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The Canadian Entomologist.

VOL. XV. LONDON, ONT., DECEMBER, 1883.

No. 12

LIST OF DIURNAL LEPIDOPTERA COLLECTED IN THE NORTH-WEST TERRITORY AND THE ROCKY MOUNTAINS.

BY CAPTAIN GAMBLE GEDDES,

A. D. C. to the Lieut.-Governor of Ontario, during Season of 1883, with Localities.

1. *Papilio Asterias*, F. Edmonton.
2. " *Troilus*, L. Fort Macleod.
3. " *Turnus*, L. "
4. " *Glaucus*, L. "
5. " *Eurymedon*, Bd. Seen but not taken.
6. *Parnassius Smintheus*, Doubd. Crow's Nest Pass.
7. Dark var. *Hermodur*, H. Edw. Summit Pass.
8. *Pieris Oleracea*, Boisd. Koutanai.
9. " *Occidentalis*, Reak. Pincher Creek.
10. " *Protodice*, Boisd. Belly River.
11. " *Rapæ*, L. N. W. T.
12. *Anthocaris Olympia*, Edw. (v. rare). Summit.
13. " *Ausonides*, Boisd. Calgary.
14. *Colias Christina*, Edw. Red Deer River.
15. " *Occidentalis*, Scud. (rare). Edmonton.
16. " *Edwardsii*, Behr. (rare). Edmonton.
17. " *Astrea*, Edw. (♀ new). Red Deer River.
18. " *Alexandra*, Edw. (rare). 5,000 ft. elevation Rocky Mountains.
19. " *Eurytheme*, Boisd. (rare). None taken W. of Moose Jaw.
20. " *Hagenü*, Edw. Fort Macleod.
21. " " " (diminutive form). Fort Macleod.
22. " *Scudderii*, Reak. Koutanai.

23. *Argynnis* Lais, N. S., Edw. Fort Edmonton.
 24. " *Cybele*, F. "
 25. " *Baucis*, Edw. (not proved new yet). Fort Edmonton.
 26. " *Coronis*, Behr. Belly River.
 27. " " (dark varieties). Crow's Nest.
 28. " *Chariclea*, Schneid.. Crow's Nest.
 29. " *Boisduvalii*. "
 30. " *Atlantis*, Edw. "
 31. " *Eurynome*, Edw. Belly River.
 32. " *V. Erinna*. Red Deer River.
 33. " *V. Arge* (?), Streck. Calgary.
 34. " *Clio*, Edw. (v. rare). Crow's Nest.
 35. " *Monticola*, Behr, (v. rare). Summit.
 36. " *Edwardsii*, Reak. (v. rare). Blackfoot Reserve.
 37. " *Artonis*, Edw. (v. rare): Koutanai.
 38. " *Myrina*, Cram. Edmonton.
 39. " *Aphrodite*, F. "
 40. *Melitæa* *Nubigena*, Behr. Crow's Nest.
 41. " *Palla* (?), Boisd. "
 42. " *Chalcedon* (?), Boisd. Garnett Ranche.
 43. " *Leanira*. " "
 44. *Limenitis* *Disippus*, Godt. Crow's Nest.
 45. " *Lorquini*, Boisd. "
 46. " *Arthemis*, Drury. N. W. T.
 47. *Vanessa* *Milberti*, Godt. N. W. T.
 48. " *Antiopa*, L. N. W. T.
 49. *Pyrameis* *Atalanta*, L. N. W. T.
 50. *Grapta* *Satyrus*, Edw. Crow's Nest.
 51. " *Progne*, Cram. Fort Macleod.
 52. *Danais* *Archippus*, F. Common.
 53. *Chionobas* *Chryxus*, West (v. rare). Summit.
 54. " *Varuna*, Edw. Calgary.
 55. " *Uhleri* (?), Reak. "
 56. *Erebia*, *Epipsodea*, Butl. Fort Ellis.
 57. *Satyrus*, *Charon*, Edw. Garnett Ranche.
 58. " *Silvestris*, Edw. "
 59. " *Nephele*, Kirby. Rocky Mountains.
 60. " *V. Boopis*, Behr. "

