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No. 5

ORYSSUS SAYI, WESTWOOD.

BY W. HAGUE HARRINGTON, OTTAWA.

At the Annual Meeting of the Entomological Society of Ontario in October, 1885, I read a brief note on *Oryssus Sayi*, which was afterwards published in the CANADIAN ENTOMOLOGIST (vol. xviii., page 30). It recorded the capture of two ♀ and one ♂ on cedar telegraph poles, and suggested that they might have emerged therefrom. During the early summer of 1886, I added several specimens of *Oryssus* to my collection, and what is of much more importance, succeeded in gaining a more definite knowledge of the habits of our species. As no account, other than the brief note just cited, has ever appeared in the ENTOMOLOGIST of these handsome and interesting insects, I propose to give a brief paper upon them.

The genus was established by Latreille, according to Westwood (Introduction to the Modern Classification of Insects, vol. ii. app., page 55), and Lucas (Dictionnaire Universel d'Histoire Naturelle, vol. ix., page 230), although Norton, in his Catalogue of the Tenthredinidæ and Uroceridæ of North America (Trans. Am. Ent. Soc., vol. ii., page 350), and Cresson (*idem* vol. viii., page 48) credit it to Fabricius, as does also Provancher (Petite Faune Entomologique du Canada, vol. ii., page 237).

Westwood, in his generic synopsis of British Hymenoptera, *loc. cit.*, gives the following characteristics:—

Oryssus Latr., one British species, type *O. coronatus* Latr.; cylindrical; antennæ ♂ 11-jointed, ♀ 10-jointed; max. palpi long, 5-jointed; ovipositor spiral, capillary.

Norton gives the generic features in more detail as follows:—

“Wings with one marginal and two submarginal cells, the first with two recurrent nervures; lanceolate cell closed; under wings without inner cell. Antennæ inserted at the nasus, 10-jointed in female, 11-jointed in male (Hartig says: ♀ 11-jointed, ♂ 12-jointed); the third and sixth longest, the joint before the last thickened. Head large, rounded, wider than thorax. Mandibles short; labrum entire with two slight lateral im-

pressions; maxillary palpi long, 5-jointed, labial palpi 3-jointed. Ovipositor concealed in a groove beneath, springing from the last segment, long and very slender. It is ordinarily concealed in a channel beneath the abdomen, but is capable of being extended, for which purpose it can be curved at the base. The terebra is formed like that of *Urocerus*. The anterior lobe of the mesothorax is wide and extended back to the scutellum, while the side lobes are very small. The scutellum is widened and large. Anterior tibiæ with one end spur, simple in the males, dilated and incised in the females. Tarsi 5-jointed in males, 3-jointed in females."

Having now some knowledge of the genus, we can proceed to consider the species. I have not been able to examine a catalogue of European Hymenoptera, but the various authors consulted mention two species. One of these is *O. coronatus* Latr., the type of the genus; the name of the other is not given. Lucas, *loc. cit.*, briefly describes *O. coronatus* as "12 m. long, of a shining black, with the abdomen of a tawny red; the two first segments black, and the last ornamented with a white spot in the males only." This description would apply equally well to a specimen taken by Mr. Fletcher in Vancouver Island, and the figure given might also answer for this specimen. It may, however, have other features sufficient to readily distinguish it from our species. It inhabits chiefly the central part of France and some portions of Germany.

The two European species were for a long time the only representatives of the genus known to Entomologists, and the American species were apparently first brought to their notice by Harris. In his "Catalogue of the Insects of Massachusetts," published in 1833, he enumerated three undescribed species, and in the second edition, 1835, he gave to them the following names: *O. hæmorrhoidalis*, *O. maurus* and *O. affinis*; signifying respectively the red-tailed, the dark-coloured, and the allied. No description of them was published by him until 1841 in his Report on Injurious Insects. In 1838, Newman (*Ent. Mag.*, vol. v., page 486) described the first of these insects under the name of *O. terminalis*, and Westwood (*Zool. Jour.*, vol. v., page 440) described the second in 1835 as *O. Sayi*, having received a specimen from Say. No additional species were recorded until 1879, when Cresson (*Trans. Am. Ent. Soc.*, vol. viii., page 48) described *O. occidentalis* from Colorado and Nevada, and *O. Mexicanus* from Mexico.

All these species have been described from single specimens, or at the most from a very limited number, and the insects have always been rare,

as is evidenced by Norton's statement that he had not seen either *hæmorrhoidalis* or *maurus*.

The first record of a Canadian specimen is by Westwood, who described the ♂ of *Sayi* from one taken in Nova Scotia, the ♀ having been sent by Say from Indiana. Provancher records the occurrence of *hæmorrhoidalis* in the Province of Quebec, a single ♀ having been captured by him.

The first specimen which came under my personal observation was a ♂ captured by Mr. Fletcher in this city in 1883. This insect, through the kindness of Mr. Guignard, is now in my collection under the name *occidentalis*. It was not until 1885 that I succeeded in capturing specimens, as described in the note mentioned at the commencement of this paper. Last year, 1886, I was more successful, and not only found several specimens, but was able to learn something definite as to their habit of life. Between the 9th and 23rd June, I captured more than a dozen, including representatives of all the American species except *Mexicanus*.

