walker, should be *T. hæsitata*, Gueneé.
- Cosymbia lumenaria*, Hubner, should be *C. pendulinaria*, Gueneé.
- Eois rotundopennata*, Pack., should be *E. Hanhami*, Hulst.
- Synchlora rubrifrontaria*, Pack., should be *S. liquoraria*, Gueneé.
- Aplodes rubrifrontaria*, Pack., equals *A. Darwiniata*, Dyar, a good species, var. *Darwiniata*.
- Deilinia erythemaria*, Gueneé, should be *D. pacificaria*, Pack., a good species, var. *pacificaria*, Pack.
- Deilinia quadraria*, Grote, should be *Ixala desperaria*, Hulst.
- D. rectifascia*, Hulst, equals *D. fæminaria*, Gueneé.
- D. litaria* (Dyar, not Hulst), equals *D. falcataria*, Pack.
- D. variolaria*, Gueneé, should be *Diastictis Hulstiararia*, Taylor.
- Sympherta tripunctaria*, Pack., equals *S. lorquinaria*, Gueneé.
- Nepytia umbrosaria*, Pack., should be *Enypia Packardata*, Taylor.
- Selidosema humarium*, Gueneé, equals *Cleora emasculatum*, Dyar, a good species, var. *emasculatum*, Dyar.
- Melanolephia canadaria*, Gueneé, equals *Mel. limitata*, Walker, var. *subgenericata*, Dyar.
- Metrocampa prægrandaria*, Gueneé, should be *M. perlata*, Gueneé.
- Metanema textrinaria*, Grote and Rob., equals *M. quercivoraria*, Gueneé.

In the foregoing list, whenever the two words are connected by the word *equals*, it signifies that the first name is a synonym of the second. When the expression "should be" is used, it means that the first name does not apply to the Kaslo species, but to a different insect.

THE MATING OF *BOREUS CALIFORNICUS*.

BY J. W. COCKLE, KASLO, B. C.

The habits of these insects, which are found travelling over snow in winter, present many curious features, amongst them being the fact that cold seems to have little effect on them. I have collected them on the snow when the temperature showed several degrees of frost, but even at this low temperature they would be capable of motion. They are usually very lively when the temperature is just above freezing point, and when the snow is deep in the woods and a slight thaw is commencing is the most favourable time at which to go out collecting. This afternoon, Jan. 26th, whilst travelling along a road through the timber, I picked up several specimens, and transferred them to a box in the hope of shipping them to Dr. Fletcher, who was desirous of seeing specimens of them alive. Having secured several, on the way back home I noticed a specimen which appeared to have something on its back, which, on closer observation, proved to be a pair in copulation; the day was cloudy, and the temperature had held at just the freezing point all day, but at this time a change was coming over the snow and a slight thaw was setting in. It is probable that the temperature at the time I noticed them was below 33 degrees. As I have collected large numbers of these insects, and this was the first occasion that I had seen a pair together, I took occasion to examine them closely. I had with me only a small pocket-lens with a three-quarter-inch focus, and in order to observe them through this I was compelled to lie down on the snow. Such a position, it can readily be understood, was not particularly favourable for an extended study. The female was riding on the back of the male, her front legs folded up in the position of kneeling, the second pair resting on the back of the male, whilst the much elongated third pair hung down below the abdomen of the male; the ovipositor was released from the sheath, which remained in its normal position, whilst the ovipositor itself was thrust down perpendicularly into the organs of the male. The male presented a very extraordinary feature, the embryonic wings, which are curved at the tips, were extended and hooked over the tibiae of the kneeling female, thus holding her in an upright position on the back when he moved about.

The fact of the wings being used as an aid in holding the female during copulation, may be possible with other insects, but this is the first instance which has come under my observation where they have been put to such a use.

My recumbent position in the snow being very unpleasant, I picked up the pair with my forceps, and transferred them to a box, but as they immediately separated, further observations were suspended.

NOTES ON NOCTUIDÆ.

Collected by Mrs. M. D. Nicholl, in Alberta, British Columbia, and the Washington Forest Reserve, in the years 1904-5-7.