61. " V. Ariana, Boisd. Rocky Mountains.
 62. " V. Olympus, Edw. "
 63. Cœnonympha Inornata, Edw. Calgary and Edmonton.
 64. " Ochracea, Edw. " "
 65. Phyciodes Carlota, Reak. Brandon.
 66. " Tharos, Drury. Edmonton.
 67-68. Several varieties from North of Edmonton. Not determined.
 69. Thecla Titus, F. Old Man's River.
 70. " Edwardsii, Saund. (rare). Summit.
 71. Chrysophanus Mariposa, Reak. (v. rare). Summit.
 72. " Florus, Edw., Nov. Spec. (v. rare). Garnett's Ranche.
 73. " Helloides, Boisd. Oxley Ranche.
 74. " Americana, D'Urban. "
 75. " Sirius, Edw. (v. rare). Fort Macleod.
 76. Pyrgus Tessellata, Scud. Medicine Hat.
 77. Amblyscirtes Viâlis, Edw. (v. rare). Fort Ellis.
 78. Thymelicus Garita, Reak. Fort Ellis.
 79. Thanaos Brizo, Boisd. Fort Ellis.
 80. Eudamus Pylades, Scud. "
 81. Lycæna Anna, Edw. Belly River.
 82. " Amyntula, Boisd. Calgary.
 83. " Sæpiolus, Boisd. Crow's Nest.
 84. " Rustica. Fort Qu'Appelle.
 85. " Pembina, Edw. Crow's Nest.
 86. " Afra, Edw. Nov. Spec. Saskatchewan.
 87. " Unknown Spec. sent for identification. Garnett Ranche.
 88. Pamphila Zabulon, Bd. Lec. Calgary.
 89. " Manataaqua, Scud. (v. rare). Fort Macleod.
 90. " Manitoba. Belly River.
 91. " Uncas, Edw. "
 92. " Cernes, Bd. Lec. Crow's Nest.

INSECTS AS FOOD FOR MAN.—In the interior of Australia the natives are very fond of a large Coleopterous larva found in the bark of certain species of Eucalyptus. They eat them generally raw, holding them by the head and biting the body off as we would a cherry. They also cook them in the hot ashes and eat them.—*American Naturalist*.

HISTORY OF THE PREPARATORY STAGES OF COLIAS
EURYDICE, Boisd., WITH REMARKS UPON THE
GENUS MEGONOSTOMA, Reakirt.

BY W. H. EDWARDS, COALBURGH, W. VA.

EGG.—Shape of *Eurytheme*, fusiform, tapering evenly from the middle to either extremity; the base broad, the summit pointed, ribbed longitudinally, and crossed by numerous striæ; color, pale green when first laid; later, changing to crimson; duration of this stage about four days.

YOUNG LARVA.—Length, .1 inch; cylindrical, thickest on two and three, tapering slightly to thirteen; each segment from two to thirteen several times creased, and on the ridges thus caused are many fine black points, each with minute black hair; scattered among these are larger black points, or tubercles, some with long, tapering, black hairs, but most with long, white, clubbed appendages; on two there is a cross row of these in front of the segment, five on either side, running from dorsum to base; on three and four are four each, also in front, but after four, there are three to the segment, disposed in triangle, two being in front, one on the last ridge; these form longitudinal rows; thirteen has three black hairs on either side in triangle, and from four to twelve are two black hairs at base of each; color, dull yellow-green; feet and legs same; head rounded, but little depressed at top; a few tubercles scattered over the face, each with long, tapering, depressed, black hair; color, pale yellow-brown. Duration of this stage about four days.

After first moult:—Length, .14 inch; color, yellow-green; the ridges thickly beset with black points, from which black hairs; on two, three and four these points are larger than elsewhere; head shaped as before, the depression being decided; the tubercles and hairs more frequent; color, yellow-green, paler than body. As the stage proceeds, a yellow stripe begins to show itself the length of body, below spiracles. To next moult four to five days.

After second moult:—Length, .22 inch; color, green, with black points and hairs as in previous stage; the band along base distinct, white; just over it, on three and four each, on the middle of the segment, is a black bead-like process; under side, blue-green; head, yellow-green; thickly covered with fine black tubercles, each with a short, black hair, and among them are about twelve of considerably larger size, with long hairs. To next moult, three days.

After third moult:—Length, .4 inch; color, same; in addition to the black processes on three and four is often a minute similar one on the succeeding segments in same line, but there is much variation as to these in number; the band white, with a yellow discoloration, which shows more decidedly as the stage progresses. To next moult three days.

After fourth moult:—Length, .6 inch; the red begins to show in the band for the first time, and there is quite constantly a black process on the segments after four, as described in previous stage. To maturity three days.

MATURE LARVA.—Length, 1.1 inch; cylindrical; color, dull green; the segments thickly covered with fine black tubercles, each of which gives out a short, black hair; along base, lying in line with the spiracles, from two to twelve inclusive, is a narrow, white band, and along the lower edge of this is a macular vermilion streak, broken at the junctions of the segments; on three and four each, over the band, in middle of the segments, is a black, vitreous, rounded process, and sometimes minute ones of same character are found on the succeeding segments, or part of them; under side blue-green; legs and feet same; head, color of body, rounded, slightly depressed at top, thickly beset with fine, black points, each with short, black hairs; ocelli, black. From fourth moult to pupation six days. One larva at the last stage differed from all the rest; in addition to the complete row of vitreous spots, it had others on certain segments, viz.:—on two, one at verge of dorsum on either side; on three, three high up on either side; on four, two high up; on five and six, one sub-dorsal each; on eight and ten, each, an abbreviated jet-black bar, instead of round processes; and below the white band were small, black marks, such as are seen in many *Philodice* and *Eurythme*.

