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PROF. FERNALD'S SPHINGIDÆ OF NEW ENGLAND.

BY A. R. GROTE, A. M., BREMEN, GERMANY.

This very carefully written pamphlet brings us quite a step forward in our knowledge of the structure of our Hawk Moths. In the first place, it may be doubted whether the divisions of the Sphingidæ, first laid down in their present shape in Grote & Robinson's Synonymical Catalogue (1865), are not of lower rank than sub-families, but as all our divisions are based on comparative characters, this point need not detain us long. I had diligently searched the literature for older terms for these groups, finding them in part, but they were not adopted by Butler, and the terms of our Catalogue of 1865 with a sub-family ending seem to be preferred. I commenced with the Macroglossinæ, because these genera more resemble the Hesperidæ in their frequent diurnal flight, pupation on the ground between leaves with a few threads of silk, and in the more prismatic antennæ. Our genera are *Hemaris*, *Aellopos*, *Euproserpinus* and *Lepisesia*, with entire wings. I never was so fortunate as to possess any specimens of the genera *Lepisesia* or *Pogocolon*. Twelve years after describing *Lepisesia* from a specimen in Coll. Phil. Ent. Soc., another species of *Lepisesia* was sent me for determination from Cambridge, where accordingly my type of *L. Victorie* now is. This species is said to be the same as Boisduval's *Pogocolon Clarkiæ*, unknown to me. We have then at least two species of *Lepisesia*. I only know Abbot's figure of *Gaura*; this represents a species with angulated wings, looking a little like the European *Ænotheræ*. In the Central Park Coll. is or was a specimen belonging to Mr. Robinson, brought by Mr. Ridings from Georgia. I thought, after only casually examining it, that it might be an allied species or a variety; but I never had it in my possession long enough to study. Nor do I know any of Mr. Hy. Edwards' species. Whether these are true *Pogocolon*, or whether this genus is distinct from *Lepisesia* (which is much the older term), I cannot at all say. But having

compared *Euproserpinus* I am satisfied that this is not *Lipisesia*; it is made a distinct section of *Macroglossa* by Boisduval; it is our nearest genus to *Macroglossa*. I have compared *M. stellatarum* with the species of *Hemaris*. Not only the opaque wings, but the vestiture, tuftings, head, neuration, give comparative differences which I set down as generic. It has been one of my studies, and I believe I am even the first writer to correct the statement that the European *Hemaris* has a vein on the cell; on removing the bar of scales I found no vein as described in European text books of ten or more years ago. We have no true *Macroglossa* and no true *Acherontia* in North America, though both are asserted. The remaining genera have the wings angulate, except *Arctonotus* and *Cautethia*. These are: the genus to which *gaurae* belongs, *Amphion*, *Thyreus* and *Deidamia*. If Prof. Fernald will examine the primaries of these three last genera, he will find them very like, also the body tuftings, though the abdomen is elongated in *Deidamia*, and has lost the plump typical Macroglossian form. But the larva has not the cordate head of *Smerinthus*, and I cannot class the moth with this latter, notwithstanding what Butler says. The fact that *Deilephila* also pupates like the first group and does not enter the ground, that the flight is often diurnal, the colors vivid, make me bring the *Chærocampini* in here. It is a noticeable fact that the lower genera of the Macroglossinæ and many Chærocampinæ feed on the grape. I have nothing to say upon these genera of the second group except that I believe *Ampelophaga* to be older than *Everyx*; if therefore *Myron* and *Versicolor* are congeneric, they may both be referred to this genus of Bremer's; while for *Chærilus* we may retain *Everyx*. Having studied extra-limital Chærocampid forms with angulated wings, I discovered an *Ambulyx* from Brazil with eye-spots like a *Smerinthus*, and I look upon this genus as a sort of passage to the Smerinthinæ in consequence, aided by the sunken head, brown colors with roseate patches, etc. The Smerinthinæ feed as larvæ on fruit and nut trees. We have one true *Smerinthus*, congeneric with *ocellatus* of Europe, viz., *ophthalmicus* from California. Then we have a type which deviates in small details and is represented by *geminatus*, having a representative in Asia Minor, as Butler tells us. Prof. Fernald points out that *Cerisyi* agrees with *Calasymbolus Astylus* in antennal structure, but I never saw *Cerisyi*, which, from the figure of Kirby, seemed to me like *geminatus*, with which, if I remember rightly, Kirby compared it. Probably there is nothing like *Astylus*, *Cerisyi* or *myops* in the Old World, and it would be

