

## FARM AND FIELD.

INSECTS INJURIOUS TO GRAIN  
AND GRASS CROPS.

The midge, a European importation, according to the evidence of the Rev. C. J. S. Bethune, first made its appearance in Vermont in the year 1820, rapidly spread itself over the Eastern and Central States, occasioned in the State of New York, in 1854, a loss to the agriculturists of not less than \$9,000,000 by its ravages, appeared in Canada in 1856, in which year the injury it did to the crops was estimated roughly at \$2,500,000, and, in the year following, destroyed, as was calculated, 8,000,000 bushels of wheat in the Province of Ontario alone. For ten or twelve years its unwelcome presence was more or less felt, but since 1869 it has ceased to do any appreciable mischief, although in one or two instances, farmers examined by the Commissioners have referred to it as one cause of recent injuries to their wheat crops.

This tiny insect, in its several stages, is represented in the accompanying illustration, both magnified and of its natural size (see Figs. 1, 2, 3, 4). In appearance it resembles the Hessian fly in many respects. The chief distinction is in the colours of the body, the midge being yellow and the Hessian fly black.

Mr. Bethune thus describes its habits:—

"The midge frequents the ripening ears of the grain; the eggs are laid in the young and tender blossoms of the wheat, and as soon as the larvæ are hatched from the eggs they begin to feed upon the juices of the grain-kernel, and continue extracting the juices of the grain, causing it to shrivel up and become utterly worthless. When the period of the ripening of the grain arrives, the larva descends to the earth, and remains there throughout the winter. In the following spring it transforms into the pupa state, and in the month of June—earlier or later, according to the season—the perfect insect or fly makes its appearance, just about the time when the young crop of grain is beginning to assume the flower state. Its presence at this time of the year is made known to entomologists and others by large numbers flying in at the windows at night, covering the lamps, the papers on one's table, etc. It is in that way I have chiefly noticed the perfect insect."

The serious loss sustained by the operations of this pest, led to many experiments with the view of arresting its depredations. It was chiefly fall wheat that suffered, the plant being, in the month of June—the time of the

appearance of the midge in the fly and breeding stage of its existence—just in a condition to suit its purposes. Efforts were made by Mr. Arnold, of Paris, and other hybridists to produce a wheat that should be midge-proof. Mr. Arnold referred to these attempts in his late examination before the Commissioners. He said:—

"When I first began, the midge was very destructive, and there were certain varieties which were midge-proof but of miserable quality, and my idea was to get our old Soule's wheat in midge-proof chaff, which I believe I accomplished; but, fortunately for

vantage resulting from this mode being that, in the following year, they would not be influenced by the warmth so early as otherwise, their development would be retarded, and in all probability their appearance would be too late to be followed by any great injury. By these several methods they would, in fact, be starved out. . . Besides these remedies another was proposed, viz., that spring wheat should be sown as late, and fall wheat as early as possible; the object being that the former should be matured too late, and the latter too soon, for the attack of the midge in the month of June."

In the opinion of Mr. Bethune, the chief cause of the disappearance of the pest was due to parasites preying upon the midge, but so minute as to have escaped discovery. These friendly insects with others will be noticed later on.

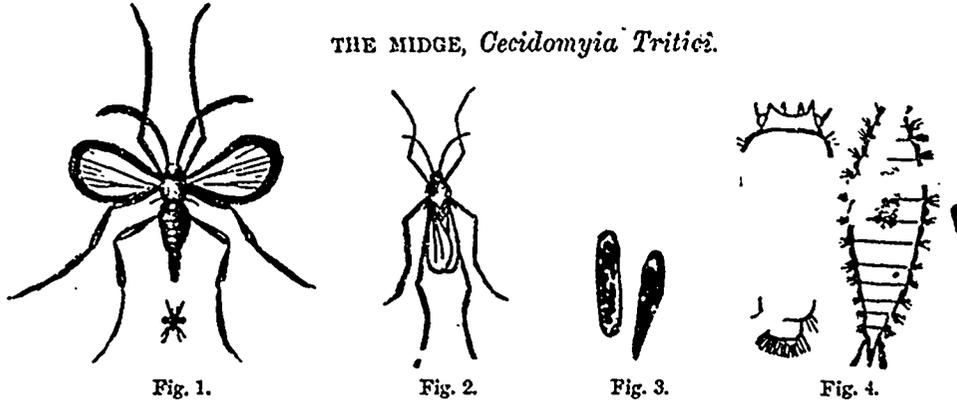
The "Hessian fly" (see Fig. 5) is now supposed to be an indigenous insect, the belief, from which it received its popular name, that it was introduced into the States by Hessian troops during the revolutionary war, being now dispelled. It is, however, a fact, that it was first noticed in the States in 1776. It was seen at Quebec in 1816, and in this Province in 1846, since which date it has been a frequent and unwelcome depredator upon the fall wheat crops, few years passing without notice of its presence being announced from some quarter. Its habits are described by Mr. Bethune as follows:—