After a very careful comparison of these and other specimens with one another, and with the descriptions of the several species, I am convinced that they are all varieties of one species, and that there are at the most only two American species, namely, *O. Mexicanus* Cresson, and *O. Sayi* Westwood, whose name takes precedence over those of Newman and Harris. The latter, indeed, stated that his *affinis* might be identical with *maurus*, as it differed only in having the face entirely black and the feet reddish. Provancher (Additions and Corrections, page 27), after recording the occurrence of *occidentalis* at Ottawa, states that the examination of a number of specimens might possibly prove it to be identical with *hæmorrhoidalis*.

As Harris did not publish descriptions when he named his species, those of Westwood and Newman must replace them, and the species will stand at present :—

1. *Oryssus Sayi*, Westwood—1835 = *hæmorrhoidalis*, Harris.
2. *terminalis*, Newman—1838 = *maurus*, Harris.
3. *affinis*, Harris—1841.
4. *occidentalis*, Cresson—1879.

I have before me twenty specimens which may in accordance with descriptions be distributed as follows :—

No. 1. Two ♀ (one taken by Mr. J. D. Evans at Sudbury), one ♂.

No. 2. Nine ♀, one ♂ (taken by Mr. Fletcher at Victoria, V. I.,
24-5-85.)

No. 3. One ♀ (from Rev. Geo. W. Taylor, Victoria, V. I.), three ♂.

No. 4. Two ♀, one ♂.

Although readily separating into these groups, they do not offer any differences of structure sufficient to constitute distinct species. Nos. 1 and 3 have the abdomen entirely black, except that the ♂ of No. 1 has a triangular white spot on apex. No. 2 has four segments black, except the ♂, which has only two, as in the European *coronatus*. No. 4 has only the first segment black, and the ♂ has a white spot on apex.

The antennæ and legs of all have white markings, varying slightly in extent, and Nos. 1 and 4 have short white lines on face. In the specimens from Victoria the smoky band of the anterior wings extends to the tip and also towards the base.

I have vainly sought to find a record of any definite information as to the life history of *Oryssus*. Regarding the European species, Lucas, *loc. cit.*, says "they are found in our woods, in the spring-time, resting upon old trees exposed to the sun, and often upon those which have been cut; they run very quickly in a straight line, moving also sideways, and even backwards. Fir trees, beeches and oaks are the trees that they prefer." Brullé (*Hist. Nat. des Insectes, Hyménoptères*, vol. iv., p. 638) quotes Dahlbom as placing *Oryssus* near *Cynips*, and conjecturing that the larvæ live in galls. Blanchard (*Les Métamorphoses des Insectes*) states that these insects have, "but without doubt wrongly," been attached to the *Uroceridæ*, and that they are "rare Hymenoptera yet unknown in their transformations; remarkable for the ovipositor of the females, slender and folded under the abdomen. The type, *O. coronatus*, is sometimes met with in the middle of France." Glover (*U. S. Ent. Rept.*, 1877, p. 94,) affirms that "the larvæ bore in the wood of the willow." This is probably an inference on his part from the statement of Harris, that "these singular insects were taken upon a willow tree by my friend the Rev. L. W. Leonard" (Dublin, N. H.) Norton says, "little is known of the larva. Latreille and Klug suppose that they exist upon the wood of standing trees. Scopoli found them upon fir trees, and Latreille upon old house-beams." Provancher merely remarks that the larvæ are supposed to live upon conifers; living trees according to some, and dead ones according to others.

My specimens have, with the exception of the three noted from

telegraph poles, all been taken from old sugar maples, *Acer saccharinum*; the majority of them upon large dead trunks. They were all captured in June upon the following dates: 9th. One male and three females, one of which was under the loosened bark; two others seen. 10th. Two captured and one seen. 11th. Three; one of these was observed just cutting its way through the wood, and its exit was accelerated by the cautious use of a penknife. This was in an old dead trunk, the bark having fallen off and the wood being very dry and hard. It was on this portion of the tree particularly that the insects were observed. 16th. One. 20th. Two. 23rd. One, a female, which was found ovipositing in the place just described, the tip of the abdomen being applied closely to the surface of the wood.

These observations prove that one breeding place of these insects is the wood of old dead sugar maples, and it may be assumed that they also infest the willow, and possibly a variety of trees. Having determined so much, it is hoped that some of our members may succeed in observing the larvæ, and discover whether they are lignivorous or parasitic in their habits. The former probably, but it would not be safe to take it for granted. Insects differing so greatly from other members of the Uroceridæ in structure may perhaps have habits as widely divergent from those of their associates.

For the benefit of those who may wish to make further observations on the habits of these insects, I will briefly describe their appearance: They are stout, black, cylindrical; varying in length from less than two-fifths to nearly three-fifths of an inch. The face is very coarsely punctured, sometimes with a short white line on each side; the vertex prominent, and the lower ocellus surrounded with conspicuous tubercles; eyes moderately large. The antennæ are peculiar: in the male they have eleven joints, the third slightly longer, and four to eleven subequal; in the female they have, however, only ten joints, of which four, five and ten are very short; in both sexes they are touched with white near the middle. The wings are hyaline, with a broad smoky band commencing near the stigma and extending almost to the tips. The legs have a spot on the tip of the femora, and a line on the tibia without, white. In the female the anterior pair are swollen, the tibiæ crooked, and the tarsi with only three joints. The abdomen has the basal segment very coarsely punctured, or scabrous; the remaining ones polished, shining, varying in color as previously mentioned.