BY SIR G. F. HAMPSON, ET., B.A., ETC., BRITISH MUSEUM, LONDON, ENG.

The numbers given are those in Dyar's Catalogue of N. American Lepidoptera, and only the more local and interesting species are referred to. The specimens are in the British Museum.

AGROTINÆ.

2407. *Heliothis vaccinia*, H. Edw.

B. C., 1905, Upper Skagit, 1 ♀. U. S. A., 1905, Robinson, 1 ♀; Washington Forest Reserve, 1905; Washington Pass, 1 ♂, 1 ♀; Horseshoe Pass, 1 ♀.

2405. *Heliothis honesta*, Grote.

B. C., 1905, Upper Keremeos, 1 ♂; Pasayten, 1 ♂.

1767. *Agrotiphila maculata*, Smith.

Alberta, 1907, Mt. Athabasca, 3 ♂'s, 2 ♀'s; 1905, Laggan, 1 ♂. B. C., 1904, Lake O'Hara, 1 ♀.

1764. *Orosagrotis incognita*, Smith.

Alberta, 1907, Brobokton Creek, 1 ♂.

1560. *Porosagrotis orthogonia*, Morr.

Alberta, 1907, Prairie, 1 ♂.

1734. *Euxoa colata*, Grote.

Alberta, 1907, Wilcox Peak, 1 ♂.

1732. *Euxoa nordica*, Smith.

Alberta, 1907, Kootenay Plains, 1 ♀.

1431. *Episilia littoralis*, Pack.

Alberta, 1907, Kootenay Plains, 4 ♀'s.

1417. *Aplectoides speciosa*, Hübn., var. *arctica*, Zett.

Alberta, 1907, Wilcox Pass, 1 ♂.

Protagrotis Nicholle, n. sp.—Head, thorax and abdomen brown, mixed with gray-white; tarsi with slight pale rings. Fore wing fuscous-brown, mixed with gray-white; sub-basal line represented by slight dark marks below costa and cell; antemedial line dark, defined by white on inner side, erect, angled outwards in submedian fold and above inner margin and inwards on vein 1; claviform slightly defined by blackish at

March, 1908

extremity; orbicular represented by some white scales; reniform defined by white on outer edge, otherwise undefined; a very indistinct sinuous dark medial line; postmedial line indistinct, dark, slightly defined by whitish on outer side, bent outwards below costa, then dentate, incurved below vein 4, some white points beyond it on costa; subterminal line whitish, slightly defined by fuscous on inner side, waved, excurved below vein 7, angled inwards in discal fold, and incurved below vein 3; a slight dark terminal line; cilia fuscous, intersected with whitish. Hind wing grayish, nearly uniformly suffused with fuscous-brown; a slight dark discoidal lunule; cilia white, with a slight brown line through them; the under side whitish, irrorated with fuscous-brown, a slight discoidal lunule, indistinct sinuous postmedial line and diffused subterminal line.

Alberta, 1907, Wilcox Pass, 3 ♀'s; Brobokton Creek, 1 ♀. B. C., 1904, Simpson R., 1 ♂ type; Glacier, 1 ♀. Expanse, 44 mm. In the collection of Prof. J. B. Smith is a specimen from Washington, Mt. Ranier, which, he informs me, is much brighter in colour.

HADENINÆ.

1936. *Anarta impigens*, Wlk.

Alberta, 1907, Wilcox Pass, 2 ♂'s; Brobokton Creek, 2 ♂'s. B. C., 1904, Simpson R., 1 ♂.

Anarta Staudingeri, Auriv.

Alberta, 1907, Brobokton Creek, 4 ♀'s.

1935. *Anarta Richardsoni*, Curt.

Alberta, 1907, Wilcox Pass, 1 ♂, 2 ♀'s; Mt. Athabasca, 3 ♂'s.

1931. *Anarta melanopa*, Thubg.

