Whether the male *Culex* can bite, or not, is a question to which I can give no decisive answer; but I do not believe it can. I have often taken male mosquitoes, with all possible care to prevent disturbing them, beneath a glass cover upon my hand, letting them remain long enough to be as tranquil as they were when upon the leaves and grass of the field, but they would neither bite nor show any desire to do so, nor have I been able to feed male mosquitoes with water, saliva or fresh blood, all of which liquids the females often drink with avidity.

Upon anatomical grounds I believe that male mosquitoes take liquid food, although I have never dissected their stomachs to see what this food was. They have mouth-parts and pharynx developed sufficiently to suck liquids; but the absence of barbed maxillae, of a free hypopharynx, and of an oesophageal bulb, leads one to suppose that they take a smaller quantity of food than the females do, and that they do not obtain it by piercing the skins of animals.

THYRIDOPTERYX EPHEMERAEFORMIS HAWORTH. ITS HABITS AND METAMORPHOSIS.

BY HELEN SELINA KING, SAN ANTONIO, TEXAS.

THIS insect, whose range embraces Europe and Australia, is also found in certain parts of the United States.

Near Dallas, Texas, hundreds of cedar trees may be seen stript of all foliage and killed by this insect, with their branches laden with its cases. Near Austin, Texas, its favorite food is a species of wild bramble, *Smilax rotundifolia* Young, but many other trees and shrubs furnish ready substitutes. Among these are the scrub-oak, the peach pomegranate, the Judas tree (*Cercis*), and even weeds of certain kinds, while the variety of cedar found there does not seem to be molested.

The habits of this insect have already received the careful attention of entomologists and my object is to fill, as far as I can, any blanks which may have occurred in previous observations, by giving such items as have rewarded my personal attention to its habits and metamorphoses.

The perfect insect is bisexual but is supposed to be occasionally parthenogenetic. I have not yet demonstrated this latter trait.

The male has short, sub-hyaline wings, sparsely scaled, of a dull brown color, and quickly expanding as in hesperians, which it also resembles in its broad head and large eyes. The antennae are deeply pectinate on their basal half, with minute pectinations on the terminal portion. The abdomen, usually short, showing the tip of the terminal segment is retractile and capable of great extension.

The female is apterous, apodous, and almost acephalous, the small head, bent slightly forward, being scarcely distinguishable as such but for its relation to the other members, and its two minute ocelli. There are no antennae, and no visible organs of manducation. This small head and the gradually enlarging thoracic segments are acutely carinated on the median dorsal line, and are en-

closed in a chitinous membrane of a burnt-straw-color. There are not even rudimentary feet, but rather indications of what would be their normal position.

On the anterior part of the sternum is a dark movable body, plainly seen beneath the skin, corresponding in its appearance and motions to the heart of the earth-worm, *Lumbricus terrestris*. The posterior end of this body is pointed, the anterior rounded. When the insect is at rest, this body is comparatively stationary.

From the thorax the body becomes of a paler color, cylindrical, rounded at posterior end, and much larger than thoracic segments. The abdomen seems filled with eggs and fat, visible through the thin membrane.

The female perfects her last transformation from about the middle of March to the middle of May. When first matured from the pupa stage she seems to have been covered with short hair of a soft silky texture and straw-color. This, rubbing off easily with her motions, falls like down around her, that on the anterior part of the body first. As soon as the female is perfected she projects her head from the lower end of the case and begins to deposit her eggs. These are cylindrico-oval, smooth, white, and glistening, and about twenty in number. They are imbedded in the soft hairs from the mother's body, and remain thus for weeks before hatching.

When the female has ceased depositing her eggs her body is an empty, lifeless shell.

It is probable that the life-cycle embraces a period of two years, as the larvae may be found at all seasons, and in various stages of growth, well protected from the heat of summer and cold of winter by their weather-proof cases.

The eggs mature, according to the season, in three, six, or eight weeks and the young larvae are found as early as the latter part of June. Having eaten their shells they at once proceed to house-building, usually finding suitable materials near at hand, as the female imago lives and dies in her case, which is swung to a twig or vine of her proper food-plant; but if by chance this is inaccessible, many other forms of vegetation will serve their temporary needs, such as rose-leaves, or the *Canna*. When first noticeable, the larva is about 2 mm. long. It cuts out circular pieces from the leaf, about the size of a small tack-head; this it spins together with a little silk into a small cone, which it carries with the apex in the air, the posterior end of its anal segment adhering to the inner surface of the cone. It moves about from one part of the leaf to another, and, unlike the more fully grown individuals, when falling, suspends itself by a silk thread. It will even leave its case and afterwards return to it. When not feeding it spins its upright tent to the leaf.

When fully grown and presenting its more permanent features, it is about 40 mm. long with a case much longer. Its head and three anterior segments are brownish, polished, and with ivory vittae and spots. These segments overlap anteriorly, and the elastic membrane between is of a dirty lavender color. The abdominal rings nearest these, which

are sometimes visible, are of a dull brown, and with no distinctive features. The silk tubes are quite conspicuous; mouth-parts dark.

The anterior segments are longer than the others, and the large, strong, clawed feet seem to spring from the middle line of the venter, making a semicircle terminated by the claws. When the larva is resting in the day these claws are all bunched up, at the mouth of the case, or withdrawn within it, only one remaining attached to the branch from which it is thus momentarily suspended.

At night the larva spins a number of threads from the case around the branch, and retires within its recesses. Ordinarily the mouth of the case, large and loose, falls together when not expanded by the larva's body. For the pupal change, it spins up the mouth and fixes it firmly to some stationary object, usually its food-plant.

If the case of one of these larvae be cut open, and an empty one be cut and applied to it, the larva, although preparing to enter the pupa stage, will rouse itself and unite these into one. The larvae also use for the construction of these cases various kinds of leaves, twigs, and vines. These are put on, one over the other, like shingles on a house, and frequently so near together that they stand out straight and look ruffled.

A larva having been removed from its case and put in a pill-box, with some raw cotton and its proper food, soon constructed for itself a new case from the cotton, lined it with silk, made a mouth for it, and then, crawling to a branch placed near, suspended itself as usual.

In order to remove it from its natural case I had only to touch this on one end, and the larva would continue retreating until it emerged at the opposite extremity. After many interesting exploits this larva disappeared.

HABITS OF *HYPOPREPIA PACKARDII*, GROTE.

BY MARY ESTHER MURTFELDT, KIRKWOOD, MO.

In 1879 I had the pleasure of tracing the larval history of the pretty little Lithosian above named, the imago of which was described some years ago by Mr. A. R. Grote in the Proceedings of the Entomological Society of Philadelphia, April, 1863, v. 2, p. 31.

Upon my writing to Mr. Grote regarding its immature stages, he informed me that nothing had been published on the subject, and that he himself had never observed the transformations. As I have seen nothing since that date referring to this species, I trust that the following notes may not be altogether without interest to those making a specialty of the group to which it belongs.

Two larvae were found in dormant state, 20 Dec., under loose bark of black oak (*Quercus tinctoria* Bart.). They were then about 6 mm. in length, hairy, and of a mottled light and dark gray color, the head being similarly clothed and colored. They bore a strong gen-