well if we accordingly restricted *Smerinthus* to the Californian species and separated our Eastern forms under *Eusmerinthus* and *Calasymbolus*. I used *Paonias* for *Excaecatus*, which differs by the scalloped wings. Also *Cressonia* for *juglandis*, correcting Dr. Clemens' notion as to the European *Populi*, which represents neither *juglandis* nor *modesta*, though nearer the latter. *Cressonia* is as distinct a genus as we have in the whole family. *Triptogon* is largely represented in Asia. I follow now with the Sphinginae, which enter the ground to pupate, commencing with *Ceratonia*, which in its larva approaches *Triptogon* and is a peculiar American form. I follow then with *Daremma*, *Diludia*, *Pseudosphinx* (= *Macrosila* Butler), *Amphonyx*, *Phlegethontius*, *Dolba*, *Sphinx* (= *Lethia*), *Dilophonota*, *Hyloicus*, *Ellema*, *Exedrium*. I do not believe these latter to be Smerinthinae, but low bombycoid Sphinginae. This group feeds especially on the Solanaceae, also Convolvulus and Privet. The tongue is often attached, like a jug handle, as Prof. Fernald says, to the pupa, which reposes in a naked cell under ground, the larva rolling the soil about it compact. I am glad Prof. Fernald uses *Phlegethontius*, which has priority and is a clean genus against which nothing can be said. If we study these insects carefully, I am sure we will finally accept all the genera, or nearly all, I have proposed. It is unwise to lose sight of the very clear characters which have been so well discussed by Prof. Fernald so far as his very readable pamphlet goes. I think when the extra-limital and especially South American forms are studied by the Professor, he may incline to place the Sphinginae where I have placed them. I have been guided by their subterraneous pupation, their gray colors like the lower moths. The Macroglossians and the Chærocampians are gayer colored, day loving, active species. How often have I not taken *Lineata*, and also *Pandorus*, at midday. I am glad to see that my use of *Pandorus*, which was made after careful comparison with the true *Saturnia* of Linné, is being sanctioned. The reading of Prof. Fernald's pamphlet has given me great pleasure, and I should be affected and ungrateful not to acknowledge it. But it will have, with all that this author has given us that I have yet seen, a far more important value than the mere vindication of this or that name in our lists. It will show how much there is yet for us to learn about our moths, and also the way to learn it.

NOTES ON AN UNDETERMINED LEPIDOPTEROUS LARVA.

BY IDA M. ELIOT AND CAROLINE G. SOULE, STOWE, VERMONT.

We have found a caterpillar which we cannot identify, nor can any one to whom we have shown the description and a water-color drawing. "Papilio," Vol. iii., No. I., p. 14, has a description which is nearest it, but is not exactly like our larva, as ours has no tufts.

Our first specimen was found Sept. 12th, 1883, and our last one Aug. 13th, 1886. Between these we have three others; all of them pupated, but none emerged.

The larva is $1\frac{1}{2}$ inches long; the head is brownish-green with a whitish bloom over it; mouth parts dark; no marks or hairs.

The body is almost evenly cylindrical, tapering very slightly towards the head; green in color, very smooth, firm, and free from markings and warts, and evenly covered with long, silky hairs, cream-white in color, and growing singly, without warts or tufts which could be seen even with a powerful lens. The hair turns towards the head, and droops in a beautiful curve over the sides, almost as if parted on the dorsal line. There are a very few short black hairs, not noticeable unless looked for, scattered on the last three segments. The feet and prolegs are green, a little brownish at the tips. Spiracles are white and inconspicuous.

The larvæ were found, three on white birch, and one each on willow and poplar, all being curled around on the under side of leaves. In this position it always rests, with the head covered by the drooping hairs, and looks like a downy white feather. It is very beautiful and conspicuous on the tree, where it is always on one of the lower branches.

It is wholly different in appearance, and in the arrangement and quality of the hair, from the *Apatelas*, *Lophocampas*, or *Arctians*, or any of our common hairy caterpillars, and some of its habits also differ from these. Resting on the leaf-stem and beginning at the edge of the leaf, it eats into the middle, leaving the margin except where it began; or it rests near the stem, and eats the leaf all around, leaving only the part on which it is resting.

None of our specimens moulted, but just before pupation every one changed color, the body being olive brown, and the hairs dull black. On the day following this change the larva began to bore into a piece of rotten wood, entering head first, then backing out with the bits of wood it

had dug out collected between the props. When outside it opened the props and dropped the bits of wood. This operation was repeated until the hole was large enough, when the caterpillar entered for the last time, leaving its black hairs at the entrance.

The last one made but one opening to the hole, and did not, as far as we could see, spin a door across. Three of the others made openings at each end, and closed both with silk and hairs. The first one was kept in a paste-board box, and, no wood being given to it, gnawed a hole through the box. When we covered this hole, the caterpillar spun against the side of the box a thin cocoon of silk mixed with the bits of paste-board gnawed from the box. None of them would go into the earth when it was provided for them. The pupa of the second one was kept for two years, but showed no sign of life, and was then thrown away.

