Myriads of small pale maggots crawling from the mow of wheat [illegible] after it is placed in the barn; the kernels of grain shrivelled and dwarfish.

The WHEAT MOW FLY, *Agromyza Tritici*, new species (Plate 2, fig. 1). → Meromyza obscurella

Several years ago a farmer in my neighborhood, soon after gathering his wheat into the barn, found countless myriads of small worms were crawling out of it, literally covering the mow of grain and wandering away from it to every part of the barn. These worms it is evident had just now completed their growth and were crawling about in search of the moist earth, wherein to bury themselves, to repose during their pupa state. It would seem that some cause had made them later than usual in reaching maturity; and had the wheat remained in the field a few days longer, they would have escaped from it there, so generally that no notice of them would have been taken, and the fact would never have been known that such an army of insects had had their subsistence upon this crop.

Alarmed with the numbers of these worms, and fearing they would perhaps wholly destroy the mow of grain, the proprietor had the whole of it threshed immediately. I happened to visit the barn as the threshed grain was being winnowed, when the above facts were communicated to me. The heap of uncleaned grain was literally alive with these worms and the cracks in the floor were filled with them. The kernels of wheat appeared to be shrunk in the same manner as when they have been infested with the wheat midge. I put a number of these worms into a small box, with some of the chaff and grain. Other engagements diverted my attention from this subject and it was wholly forgotten until many months afterwards, when, happening to open the box, I found in it quite a number of small flies, which had completed their transformations and perished in their confinement. It therefore appears that it is by no means essential to these worms to bury themselves in the moist earth, though that is doubtless their natural habit. But if they can find any crevice in the dry barn where they can stow themselves and lie undisturbed, it is all they require in order to complete their transformations.

The worms, according to my recollection, were much like the little yellow maggots of the wheat midge, but were of a dull white color, a[illegible] rather larger. Their transformations are like those of flies generally, the outer skin of the larva or maggot contracting and becoming dry and hard, and forming the case within which the insect lies in its pupa state. When the larva skin of this species is thus dried, with the pupa reposing within it, it appears as represented, plate 2, fig. 2, 2 *a* being a highly magnified view of its upper and 2 *b* of its under side. It is but the tenth of an inch long, and 0.03 in diameter; it is shining and of a pale yellow color, of an oval or rather an elliptical form, more rounded at the head and pointed at the opposite end, the segments distinctly marked by transverse constrictions.

These flies appear much like the common house fly, reduced to an infantile size. I supposed they would prove to be one of the European species of Oscinis, until I came to examine them, when I found that, though they belong to the group OSCINIDES, they are generically distinct from both Chlorops and Oscinis, in having bristles or hairs upon the face as well as upon the crown, and in having the two little transverse veinlets of the wings situated quite near the base. They thus pertain to the genus *Agromyza* a name meaning field flies, as this genus is characterised by Macquart, and to his section AAA, and to his subsection DDD, but they are clearly distinct from either of the species which he describes; nor am I aware that any of the members of this extensive genus have hitherto been noticed as depredators upon wheat, like their kindred of the genera Chlorops and Oscinis. The present species may therefore be designated

The WHEAT MOW FLY, *Agromyza Tritici*, (plate 2, fig. 1.) It is 0.08 in length, and to the tip of the closed wings 0.11. It is black, with a broad pale reddish yellow band upon the front above the base of the antennæ, and the mouth broadly margined with dull yellow. The legs are brownish black, the knees slightly marked with pale yellow. The wings are notched on their outer margin near the base, at the apex of the first vein. The veinlets are situated near the base of the wing and near each other; and the inner middle vein is not prolonged beyond the second veinlet.

In the same box in which these flies were hatched was found four individuals of a parasitic fly which had evidently come from some of the worms of the wheat mow fly. They pertain to the Family PROCTOTRUPIDÆ of the Order HYMENOPTERA, and to the genus *Diapria*. They may therefore be named

The WHEAT MOW FLY'S PARASITE, *Diapria Agromyzæ*. They measure 0.06 in length, and to the tip of the closed wings 0.08. They are black and shining, with shanks

thickened towards their tips, the hind pair being very long, and the legs are pale yellowish, with the thighs and the thickened ends of the shanks black. The abdomen is elliptic. The antennæ in the males are thread-like and nearly as long as the body, composed of fourteen joints, which are very distinct, equal, oval, a third longer than broad, the apical one being a little longer and egg-shaped, and the basal one club-shaped and thrice as long but scarcely thicker than the following ones. In the female they are shorter and composed of twelve joints which are compacted together, the three last enlarged and forming a kind of knob or club, the last joint nearly as long as the two which precede it, its end bluntly rounded.

Upon the heads and stalks in June and July, exhausting the juices of the kernels and rendering them dwarfish and shrivelled; exceedingly minute, active, long and narrow, six-legged insects, of a bright yellow or of a shining black color.

The Wheat Thrips, *Thrips Tritici*, new species.
The Three-banded Thrips, *Coleothrips trifasciata*, new species.

My attention has been called to these insects by a letter from David Williams, dated Geneva, Wisconsin, July 9th, 1855, which says: "Enclosed I send you specimens of a minute little insect that is causing some alarm in this vicinity. They are found in all blossoms in great numbers. They first made their appearance about the middle of June, or at least they were then first noticed, so far as I have heard. For about two weeks they were found in the blossoms of wheat and of clover, causing numbers of the blossoms to wither, and in some cases the kernel was also attacked. About a fortnight ago we had a very heavy fall of rain, which appeared to destroy them; but within a few days I have noticed their reappearance in countless numbers. They are very nimble, requiring good eyes and ready fingers to secure them, and I was obliged mainly to my wife for the capture of those which I send you."

