

middle, running inward and then curving backward, until it approaches the outer edge, when it abruptly turns forward almost at a right angle and extends straight in an oblique direction more than the tenth of an inch to the outer edge. In the middle of the pale gray space forward of this band is a slender black crescent having some resemblance to the letter *L*, with a dot between it and the outer margin, a slender black line sometimes reaching with a curve from the crescent to the dot. The wing back of the band is pale smoky brown, except toward the outer margin, where it is pale gray, with a rhombic black spot on the margin immediately behind the band, this spot being cut across longitudinally by a slender gray line. Inside of this spot and much nearer the hind edge are two smaller blackish spots or streaks. Near the inner hind angle is a large white comma-like dot having its tail towards the inner edge, from this dot a pale streak often extends across the wing, parallel with the hind margin. The fringe is smoky, crossed by pale lines at the tips of the veins.

In the northern variety (*O. leucostigma* var. *borealis*) which is met with in the more northern sections of the State, the wings when spread measure from 1.20 to 1.30. Both pairs are alike in color, being dull smoky or dingy brown. The upper ones have a large ash-gray patch on the middle of the outer margin, which commonly extends to the tip, and is crossed by an oblique blackish streak, which is all that can be perceived of the band noticed in the preceding variety. Immediately back of this is a blackish spot, commonly of a rhombic form and sometimes crossed by a pale line. The base of these wings is somewhat clouded with ash-gray; and near the inner hind angle is a roundish white spot which is sometimes faint and almost effaced. Sometimes a row of small dark brown crescent-shaped spots is perceptible along the apical edge at the base of the fringe. The specimens which I have gathered in Washington county have uniformly been of this variety.

The antennae of these moths are about a third of the length of the wings. They are gray, with a double row of dark brown branches resembling the teeth of a comb. Each branch has a row of very fine hairs, like eye-lashes, along each side, and at its tip three bristles, one of which is much longer and directed inward towards the head. The body is gray, with a small black tuft near the base of the abdomen. The under side is paler and the legs are varied with blackish.

It is the male insects which we have described above. The females are totally different objects, to appearance, being destitute of wings, and having in place of them two small scales the tenth of an inch long and half as broad, situated upon each side of the thorax. The vaporier moth therefore analagous to the canker worm in this respect, the females in both species resembling worms more than perfect insects. The body of the female vaporier moth is short and thick when it first crawls from the cocoon, and longer and more cylindrical after the eggs have been deposited, being over half an inch long and a third as broad. It is of an ash-gray color from the hairs with which

the body is densely covered, and often a broad dusky stripe runs the whole length along the middle of the back. The colors become more dull and obscure after the eggs are deposited. The antennae in this sex are short and not branched as in the males, merely presenting a row of saw-like teeth along their inner side, each tooth having a short bristle at its apex.

The females merely crawl from the inner to the outer side of their cocoons, and their remain awaiting the approach of their mates, who invariably find them immediately. The instinct of the males for discovering the opposite sex is remarkable; and collectors are accustomed to avail themselves of it for obtaining specimens. By placing a box in which a newly hatched female is enclosed, in the haunts of this species, dozens of males will sometimes be attracted to it. Thus the females commence depositing their eggs often within a few hours after they have left the chrysalis state. The eggs are from one to two hundred in number, about the size of a mustard seed, white and round with a small depression in the summit. They are placed upon the cocoon from which the female came, and are developed in a large quantity of frothy milk-white, viscid matter, causing them to adhere securely to the cocoon and to each other. They are extruded in a continuous string, which is folded and matted together so as to form an irregular mass. I once pierced one of these females with a pin while she was in the act of depositing her eggs; and so tenaciously did she adhere to them that for a time it was uncertain whether the body would not tear asunder before it would separate from the string. Within a day or two after she comes out of the cocoon the female has completed her labors. Her body which was at first plump swollen and unwieldy, is now shrunken and flaccid, and she is so exhausted that she soon lets go her foothold, falls to the ground and perishes. The designs of nature in giving to these insects the habits which they possess are very evident. Having no wings by which to escape when menaced with danger, were these worm-like females to crawl about the limbs and trunk of the tree, as the canker worms are accustomed to do, their pale gray bodies would cause them to be discovered and devoured by birds. The canker worm runs no risk of this kind, as it makes its ascent in the winter and early spring when the birds are all absent upon their migration to a warmer climate. The vaporier moth coming out in August, by remaining stationary upon its light colored cocoon, is but little liable to be noticed. Still, there being even here some risk of its discovery, it hastens to fulfil the purpose of its existence immediately upon coming out of its cocoon,

lest some mishap should befall it were it to remain longer in this exposed situation.

The white frothy matter with which the eggs are covered becomes dry and hard and impervious to wet, thus protecting them through all the storms and vicissitudes of autumn, winter and spring. Nor will a bird be inclined to pick off and devour these eggs with this foam and the hairs of the cocoon adhering to them. They are thus shielded from harm although placed in such an exposed situation, until the return of warm weather brings out a crop of leaves for the subsistence of the worms; whereupon they hatch from the eggs, early in May, and grow up till they become the gay caterpillars which we first noticed above.

But though the vaporier moth is able to guard itself and its progeny from destruction in several directions, it is not thus fortunate in other particulars. It is exposed to the attacks of parasites. These are minute bee-like insects pertaining to the Family *CHALCIDIDÆ* in the Order *HYMENOPTERA*. They puncture the skin of these pretty caterpillars dropping an egg therein, from which hatches a minute maggot which feeds internally upon the fatty matter of the caterpillar, thus exhausting and eventually killing it. I once gathered two of these caterpillars which I placed with some leaves in a box. Two days afterwards one of them was found to be dead, and the other being lively and vigorous was removed to another box. Next day what appeared to be the ends of little worms were seen protruding from the body of the dead caterpillar. Upon the following day these worms were found to be seventeen in number. They had all left the dead carcase of the caterpillar and just above it upon the side of the box they had arranged themselves in a circular row, and had changed to pupae of a milk white color, 0.12 long and half as broad, hanging by their tails with their heads downward and their backs against the side of the box. This was upon the last day of July. Next day they had changed to a pale red color and had somewhat shrivelled, each having discharged a little cluster of clay yellow grains which were adhering to the side of the box at the tip of their bodies. They subsequently altered to a black color, and on the sixth of August they hatched the winged insects, which were of a brilliant brassy green color, with a blackish purple abdomen and white legs, and about the same size as the pupae. In an account of the vaporier moth which I published in the Country Gentleman in reply to enquiries respecting it from some of the subscribers of that paper, I named this insect (vol. vii, p. 235) the vaporier-moth parasite (*Trichogramma? Orgyia*.)