Alberta, 1907, Wilcox Pass, 2 ♀'s; Mt. Athabasca, 3 ♂'s, 6 ♀'s; Brobokton Creek, 3 ♀'s. B. C., 1904, Okanagan, 2 ♂'s, 1 ♀; 1905, Ashnola, 1 ♀. U. S. A., 1905, Washington Forest Reserve, Upper Skagit, 3 ♂'s, 1 ♀.

1915. *Lasiestra phoca*, Möschl.

Alberta, 1904, Lake Louise, 1 ♂, 1 ♀; 1907, Mt. Athabasca, 3 ♀'s; Sheep Mt., 1 ♀; Brobokton Creek, 1 ♂, 1 ♀. B. C., 1904, Kicking Horse Pass, Yoho Peak, 1 ♀; Mt. Assiniboine, 2 ♀'s; Lake O'Hara, 1 ♀.

1910. *Lasiestra uniformis*, Smith.

B. C., 1904, Mt. Assiniboine, 1 ♀.

Lasionycta Rainieri, Smith.

B. C., 1904, Kicking Horse Pass, Yoho Valley, 1 ♂.

1998. *Miselia ingravis*, Smith.

Alberta, Wilcox Pass, 1 ♀. B. C., 1907, Vancouver I., Cowichan Lake, 1 ♂.

Miselia carbonifera, n. sp.—♀. Head, thorax and abdomen fuscous-black, mixed with some gray; frons with black bar above; tarsi slightly ringed with white. Fore wing fuscous-black, irrorated with gray; sub-basal line represented by diffused black striæ from costa and cell; antemedial line slight, black, somewhat sinuous and oblique; claviform small, defined by black; orbicular slightly defined by black and irrorated with whitish, irregularly rounded; reniform indistinctly defined by black, its annulus represented by a white line on outer side, curved inwards at lower angle of cell; postmedial line very indistinct, black, defined on outer side by some white scales towards costa, bent outwards below costa, then dentate, excurved to vein 4, then incurved, some white points beyond it on costa; subterminal line represented by some white scales defined on inner side by black lunules, slightly excurved below vein 7 and angled outwards at veins 4 and 3; a terminal series of slight black lunules; cilia intersected by whitish at the veins. Hind wing fuscous-black, mixed with gray; a fine black terminal line; cilia whitish, mixed with black; the under side with faint blackish discoidal spot and indistinct diffused curved postmedial line.

Alberta, 1907, Wilcox Pass, 2 ♀ type. Expanse, 50 mm.

There is a worn female of a closely-allied unnamed species in the British Museum from N. Siberia, Verkhoiansk, it appears to be most nearly related to *M. mystica*, Smith.

CUCULLIANÆ.

Eumichtis maida, Dyar.

B. C., 1904, Glacier, 1 ♀.

Sympistis Zetterstedti, Staud.

Alberta, 1907, Mt. Athabasca, 1 ♂. B. C., 1904, Kicking Horse Pass, Yoho Valley, 1 ♀.

The specimen recorded as *S. lapponica* in Cat. Lep. Phal., VI, p. 416, belongs to this form.

Var. *labradoris*, Staud.

Alberta, 1904, Lake Louise, 1 ♂, 1 ♀; 1907, Mt. Athabasca, 1 ♂, 1 ♀; Wilcox Peak, 1 ♂. B. C., 1904, Lake O'Hara, 1 ♂, 1 ♀; Mt. Assiniboine, 1 ♂.

Sympistis coclei, Dyar.

Alberta, 1907, Brobokton Creek, 1 ♀.

Closely allied to *S. funesta*, Payk., and not a *Homohadena*.

ACRONYCTINÆ.

2260. *Calamia tranquila*, Grote, var. *viridula*.

U. S. A., Washington Forest Reserve, 1905, Early Winter Creek, 1 ♀.

2423. *Eutrichopsis nexilis*, Morr.

B. C., 1904, Lake O'Hara, 1 ♂; 1907, Sheep Mt., 1 ♀. U. S. A., Washington Forest Reserve; 1905, Washington Pass, 1 ♀.

CATOCALINÆ.

2761. *Drasteria annexa*, H. Edw.

Alberta, 1904, Banff, 1 ♀.

2755. *Drasteria crassiuscula*, Haw.