We should be very glad of any information about this larva that any readers of the ENTOMOLOGIST can give.

COLEOPHORA LARICELLA Hb. VERY INJURIOUS TO LARIX EUROPEA, IN MASSACHUSETTS.

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

Professor Sereno Watson communicated to me some twigs cut on the grounds of Mr. Henry Watson, in Northampton, Mass. Several *Larix Europea* about thirty years old stand on an avenue, and have never suffered before. In April they showed to a large extent pale needles and many little larvæ of the well known sac-bearing form. In May numerous slate-colored moths appeared, the true *Coleophora laricella* Hub. This insect in all its stages is well described in Stainton's Nat. Hist. Tineina, vol. iv., p. 1, and figured on pl. i., f. 2. It would be useless to give a description here. Our biological collection possesses types of all stages by Rosenhauer, Zeller and Hofmann. As far as I know, it has not yet been observed in the United States. Some twigs given by the late J. Boll were perhaps collected in 1872 in Cambridge, Mass.; but as he did not mark any locality on the label, I am not sure that he did not bring them over from Europe. I am not able to find any published notice in North American papers. I may notice that the caterpillar keeps its abode very clean by expelling the fæces out of a hole in the needles.

Ratzeburg Waldverderbniss, Ton I., speaks at some length about the injury done by the insect. There is till now no remedy known for the insect, as the caterpillar is well protected in the needle.

This year *Chernes laricifolia* A. Fitch, Rep. 4, No. 289, is very common in the Arnold Arboretum here. I do not find the species mentioned except by A. Fitch, of which Prof. Packard gives a copy.

EMBIA MINUTA, COSTA.

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

I am indebted to Sc. E. Bergroth, Helsingforz, for knowledge of this species. Prof. A. Costa has published, Atti della R. Accad. Sc. fisiche, etc., vol. vii., 1878, Napoli No. 2, the account of his journey through Egypt and Palestine. He was (p. 11) very interested to find, Feb. 17, after Assouan, at Kom-Ombos, on irrigated and humid grounds, a very small (long. corp. 5 millim.) species of *Embia*, for which he proposes the name *E. minuta*. As far as I know, nothing more has been given about this insect, and we will have to wait till Prof. A. Costa will publish its description. *Oligotoma Westwoodi* is the only species known of such small size, but it has only been found in copal.

A LIST OF THE NORTH AMERICAN SPHINGIDÆ, OR HAWK MOTHS.

BY A. R. GROTE, A. M.

The present List of the North American Sphingidæ or Hawk Moths embraces the principal features of my former Lists, in particular the division into groups, retained by Butler and lately by Fernald. I have originally in our Synonymical Catalogue (1865) proposed the genera *Macroglossa*, *Chærocampa*, *Smerinthus* and *Sphinx* as typical of the four principal groups recognized by me. A fifth group, represented by the Old World genus *Acherontia*, seems to me to fall in between the *Smerinthinæ* and *Sphinginæ*. It seems to me unimportant whether we consider these groups as Tribes, with the ending *ini* to the terms, or as Subfamilies,

with the ending *inae*. I am myself of the opinion that these divisions are only of tribal value, and should prefer to so designate them. But, under this view, the Family Sphingidæ, as here considered, would remain only of Subfamily value, somewhat as intended by Dr. Harris, whose "tribes" have a wider significance, whereas I intend by "tribes" assemblages of genera subordinate in rank to Subfamilies, and as intended by LeConte in Coleoptera. These matters must be left, however, to final revisions of our classification. At this moment I am interested, in view of Prof. Fernald's recent valuable paper, in defending my sequence of the genera and groups as laid down in my former papers.

I have commenced with the Macroglossinæ on account of their diurnal flight, the frequent use of silk in the pupation, the fusiform antennæ, characters which ally the moths to the lower butterflies. I have, since 1865, pointed out that the European *Macroglossum stellatarum* is the type of a distinct genus from *Hemaris*; it is an Old World genus containing several species and differing from a large number of partially vitreous allies, by the abdominal tufts, the comparatively stouter antennæ, the thicker palpi, different vestiture, besides the thickly scaled wings. I denuded the wings of these forms, discovering that V. Heineman's statement that the cell of *Bombylifomis* was crossed by a vein, to be incorrect, the bar being formed by scales only, and found certain slight neuronal characteristics which I no longer can refer to. The neuration of *Lepisesia* is figured in my Sphingidæ of Cuba, p. 6 (1865).