Another had on each segment, from two to thirteen inclusive, on the second ridge from the point, a black band from the white band on one side to that on the other; these had the sides more or less crossed, but were pretty regular; on thirteen was a short black bar along each side, and the shield was black. This was a remarkable variation.

[NOTE.—All the larval measurements and descriptions above given were taken at or near twelve hours from the moult.]

CHRYSAEUS.—Length, .8 inch; greatest breadth across mesonotum, .19; across abdomen, .2 inch; greatest depth, .28 inch; compressed laterally, the abdomen conical, the head case produced to a point; the thorax on ventral side prominent and compressed to a narrow ridge; the mesono-

ttum low, rounded, with a slight carina, and followed by a slight excavation; color, apple-green; a white stripe along side of abdomen to extremity. Duration of this stage nine to ten days.

Boisduval's type male is described as having the yellow replaced by vivid orange, and the fore wings as having a violet reflection. This is the form figured in *But., N. A., Vol. I.* But many are utterly without any sort of reflection, and the dog's head is ochre-yellow.

Mr. Henry Edwards, in *Proc. Cal. Acad., Dec. 18, 1876*, called attention to the var. *Amorphæ* of *Eurydice*, and speaks of it as the autumn brood of *Eurydice*, distinguished by a decided black marginal border to hind wings of the male, and by brown patches upon the marginal border of the female. It is a seasonally dimorphic form rather than a variety. Mr. Edwards discovered that *Amorpha Californica* was the food plant of *Eurydice*, and described some part of the transformations in *Proc.* before cited, June 5, 1876. He notices that the caterpillar refused all other plants offered by him. The mature larva and chrysalis are described. I see that Mr. Edwards gives the length of the larva as 1.45 inch, and of the chrysalis .95 inch. The largest larva which I have seen had a length of only 1.1 inch, and the chrysalis of .8 inch. It may be that the larva of spring brood is smaller than the fall brood. All my larvæ were of the spring. Mr. W. G. Wright, of San Bernardino, sent me several eggs by mail, which hatched on the road, and the larvæ reached Coalburgh 2nd April, 1883. On 23rd April, I received quite a number of larvæ of all stages from first to last; 24th April, came another lot of larvæ. With each lot came a supply of the food plant, and boxes of this were sent me repeatedly, and till I announced that I wanted no more; also plants with roots were sent, and these I succeeded in saving, and before fall had three large bushes four feet high. I tried, in vain, to make the larvæ eat clover. Their habits are similar to those of *Philodice*. When first hatched, they eat furrows in the surface of the leaf; by first moult eat the leaf itself; always lie extended on the upper side along the mid rib. There is not the slightest difficulty in raising them to chrysalis, if one has the plant.

The several stages of this butterfly—egg, larva from egg to pupa, and the pupa, are closely like those of other Coliads, as *Philodice*, *Eurythème*, &c. There is no generic difference whatever observable in any of these stages between *Eurydice* and *Philodice*, and so far as my observations with Diurnal

Lepidoptera go, there is no case where a natural genus does not show its distinctive characters in the preparatory stages, either in all of them, or part. There is no more natural genus than *Colias*, and it seems to me enough that the differences in the imagos should be indicated by groups merely. A group may stand for a sub-genus, but the differences in *Colias* are hardly enough to make sub-genus of. Therefore, I do not approve of the genus *Megonostoma*, created by Reakirt in 1863 to accommodate *Eurydice* and *Casonia*, and a supposed species called by Mr. Reakirt *Helena*, but which is a variety of one of the others. Mr. Reakirt was, at that date, a zealous collector, but, like myself, was but a beginner, and undertook to generalize in this case on very slight grounds. His most important character for the new genus consisted "in peculiar appendages, found on the middle and posterior legs of the female," to which he gives the name *Eupronychia*. "To be found on the under side of the tarsi, respectively, at two-thirds and three-fourths of their length, as two small membraneous appendages, each being tri-jointed." And nearly a whole page of the Proc. Ent. Soc., Phil., Vol. II., is devoted to a description and elaborate measurements of those appendages, running into the hundred thousandths of a millimeter. Now, I never was able to find in any example of *Casonia* or *Eurydice* any such appendages, and I recollect very well that at the time this genus was made known, another lepidopterist said the appendages were merely spiculæ from some flower, probably of *Asclepias*. Recently I made a fresh examination and have found nothing, though I have a great many females of these species to make examination of. Desiring the observations of some one besides myself, I wrote Mr. E. M. Aaron, at Phil., asking him to subject examples to the action of a powerful microscope. He replied: "After a careful examination of a number of specimens, I fail to find anything that will answer to Reakirt's *Eupronychia*. It would seem that this characteristic is worthless, at least. The microscope used is a most powerful one." In the other characters cited by Mr. Reakirt—as eyes, oval, projecting, &c., &c.—there is nowhere a generic distinction. *Eurydice* and *Casonia* have falcate fore wings, but that is not a generic difference, else *Papilio Rutulus* would have to be separated from *P. Turnus*. Between the imagos of these two species and *Eurytheme* and *Philodice* are resemblances which bind them closely together, and which can have come only from a common ancestor: as the discal spots, the sub-marginal points on under side, the spots at base of hind wings, and the patches at outer

angles. So the noted "dog's head" breaks out now and then in both the species named.