B. C., 1904, Greenwood, 1 ♂, 1 ♀; L. Okanagan, Penticton, 2 ♀'s, 1905, 1 ♂; Ashnola, 2 ♂'s, 2 ♀'s; Up. Keremeos, 1 ♀.

PLUSIANÆ.

2492. *Plusia Californica*, Speyer,

Alberta, 1907, Bear Creek, 1 ♀. B. C., 1905, Ashnola, 3 ♀'s.

2526. *Plusia speciosa*, Ottoleng.

B. C., 1905, Pass D. Hope, 2 ♂'s. Identified by Dr. Ottolengui.

2502. *Plusia octoscripta*, Grote.

B. C., 1905, Pass D. Hope, 1 ♀. U. S. A., Washington Forest Reserve, Early Winter Creek, 2 ♀'s.

2512. *Plusia angulidens*, Smith.

U. S. A., Washington Forest Reserve, 1905, State Creek, 1 ♀.

Plusia orophila, n. sp.—Head and thorax blue-gray, mixed with some brown and black; palpi mostly black; tegulæ with diffused black medial line; tarsi black, ringed with white; abdomen gray, tinged with reddish-brown. Fore wing blue-gray, slightly irrorated with black, the terminal area tinged with reddish-brown; sub-basal line black, slightly defined by white on outer side, excurved below costa and ending at vein 1;

antemedial line obsolete on costal half, white, nearly straight and oblique from median nervure to inner margin; medial area black-brown from cell to inner margin; claviform absent; orbicular with faint whitish annulus, with gray centre, slightly defined by black above, round; reniform with whitish annulus, its inner edge straight and oblique, defined on each side by black, its outer concave at middle with some black in upper part and beyond middle; a U-shaped silvery-white mark filled in with gray below median nervure, its inner arm bent inwards; postmedial line double, filled in with whitish, slightly excurved below costa, oblique to vein 5, then slightly incurved; subterminal line absent; a terminal series of slight, black lunules, defined on inner side by gray lunules; cilia gray, mixed with brown and with series of blackish spots. Hind wing orange-yellow; some brown suffusion at base; a slight discoidal striga; the terminal area black-brown, narrowing to tornus; cilia chequered brown and white, and with brown line through them; the under side with the costal area slightly irrorated with brown, traces of a curved postmedial line.

Alberta, 1907, Brobokton Creek, 6 ♂, 2 ♀ type. U. S. A., Washington Forest Reserve, 1907, Early Winter Creek, 1 ♂. Expanse, 34-40 mm.

A specimen of this species was identified by Dr. Ottolengui as *P. diasema*, Boisd.; this, however, which is found in N. Europe and Asia, and in America, from Greenland to Labrador, has the head, thorax and fore wing much more strongly tinged with red-brown, the last with the antemedial line excurved below the cell, the stigma more V-shaped, with a slight tail or point beyond its lower extremity; the hind wing with the terminal area reddish-brown. The record from Colorado probably refers to the new species.

2528. *Plusia sacconi*, Grote.

Alberta, 1907, Mt. Athabasca, 1 ♂.

2532. *Plusia parilis*, Hübner.

Alberta, 1907, Mt. Athabasca, 6 ♂'s; Wilcox Pass, 1 ♂.

2535. *Plusia alticola*, Wlk.

Alberta, Mt. Assiniboine, 1 ♀; 1907, Wilcox Pass, 2 ♂'s; Brobokton Creek, 1 ♂; Brazeau Creek, 1 ♀. B. C., 1904, Kicking Horse Pass, Hector, 1 ♂.

The type was taken by Lord Derby in the Canadian Rockies in 1845, and is quite distinct from the European *devergens*, Hübner. The record from Colorado probably refers to this species.

NOCTUINÆ.