The characters of the Family Sphingidæ are the narrow wings, the primaries long, the secondaries short; the frenulum is present; the fringes short, vestiture scaly and close; there is a general absence of tuftings and all impediments to a swift and continuous flight. The abdomen is heavy, long, usually tapering, the segments armed. The head is prominent, ocelli wanting, eyes naked, large; antennæ prismatic, maxillary palpi wanting, labial palpi thick, tongue variable but usually well and even excessively developed. Pupation sometimes on the surface in a slight web, but oftenest in the ground without cocoon. In the higher genera of the first Subfamily the wings are entire, in the lower, *Thyreus*, *Deidamia*, etc., angulated. These lower genera of the first Subfamily approach the Chærocampinæ, and I cannot interpolate here the Sphinginæ. The larvæ feed also on the grape and *Ampelopsis*; the young of *Thyreus* are comparable to *Philampelus* in the loss of the caudal horn and the assumption of a tubercle. While the larvæ of *Hemaris*, etc., feed in preference on

Viburnum, *Vaccinium*, *Lonicera*, the genera with angulated wings and the Chærocampinæ generally are grape-feeders. *Everyx* and *Ampelophaga* spin surface cocoons like *Hemaris*. The colors of the lower Macroglossinæ are brown and green, with here and there light yellow, as on the secondaries of *Danum* and *Abbotii*. Claret red, olive green, sericeous yellow, are the tints of the first two Subfamilies, with rich browns and hard red tints; the gray colors of the Smerinthinæ and especially of the typical Sphinginæ are not as yet displayed. I think that, from the pupation, *Everyx* is higher than *Philampelus*, while from a structural study I have formerly brought *Deilephila* and *Philampelus* together. I merely remark here that in reference to recent statements, I do not know Abbot & Smith's *Gauræ*, nor any of the species with angulated wings referred here to *Pogocolon*. I had only examined and described the two species of *Lepisesia*, while from figures I should judge Abbot's species belonged to a different genus. While the higher genera of the Chærocampinæ have the wings entire, often falcate, the lower have them angulated, and in the genus *Ambulyx* we have a species with ocellated secondaries. The colors become rich tints of gilded brown and yellow; roseate hues obtain largely and the spots on the secondaries prepare us for their final expression in *Smerinthus*. The ornamentation of the thorax in *Smerinthus* recalls *Philampelus*, *Ambulyx*. Although, on general grounds, I would admit that the Bombycid analogies of the Smerinthinæ lower them in the rank in the family, I believe the nearest approach to them at present existing is the genus *Ambulyx* among the Chærocampinæ. The frequently pink secondaries in *Ambulyx* prepare us for the usually pink hind wings in the Smerinthinæ. Every indication from color, pattern and shape of wing, favors the idea that the two Groups, Chærocampinæ and Smerinthinæ, are related. This is the main point of my arrangement of the imagoes, and I believe the known larvæ sustain this view of the relationships within the Family. The real gray colors only obtain as a rule within the Subfamily Sphinginæ; the Smerinthinæ are gray, tempered with brown shadings and with pink discs to the secondaries, as we see in some other moths, such as the Dryocampæ. The most splendidly ornamented Hawk Moths are to be found in the Chærocampinæ, radiant in rich golden yellows and olives, and some Asiatic species are marvels of beauty. The larvæ of the Smerinthinæ feed by preference on fruit and nut trees. The larvæ of the Acherontiinæ and Sphinginæ on plants belonging to the

Solanaceæ (Tobacco, Tomato, Potato, Deadly Nightshade, etc.) A few species, such as *Paonias Excæcatus*, may be almost considered polyphagic; but, generally, the species are pronounced in their preference for special genera or families of plants. At last the gaudy colors yield to gray, in the Smerinthinae, suffused with rich brown and with pink shaded secondaries; the dull gray and blackish species at the most only relieved by yellow spots on the body in the Sphinginae. A few species have warmer tints, but the resemblance to the gray Noctuidæ becomes now apparent and the gay colors of the Chærocampinae do not again appear. The pupation is subterranean, the cocoon wanting, the flight crepuscular and even nocturnal. After a very diligent study of foreign genera, which we must always consider, I think the naturalness of the sequence as proposed by me cannot be gainsayed. There may be a better sequence for the genera here and there, within the groups, to be attained, but that the groups do thus better arrange themselves in a linear series, I am convinced, not leaving out of sight the fact that the relationship is net-like and not to be truly expressed by a straight line. As to particular points, I believe *Ampelophaga* is older than *Everyx*, which latter I retain for *Chærilus* with its spined tibiæ. I believe *Deidamia* to be allied to *Thyreus* by the shape of the wings. I follow Butier's extension of *Calasymbolus*, leaving *Eusmerinthus* as a subgeneric title for *Geminatus* with its bi-pectinate male antennæ. Our only true *Smerinthus*, as originally pointed out by me, is from the West Coast, but I believe the Californian species has also occurred in Upper Canada. We have in South Florida a West Indian colony, the extent of which is not yet known. Stragglers from the south, as *Ello*, *Titan*, *Labruscæ*, invade even New England. How far north these breed with us, is not known. They seem hardly to belong to the North American Fauna, but are all included here so far as they have been reported to me as being taken within the political limits of the United States.