I think, therefore, that the genus *Megonostoma* should be dropped from circulation, for there certainly is no more to justify a separate genus for these two species than there is for *Edusa* or for *Behrii*.

NOTES ON SOLPUGIDÆ.

AY W. G. WRIGHT, SAN BERNARDINO, CAL.

My first *Solpuga* was found under a clod of hard earth, which I overturned in search of spiders. Upon being uncovered, it reared its palpi aloft with a menacing motion, and backing down as closely as possible into a little depression, stood motionless till captured. This was in August, 1882. The specimen is apparently a ♀, *Datrines constricta*, of medium size. The head and mandibles conform closely to the figure of that species, but it differs materially from the letter-press description of *Constricta*; as to the other parts.

The second individual was taken in the evening, after a favorable opportunity for observing its motions. It was in May, 1883, at 9 or 10 o'clock, as I was sitting at my work-table writing a letter. A shaded lamp threw a strong light down upon pen and paper. For a few moments I had sat still, elaborating a sentence in my mind, when a magnificent *Datrines* came up from under my left arm as the elbow was extended after usual fashion, and ran with rapidity across the paper upon which I was writing, to the cover of some loose papers two feet to the right. As it ran I distinctly saw its motions. The body was nearly or quite dragging, and its palpi were raised up and curved forwards, and were in rapid motion, evidently as antennæ or feelers, and not from fear or as a menace. Immediately recognizing my visitor, I hastily got the alcohol bottle and soon dislodged the animal from the papers, when it ran, with the same motions as previously, to regain its old hiding-place under the table, almost re-passing over its previous track; and as it dropped over the edge of the table, by good fortune it fell into the bottle.

This, larger one, is evidently a *Datrines*, but is unlike any plate or description seen by me. It is much larger than *D. constricta*, but, like it, is also a ♀.

From what I saw of these two individuals, I do not think them belligerent, nor that they would willingly bite or attack anything except their natural prey. Rather, I regard them as extremely timid things, and think that their so-called belligerent attitudes are in defence, or from the same feeling, whatever it may be called, that prompts a hare or a sheep to stamp upon the ground when it sees something that it does not understand.

POLENTA, SCOLECOCAMPA AND EUCALYPTERA.

BY JOHN B. SMITH, BROOKLYN, N. Y.

In my synopsis of the genera of the *Noctuidæ* I placed *Polenta*, Morr., in a section with the anterior tibia unarmed at tip, and *Eucalyptera*, Morr., I retained as distinct from *Scolecocampa*, Gn., the genera coming into different sections by the form of the palpi, and no particular comparisons being made, because I considered the genera so widely distinct that there was no possible chance of confounding them. On this account I have been criticised by Mr. Grote, and attention has been called in the case of *Polenta* to the fact that a specimen in Mr. Neumoegen's collection had a claw terminating the anterior tibia, and that, therefore, I had inexcusably overlooked an important and obvious structural character. With all due deference to Mr. Grote, I think the mistake is not on my side; of *Polenta* I saw Mr. Morrison's type and three other specimens; these I carefully re-examined, after reading Mr. Grote's strictures, and *not a single one of the specimens has any trace of armature at the tip of the anterior tibia.* That Mr. Grote has seen a claw terminating the anterior tibia of an insect labelled *Polenta Tepperi*, Morr., it would be folly for me to dispute. That the insect is correctly determined I may be permitted to doubt, for it is scarcely possible that on all of the specimens I have examined the claw was so broken off as to leave no trace. I believe, therefore, that I was right, and that Mr. Morrison's generic diagnosis in this particular was correct.

As to *Eucalyptera* Mr. Grote fails to see any reason whatever for "re-habilitating" this genus. I have the type of *Eucalyptera* and three other specimens, agreeing in all respects with it; and *Scolecocampa* is

so well known that it will scarcely be contended that I have mistaken the insect. I give in parallel columns the generic diagnosis of each :

SCOLECOCAMPA.

Form robust, strong; eyes naked; tibiæ unarmed; legs moderate, strong, densely clothed with long hair, forming tufts in the ♂.

Tongue moderate, spiral; front not globose, with a pointed tuft directed *downward*; palpi *straight*, projecting far beyond the head, rather roughly clothed, the second joint longest, much enlarged and more heavily clothed at tip, the terminal joint drooping; the whole, with the frontal tuft, forming a pointed snout.

