

gall-gnat family, you were probably misled by the jaws of the larva of the gall-making *Chalcis* fly meeting together in repose in the form of a V. If you had watched one of these larvæ closely for an hour or two, you would probably have seen him open his jaws and shut them together again; whereas, the two prongs of the 'breast-bone,' whether it be V-shaped or Y-shaped, in the larva of every gall-gnat are soldered solidly together, and are absolutely incapable of the least motion.



Fig. 1.

"The sum and substance of the above is, that Dr. Fitch was right and I was wrong in the matter of these barley galls. It is true that I never asserted positively that Dr. Fitch was wrong, but as I have thrown doubt upon his theory, I think it proper to take an early opportunity of acknowledging my error. I write for truth, and not for victory, and never claimed to be infallible."

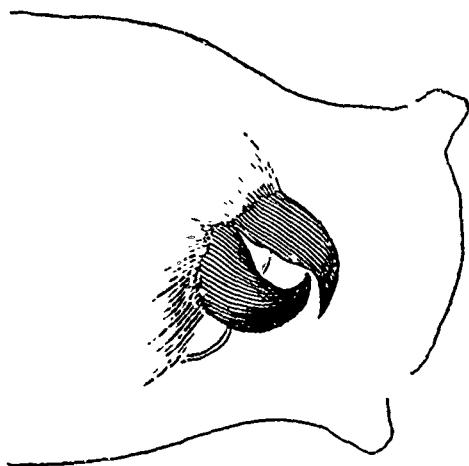


Fig. 2.

The foregoing communication, with its straightforward acknowledgment of a previous wrong conjecture, is exceedingly valuable as settling once and for all that the insect in question is our enemy, and therefore should be destroyed whenever found in our barley fields. Mr. Walsh's clear statement of the facts of the case renders it unnecessary for us to add anything further as to the nature of the insect.



Fig. 3.



Fig. 4.

With regard to what we supposed to be the 'V-shaped breast-bone' of the worm, we have also to acknowledge a mistake. Before receiving Mr. Walsh's letter, we had an opportunity, through the kindness of a friend, who is a thorough microscopist, of making a careful examination of the insect with his instrument. With it we at once perceived that what we took to be the "breast-bone" was the mouth of the worm, the dark lines being two very strong and sharp teeth. Our friend has furnished us with the annexed drawings from the microscope,

which will afford a good idea of the worm as it appears when highly magnified. Fig. 1, shows the shape of the grub, somewhat reduced from the apparent size under the microscope, as seen with an inch objective, which magnifies about thirty times linear, ordinarily called one hundred superficial. There is no trace of legs; eight spiracles, or breathing-holes, on each side; two prominences in front (? for feelers); very strong muscles of the two teeth, which are unusually sharp-pointed. Fig. 2, shows the teeth as seen with a quarter-inch objective, which magnifies about 250 times, or 1000 superficial. Figs. 3 and 4 represent a stalk of barley (natural size) with two of the swellings, or galls, produced by the worm; Fig. 3, as seen in front, Fig. 4, sideways. These occurred on the third joint from the root, and on the part of the straw that should be destroyed.

In our former remarks upon this insect we requested our correspondent to describe as fully as he could the operations of the flies that he witnessed, and to tell us whether they deposited their eggs in healthy straw, or in that which was already diseased and swollen. Mr. J. Pettit has very kindly sent us a full and clear account of the process of ovipositing, which would prove conclusively the noxious character of the flies, even had we not Mr. Walsh's testimony to the same effect. He writes as follows:—"The first intimation I had of these insects infesting the barley here was last year, when I found the galls in the growing crop, and collected a large quantity to breed specimens from. About the 8th of June of the present year the perfect insects began to make their way out of the galls, and proved to be all of one species, *Eurytoma fulvipes*, Fitch,* from which I drew the inference that they could not be parasites of any *Cecidomyioides* insect, of which the straw did not produce a single specimen. Desirous of knowing more of their habits, I watched the growing barley, and on the 10th of June found them actively at work ovipositing in the then healthy stalks of the plant. Before commencing operations they walk leisurely up one side of the plant as far as the last leaf, and then down the other, apparently to make sure that it has not already been oviposited in. Head downward, they then begin by bending the abdomen downward, and placing the tip of the ovipositor on the straw at right angles with the body, when the abdomen resumes its natural position, and the ovipositor is gradually worked into the plant to its full extent.