2782. *Syneda divergens*, Behr.
B. C., 1905, Ashnola, 1 ♂, 1 ♀.
2781. *Syneda graphica*, Hübn.
B. C., 1904, Up. Kerameos, 1 ♂; 1905, 1 ♂; Ashnola, 1 ♀.
2783. *Syneda patricola*, Wlk.
Alberta, 1904, Banff, 1 ♂; Laggan, 1 ♀. B. C., 1904, Greenwood, 1 ♀; Kaslo, 1 ♀; Up. Kerameos, 1 ♀.
2800. *Syneda athabasca*, Neum.
Alberta, 1907, Mt. Athabasca, 3 ♂'s; Wilcox Pass, 2 ♂'s, 1 ♀.
2799. *Syneda hudsonica*, Grote and Rob.
Alberta, 1904, Banff, 1 ♂; 1905, 1 ♀; 1907, Kootenay Plains, 1 ♂.
B. C., 1904, Kaslo, 2 ♂'s; Greenwood, 1 ♂; Okanagan, 2 ♂'s, 1 ♀; 1905, Ashnola, 4 ♂'s.
2788. *Syneda ochracea*, Behr.
B. C., 1904, L. Okanagan, Penticton, 1 ♂; 1905, Up. Kerameos, 1 ♀.

A NEW LEPIDOPTEROUS GALL-PRODUCER.

BY A. COSENS, M.A., TORONTO.

Stigmatophora ceanothiella, n. sp.—This small moth produces galls on *Ceanothus Americanus*, L.; these abnormal growths are found commonly on a main stem, but rarely on a branch. The flower cluster is sometimes entirely aborted, but usually only partly so, the lower pedicels in the cluster remaining normal.

In the majority of cases the gall is terminal, but in a few instances the stem was found to project a short distance beyond it. The gall has the relatively simple structure of a spindle-shaped enlargement of the stem. In length it varies from 10 to 15 mm., and in greatest width from 5 to 8 mm. It is roughened on the outside by the stumps of the aborted branches. On account of the shortening of the stem axis and the consequent crowding of the nodes, these branches are more numerous on a gall than on a corresponding length of normal stem. This gives the gall a gnarled surface and forms a strongly-protected case for the larva. The gall in some cases is surmounted by a tuft of leaves growing from its apex.

The aperture through which the moth escapes from the gall is made always near the upper end.

March, 1908

The insect passes the winter in the larval condition. Galls examined in December were lined with silk, which, no doubt, was a protective measure against cold and moisture.

The dates of emergence of specimens from galls collected are the following: June 23, 1907, five specimens; June 24, ten; June 25, six; June 26, five; June 27, two, and June 30, three.

Larva.—Length, 6–8 mm. Head black, the rest of the body light yellow, except the dorsal part of the first segment. This bears a pair of light brown, somewhat triangular-shaped, spots. The base of the triangle is slightly indented. Four rows of very short hairs run the whole length of the body, two of these rows are dorsal and two lateral. The rows are composed of from 4 to 6 hairs on each segment.

Pupa.—Length, 4–5 mm. Light brown in colour.

Imago.—♀, ♂. Expands 10–12 mm. Head: Colour dark brown, with a bright bronzed lustre, which imparts a greenish tint. The basal joints of the antennæ are relatively long and much enlarged at the distal end.

Thorax: The dorsal surface presents the same lustrous bronzed appearance as the head, but the ventral surface is somewhat paler in colour and with a less brilliant lustre. The legs present the same colour as the dorsal aspect of the thorax, but the lustre is less brilliant on the inner surface.

The fore wings show the lustrous bronzed-green of the body with less brilliancy below. They are fringed along the inner and the outer margins. The fringe is light brown in colour, darkening towards the outer margins of the wings. It entirely lacks the lustre of the remainder of the wings.

The hind wings are plume-like, as all the margins of the wings carry the light brown fringe, which becomes darker on the outer margin. The axis of the wing is of a lighter brown colour than the fringe, and presents in some cases a silvery lustre.

Abdomen: Coloured like the thorax, but the tints are decidedly lighter and the lustre slightly silvery.

I am indebted to Mr. Augustus Busck, of the Smithsonian Institution, who has supplied me with the generic relations of the form. He states that it is somewhat aberrant in the genus *Stagmatophora*, as veins 5, 6 and 8 are all from one stalk in the fore wings.