The species *bipuncta* has a very close resemblance, structurally and superficially, with *Doryodes acutaria*, and, like it, is found in salt marshes. I certainly cannot be accused of an overfondness for numerous genera, but I do most firmly believe that *Eucalyptera* and *Scollecocampa* can *not* be properly united.

EUCALYPTERA.

Form slender, slight; eyes naked; tibiæ unarmed; legs long, slender, closely scaled, anterior coxæ unusually large.

Tongue rudimentary, obsolete; front globose, with a pointed tuft directed *upward*; palpi *oblique*, moderately exceeding the head, closely scaled except at tip of second joint, where a tuft of scales creates an apparent enlargement; terminal joint, straight, the whole forming a pointed snout, but projecting upward as well as forward.

 TO ENTOMOLOGISTS.

Dr. H. A. Hagen, of Cambridge, Mass., is working on a monograph of the Odonata, with special regard to their early stages. He will be thankful to receive material from any collector who may have such, and will duly acknowledge the same. Larvæ or pupæ (dry or in alcohol) will be valuable to him, but he especially desires reared specimens of the insects, with such notes as can be furnished of the earlier stages. We trust that all who can will assist this distinguished author, who has done so much to aid others in their entomological studies.

ENTOMOLOGY FOR BEGINNERS.

*THE PROMETHEA EMPEROR-MOTH.**Callosamia Promethea*, DRURY.

BY THE EDITOR.

In Fig. 10 we have a faithful representation of the male of this beautiful insect, and in Fig. 11 the female is shown. Both of these were drawn from



FIG. 10.—MALE.

nature, and engraved by H. H. Nichol, of Washington, and are of the



FIG. 11.—FEMALE.

natural size. This species is found throughout most of the Northern States and in Ontario, appearing on the wing late in June or early

in July. The wings of the male are of a brownish-black color, those of the female light reddish-brown. In both sexes the wings are crossed by a wavy whitish line near the middle, and a yellowish border along the hinder edges. They both also have an eye-like black spot with a pale bluish crescent within, near the tip of the fore wings. Near the middle of each of the wings of the female there is an angular reddish-white spot, margined with black; these are also visible on the under side of the wings of the male, but are seldom seen on the upper side. The wings of the male are narrower than those of the female, and the antennæ much broader.

The female lays her eggs in clusters of five or six or more together. They are of a creamy-white color, with an ochreous spot on the upper side, and are about one-sixteenth of an inch in diameter. They hatch towards the end of July.

The young larva is pale green with yellow bands and faint rows of black tubercles. After passing the second moult it appears as at *a* in Fig. 12. During the subsequent moults the larva changes very much, and when full grown it measures two inches or more in length, and presents the appearance shown at *b* in the figure. It is then of a bluish-green, or sometimes of a greenish-yellow color, with a whitish bloom, and has the head, feet, and hinder segments yellow. On each segment there are about eight small warts or short horns of a deep blue color, except the two uppermost on the top of the third and fourth rings, which are of a rich coral



FIG. 12.—After Riley.

red, and a long yellow one on the top of the twelfth segment.

When full grown it selects a suitable spot from which to suspend its cocoon, usually a twig of cherry, sassafras, or some other tree, on which the larva feeds. The twig is first wound round with silk for about half an inch on each side of the base of a leaf; the silk is then spun down around the leaf stalk, so that the leaf is firmly fastened to the twig, and cannot be detached without using much force. The expanded leaf is then drawn

together with silken threads in the form shown in Fig. 13, and within this enclosure the cocoon is spun. These cocoons may often be seen during the winter hanging from the twigs of trees and shrubs.

In addition to the cherry and sassafras, the larva feeds on ash, poplar, azalea, button bush, and other shrubs and trees; although the ash is a very common food plant the cocoons are rarely, if ever, found upon it. The leafstalks being very long, it is perhaps too laborious a task for the caterpillar to fasten them to the twigs, and hence it leaves them in search of leaves with shorter stalks.

Birds frequently devour the contents of these cocoons during the winter, perforating them with their beaks; the insect is also liable to be attacked by Ichneumon flies, which live in the larval state within the bodies of their victims and consume them.

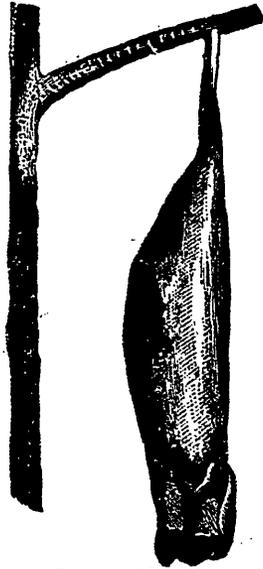


FIG. 13.—After Riley.

A DISTINGUISHED HONOR.