"It appears first in the fall at the root of the fall wheat plant; its eggs are laid, and the larvæ hatched out below the surface of the earth on the surface, and there they remain all winter, the brood appearing in the spring. There is a second brood in the spring which attacks the stalk, where the insect is most generally noticed. Farmers hardly ever observe the insect at the root, but every one who has observed

it has seen it on the stalk. |

"It attacks the stalk just above the first or second joint from the root, where it is enveloped by the leaves. The larvæ vary in colour at different periods of their existence, being very pale at first, but afterwards of a deep chestnut colour. Their first attack is made when the stalk is very tender and green, and they puncture it to extract the sap, the result being to cause a small depression where the larvæ remain. There may be five or six encircling a single stalk at one time, and the result of their combined efforts is to weaken and finally to break it, causing it to fall down, thus ruining the grain.

"After the larva has fed for a considerable time upon the stalk, it assumes what is called the 'flax-seed' state resembling in colour, size,

THE MIDGE, *Cecidomyia Tritici*.

Not more than one-tenth of an inch long. Fig. 1 represents a highly magnified specimen with the wings expanded; the outline below shows its natural size. Fig. 2, the same, with closed wings. Fig. 3, the eggs. Fig. 4, the outline of the larva, highly magnified.

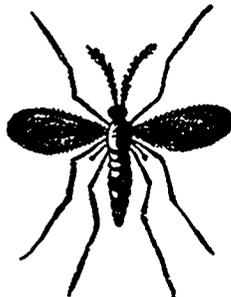
THE HESSIAN FLY,  
*Cecidomyia destructor*.

Fig. 5.

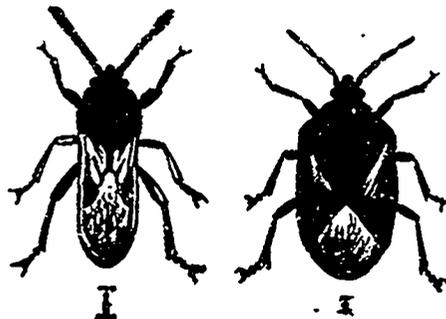
THE CHINCH BUG,  
*Micropus Leucopterus*.

Fig. 6.

Shows, on the left hand a specimen of the true chinch bug, on the right an ordinary bug, magnified.

## THE APHIDÆ, OR PLANT LICE.

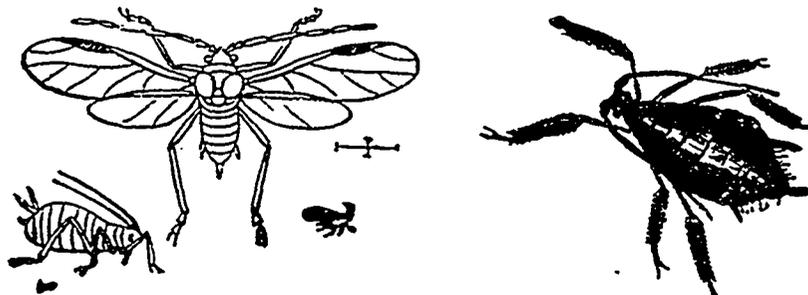


Fig. 7.

Fig. 8.

The above figures will serve to illustrate the insects belonging to this family. Fig. 7 represents a highly magnified winged male and wingless female. Fig. 8, the wingless female very much enlarged.

the country, by the time my wheat was ready to introduce, the midge had disappeared everywhere, though I believe it has re-appeared since in some localities."

Other proposed remedies are thus referred to by Mr. Bethune:—

"One practical remedy that was recommended at the time was to burn all the screenings of affected wheat—all the refuse of the fanning-mill, the sweepings of the barn floor or any place where the grain had been stacked, and where the insects would naturally be shaken out. Another remedy was that in the fall the infested wheat fields should be very deeply ploughed, with the object of burying any insects that might remain, as far below the surface as possible, the ad-