In this list I have followed with a dash (—) all species not known to me in nature. (I trust my critics will observe these signs.) I have also used the sign † to denote erroneous identifications. In the localities of the species known to me I have tried to express my idea as to their distribution.

Family SPHINGIDÆ.

Sub-family MACROGLOSSINÆ.

Genus *Hemaris* Dalman.

1. *Palpalis Grote.* California.
2. *Thetis Boisd.* California.
3. *Cynoglossum Hy. Ed.*—
4. *Rubens Hy. Ed.*—
5. *Senta Streck.*—
6. *Aethra Streck.*—
7. *Tenuis Grote.* Can., N. Y.
Fumosa Streck.
8. *Diffinis Boisd.* N. Y., southward.
9. *Marginalis Grote.* Ohio, south and west.
10. *Axillaris G. & R.* Texas to Ill.
Grotei Butl.
11. *Metathetis Butl.* 1 —
(Subgenus *Chamaesesia* Gr.)
12. *Gracilis G. & R.* Maine; N. Y.
(Subgenus *Hæmorrhagia* G. & R.)
13. *Thysbe Fabr.* Can., southward.
Pelasgus Cram.
dim var. Uniformis G. & R.
(?) *var. min.* Buffalocensis Gr.
(?) *var. maj.* Floridensis G. & R.
14. *Fuscicaudis Bosid.* Georgia.

Genus *Aellopos* Hübn.

15. *Titan Cram.* Florida, northward.
Annulosum Swains.
Balteata Kirtl.
16. *Tantalus Linn.* Florida, northward.

1. How many of these eleven species, belonging to the typical group of *Hemaris*, are really distinct, it is difficult to say, and there must be careful breeding from the egg to decide. In collections *Tenuis* is usually labeled *Diffinis*, but the latter, from Abbot's and Boisduval's figures, differs in several points. Since Mr. Hulst has shown that *Uniformis* is only a dimorphic form of *Thysbe*, the value of the terminal band of primaries as a specific character becomes doubtful.

Genus *Euproserpinus* G. & R.

17. Phæton G. & R. California.
Erato Boisd.
 Genus *Cautethia* Grote.
18. Grotei Hy. Ed. Florida, Cuba.
 Genus *Arctonotus* Boisd.
19. Lucidus Boisd. California.
 Genus *Lepisesia* Grote.
20. Flavofasciata Barnst. Can., N. Y.
21. Clarkiæ Boisd. California, etc.
Victoria Grote.
 Genus *Pogocolon* Boisd.
22. Circeae Hy. Edw.—
23. Gaurae Abb. & Sm.—
var. Juanita Streck.—
 Genus *Amphion* Hübn.
24. Nessus Cram. Can., southward.
 Genus *Thyreus* Swains.
25. Abbottii Swains. Can., southward.
 Genus *Enyo* Hübn.
26. Lugubris Linn. Florida, northward.
27. Camertus Cram. Florida, northward.
28. Danum Cram. Florida, northward.
 Genus *Deidamia* Clem.
29. Inscripta Harris. Can., southward.

Sub-family CHÆROCAMPINÆ.

Genus *Everyx* Boisd.

30. *Choerilus Cram.* Can., southward.
Aziuleæ A. & S.
Genus *Ampelophaga* Brem.
31. *Myron Cram.* Can., southward.
Pampinatrix Ab. & Sm.
var. *Cnotus Hübn.*
32. *Versicolor Harris.* Can., southward.
Genus *Cherocampa* Dup.
33. *Tersa Linn.* Southern States, northward.
Genus *Deilephila* Ochs.
34. *Chamaenerii Harris.* Can., southward.
Canadensis Guen.
? *Intermedia* Kirby.
? *Oxybaphi* Clem.
35. *Lineata Fabr.* East to west.
Daucus Cram.
Genus *Philampelus* Harris
36. *Vitis Drury.* Southern States.
Fasciatus Sulz.
Jussienacæ Hübn.
37. *Linnei G. & R.* West Indies, Fla., Ga.
Vitis † Cram.
38. *Pandorus Hübn.* Can., southward.
Satellitii † Harris.
39. *Posticatus Grote.* West Indies, Fla.
Lycaon † Gr.
40. *Achemon Drury.* East to west.
Genus *Argus* Hübn.
41. *Labruscae Linn.* West Indies, northward.
Genus *Pachylia* Walk.
42. *Ficus Linn.* West Indies, northward.
Crameri Men.