We are much gratified to learn that at the annual convocation of Trinity College, Toronto, held on the 15th of November, the distinguished title of D. C. L. (Doctor of Civil Laws) was conferred upon the Rev. C. J. S. Bethune, M. A., head master of Trinity College School, Port Hope, Ontario. This is the highest title Trinity College can confer, and it is the first time it has been bestowed upon one of its own Bachelors. Mr. Bethune's career as an entomologist is so well known that it is perhaps scarcely necessary to remark that he is one of the most prominent of Canadian Entomologists; was formerly editor of this Journal, has been from the outset one of the pillars of our society, and has done much to advance Entomology in this country. Many we know will rejoice with us that Mr. Bethune has been made the recipient of this well-merited honor.

BURNING OF THE SOUTHERN ILLINOIS NORMAL UNIVERSITY AT CARBONDALE, ILL.

On the afternoon of November 26, a fire was discovered in the south-east portion of this structure, directly above the museum, which spread rapidly, and in a short time consumed the entire frame-work of the building, leaving only the bare and blackened walls standing. The loss is estimated at \$150,000. The greater portion of the library, apparatus, and furniture was saved, but the valuable museum, with all its contents, was destroyed, including large collections of insects, birds, plants and shells. By this fire there have been lost the type specimens of a number of species of Orthoptera and Hymenoptera, besides a large number of fine examples of insects of all orders. Fortunately there were 22 drawers of the 72 in the insect cabinet down stairs in Prof. French's room; these were saved, together with about fifty smaller boxes partly filled. The types also of the new species of Diptera, recently described by Mr. Marten in the CAN. ENT., were saved. The earnest workers in this institution have our sincere sympathy in the disaster which has befallen them. We trust that the enterprise so characteristic of Western people will be equal to the occasion, and that the University will be promptly rebuilt.

EGG AND YOUNG LARVA OF PAPILIO CRESPHONTES.

BY THE EDITOR.

On the 2nd of September I observed a number of young larvæ of *P. crespfontes* on the leaves of a small bush of prickly ash, *Xanthoxylum fraxineum*, and among them some eggs, unhatched. The eggs were laid singly and usually on the upper side of the leaf, to which they were firmly attached. They were about one-twentieth of an inch in diameter, nearly round, slightly flattened, and concave at the base at the point of attachment to the leaf; color pale yellow; not reticulated; almost smooth, with a few irregular yellow dots and patches, as if yellow mucus had been dropped on the surface and dried. The eggs were semi-transparent portions of the young larva, with the black hairs which adorn it showing through. The young larvæ varied from a quarter to half an inch in length. They were black, with an irregular pale patch almost covering

the seventh and eighth segments, and another on the two hindermost segments. Each segment was adorned with semi-transparent tubercles, which were pale on the pale patches and dark on the other portions of the body; each tubercle was armed with a few short black spines. On each side of second segment is a prominent tubercle with two smaller ones between them; the third, fourth and fifth segments have six tubercles on each, arranged in irregular transverse rows; the remaining segments have only two tubercles. Body thickest towards the front, tapering behind.

MOTHS INJURIOUS TO VEGETATION.

BY A. R. GROTE, A. M.

Under this head one might arrange nearly the whole of our moths, except, perhaps, a little species, the *Euzephora coccidivora*, which Professor Comstock has discovered to be predaceous, and to live upon plant-lice in the larval state, and one or two others, which, perhaps, have similar habits. A good many species become unusually numerous, however, in certain years and localities. Almost always this seems to be owing to the temporary cessation of action of the checks which keep down species from excessive multiplication, and disturbing the order of things. When we cultivate a large quantity of any cereal or plant of economic value, we in effect afford abundant food for the insects which habitually infest it. Many will recollect that the maple and other shade trees in Brooklyn and New York used to be completely defoliated by the middle of summer by the common Brown Drop or Measuring Worm, *Eudalimia subsignaria*. The English sparrow rid us of this nuisance; it eat every one of them. This Measuring Worm sought refuge in the cities from the birds which attacked it, and kept it down in the country. In the cities the birds were less plentiful and, this check being removed, they thrive exceedingly. When the Measuring Worms were gone their place was taken by a different moth, the Gray Vaporier, *Orgyia leucostigma*, whose caterpillars, being hairy, were unpalatable to the sparrows. In Philadelphia this substitution merely exchanged one nuisance for another, so plentiful have the Vaporier caterpillars become. In Buffalo, where the Vaporier was always the prevailing pest, no change has been made upon the entry of

the English sparrow into that city. Other species occasionally increase largely in certain seasons for some unknown cause. On Mount Desert one season I saw myriads of the Pretty Pine Spanner, *Cleora pulchra*, which is not usually so plentiful. Some of the principal species which injure our cultivated plants are the Army Worm, *Heliothrips unipuncta*; the Cotton Worm, *Aletia argillacea*; the Cabbage Cut-worm, *Hadena devastatrix*, and other Cut-worms belonging to the genera *Agrotis* and *Hadena*. The pine trees are bored by the larvæ of several moths, and so with the hickories, as well as the fruit trees in our orchards. Some excellent scientific work towards working out the natural history of all these species has been done by the Department of Agriculture at Washington and the various State Governments. Taking into consideration the damage inflicted by these insects, it may be said that money is well spent towards understanding all about these pests, and the way to abate them is to understand their histories and modes of attack first. The fact remains that in many instances, we can do comparatively little to check the ravages of insect pest; we have them chiefly removed by the multiplication of their natural enemies.

