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PROF. FERNALD'S SPHINGIDÆ OF NEW ENGLAND.

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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 *Lipisesia* 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 Clarkie*, unknown to me. We have then at least two species of *Lepisesia*. I only know Abbot's figure of *Gauræ*; 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 *gauræ* 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 *Charilus* 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 *Calasymphobolus*. 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 *Ceratomia*, 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 subterranean pupation, their gray colors like the lower moths. The Macroglossians and the Chcerocampians 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 *Satellititia* 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.