

its operations and habits. It is, however, not a stranger to certain ingenious foreigners, who have noticed its ravages in the rye-fields of France, and have published accounts of it in the scientific annals of their country. The fly itself is about half an inch long, and black, with four transparent and iridescent wings; the legs are yellow, striped with black. Many of them may be frequently observed on flowers, in corn-fields, during June, and on grasses, in woods; but a casual glance at them gives no indication of their mischievous habits. The female lays her eggs just below the ear, in the straw of the corn plant, and the larvæ travel from the top to the bottom, eating as they go, and working through the knots with perfect ease, until the time of the ripening of the harvest, when they eat through the stem near the ground, and pass into the chrysalis state. France has, at times, suffered extremely by the attacks of this singular insect, whose habits have hitherto been little known and less suspected by those whom they much concern in this country. Persons have now been led, by the light thrown on the subject through the papers of Mr. Curtis, to search for it; and an interesting communication appeared respecting it in the "Gardeners' Chronicle" for Feb. 21, 1846. It is stated in this periodical, that the maggots inhabiting the straws live through the winter enclosed in transparent cases, of very close texture, and enter the pupa condition in March. It is also added by the correspondent of this valuable paper, that "these flies resort to flowers in corn-fields, grass in woods, and umbelliferous and composite flowers on banks and roadsides." The straws containing the larvæ may be detected after harvest by a little attention. The short pieces of stubble being cut horizontally by them. They undoubtedly cause serious mischief, as the ears of the infested stems are either sterile, or contain only a small number of shrivelled grains. Burning the stubble seems to be the best means of extirpating the cephus; but there is an ichneumon named *pachymerus calcitrator*, which keeps it in check by depositing eggs in the maggots, which hatch and live upon them."

There are many other little insects found on the stems and ears of the *cerealia*, or corn plants, the habits of which have not yet been sufficiently inquired into, nor the actual services performed by others that accompany them. We have an example of this in the *thrips*, as it is called, that Mr. Kirby described many years ago; but it ought to become the subject of fresh observations. This venerable naturalist took the orange powder in the ears for the excrement of the thrips. It was probably the *uredo rubigo* which he saw. The author found quantities of the *thrips* last autumn, (1845.) He has also found a great many this year, (1846.) The larvæ likewise of a fly called chlorops has this year attacked barley. In some instances the orange powder in the wheat appeared, and some not. Where it did appear, it was the *uredo fungus* just mentioned.

To say that wheat is subject to the presence of *aphides*, or plant-lice, is only to state in the case of wheat what may be affirmed of almost every known produce of our soils. The same may be likewise said of several other minute creatures that are found in the fields. In our granaries besides weevil, the larvæ of a species of *tinca* make great havoc. Thousands of *acar*i will be found in bran kept for any length of time. All these minute creatures, like the weeds, the thorns, and the briars, have been permitted to spring up; and in this our fallen condition we must count upon "the years to be eaten by the locust, the canker-worm, and the caterpillar, and the palmer worm," which are "His great army," who rules over all things.

When alluding to the *vibrio tritici*, or eel of the wheat, it has been more than once stated that it belongs, properly speaking, to the class of animalculæ called infusorial, because they constantly appear in infusions of certain substances. The possessor of a tolerable microscope may soon convince himself of the truth of this assertion. Let him take a small glass vessel, a tumbler if he please, and place in it a little hay, and then fill it nearly full of rain water. When it has stood a few days exposed to the air, a slimy sort of matter will be seen floating on the surface; take a little of this off with a pointed feather,

and put it on a slip of glass; use a quarter of an inch achromatic. A sight perfectly astonishing will now present itself: the little drop of water will appear a perfect mass of active life. Sour paste will also be found teeming with vibriones, or little eels of extreme activity. The author obtained the most active and curious eels he ever met with from an infusion of ripe strawberries in rain water; they darted about with amazing quickness. Myriads of little black vibriones abound in almost all stagnant waters, and may be seen mingled with the other infusoria by taking a little of the scum in the way just recommended. Those who wish for acquaintance with the several forms these animalculæ assume, must consult writers on the subject, particularly the great work of Ehrenberg. Some of the most beautiful sights exhibited by the microscope, may be enjoyed by those who make various infusions with a view to observing these infusoria. Besides those mentioned, cabbage-leaves, sage-leaves, leaves of sea-kale, and other vegetables, make excellent infusions teeming with life. Like the sporules of fungi, their eggs are universally diffused, and hatch in any suitable place.

The forms of these infusoria are capable of the greatest possible variety. Some of them can hardly be said to have any well-defined figure, but are composed of a kind of gelatinous substance, having no solid framework, and so may be made to assume almost any kind of outline. Others are enveloped in shields or sheaths, which continue after the animalculæ themselves have long ceased to exist. Ehrenberg, believing that they are provided with many stomachs, calls them *polygastrica*. If they are suffered to remain a short time in water containing finely divided particles of colouring matter, the appearance of these particles in their transparent bodies, is such as to indicate that they contain numerous globular cavities. Still this point cannot be regarded as completely decided; and by many persons the views of Ehrenberg are declared to be untenable.

Round the mouths of these animalculæ there are found *cilia*, moving with a rapidity that astonishes the observer: they look like hairs vibrating with a vehemence that is incredible till witnessed. This vibration produces currents in the fluid containing the infusoria, and thus the food on which they live floats into the mouth. At the same time, they are enabled by the cilia also to swim quickly about. Totally invisible to the naked eye, a good quarter of an inch achromatic presents them to the view of the microscopist in a little globule of water. 'When,' says an eminent physiologist, 'a number of dissimilar forms are assembled in one drop of water, the spectacle is most entertaining. Some propel themselves directly forward, with a velocity which appears, when thus highly magnified, like that of an arrow, so that the eye can scarcely follow their movements; whilst others drag their bodies slowly along, like the leech. Some make a fixed point of some portion of the body, and revolve round it with great rapidity; whilst others scarcely present any appearance of animal motion. Some move forwards by a uniform series of gentle undulations or vibrations; while others seem to perform consecutive leaps of no small extent compared with the size of their bodies. In short, there is no kind of movement which is not practised by these animalculæ; they have evidently the power of steering clear of obstacles in their course, and of avoiding each other when swimming in close proximity. By what kind of sensibility the wonderful precision and accuracy of their movements is guided is yet very doubtful. The general surface, in those whose bodies are not inclosed in a firm envelope, appears very susceptible of impressions. No organs of special sensation, however, can be detected, except certain red spots observable in the bodies of many species, which are believed by Ehrenberg to be eyes.'

The least and simplest of these infusoria are called *monads*, which generally are spherical in shape, and swim about with ease and rapidity. It is not, however, the object of this notice to trace the various families of infusoria, but by a few general observations to show their most prominent characteristics, and the singular analogy between them and the minute fungi brought before the reader in the foregoing parts of the volume. All geologists are acquainted with the quantities of fossil infu-