CORRESPONDENCE.

COAL TAR FOR THE PLUM WEEVIL.

Dear Sir,—Respecting the use of coal-tar in the matter of driving away the plum-weevil about which Prof. Claypole inquires (p. 180), I have seen it recommended several times, and perhaps the source of the different commendations of it was Prof. Alex. Winchell's paper. I have tried the coal-tar and found it of no avail. Some have followed advice published at one time, and applied the tar directly to the bark of the trunk and branches and thereby destroying the life of the tree, as has also been done with carbolic acid. All similar ways of fighting the plum-weevil must be classed as *parrying* methods. Systems aiming at wholesale slaughter, permit me to say, I deem are more judicious. There are at least two very reliable *exterminating* methods in use against the pest, both of which are explained by Mr. B. Gott in his article on the "Plum Curculio," in Annual Report of Entomological Society of Ontario, 1879.

Very respectfully yours,

Clyde, N. Y.

W. L. DEVEREAUX.

PIERIS RAPÆ VAR. NOVANGLIÆ.

Dear Sir,—In the CANADIAN ENTOMOLOGIST, Vol. iv., p. 79, Mr. Scudder describes a variety of *Pieris rapæ* under the name of *Novangliæ*, and indicates that it is a new variety, developed since the introduction of this species into America. He gives Mr. Stainton as authority that nothing of the kind occurs in Europe. Curtis, in his "Farm Insects of Great Britain," page 101, after describing *Rapæ*, says: "But I possess a male, taken near Oldham, in Lancashire, which has all the wings of a bright yellow color." Is not this Mr. Scudder's variety *Novangliæ*? If so, the origin of it must be placed further off than since the introduction of the species into this country, and the cause of its development, something operating in England as well as in New England. Yours truly,

State College, Orono, Me., Dec. 20, 1883.

C. H. FERNALD.

PARASITE ON VANESSA ANTIOPA.

Dear Sir,—In the ENTOMOLOGIST for September, your correspondent, Frederick Clarkson, speaks of obtaining so few parasitic insects from various cocoons. Perhaps it may interest some of your readers if I mention some cases of an opposite character that have come under my own observation. From a chrysalis of *V. Antiopa* I counted 145 little green flies, and from the cocoon of a curious green and white worm, of which I have not been able to find the name, I *carefully* counted 1,257 very small black flies. This cocoon was not as large as *V. Antiopa* chrysalis. You see I am not scientific enough to know the names of these parasites, but I send the facts for what they are worth. Yours truly,

Watertown, N. Y., Nov. 8, 1883.

HARRIET H. KEYES.

REMARKABLE GATHERING OF BEETLES.

Dear Sir,—On the 10th of October last, while walking along the new dock, now in course of construction at Weller's Bay, I noticed what seems to me a remarkable occurrence, and one which I should like to know if others have observed. Along the outer edge of the crib-work were thousands of beetles, which were so thickly collected together in some places that a spot the size of one's hand would have on it from 30 to 40 insects; they were chiefly *Coccinellidæ*, but among them were *Carabidæ*, *Chrysomelidæ*, *Staphylinidæ*, and other families. In the course of a few minutes I picked up, besides specimens of many other species, no less than 55 *Donacias*.

At the time there was a strong southerly breeze blowing off the water, to which they were fully exposed. They were clinging to lumps of moist sandy mud, which had been recently dredged for filling the crib, and to moistened wood-work. No attempt was made at flight while being picked up. On the inner edge, or land side of the crib, not one was to be seen.

JOHN D. EVANS, Trenton, Ont.

NOTES ON THE LARVÆ ON SOME SPHINGIDÆ.