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43. Syces *Hüb.* West Indies, northward.
Inornata Clem.
Ficus † Mén.
44. Lyncea *Clem.* —
 Genus *Ambulyx* Walk.
45. Strigilis *Linn.* 2 West Indies, Fla.
 Sub-family SMERINTHINÆ.
 Genus *Calasymbolus* Gr.
46. Astylus *Drury.* Can., southward.
Io Boisd.
Integerrima Harr.
47. Myops *A. & S.* Can., southward.
48. Cerisii *Kirby.* Can., Maine, N. Y.
 Subgenus *Eusmerinthus* Gr.
49. Geminatus *Say.* Can., southward.
var. Jamaicensis *Drury.* —
 Genus *Smerinthus* Latr.
50. Ophthalmicus *Boisd.* California.
var. Pallidulus *Hy. Ed.*
 Genus *Paonias* Hübn.
51. Excaecatus *Ab. and Sm.* Can., southward.
 Genus *Cressonia* G. R.
52. Juglandis *Ab. and Sm.* Can., southward.
 ♀ *Pallens* Streck.
var. maj. Robinsonii *Butl.*
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2. This species, *Phil. Posticatus*, *Amph. Duponchel*, have been reported to me from South Florida, but I have seen no specimens. The same is true of *Macrosila Ochus*, reported to me from South Texas. It is probable that most of the Cuban Sphingidæ may occur sporadically on our shores.

Genus *Triptogon* Brem.

53. *Modesta Harris.* Can., southward.
Princeps Walk.
Cablei Von Reiz.
54. Occidentalls *Hy. Ed.* California, etc.
Imperialis Streck.

Subfamily SPHINGINÆ.

Genus *Ceratonia* Harris.

55. *Amyntor Hübn.* Can., southward.
Quadricornis Harr.

Genus *Daremma* Walk.

56. *Undulosa Walk.* Can., southward.
Brontes † Boisd.
Repentinus Clem.
57. *Hageni Grote.* Texas.
58. *Catalpae* Boisd. Southern States.

Genus *Diludia* G. & R.

59. *Jasminearum Boisd. and Lec.* Ga., northward.
60. *Leucophaeata Clem.* —
61. *Brontes Drury.* —

Genus *Dolba* Walk.

62. *Hylaeus Drury.* Southern States, northward.
Prini A. & S.

Genus *Amphonyx* Poey.

63. *Antaeus Drury.* West Indies, Fla.
64. *Duponchel Poey.* West Indies, Fla. (?)

Genus *Phlegethontius* Hübn.

65. *Rustica Fabr.* Southern States.
Chionanthi A. & S.

66. *Ochus Klug.* Mexico, Tex. (?)
Instita Clem.
 67. *Carolina Linn.* West Indies to Can.
 68. *Celeus Hubn.* Can. southward.
5-maculata Steph.
Carolina ‡ Harr.
 69. *Cingulata Fabr.* Southern States, northward.
var. Decolora Hy. Ed.

Genus *Hyloicus* Hübn.

70. *Plebeius Fabr.* Can., southward.
 71. *Sequoiae Boisd.* —

Genus *Ellema* Clem.

72. *Bombycoides Walk.* Can., southward.
var. Harrisii Clem.
 73. *Coniferarum Ab. and Sm.* Southern States, northward.
 74. *Pineum Lintn.* —

Genus *Exedrium* Gr.

75. *Halicarnie Streck.* —

Genus *Sphinx* Linn.

(= *Lethia* Hübn.)

76. *Drupiferarum Ab. and Sm.* Can., southward.
var. Utahensis Hy. Ed. Utah.
 77. *Kalmiae Ab. and Sm.* Can., southward.
 78. *Chersis Hübn.* Can., southward.
Cinerea Harris.
 79. *Oreodaphne Hy. Ed.* —
 80. *Libocedrus Hy. Hd.* —
 81. *Perelegans Hy. Ed.*
 82. *Vancouverensis Hy. Ed.* West Coast.
Vashti Streck.
 83. *Canadensis Boisd.* Can., southward.
Plota Streck.
 84. *Gordius Cram.* Can., southward.
 85. *Albescens Tepper.* —

86. *Luscitiosa Clem.* N. Y., Maine, N. J.
 87. *Lugens Walk.* Western States.
 Eremitoides Streck.
 88. *Eremitus Hübn.* Can., southward.
 89. *Separatus Neum.* —
 90. *Dollii Neum.* —
 91. *Elsa Streck.* —

Genus *Dilophonota* Burm.

92. *Ello Linn.* West Indies, northward.
 93. *Melancholica Grote.* West Indies, northward.
 94. *Merianae Grote.* West Indies, Mex., Tex.
 95. *Festa Hy. Edw.* —
 96. *Obscura Fabr.* Southern States.
 97. *Edwardsii Butler.* —

BROTIS VULNERARIA HUBN.

