

the anterior extremity being nearly hemispherical and the posterior extremity tapering rapidly in the last two segments to a blunt point which is extended into a bipronged spine three-sixteenths of an inch long. The surface of the hemispherical portion is studded with minute sharp triangular points. Wing cases small, covering only the sides and under surface of the anterior one-third of the pupa. Four of the abdominal segments are separated by a broad, deep sulcus; the anterior and posterior margins of these segments are armed with a row of minute sharp spines.

Imagines began to appear on July 3d, and had nearly all emerged by July 10th.

The insect is three-brooded here, hibernating in pupa. Although the large majority of each brood follows the cycle of development as described, yet a few of each brood are much slower in making their changes. Thus a few of the brood did not complete their growth till the end of July, and three pupæ formed June 26 are still alive (Feb. 28th), having hibernated. Other pupæ of the same brood disclosed their imagines at various periods during July and August. This accounts for the fact that larvæ in all stages of development may be found at any time throughout the summer till frost kills their food plants, which are *Gleditschia triacanthos*, L. (Honey Locust or Three-horned Acacia) and *Gymnocladus Canadensis*, Lam. (Kentucky coffee-tree.)

Up to the third month the larvæ, when alarmed, move the protuberances on the second and third segments as if to frighten away the intruder. The larvæ pupate readily on the bottom of the breeding cage if ground is not furnished them. In this case they build no cocoon.

THE NOCTUIDÆ IN THE MISSOURI ENTOMOLOGICAL REPORTS.

By C. V. RILEY, M. A. PH. D.

To the Editor of "PAPILIO:"

There are two articles in "PAPILIO," (Vol. I, No. 8), by Mr. A. R. Grote, to which I beg leave to reply, in the belief that in so doing I may contribute something to Lepidopterology, and charitably overlook reflections unjust and irritating.

In the "Note on *Agrotis repentis*," (p. 126) Mr. Grote again changes his mind as to the synonymy of this species, weakening his previous argument to the effect that it is identical with *A. messoria*, Harris. On p. 77, of Bulletin No. 6, U. S. E. C.,* after repeating the original description of *A. cochranii*, Riley, I remark, "There is little question but that this is the moth briefly characterized by Harris (Ins. Inj. to Veg., p. 444) as *Agrotis messoria*, an examination of the type confirming this view. *A. repentis*, G.

* General Index and Supplement to the nine Reports of the Insects of Missouri, Washington, March 24, 1881.

and R., and *A. lycarum* are also conceded by Grote to be synonyms."

I have on two occasions, by an examination of the types in Harris's collection, satisfied myself that *messoria* and *cochranii* are really identical, and notwithstanding Mr. Grote states that he was unable to find the species in Harris's collection, it must be there, unless destroyed or taken away since 1876. Mr. H. K. Morrison also informs me that it was there in 1874, when he carefully studied and compared it with specimens of *cochranii*. Whether *repentis* is or is not the same, this deponent sayeth not, further than that the figure and description of this last confirms the conclusion that it is.

The readers of "PAPILIO" will doubtless wonder why a copy of Harris's original report should have caused Mr. Grote to change his mind, when the description of *Agrotis messoria* there given is repeated *verbatim* in all subsequent editions.

The little skirmish on the question of the identity of *messoria*, seems, however, but a feint to cover a general criticism of the descriptions of Noctuidæ in the Missouri reports, in which Mr. Grote finds "that most, if not all, of the Noctuidæ there described as new, were in reality known to science," and then specifies as follows:

- *Agrotis Cochranii*, Riley, is *A. REPENTIS*, G. and R.
- Agrotis Scandens*, Riley, may be *A. MESSORIA* H.
- Acronycta Populi*, Riley, is *A. LEPUSCULINA* G.
- Prodenia Autumnalis*, Riley, is *LAPHYGMA FRUGIPERDA* A and S.
- Xylina Cinerea*, Riley, is *X. ANTENNATA*, Walk.
- Plusia Brassicae*, may be *P. NI. HUBN.*

The above are, I believe, all the new Noctuidæ in the Missouri Reports.

Among the identifications of Noctuidæ in the same Reports, the following are erroneous: *Prodenia Commelinae*, Riley, is not Abbot and Smith's species, but *Lineatella* of Harvey. (It is possible that *Flavimedia* and *Lineatella* are sexes of one species). Again, the *Agrotis Jaculifera* of Prof. Riley includes *Agrotis Tricosa* of Prof. Lintner and, perhaps, *Agrotis Herilis*, Grote.

By way of comment on the above permit me to call attention to the following facts:

FIRST. That the synonymy there given in September was, so far as it is correct, published in The Bulletin above cited, copies of which were sent early in April to the New York Entomological Club, as well as to several of its members individually.