"With the aid of a good lens, and by pulling up the plants on which they were at work (which did not appear to disconcert them in the least), I could view the whole operation, which, in some cases, was accomplished in a few minutes, and in others was the work of an hour or two. When a puncture was completed they usually backed up a little and viewed it for a few seconds, and then apparently satisfied, moved to one side and commenced another. As the puncture made by these insects in the straw were as plainly apparent under the glass as a post-hole to the ordinary vision, I felt, perfectly satisfied that they were not made in any previously formed galls, of which there was not the slightest appearance."

The Hop Aphis.

MR. ANGUS SHAW, of Lake Side, county of Oxford, has sent us some leaves from his hop-yard, which are very badly affected with the *Aphis*—that plague of the hop grower. He states that the hop-yards, not only in his own neighborhood, but also in Middlesex, are generally affected with this pest; we have ourselves also seen its attacks in the Township of Toronto.

* It is a strange oversight on the part of Dr. Fitch, that he names his "yellow-legged barley fly" *E. fulvipes* when first speaking of it on page 164 of his 7th report of the noxious, etc., insects of 'N. Y.' but on page 139, he names it *E. flavipes* when proceeding to describe it. As he refers to both places in his index under the former name, we presume it is the one he means should stand.

In our last issue we gave an account of the *Aphis* that infests the leaves of the cherry and pear; as the remarks we made then respecting the habits of this insect apply equally well to the one before us, it is needless to repeat them here. The hop *aphis* differs from that of the cherry only in being entirely green; the injury, however, which it inflicts is immeasurably greater, as the crop at stake is of so much higher value, and is cultivated on so much larger a scale.

The remedies for this grievous pest are of two kinds, natural and artificial; and of these the checks provided by nature are ordinarily wont to be the most efficacious.



Fig. 1.



Fig. 2.

Natural remedies,—(1.) The various species of lady-birds or lady-bugs, as they are termed—a beetle that is familiar to every child. This insect lives upon aphides in both its larval and perfect stages, devouring infinite numbers, and always appearing wherever its food is to be found. Upwards of thirty different species of this family of insects are known to inhabit Canada. As it is highly important that all should recognize these friends of mankind, and not destroy the innocent with the guilty, we annex cuts of one of the most common species, the nine-spotted lady-bird (*Coccinella 9-notata*, Herbert). Fig. 1 represents the larva, which is of a bluish-grey color, spotted with reddish yellow; Fig. 2, the perfect insect, which resembles a 'plum' in shape, and is yellow or reddish, spotted with black.



Fig. 3.



Fig. 4.

2. The lace-winged, or golden-eyed fly (*Chrysopa*) Fig. 5, so-called from some of its most striking characteristics. This fly has four delicate transparent white wings, like bits of fine lace, bright golden eyes, and a lovely green body; but though so pretty to look at, it is most horrible to handle, the odour it emits being of the most sickening and disgusting character. Our Canadian species certainly possess this offensive smell, as we know from experience, though, according to Mr. Walsh, those in the Western States are free from it. The habits of the larvæ (Fig. 3) are similar to those of the lady-bird, and they are generally to be found on the leaves of the hop where the *aphis* is numerous. Its eggs (Fig. 4) are attached to the ends of long threads affixed to the leaf by the female, probably in order to be more free from danger.

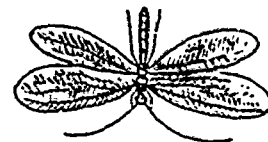


Fig. 5.

3. The next family of insects that preys upon the *aphis*, is that of the *Syrphus* flies. These are two-winged insects of variegated colours; it is only, however, in the larval state that they wage war on the plant-lice. The parent fly deposits her eggs singly on affected leaves, so that the young are hatched in the midst of their food; these are footless grubs, destitute of eyes, and with the mouth provided with a very peculiar organ of suction. They move slowly along the surface of a leaf until they meet an *aphis*, which is no sooner touched than it is transfixed, and speedily sucked perfectly dry. Other enemies