The ovipositor is of special interest, as it differs remarkably from those of other Uroceridæ. Usually it is not visible, as when retracted the tip is concealed in a deep cleft in the terminal segments. It has the appearance, as stated by Norton, of springing from the last segment, but it is evidently attached much nearer the base of the abdomen, and is protruded from beneath a small ventral scale which is apparently a portion of the fifth segment. It is very slender, hair-like, and nearly twice as long as the insect, and must consequently be coiled within the abdomen in a manner somewhat similar to that of *Ibalia*. Norton says it is ordinarily concealed in a channel beneath the abdomen; Brullé, and other authors, as rolled spirally within it.

The insects are very lively in their motions, running actively to and fro, and always on the alert. They have at such times a marked resemblance to some species of wasps, and might be easily classed as such by casual observers. When disturbed they dart swiftly away, but will generally be found shortly afterwards near the same spot, so that one may frequently, with a little patience, succeed in capturing them, even if they have been missed at the first attempt.

In conclusion I will recapitulate what I have been able to learn of our Canadian species. Its range embraces a vast extent of country, from ocean to ocean, and apparently far northward.

O. Sayi, Westwood.—Ottawa, Sudbury, Nova Scotia.

var. *terminalis*, Newman.—Ottawa, Quebec, Vancouver Island.

var. *affinis*, Harris.—Ottawa, Vancouver Island.

var. *occidentalis*, Cresson.—Ottawa.

Breeds in dead, or old decaying sugar maples, and appears in June.

ADDITIONS TO LIST OF MONTREAL LEPIDOPTERA.

BY G. J. BOWLES, MONTREAL.

During the years 1875, 1876 and 1877, Mr. F. B. Caulfield published in the CANADIAN ENTOMOLOGIST lists of the Lepidoptera occurring at Montreal and vicinity, as far as the end of the Bombycidæ. Since that period the following species have been taken here, and are now added so as to make the list as complete as possible to date. Chateauguay is on the south shore of the St. Lawrence, directly opposite the upper part of the Island of Montreal, and only a few miles distant.

DIURNA.

50. *Papilio cresphontes*, Cramer. Several examples taken by Mr. J. G. Jack at Chateauguy.
51. *Argynnis bellona*, Fab. Not common. Taken at Chateauguy and Lachine Flats.
52. *Euptoieta claudia*, Cram. One specimen by Mr. Jack, Chateauguy.
53. *Grapta satyrus*, Edw. One specimen, Mr. Pearson, Chateauguy.
54. *Thecla acadica*, Edw. Very rare, Mr. H. H. Lyman.
55. *Amblyscirtes vialis*, Edw. Rare, Mr. Lyman.

NOTE.—Of *Grapta comma*, the forms *dryas* and *Harrisii* have been taken, and of *Lycaena pseudargiolus*, the forms *violatæa* and *neglecta*.

SPHINGIDÆ.

20. *Deilephila lineata*, Fab. Very rare, Montreal Mountain.
21. *Philampelus achemon*, Drury. Very rare, larva found feeding on vines in city.
22. *Ellema bombycoides*, Walker (*Harrisii*, Clem.) Very rare.

AEGERIADÆ.

3. *Trochilium tibiale*, Harris. Rare.
4. *Albuna torva*, Hy. Edw. Rare.

BOMBYCIDÆ.

60. *Clemensia albata*, Pack. Rare, Montreal Mountain.
61. *Parorgyia Clintonii*, G. & R.
62. *Phobetron pithecium*, A. & S.
63. *Limacodes fasciola*, H. S.
64. *Ichthyura inclusa*, Hub.
65. *Ichthyura albosigma*, Fitch.
66. *Datana integerrima*, G. & R.
67. *Gluphisia trilineata*, Pack.
68. *Notodonta basistriens*, Walk.
69. *Lophodonta angulosa*, A. & S.
70. *Oedemasia badia*, Pack.
71. *Heterocampa biundata*, Walk.
72. *Heterocampa cinerea*, Pack.
73. *Heterocampa unicolor*, Pack.
74. *Prionia bilineata*, Pack.
75. *Dryopteris rosea*, Walk.

All the above species are rare.

76. *Prionoxystus querciperda*, Fitch. This borer has been taken by Mr. Keutzing in a small grove of oaks at Hochelaga, the only known locality near Montreal.

NOTE.—Of *Callimorpha Lecontei*, the varieties *confinis* and *contigua* are not uncommon.

FURTHER ADDITIONS TO THE LIST OF CANADIAN MICRO-LEPIDOPTERA.

BY J. ALSTON MOFFAT, HAMILTON, ONT.

Last season being but a poor one for the Lepidopterist in this locality, I got but little that was new to me in this department. Being in communication with Prof. Fernald about the few I had in duplicate, I proposed to send all my single specimens to him, to name what he could and return them to me again. The Professor most generously consented to the very exacting conditions, and returned my insects, which made the double journey by express, without a break, accompanied with the following names:—