BY GEO. D. HULST.

In the CANADIAN ENTOMOLOGIST, this volume, p. 72, Mr. Ph. Fischer tells us of the capture of the above moth at Buffalo, N. Y., adds something of the bibliography of the species, and remarks upon its aberrant appearance and character. Permit me to add a few words to what was there said.

Guenee, Phalenites, vol. ii., p. 116, 1857, describes this species of Hubner, under the generic name *Sphcelodes*, crediting the species to Hubner, but ignoring his genus, as was Guenee's custom. He also describes the ♀, and pl. 22, f. 9, gives a figure of it. It differs very much from the ♂, having ciliated antennæ, and lacking the triangular flesh-colored costal spot. He is as much in doubt as was Hubner, as to its classification, but places it among his Fidoniidæ. Walker, Cab. Brit. Mus. Geometridæ, p. 213, 1860, catalogues *vulneraria* under *Brotis* Hubn., placing *Sphcelodes* Guen. as a synonym of the genus. He also is in doubt as to the proper location of the genus, but places it at the end of the Ennominae, and says it does not seem to fit well anywhere. Guenee's

five specimens were from Brazil. Walker's five specimens were from St. Domingo. Neither seemed to have any doubt that the insect was a Geometer, though a somewhat anomalous one.

In the CANADIAN ENTOMOLOGIST, viii., 154, 1876, Mr. Grote tells us: "A drawing which I recognize as of this species (*Brotis vulneraria* Hub.) has been shown me by Prof. Hinsdale, of Racine, Wis., where the original was taken. I would not refer it to the Geometrae, but to the Noctuae (Fasciatae)." In the CANADIAN ENTOMOLOGIST, xii., 116, 1880, under the heading "North American Noctuidae in the Zutraege," Mr. Grote, after mentioning its capture as above stated, says: "Hubner considers it to be a Geometer, but I think incorrectly." But neither in these places, nor elsewhere that I can find, does Mr. Grote give any hint as to his reasons for his determination of the place of the insect.

In Papilio, iv., 72, 1884, Rev. W. J. Holland describes as new, *Sphelodes floridensis*, from Indian River, Florida. I have one of his type specimens, but am not able to separate it specifically from *vulneraria* Hubn.

From the above it seems the species ranges from the Lakes to Buenos Ayres. It is probably common through the Tropics, and may be common in Southern Florida.

So far as its classification is concerned, it seems to me to be beyond doubt a Geometer. Antennae, head, venation and legs are all geometri-form.

ENTOMOLOGICAL NOTES, SPRING, 1886.

BY A. W. HANHAM, HAMILTON, ONT.

Owing to the unusual and continued warmth of the weather during the two weeks ending April 28th, insect life has been very abundant, considering the time of year, and the few opportunities I have so far^e enjoyed of looking up their haunts have amply repaid me.

April 17.—Under boards and pieces of wood along fences were to be seen hundreds of *Drasterius dorsalis* Say. In company with this *elater*, besides many, to me, common beetles, I secured for the first time several *Languria Mozardi* Latr., a very showy beetle—the male looks very small by the side of the female. In the same afternoon I found a fine specimen

of the goldsmith beetle, *Cotalpa lanigera* Linn. Is not this an early appearance?

April 18.—Observed Hymenoptera and Diptera in large numbers and variety on and about a row of young sugar-maples, the bark of which had been punctured. Some hibernated Lepidoptera could have been easily secured by hand had I felt so inclined, so engrossed were they in imbibing the sweet sap. There were, however, too many Vespidae about for me to care to do much investigating.

April 23.—I found *Erycus puncticollis* Lec. very plentiful under logs and debris generally, along the edge of the marsh near Dundas. These weevils were all paired. Among some others taken the most conspicuous was *Sphenophorus pertinax* Oliv. Many Elateridae were taken from under the bark of stumps and fallen logs. They included several *Adeloceras*. I was fortunate enough to find a pair of *Cychnus Lecontei* Dej. copulating under a piece of wood. Also *Brachylobus lithophilus* Say. Other Carabidae were numerous, especially near the water. A better locality could hardly be found for the last named family. *Bothrioderes geminatus* Say, and *Chrysomela clivicollis* Kirby were among my captures this day.

April 26.—Took *Dicaelus elongatus* Dej., a few Silphidae, and from under the bark of decaying stumps lots of small beetles, mostly Scolytidae.

April 27.—Two fresh specimens of *Staphylinus maculosus* Grav. from under stones.

