

when it assumes the pupa state, and finally emerges as a four-winged fly in the month of June. This fly is about one-tenth of an inch in length; its wings are clear and transparent, its body black, and its legs dull pale yellow, sometimes darker, and even black. In fig. 59, *a* represents the female, *b* the male, *c* the antenna of the female, *d* that of the male, *e* the abdomen of the female, enlarged to show the rings or segments of the body, and *f* that of the male.

The best, in fact the only remedy that we can recommend for these insects when they prove abundant and destructive, is to burn all the stubble in the affected field and also all the refuse straw after the grain is threshed. By this means the larvæ enclosed in their cells will be consumed, and in them the parents of the next year's brood will be effectually got rid of. To ensure complete immunity from a second attack, it will be necessary that all the farmers in a neighbourhood should adopt the same method, else the insects hatched on one farm will easily fly over to another.

## 6. THE ANGOUMOIS MOTH (*Butalis cerealella*, Olivier.)

### LEPIDOPTERA—TINEIDÆ.

The five great enemies of the wheat-plant that we have thus far described are all known to inhabit this country, though two of them—the Chinch Bug and the Joint-worm—not in any great numbers; and they have all, to a greater or less extent, come under our own observation. Besides these five species, there are several other insects that inflict depredations upon wheat, and often cause great loss to the owner; but happily they are most of them entirely unknown to us in this country, and of some of them we have never even seen a specimen, living or dead. Among these may be mentioned the insect whose name we have prefixed to this section.

The Angoumois Moth, according to Dr. Fitch, is one of the most destructive insects to wheat, barley, oats and Indian corn, in France, and was long ago introduced into the Southern States, where it has become fully naturalized. From thence it is frequently brought into New York in cargoes of grain, but the climate appears to be too cold for it to thrive and establish itself. We need not, then, feel much alarm respecting it in Canada.

The larva is a smooth, white worm, which attacks grain when stored in the bins of granaries or storehouses. Each individual worm attacks a single kernel of the grain, and consumes all the flour inside without injuring the external shell. It passes the pupa state also in the grain, and comes out in May, or in November as a tawny, dull yellowish-grey moth, having its fore-wings commonly sprinkled with a few black dots, and expanding half an inch.\*

The most effective remedy for the insect is to subject the infested grain to the heat of an oven, or of a very warm, dry room. To accomplish this, in France machines called "insect mills" have been invented. They consist of a large hollow iron cylinder, much resembling an ordinary coffee-roaster, into which the infested grain is put, and then the instrument is placed over a fire and revolved, heating the grain up to a certain point. In this way all the insects in the grain are killed in a short time, and with little expense. This might be found a useful mode of dealing with the Pea-weevil (*Bruchus pisi*), which is often very destructive in this country.

## 7. THE ARMY-WORM (*Leucania unipuncta*, Haworth.)

### LEPIDOPTERA—NOCTUIDÆ.

This is another redoubtable foe that the wheat grower has to combat in many parts of the United States. The insect is very familiar to us here; we have frequently taken dozens of the moths by the process of "sugaring," on a warm summer's evening; but though abundant, we have never heard of its larvæ appearing in Canada as they do in the United States, in countless myriads, marching on in regular column, and devouring everything in the shape of grain or grass that comes in their way.

The following description of the insect we quote from the *American Entomologist*, (vol. 1, p. 215):—"The eggs hatch during the early part of May, in the latitude of South Illinois and Missouri, and the young worms may feed by millions in a meadow without attracting attention; but when they have become nearly full grown and have stripped bare the fields in

\*Vide Dr. Fitch's 7th N. Y. Report, pp. 127-133, from which our account is chiefly compiled.