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| 34. <i>Botis unimacula</i> , G.—R. | 50. <i>Amorbia humerosana</i> , Clem. |
| 35. <i>Diathrausta octomaculalis</i> ,
Fernald. | 51. <i>Cænectra irrorea</i> , Robs. |
| 36. <i>Nephopteryx undulatella</i> , Clem. | 52. <i>Cenopsis reticulatana</i> , Clem. |
| 37. <i>Salebria fusca</i> , Haw. | 53. do <i>Groteana</i> , Fern. |
| 38. do <i>contatella</i> , Grote. | 54. <i>Dichelia caryæ</i> , Robs. |
| 39. <i>Meroptera pravella</i> , Grote. | 55. <i>Platynota exasperatana</i> , Zell. |
| 40. <i>Ephestia ochrifrontella</i> , Zell. | 56. do <i>sentana</i> , Clem. |
| 41. <i>Crambus caliginosellus</i> , Clem. | 57. <i>Conchylis dorsimaculana</i> , Robs. |
| 42. do <i>fuscicostellus</i> , Zell. | 58. <i>Eudemis botrana</i> , Schiff. |
| 43. <i>Propexus pexellus</i> , Kad. | 59. <i>Eccopsis fasciatana</i> , Clem. |
| 44. <i>Schoenobius Clemensellus</i> ,
Robs. | 60. <i>Proteoteras Moffatiana</i> , Fern.
MSS. |
| 45. <i>Teras maculidorsana</i> , Clem. | 61. <i>Phoxopterus semiovana</i> , Zell. |
| 46. do <i>Logiana</i> , Schiff. | 62. do <i>dubiana</i> , Clem. |
| 47. do <i>americana</i> , Fern. | 63. do <i>angulifasciana</i> , Zell. |
| 48. <i>Loxotænia virescana</i> , Clem. | 64. <i>Depressaria atroclossella</i> , Clem. |
| 49. <i>Lophoderus triferana</i> , Walk. | 65. do <i>applanata</i> , Fab. |
| | 66. <i>Semioscopis allenella</i> , Wlsm. |

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| 67. <i>Semioscopis inornata</i> , Wlsm. | 74. <i>Gelechia bicostimaculella</i> , Cham |
| 68. <i>Anesychia texanella</i> , Cham. | 75. <i>Plutella cruciferarum</i> , Zell. |
| 69. <i>Choreutis leucobasis</i> , Fern.,
MSS. | 76. <i>Bucculatrix pomifoliella</i> , Clem. |
| 70. <i>Ecophora argenticintella</i> , Clem | 77. <i>Adelia purpurella</i> , Walk. |
| 71. <i>Gelechia innocuella</i> , Zell. | 78. <i>Dasycera newmanella</i> , Clem. |
| 72. do <i>flavocostella</i> , Clem. | 79. <i>Ypsolophus pometellus</i> , Fitch. |
| 73. do <i>agrimoniella</i> , Clem. | 80. <i>Tinea granella</i> , Linn. |

There were six names besides these that were new to me, but not to the Canadian list. Twenty-five specimens were returned unnamed. Upon these the Prof. remarks: "Some of the unnamed ones are too poor to name; others are unnamed in my collection, and may or may not be new species; and still others I have not seen before."

I may add here the two following:—

Crocidophora serratissimalis, Zell. Identified by a specimen received from the Rev. Mr. Hulst. Not uncommon here, but resembling others, which makes it liable to be overlooked.

Margarodes quadristigmalis, Guen. Also identified by a sp. from Mr. Hulst; three taken here last summer for the first time. I also saw several of them when in London last October, in the collection made by Mr. Henry Saunders at electric light.

NOTE.—In Mr. Moffat's previous paper (C. E., vol. xix., page 4) the following errors require to be corrected:—

For "5. *Arthena*" read "*Asthenia*."

"12. *H. Harneiata*" read "*Harveiata*."

"16. *P. lunigerata*" read "*cunigerata*."

And on page 5, line 18, for "*C. lunigerata*, var. *dispunctaria*," read "*C. cunigerata*, var. *disjunctaria*."

STRAY NOTES ON MYRMELEONIDÆ.

BY DR. H. A. HAGEN, CAMBRIDGE, MASS.

1. *Palpares inclemens* Walk., p. 303, No. 4.

This is one of the largest species. Length of body, male 75 m.m.; fem., 60; exp. al., 145-160 m.m. I have before me a couple collected by Dr. Krauss, Stuttgart, on *Cap. b. sp.*, from the collection of the late Dr.

Schneider, Breslau ; and two females from Zanzibar, collected by Mr. C. Cooke, Salem, and a female from Zanzibar Island, from Mr. Thorey, Hamburg. It belongs to this species, *P. latipennis*, Gerstaecker, Insects from Zanzibar, 1873, p. 55 ; a female from the Galla land, 2° latit., which is compared with the male described by myself in Peters' Voyage, p. 99. But this last male is from Loanda (west coast), and not, as stated by Gerstaecker, from Mozambique. Dr. Krauss has collected from 1839 to 1840 on Cap. b. sp. and Natal. Therefore, as far as known to me, the range of this species goes from the Cape along the east coast to the equator. There does not yet exist a description of this species except Walker's, which is correct. I have compared (1857) my specimens with the types of *M. inclemens*, females, so that I have no doubt about the identity. The spots of the wings are sufficiently well described, but there is a character not mentioned which is important. The large transverse band of the hind wing, following the somewhat incomplete basal band, has always in its lower half a large horseshoe-like incision looking with the open side to the base of the wing. This incision is wanting in *P. latipennis* Gerst. The appendages of the male are short, 3 m.m. long, black, with dense black hairs, cylindrical, straight, very little curved internally and at base ; tip rounded, a little inflated, covered with short spines. Below at the base between the appendages is a short, dark, spoon-shaped plate, with a yellow spot on tip.

McLachlan unites *M. sollicitus* Walk. and *M. subduccus* Walk., both nearly related to each other, with *M. cephalotes* Klug, as I believe, erroneously. Both are presented by Lord Byron from the Voyage of the Blonde, locality unknown. I have carefully compared the Voyage of the Blonde, because both insects are nearly related to *M. inclemens*, and supposed to be from Africa. The Blonde stopped at Madeira, October 18-23, going then to Rio. On the way home she came from Talcahuana, Coquimbo, to St. Helena Isl., staying there from January 23 to 28. All the time between these dates the Blonde was in the Pacific Ocean. In Madeira certainly these Myrmelcons have never been observed, and from St. Helena Island they have not been mentioned by any collectors since that time. We find it noted that many insects have been observed and collected during the stopping of the Blonde on the Society and Sandwich Islands. If my supposition is erroneous for the locality of the species, I am at least not able to understand how these Myrmelcons could have been brought home by the ships, except by a purchase in other harbors.