Dear Sir,—In looking over your Entomological Report for 1881, I find, among the descriptions of the larvæ, pupæ and imagos, the following about the larva of *Hemaris tenuis*, Gr.: "The larva is, we believe, at present unknown." I have collected and reared this same larva for the last four or five years, and found it plentiful, feeding on the snowberry, *Symphoricarbus*, of which I have noticed, I believe, two varieties or species: one with small, almost round leaves, the other, which seems very rare, with larger leaves and more pointed. Having believed this larva to be fully described, I took no pains to make notes of its color or characteristics, and could not now furnish a description of it. I have a number of pupæ of this species. I also found two sphinx larvæ this season, of which I have not yet seen a published description. Being much occupied at the time I was feeding these, I put off making notes until one day when I was at leisure, then I found it was too late, as they had entered the ground. One I took feeding on Privet *Ligustrum*; it had the general appearance of *Sphinx drupiferarum* in size and color, only that the oblique lines were light yellow, almost white, with a broad band nearly an eighth of an inch wide of a beautiful dark ultramarine blue; caudal horn light bluish-green, ending in a horny brown point, heavily granulated with black. The other larva I found on black ash and on the fringe tree, of which we have several fine specimens in the city park; on these latter I also found feeding *S. chersis*, which much resembled this one. *Chersis* differs in that it tapers slightly towards the head; the stigmata are white in the centre, surrounded with bright red, and the caudal horn is but lightly granulated with black. Pupæ without tongue case; of a coffee-brown color, whilst in the former it is almost black. Both larvæ fed readily on black ash in my garden. *H. tenuis* I have never found feeding on any other than the above mentioned shrubs. I also found a third larva feeding in company with *H. thysbe*, much resembling *D. myron*, on *Viburnum dentatum*, the pupæ of which is a light grayish tan color, with the markings of a *Darapsa*. PH. FISCHER, 528 High St., Buffalo, N. Y.

VARIATIONS IN MARKINGS OF *CICINDELA SEX-QUITTATA*.

Dear Sir,—I have just read with much interest Mr. Townsend's article (Vol. xv. p. 205-8) "On the variation of the elytral markings of *Cicindela sex-quittata*," and as he quotes from my field notes for 1881, I feel called upon to modify the record therein made casually of a two-spotted variety of this beetle. A more careful examination shows that, in addition to the anterior spots of normal size, rudimentary posterior ones may be discerned with a good glass, or more plainly, as Mr. Townsend points out, by examining the under surface. I can discover no trace, however, of the intermediate spots. The specimen is apparently a variation in the direction of the immaculate southern variety known as *Violacea*, Fab., towards which it also tends in coloration. I may add that of eighteen other specimens at present all in my collection (and taken promiscuously), five belong to the first variety and five to the third; one of the latter showing an interrupted line from the anterior to the inner spot, and having the posterior ones rudimentary. Three belong to the fifth variety; one of these has also an interrupted line from anterior to inner. The remaining specimen belongs to the the seventh variety. Other interesting varieties probably occur; and as the beetles are very common here, I will endeavor next season to obtain a more extended series. The color of many specimens also departs very much from the typical green toward a decided blue.

W. HAGUE HARRINGTON, Ottawa, Ont.

ON THE GENUS *IDIOSTOMA*.

Dear Sir,—I have seen in the July number of your valued periodical (Vol. xv., p. 139) in a letter from my esteemed correspondent, Miss Murtfeldt, the confession which she has kindly made public on my behalf of my oversight in characterizing the genus *Idiostoma* as new to science, whereas it had been already described by Messrs. Grey and Boll under the name "*Metamorpha*." When I first received an example of this genus from South Africa, I had not seen the original description, nor should I have expected to find it among North American genera. I make no excuses for the mistake; but as the name *Metamorpha* is pre-occupied, having been used by Hubner for another genus of Lepidoptera, I venture to point out that, according to the accepted rules of Zoological nomenclature, the name "*Idiostoma*" should now be retained.

I am, yours faithfully,

WALSINGHAM.

BOOK NOTICES.

Bulletin No. 3 U. S. Department of Agriculture, Division of Entomology ;
8vo., pp. 75.

We are indebted to Prof. Riley for this useful report of observations and experiments in the practical work of the division. It contains further notes on the Army Worm, details of an interesting series of experiments with Pyrethrum powder on larvæ, notes on forest-tree insects by Dr. A. S. Packard ; on the Cotton Worm and the machinery which has been devised for destroying it, and on the tree borers of the family *Cossidæ*, by the late Dr. J. S. Bailey, of Albany, N. Y. The closing paper is by W. McMurtrie, on tests of silk fibre from cocoons raised at the Department. This report contains much valuable matter. The paper on the *Cossidæ* is illustrated by two plates beautifully executed ; there is also a plate illustrating the chapter on silk fibre.

A Bibliography of Fossil Insects ; by Samuel H. Scudder ; republished from the bulletin of Harvard University ; 8vo., pp. 47.

A valuable compilation, which will greatly aid the student in this department of natural science.

On the Color and the Pattern of Insects ; by Dr. H. A. Hagen ; from Proceedings of the American Academy of Arts and Sciences.

In this paper the author discusses the various theories which have been propounded to account for the diversity of pattern and color in insects, reviewing the facts which have been cited for their support. It is a most interesting and instructive article, at the conclusion of which the writer expresses his conviction that color and pattern in insects are produced by physiological processes in the interior of their bodies.

Bulletin of the Buffalo Naturalists' Field Club.

The fifth number of the first volume of the records of work done by this enterprising body of naturalists is before us. It includes notes on *Protozoa*, by Prof. Kellicott ; also papers on the Butternut, Indian Relics and other interesting subjects, followed by botanical and ornithological notes. This serial is handsomely gotten up, well printed on excellent paper, and is in every way a credit to its promoters.

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