SECOND. That the species were, in most cases, published as new in the Missouri Reports, upon the determinations of Mr. Grote himself. To be more explicit:

1. Since it is admitted that *repentis* G. and R. is *cochranii*, Riley, and the latter, as I have proved by examination of the types, is *messoria*, Harr., it follows that this last cannot be *scandens*, Riley, which, in fact, bears no resemblance to it, and has always been pronounced a good species by Mr. Grote, both in his published papers and in his correspondence with me. It were

more appropriately compared with *murænula*, Grt. Assuming, however, for the sake of argument, that *messoria* is not *repentis*, then why is *cochranii* made a synonym of *repentis*, since the description of the former was published June 22, 1867, and that of the latter in January, 1868. Mr. Grote could at no time have claimed ignorance of the former description because he wrote me, by date of June 24, 1867, as follows: "I thank you for the *Prairie Farmer*, containing a detailed and interesting account of cut-worms, with your description of *A. Cochranii*. n. sp."

2. *Acronycta populi*. I have accepted Mr. Grote's decision that this is *lepusculina*, Guen., though, as I have pointed out, *populi* differs in several respects from the description of *lepusculina*. See Mo. Rep., II, p. 121, and General Index, etc.: 6, p. 74.

3. *Prodenia autumnalis*. This was pronounced by Mr. Grote, by letter of August 25, 1869, as "*Prodenia* sp. new to me," and while I have long since accepted *Laphygma frugiperda*, S. and Abb., as a synonym of one of its varieties, the other varieties would, without the proof to the contrary, which I gave, have undoubtedly been described as distinct.

4. *Xylina cinerea*. This was pronounced different from anything known to Zeller, at the time of the description, and was then, and for several years thereafter, pronounced a good species by Mr. Grote. I discussed its affinities at the time of the description, and the authors of the recent "Check List of Macro-lepidoptera," published by the Brooklyn Entomological Society, express their doubt as to the identity of *cinerea* and *antennata* by retaining the former without number. I have since read Walker's description, and no one could say positively what is meant without seeing the type.

5. *Plusia brassicæ*. This was described as new on the authority of Zeller, as stated at the time. Speyer, as I have shown (General Index, etc., p. 78), proves it to be really distinct, and his careful comparisons will doubtless convince most Lepidopterists.

6. *Prodenia commelinæ*. This was so pronounced by Mr. Grote, from a specimen sent him August 8th, 1867. *Flavimædia* and *lineatella* were characterized by Mr. Harvey, some years later, as I have stated in the "General Index," p. 56. Here again, however, as in the case of *A. subgothica* and its forms we have, I am satisfied, a question of varieties rather than species. With the well known varieties of *Laphygma frugiperda* in mind, I have been particularly interested, for a good many years, in breeding this *Prodenia*, and I record here my belief, which will be the accepted belief in the future, that *flavimædia* and *lineatella* are one species not distinct from *ornithogalli*, Guen. The larvæ, so far as I have bred material, are extremely variable and not separable, and the same may be said of the mature insects. They are more readily separable from the typical *Commelinæ*, though doubts, even as to their specific distinctness from it are justifiable.

7. *Agrotis jaculifera*. This (Mo. Rep. I, p. 82) neither includes *tricosa* Lintner, nor *herilis* Gr., but, as stated in the "General Index," (p. 56), the true *subgothica*, Haw. Mr. Grote was formerly of this belief, too,* and, it may be of interest to state, in this connection, that upon sending plate I, of my first Mo. Rep. for his opinion of the various species figured thereon, prior to publication, he replied from Danopolis, Ala., by date of March 17, 1869: "No. 11 is *A. subgothica* of which *A. jaculifera* is a synonym." In the "General Index" I have simply stated the fact, without further comment, that, subsequent to the publication of the first Missouri Report, fig 59a, had been described as *herilis* by Mr. Grote, and 59b, as *tricosa* by Mr. Lintner. It may be as well for me here to record my firm belief that we have to do in this instance with mere variations of one species, and that Guenée and the older authors were wiser in so considering them than the later authors in separating them as distinct species. I fully appreciate the care with which Mr. Lintner has separated the three well marked forms, but with every year that I have been able to get additional material for comparison, I have been more and more convinced of the correctness of the view here expressed, and that between the typical *subgothica* on the one hand, and *herilis* on the other, there is a perfect series, so that it is impossible, in some instances, to refer specimens to any one form more than another.

To sum up, I maintain that Mr. Grote, where he is not actually wrong in his conclusions, or opposed to men whom he himself acknowledges as authorities, simply repeats what I had six months previously published; further, that the present synonym of the species described in the Mo. Reports was *not* known at the time of the descriptions, and that if, as he avers, the species were "known to science," the blame for the synonym falls partly on him who, claiming special knowledge in the family, was not aware of the fact when the moths were referred to him.

Opinions as to the relations of such forms as *Agrotis herilis*, and *A. tricosa*, *Prodenia lineatella* and *P. flavimedia* will differ according to the conception of what constitutes a species, and there is all the less reason for dogmatism. However I may differ from the describers of those forms as species, I recognize the value of their work in separating the forms and the convenience of designating them by names. "In the field of [science no less than of] thought and literature it is no less our duty to speak and write in such a way that comprehension and knowledge may be increased by our labors without offense being given,"† and, I would add, in such way that practice comport with preaching.

I reserve remarks on *Dakrura* for another occasion.

* Bull. Buff. Soc. Nat. S. I., p. 100.

† "The New Infidelity," by A. K. Grote, p. 91.