2. *Palpares latipennis*, Rbr.

I have never seen the type of Rambur, which McLachlan considers to be a good species. After Rambur's description, I have considered to belong to *P. latipennis*, two males from Angola and a female from the Senegal; one of the males is not now before me. After comparison with the types of Walker, I considered *M. cephalotes* Walk. (not Rambur) to be identical with his *M. furfuracens* (not Rambur's species, which McLachlan, after comparing the type, found new to him), and both were identical with my species. Prof. Peters brought home a male from Loanda a little smaller than the two males from Angola, but perfectly identical; it is now in the Berlin Museum. From those four specimens my detailed description is made in Peters' *Reise nach Mossambique*, vol. v., p. 99. My manuscript was delivered in 1853, printed in 1854, but published only in 1862. As I have not received any separata, and as the book is rather expensive, my work is very little known. I shall even now consider my species as *P. latipennis* Rbr., until the contrary is shown by evidence.

Length of body, male, 66 m.m.; female, 55 m.m. (not perfect). Exp. alar., male, 118-136 m.m.; female, 144 m.m. The appendages of the male, now broken, were 3 m.m. long, and similar to those of *P. inclemens*.

The species, though visibly smaller, is so similar to *P. inclemens* that it was very nearly believed that *P. latipennis* is a western variety, or at least a representative variation of *P. inclemens* from the east coast. The fact will have to be decided by a much larger material than the specimens at my disposition. The differences are (I can not now compare the appendages) the dilatation of the black middle band on the vertex, and the want of a transversal black band below the antennæ; the color of legs is more yellow, but in one specimen nearly brown; the front wings are narrower, less obtuse on tip, the large spots smaller, the apical one rudimentary; the hind wings are narrower, less obtuse on tip, the three basal bands smaller, connected with each other, the first basal band nearly rudimentary, forming only an indication of a narrow horseshoe-like incision; on the hind margin a number of rounded brown spots.

Knowing the variability of large Myrmelcon, of course my opinion of the difference of *P. inclemens* and *latipennis* has to be supported by a larger material; if I am right, and if *P. latipennis* Rbr. is surely different, a new name should be given for my species.

3. *Palpares cephalotes*.

Myrmeleon cephalotes, Klug, Symb. Phyr., i., iv., pl. 35, f. 1, fem.

This species has been misunderstood by all entomologists, and so by Rambur, Walker, McLachlan. As the latter says, "Klug n'en a ce pendant connu que la femelle," he cannot have seen the description where the forceps of the male is described. Professor Ehrenberg has collected a large number of specimens in Egypt and Dongola, and I have still before me two typical couples, with the name written by Klug still on the pins. Length of body, male, 67 m.m.; female, 58 m.m.; exp. alar., male, 126 m.m.; female, 140 m.m. Pale grayish, a brown dorsal band on the thorax ends narrowed on vertex; facies and mouth pale yellow; antennæ black, the two basal joints yellowish brown; palpi pale reddish brown; last joint of the labials a little incurved, fusiform on tip; mandibles black, shining, long, much more prominent than in the foregoing species; thorax white-villous; mesothorax above on each side with an obsolete stripe; legs ferruginous, femur on tip, tibia on base less dark; tarsi darker, of the female nearly blackish. Abdomen of the male pale, basal half enlarged, covered with a longer dense white villosity; appendages yellow, 6 m.m. long, curved at the base and inward; space between ovoid; hairy externally; apical half inside with a black brush ending on the somewhat globose tip; each on the extreme base inside with two yellow elongated papillæ, with a black blunt spine as long as the papillæ, articulated to the tip of the papillæ; between and before the two appendages a small conical yellow part. Wings of the males nearly hyaline; smaller, elongated, narrower, tip less obtuse and more pointed than in the foregoing species; front wings with the ante-cubitals brownish at base; a row of small more quadrangular spots around the hind margin at the distance of 2 m.m.; basal part after the 5th vein with more small dots, reaching the hind margin; in the middle of the wings two small oval spots, oblique, about 6 m.m. long, and a more longitudinal one below on tip. Hind wings with few dots on the base of the ante-cubitals; a row of irregular, little larger dots along the hind margin, some of them reaching the margin; the row begins after the basal third of the margin, and ends on the tip; base to the fifth vein without spots; in the middle of the wing five pale brown narrow bands, of irregular shape, not connected, the apical one more or less divided. Wings of the female larger, broader; spots larger and darker, to blackish brown, the two penultimate bands before tip mostly connected; the pterostigma yellow. Abdomen of female brown below, before and around the anus a row of black strong spines.

I have described a larva which belongs very probably to this species.

4. *Palpares Burmeisteri*, Hag.

Myrmecoleon gigas, Burm., ii., p. 998, No. 25.

Palpares cephalotes, Rbr., p. 368, No. 3.