May 1.—Discovered a good hunting ground a few miles from town, near the lake, namely, a few acres of thinly wooded forest land, on which were the stumps of many freshly-cut hardwood trees. On these, and especially under the chippings surrounding them, Coleoptera were very abundant, the most common being *Hylobius stupidus* Boh., *Clerus dubius* Fab., and several species of Nitidulidae (Ips). I captured one specimen of *Grynocharis 4-lineata* Mels., and a pair of *Cytilus trivittatus* Mels. On several of the stumps in sheltered nooks I came across patches of that beautiful lady-bird, *Megilla maculata* De Geer. Some of the larger patches must have contained quite fifty beetles. They were mostly of a lovely bright pink color; a few, however, had a brown or reddish tinge. About this date I took, in quantities, *Byturus grisescens* Lec. ? off wild raspberry canes, evidently feeding on the opening buds. A little later in the year they are common upon the blossoms of the wild plum and cherry.

I must have taken or observed over thirty species of Carabidae during

my rambles on the days mentioned, some of them rather scarce ; also the following Cicindelidae : *C. Lecontei* Hald., *C. sexguttata* Fab., *C. purpurea* Oliv., *C. vulgaris* Say, and *C. repanda* Dej., the first named being the only rare or local kind. In walking over some sand hills or tracts on April 23rd they arose from about my feet almost in clouds. I do not remember to have met with them so abundantly before except late in the summer.

Cut-worms of many sizes and markings appear to be common this spring under boards, stones, etc. One morning about the beginning of May I noticed a sand wasp (Pompilidae Leach.) dragging a cut-worm, apparently nearly full grown, to its nest in the sand. When first seen by me the wasp was a foot or more away from home. The larva was not only much larger but heavier than its capturer, and much too weighty to be carried. The wasp found it quite an undertaking, for it left its prey several times, going to the nest, only to return for another pull. It is not unlikely that the distance covered previous to my arrival was considerably more than that while I was present.

I intend in the course of a few weeks to trespass further on the kindness of readers of the ENTOMOLOGIST by the insertion of continued notes.

ON WILLOW AS FOOD-PLANT OF *P. TURNUS*.

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

In Nov. No., 1885, I asked if readers of this magazine had ever found the larva of *Turnus* feeding on willow, etc., to which I have had several replies.

Mr. W. Brodie, Toronto, Can., wrote that on Sept. 10, 1885, Thos. Parks, of Toronto, found three larvæ in his garden under a peach tree, and he put them in a box and fed on peach leaves for several days, and till pupation. So far as I know, the peach has not before been observed to be a plant of *Turnus*.

J. D. Sherman, jr., Peekskill, N. Y., writes that his father, who once had a very large collection of American butterflies, "states positively that he has several times taken the larva of *Turnus* from the wild willow."

Miss Caroline G. Soule, of Boston, Mass., writes : "I have found more larvæ of *Turnus* on willow than on any other plant. I have found it on ash and poplar, but if I hunt for it, I take willow as the plant most likely to supply my need. This is in Stowe, Vermont, where most of my

entomological work is done. So marked was the preference for willow, that I find written on the margin of my *Insects Injurious to Vegetation*, 'chiefly willow, sometimes poplar.' I have always raised my *Turnus* larvæ on willow." And Miss Soule quotes from a letter from Miss I. M. Eliot, of New York, "with whom my summer work is done," and to whom she had mentioned the subject: "I wish Mr. Edwards could have seen the willow where we first found *Turnus*!"

Also, Wm. Bente Müller, of New York, writes: "I have frequently found the larva of *Turnus* feeding on willow."

It is therefore settled beyond all question that willow is one of the food plants, though I do not learn that it is known to many collectors. Mr. Scudder quoted willow in his "Butterflies," but from a statement made by Mr. Gosse in 1845. And as I have before said, my larvæ at Coalburgh died before they would eat willow, and the plant was offered them repeatedly. As the same thing happened with me when I gave spice wood and sassafras to larvæ of *P. Ajax*, though in Tenn. Mr. Aaron says these larvæ certainly will eat both these plants, I conclude that larval habits as to food may differ decidedly in different localities.

ANNUAL REPORT, 1885.

Owing to unforeseen circumstances, the distribution of the Annual Government Report for 1885 has been unavoidably delayed. We are glad to state, however, that they have at last been received and forwarded to those members entitled to receive them.

ANNUAL MEETING.

The Annual Meeting of the Entomological Society of Ontario will be held in the Society's Rooms, London, Ontario, on Wednesday, October 20, 1886, at 7.30 p.m. Members are invited to prepare papers to be read, and to send them to the Sec.-Treas., Mr. E. B. Reed, if they are unable to attend.

CORRESPONDENCE.

Dear Sir: I notice in my article two serious errors that I overlooked in the proof, one clerical and the other typographical: Page 112, 11th line from bottom, read *dorsal* instead of ventral; page 115, 13th line from top, read *beak* instead of back.

JOHN HAMILTON, Allegheny, Pa.