

seasons further or hinder the advent of insects, is undoubtedly true, but as a general rule their time-table is quite as exact as the migratory birds.

I think it may be problematical as to whether the pupa remains beneath or upon the surface of the ground during the winter. My experiments, after having made the most natural provision at hand, have resulted in the pupa appearing upon or near the surface, and I would add that I find by my records that a larva obtained the previous season to that mentioned in the article already referred to, transformed in the same manner, the moth appearing on the 28th of May. My theory, in the absence of more essential data, is that the pupa of this moth, in its natural state, seeks the surface and finds security under the winter leaves. I have read with much pleasure what Mr. Hamilton writes with regard to this question, but it seems to me that the only satisfactory test, other than natural, would be in the use of soil common to the growth of the hickory, as that which is the most likely habitat of this species at this period of its history, giving to the pupa when thus conditioned the full service of all climatic changes. The provision as recommended by Mr. Hamilton is somewhat in agreement with what I have stated. He writes: "Take two parts of sandy loam, such as is used by plasterers, and one part of black friable soil from the woods, mix together \* \* and when the larva disappears cover over with a layer of moss, and then the pupa will not come to the surface." This effectually imprisons the pupa, and it becomes a matter of curious enquiry if the larva, in order to transform, could have selected a spot similarly conditioned.

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ON TROGODERMA ORNATA, PHYSONOTA UNIPUNCTATA  
AND TANYSPHYRUS LEMNÆ.

BY JOHN HAMILTON, ALLEGHENY, PA.

*Trogoderma ornata.* Since the publication of the remarks in vol. 15, p. 91, more has been learned concerning this pest. That it disclosed without entering the earth was eventually made evident by several of the beetles being found in a large, close box, just emerging. Why they should disclose in a large box and not in a small one was not very obvious. At last the thought occurred that hygrometric differences in food and atmosphere might account for it. Having some of the larvæ reared in a small wooden pill box, at the usual time for pupation some of these were placed

in another box of the same size, and their food moistened. In a few days they were found to have pupated, the beetles emerging about ten days thereafter. Their companions left unmoistened in the other box never developed. This is sufficient demonstration. Their entering the ground to pupate is exceptional, and the inference that they do so normally is erroneous.

*Anthrenus varius* is quite innocent when compared with this pest, the larva usually staying where the parent deposits the egg. But it is quite otherwise with our *T. ornata*. The female oviposits wherever she finds a dead fly, moth, or other insect; and when the young, after hatching, have devoured this, they travel off in every direction, gliding into boxes through the minutest crevice, often effecting an entrance with their jaws. Last summer a couple of small exchange boxes containing a few beetles were wrapped in four thicknesses of paper and stowed away. Later, the paper was found to be riddled with minute holes and these larvæ were in possession. An effectual mode to keep them out of boxes is to fold some crystalized white naphthaline in a paper and pin it in each box, renewing it yearly. This preventive is reliable. I have some boxes made of Red Cedar, in which there are open seams, but no museum pest ever enters them. The introduction of this insect into my premises has been traced to a lot of moths, crickets, etc., sent me from West Chester, in Eastern Pennsylvania, and last year it had so increased as to give great annoyance. Having observed its habits as above, I applied vigorous treatment early this season, which I am satisfied has resulted in its absolute annihilation. As a knowledge of the method may be of advantage to some unfortunate entomologist, the outlines are given. About the first of April I saturated some two inches of the borders of the carpets around my rooms with a solution of corrosive sublimate in alcohol—two drachms to the pint. Then, in the corners and out-of-the-way places, powder and pill boxes were placed containing dead flies, moths, and small insects. The beetles oviposited in these, avoiding altogether such as occurred on the carpet along the walls. About the first of June it was considered safe to remove the traps and consign the whole to the flames. In connection with this, all refuse material in boxes, etc., not insect proof, was destroyed, and places that alcohol would not injure received a brushing with the solution. Result—not a single larva has been observed this season.