Dalman, Anal., p. 88, describes *M. gigas* only after Drury's figure, as Rambur has done also, but Dalman's description is very incomplete. Apparently the fact was overlooked by Burmeister, and as he had not at hand Drury's figure, he determined *M. gigas* after the insufficient description of Dalman. Burmeister's type from Winthem's collection, a female, is before me. I believe it is *P. cephalotes* Ramb., and therefore Burmeister's species has to be named, until it is proved by evidence that Rambur's *P. cephalotes* is a larger western form of Klug's species. As I have no male before me, I am unable to decide this question. The type is from Senegal. Length of body, 63 m.m.; exp. alar., 150 m.m.

Nearly related to *P. cephalotes* Klug., but larger, the wings broader, with a stronger tinge of pale brown, head broader, 9 m.m. (Klug's species 7 m.m.); vertex much more convex, with a broader black band (only dagger-shaped in Klug's spec.); black bands on thorax larger. Wings more blunt on tip, more spotted near the veins and especially near the hind margin; hind wings in the apical half of the hind margin a regular row of rounded brown spots, distant from the margin, and a row of smaller more irregular spots on the margin itself; this is not the case in Klug's species; of the large brown bands the penultimate is divided, and only the lower part united with the ante-penultimate band.

It would be useless to give more details till more material of both sexes is at hand.

(To be Continued.)

BOOK NOTICES.

THE HESSIAN FLY (*Cecidomyia destructor*) IN GREAT BRITAIN, by Eleanor A. Ormerod, F. R. Met. Soc., Consulting Entomologist of the Royal Agricultural Society of England. Pp. 24, Svo., London, 1886.

The above is the title of an admirable pamphlet just issued by Miss Ormerod, and adds one more to the many boons for which the agricultural classes in England are indebted to this talented lady. Although all

the information published is contained in 21 of the small pages of a crown octavo pamphlet, so methodical is the arrangement and so concise are the statements, that it may be said to contain all that it is important for the farmer to know of what has been positively ascertained concerning the habits of this destructive insect and the most approved remedies for keeping it in check. With Miss Ormerod's pamphlet he can in a few minutes learn from her excellent illustrations whether an attack upon his crop should be ascribed to the Hessian Fly or not. And if so, he will also find himself provided with advice as to the best steps to take to limit the injury to the smallest possible amount.

Immediately upon the first appearance of the Hessian Fly in England, Miss Ormerod, with characteristic promptness, visited the fields attacked, and at once identified the marauder. That there should be no mistake in the matter, she referred specimens to the highest authorities, and amongst others to our ex-President, Prof. Saunders. All of them agreed with her that it was the true Hessian Fly. She then lost no time in writing to the newspapers and describing how the attack might be recognized. In a few weeks she had examined all the literature on the subject, and had accumulated a vast amount of information as to the extent of the injury committed; so that before the winter set in she was able to give the farmers good practical advice as to the best means of stamping out the new enemy. This she has now consolidated into the useful report under consideration. We have, first, a short historical sketch of the fly as an injurious insect; then an estimate of the injury caused during the past season in England and Scotland, which was considerable. In one English and three Scotch localities the loss was calculated to be several bushels to the acre. The appearance of the attacked crops is described in a plain, intelligible manner, together with the insect in its different stages, from the egg to the perfect fly, and an abstract is given of its life-history. The important question, "Where does the Hessian Fly come from?" is then discussed. This treats of the different means by which the insect may be introduced, and it is shown that it may come in the "flax-seed" state amongst seed-grain, or in straw which having come from infested countries either as straw-cargoes, or as packing, is used for horses and cows in London, and then sent out to farms in the country as slightly used litter, or as "long manure." When this is the case, says Miss Ormerod, "a sufficiently large proportion of the flies in the flax-seed state are likely to develop to cause mischief such as we have seen in the past season. On

the first farm on which the attack was observed near Hertford, I found on enquiry that London manure had been used of mixed kind, but mainly cow and horse manure in very 'long' condition."

An observation of the greatest importance was made by Mr. Palmer, of Revell's Hall, near Hertford, viz., that the "flax-seeds" are separated from the straw in threshing. This was previously thought not to be the case. As, however, they are thus loosened from the straw, they are, of course, liable to be mixed with grain, and with it transmitted from place to place; but in Mr. Palmer's case they were not found amongst the grain, nor in the chaff, but in the dust and rubbish which falls beneath the threshing-machine. In a handful of siftings he found no less than fifteen "flax-seeds." This rubbish is comparatively worthless, and if English farmers are careful always to burn it upon a waste spot, it will certainly reduce the number of the parent flies from which another serious attack may originate. It is the custom amongst our best Canadian farmers to do this in districts where the Wheat Midge ("Weevil") is prevalent, and is attended with very satisfactory results.

Our authoress continues: "From the above observations it appears that puparia, or 'flax-seeds' *may* be transmitted in corn rubbish. In samples of screenings and sweepings from imported corn, I have found, besides a large amount of live and dead beetles, also weed-seeds, smut and other matters undesirable to spread abroad (as may easily be done where these are used for poultry-food, and thus thrown out in farm-yards), and as, with these, broken bits of stem are to be found, it appears at least possible that 'flax-seed' may also be conveyed. In Dr. Packard's paper on the subject, he alludes to the possibility of the pest being transmitted in wheat."

The best methods of prevention are treated of at some length, and their applicability to the farming processes in vogue in England are reviewed. The favourite preventive remedy—late sowing—is shown to be applied in England as an ordinary part of the regular arrangements of the work on most farms; as a rule wheat is not sown until some time after the 20th of September, the date which we consider the latest it is necessary to wait to avoid attack, and thus the young wheat plants are not up till after the autumn brood of the fly is dead. The importance of this point cannot be laid too much stress upon, for if late sowing be regularly practised, the Hessian Fly must be dependent for its subsistence upon self-sown plants in fields which had been attacked, or upon rye or other

grain sown as sheep-feed. This reduces to narrow limits the lines in which experiments may be successfully tried to prevent this enemy to England's staple crop from establishing itself and getting beyond the control of the farmers.