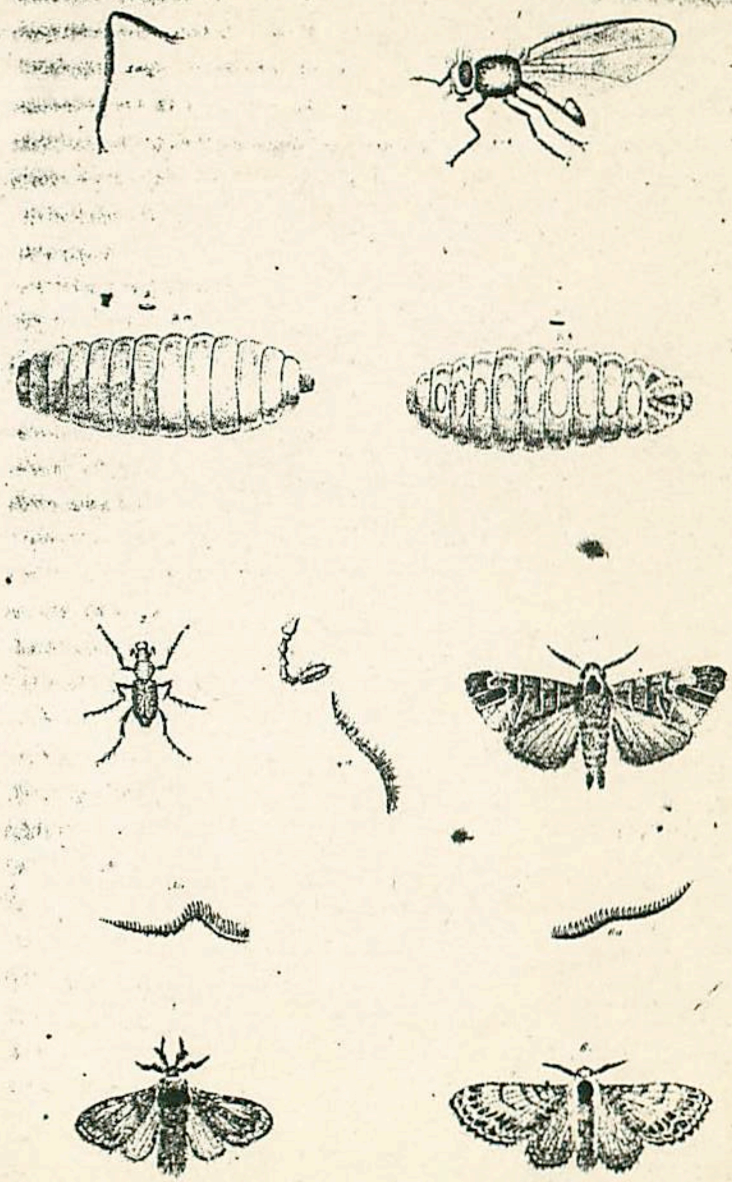
The insects alluded to in the above extract are so minute, that had only two or three specimens been sent me, I should have been unable to give any definite account of their species. An acknowledgment is due Mrs. Williams for the number of these insects which she enclosed in the quill—a task which the bungling fingers of a man could scarcely have accomplished. Among them I find specimens in all the stages of their growth, and am hence able to present a tolerably complete history and description of the species; although it is only from living specimens that such

minute objects can be satisfactorily studied, and described with that precision and fullness which science requires.

Insects of the kind to which these belong may be distinguished from all others by their wings (see the accompanying figure, *e*), which are long, narrow and strap-like, and in most of the species are fringed on both sides with long hairs like eye-lashes. Their mouths are also different from those of all other insects, being nearly intermediate between the *beak* or bill with which some of the orders of insects puncture and *suck* the fluids on which they subsist, and the *jaws* with which all the other orders *gnaw* the substances on which they feed. These insects originally formed the genus *Thrips*, placed by Linnæus next to the plant-lice, in the Order Hemiptera. But as their wings and the structure of their mouths is so wholly unlike that of any other insect, naturalists of late rank them as a distinct order, which is named Thysanoptera, i. e. fringe-winged. This order contains the single family Thripidæ (currently written Thripidæ by authors, but incorrectly), which is divided into seven genera by Mr. Haliday, whose researches in this group have been unsurpassed. About fifty species of these insects are known to the entomologists of Europe. They are all of small size, more than half of them being only about the twentieth of an inch in length, or less, and but few slightly exceed the tenth of an inch; though recently some have been found in Australia which are three times as large as any which were previously known.

Most of the species are found in the flowers of different plants. They feed upon the juices, and are very injurious, especially in hot-houses, causing small dead spots upon the leaves and flowers wherever they wound them. Some of them also infest melons and cucumbers. One species is very injurious to the olive trees in Italy. Another attacks peaches and other fruit to a mischievous extent. But the species which appears to do the greatest amount of damage is the grain Thrips (*T. cerealium*). Our first accounts of this insect are from Mr. Kirby, in 1796 (Linnæn Transactions, iii, 216), who however supposed it to be the *Thrips physapus* of Linnæus, until Mr. Haliday showed it to be distinct from that species. An excellent history of this

Plate 2.



Lith of C. Van Benthuysen.