*Physonota unipunctata* Say. Three years ago, in the month of July, I found a colony of these beetles on the river bank feeding on *Monarda*

*fistulosa* L., taking over fifty individuals. They almost wholly stripped the mint of its leaves. A few of the larvæ were feeding with them—a curious object indeed; bright yellow, its body depressed, oblong oval, with serrate spinose margins and a long bifurcate caudex turned over its back, reaching nearly to its head. I regret a more minute description can not be given, as I neglected to take any of them at that time, and none could be found when again sought for. This species had not previously been observed here and has not been since. The whole colony was no doubt the progeny of one beetle transported from some more northern region by the Allegheny during the annual spring inundation. They were all taken on a patch of mint not two rods square, none occurring on neighboring patches. With age the elytra become too hardened to pin in the usual way. All taken were of Say's type—namely, pale above with *one* black spot on the thorax. Mr. Randall, in the Boston Jour. Nat. Hist., vol. 2, p. 30, describes a variety (*Cassida helianthi*) with *three* black spots on the thorax and with the elytra in life “blackish, irregularly spotted with white,” which he found on a species of *Helianthus*. Messrs. Walsh & Riley describe another variety (*Cassida 5-punctata*) found in Northern Illinois, the food plant of which has also been discovered to be a *Helianthus*. Mr. Say mentions still another variety occurring in Mexico of a smaller size and with a transverse, arcuated, black line on the thorax behind the abbreviated one.

Thus it appears that the species as a whole is very variable as to color ornamentation. It would be interesting to learn whether the races breed true to their types, or whether like *Anomala undulata* Mels., color variations occur in the same brood. And further, whether each race has a food plant of its own. Perhaps some of your readers living where the species occurs frequently could give the desired information.

The colony that was found here must have fed on the *Monarda* of choice rather than of necessity, because three species of *Helianthus* (*decapetalus* L., *giganteus* L., *divaricatus* L.) grew with it and were not eaten by either larvæ or beetle.

Mr. Riley in his Second Annual Report on the Insects of Missouri, p. 59, gives a wood cut of a larva of *Ph. 5-punctata* W. & R., distended, classifying it with the me[r]digerous larvæ. The ones I saw must have been nearly mature and were all clean, their furcate tails turned forward over their backs and not loaded with stercoraceous matter and cast skins,

however it may have been with them when younger and in greater need of protection.

*Tanysphyrus lemnae* Fab. This is a very small thing, being among the minutest of Rhyncophora, about .05 inch in length, though this does not detract from its interest. Its trivial name is derived from the plant on which it feeds, *Lemna (minor)*, Duckweed, the little plant that floats on stagnant waters in the summer, mantling them with green, and like the insect, common to Europe and America. Though exceedingly abundant, it does not seem to be generally known, appearing on few catalogues. It occurs in August and September, and its presence may be known by observing the little circular hole it has eaten through the centre of the Lemna frond. They stay beneath the leaf as it lies on the water, or liquid mud, and come to the upper surface when this is agitated. Such as emerge from clear water are entirely black, but those from the mud appear mottled; the dorsum of the thorax and elytra from which the mud is wiped as they come forth between the contiguous edges of the fronds, is black, while the other parts are more or less gray from the dried mud. No other Rhyncophorus insect being found on this plant, this alone will suffice for its identification when found. It has very long legs, and unlike most Curculionides, the insect in death does not fold them under its body, but spreads them out on either side.

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LIST OF DIPTERA TAKEN IN THE VICINITY OF  
MONTREAL, P. Q.

BY F. B. CAULFEILD.

*Determined by Dr. S. W. Williston.*

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BIBIONIDÆ.

*Bibio albipennis*, Say. Common, end of May and beginning of June.

TIPULIDÆ.

\**Bittacomorpha clavipes*, Fabr. Several specimens taken in a damp meadow, June.

XYLOPHAGIDÆ.

*Xylophagus rufipes*, Loew. Not common, June 7, 1877.

CÆNOMYIDÆ.

*Cænomyia ferruginea*, Meig., *pallida* Say. Not rare on parts of Montreal Mountain, June, 1883. I found them sitting on ferns in open