Perhaps the most satisfactory feature about this outbreak of the Hessian Fly in England is the fact that it has appeared in so many places, and has thus been brought forcibly before the attention of farmers in all parts of the kingdom, and they, being aroused, will now see the necessity of promptly carrying out the instructions necessary for its extermination.

The Royal Agricultural Society through Miss Ormerod, and the Government through Mr. Whitehead, have done everything in their power to apprise the farmers of their danger, and have put in their hands as weapons with which they may confidently hope to cope successfully with their new enemy, concise information as to its life-history and habits which will enable them to recognise it at once,¹ and apply without delay the proper treatment. Briefly, this consists of (a) late sowing of the main crop, so that there is no accommodation ready for the autumn brood, by which a large proportion will necessarily perish without egg-laying; (b) feeding off or ploughing in any early-sown or volunteer crops which may be found to be infested, so that the eggs and maggots may be destroyed; and (c) deep ploughing, by which loose puparia or infested stubble may be buried too deep in the ground to allow the perfect flies to emerge.

From the historical sketch which is given of the occurrence of *C. destructor*, it would appear that although a watch has been kept upon it since its first outburst as a destructive scourge in North America in the year 1786, it had never been actually identified as occurring in Great Britain until July, 1886. The large number of widely separated localities, however, from which its ravages have now been reported, might lead one to the conclusion, either that it must have been established for some time previous to that date, and that it was only Miss Ormerod's energy and zeal which then brought its operations to light; or that some special circumstance has taken place during the past summer by which it has been distributed over the whole kingdom; or again, that some special climatic condition has allowed it to exist where it had failed to do so before. For several years Miss Ormerod has had an active and observant body of intelligent workers in all quarters of Great Britain, and it is strange, if it existed at all, that nothing has been heard previously of its operations. Nevertheless, on the other hand, from the large quantities of straw and

seed grain imported annually into the British Isles from countries known to be infested by this fly, together with the present rapid and easy methods of transport, it is at least extremely probable that it has been introduced over and over again, and it is difficult to understand why it has not long before now secured a firm foothold there. May it not be hoped that the law which applies with regard to many noxious weeds, will also be found to hold good in the case of this injurious insect? The existence of any plant as an aggressive weed in a given locality appears to be not so much a question of the introduction of the seed, as of the plant finding there the conditions suitable to its growth and healthy reproduction. There are many plants, for instance, troublesome weeds here, which must have been frequently introduced into Europe from this continent (or in some instances taken back again to the place whence we originally received them), but which have never yet taken forcible possession of cultivated ground, e. g., the common Purslane (*Portulaca oleracea*), Hound's Tongue or Burrs (*Cynoglossum officinale*), Small Burrs (*Echinopspermum Lappula*), and the common Foxtail grasses (*Setaria glauca* and *viridis*); and then, although relatively they are far fewer, there are some which must have been frequently introduced on this continent, but which, except in a few localities, cannot (or do not) exist for more than two or three seasons, e. g., the common Scarlet Corn Poppy (*Papaver Rhæas*), Scarlet Pimpernel (*Anagallis arvensis*), common Groundsel (*Senecio vulgaris*), Corn Gromwell (*Lithospermum arvense*), and the common Nettles (*Urtica dioica* and *urens*). In the same way there is no doubt whatever that the Colorado Potato Beetle (*Doryphora 10-lineata*) has been many times conveyed to the British Isles on transatlantic steamships, but not finding there conditions suitable to its requirements, it has failed to establish itself.

Miss Ormerod, quoting from Bulletin 4, U. S. Ent. Commission, tells us that "the original habitat of the Hessian Fly is considered most probably to have been Southern Europe and Western Asia, i. e., about the shores of the Mediterranean Sea," a district with a summer climate of far greater heat and aridity than is found in the British Isles. Again, in North America, where—whether introduced or indigenous matters not in this connection—this pest to our sorrow flourishes to a most remarkable degree, it has always dry, hot weather during the periods in which it passes through its active stages.

In view of the above facts, and notwithstanding that it has occurred in considerable numbers in many parts of Great Britain during the past

summer, I think it probable that its wide-spread appearance as an injurious insect was due either to some special cause which had not existed before, or to some unusual climatic condition, rather than to its having established itself in a new habitat suitable to its reproduction and increase. Furthermore, if the farmers can only be frightened sufficiently to induce them to obtain the pamphlet under consideration and to follow closely the advice which is there offered them, I cannot help thinking that before very long Miss Ormerod will be able to relegate the Hessian Fly to a place amongst the foes she has conquered.

JAMES FLETCHER, President Entom. Soc. of Ontario.

NORTH AMERICAN LEPIDOPTERA: THE HAWK MOTHS OF NORTH AMERICA, by A. Radcliffe Grote, A. M. Printed by Homeyer and Meyer, Bremen, 1886. 1

The above is the title of an interesting brochure by our old friend Prof. Grote, who has done so much to advance our knowledge of the North American moths. The press work is superb. For clearness of print, nice paper, and excellent taste in the selection of contrasting type for the heading of the sections, this work is a model.

After a graceful dedication to Prof. William Saunders, former editor of this journal, our author gives directions for collecting and preserving insects, followed by a chapter on the relation and habits of the *Sphingidæ*. He then takes up their classification, beginning with the sub-family *Macroglossinæ*, under which he includes the genera *Hemaris*, *Lepisesia*, *Thyreus*, *Enyo* and *Deidamia*. Then follow the sub-family *Chærocampinæ*, including the genera *Everyx*, *Ampelophaga*, *Deilonche*, *Deilephila* and *Philampelus*; the sub-family *Smerinthinæ*, including the genera *Calasymbolus*, *Paonias*, *Cressonia* and *Triptogon*; and the sub-family *Sphinginæ*, including *Ceratomia*, *Daremma*, *Diludia*, *Dolba*, *Phlegethontius*, *Atreus*, *Ellema*, *Sphinx* and *Dilophonota*.

The reason for establishing the new genus *Deilonche* for *tersa*, is not very clear to me, nor do I feel so sure of the wisdom of establishing the new genus *Atreus* for the reception of *plebeius*. The fact is, that while studying the *Sphingidæ* of New England, I found more genera than I well knew what to do with, and perhaps I am on that account less disposed to look with favor on new genera. Our author says, "the type (*plebeius*) is, I think, not congeneric with the European *pinastri* (the

type of *Hylonicus*) nor can I find an Hubnerian genus for its reception. I should leave it in *Phlegethontius*, as Fernald seems to suggest, but it differs in the 12-veined primaries, etc." It is, perhaps, proper for me to say that in my studies of the venation of the *Sphingidae*, I found that the species of this family, so far as I had material to study, had either eleven or twelve veins in the fore wings according to whether vein 10 was present or wanting. This vein arises from 9, near its outer end, and lies so close to it as to be easily overlooked. After denuding a long series, including many individuals of some of the species, I found that while the other veins were constant as to origin and termination, vein 10 is very variable and not to be relied upon, for in some examples it was present in one wing but absent in the other. It seems to differ as to the point of origin, sometimes arising from vein 9 at some distance from the border of the wing, at other times nearer the border, again close to the border, and again it was entirely wanting either in one wing or both; all in the same species. In my essay on the *Sphingidae*, I stated that it was very doubtful if this vein would prove of any assistance in classification. I still hold to the opinion that this species will finally gravitate into the same genus as *celeus*. Finally the generic name *Atreus* is pre-occupied, having been used by Hoch in 1837 for a genus of Scorpions, and therefore cannot be used in this connection.

Cerisii is placed by itself in the subgenus *Copismerinthus*, and *geminatus* under the subgenus *Eusmerinthus*, with the variety *tripartitus* Gr., given for those individuals which have three blue spots on the black anal patch on the hind wing.

Prof. Grote divides the time of the work on our lepidoptera into three periods: The first including that of Abbot, Boisduval, the elder LeConte, Say, Peck, Harris, Gosse, Kirtland, and their historian, Dr. J. G. Morris. The second period, the one which he calls the "Renascence," is the period in which the American Lepidopterists catalogue the different families of the lepidoptera and thus lay the foundation for present and future discoveries. This period, which came to an end with the appearance of Grote's New Check List, "was a time during which a great deal of work was performed with good humor and at considerable self-sacrifice," and no one did his share of this work, which was more or less drudgery, more cheerfully than did Mr. Grote himself.

The author says that the writings of our entomologists have a flavoring of the localities from which they emanate, thus, "in some way the

scent of the Maine woods has got into Prof. Fernald's writings," and we may say in return that a vein of poetry runs all through this charming little work which we are now reviewing.

C. H. FERNALD, Amherst, Mass.

CORRESPONDENCE.

THE GENUS QUADRINA.

Dear Sir,—Mr. Grote, in the current vol. of the CAN. ENT., p. 40, takes exception to my note on this genus, and says my "remarks as to *Hemileuca* are uncalled for." The only thing I said in the note commented on by Mr. Grote, in regard to *Hemileuca*, was: "In Mr. Grote's Catalogue of 1882, *Quadrina diazoma* is placed in the '*Hemileucini*' and is associated with *Hemileuca*, *Hyperchiria* and *Coloradia*, which are all typical *Bombycids*." This is the fact, as a simple reference to the list will prove, and I cannot see in what manner the remark was uncalled for. I knew of all that Mr. Grote had written on the subject, and simply assumed, as I had a right to do, that Mr. Grote had changed his views as to the position of the genus, and that his latest view was expressed in the list. That the location was due to a printer's error I could not know. However, its position in the *Ceratocampidæ* is equally unnatural. As that group stands in Mr. Grote's list it is a perfectly natural and sharply limited one, all the members of which have in the male two branches to each side of each joint of the antennæ, which are moderately long, and the pectinations do not extend to the tip. In *Quadrina*, on the contrary, the joints are extremely short, the pectinations extend to the tip, and are very long; there is only a single branch to each side of each joint. If the specimen is a female, as Mr. Grote says, the antennal structure is unique and out of harmony with that of the other *Ceratocampidæ*. It would break up the group entirely to admit such a form in it. But I believe the specimen to be a male. I do not find in my notes on the species any mention of the sex, but my recollection is that it was a male. The species belongs most nearly where Mr. Grote first put it. I quote my own remark—"nearly related to *Gloveria*."

As to the *Hemileucini*, I have taken from it the genera *Hyperchiria* and *Coloradia* and placed them in the *Saturniidae*, in a recent revision of that Group in the Proc. Nat. Mus., ix., pp. 414-437.

JOHN B. SMITH, Washington, D. C.