

X.—*Microscopical Observations on a Malady affecting the Common House-Fly.* By CORNELIUS VARLEY, Esq.

(Read November 14, 1849.)

THE common house-fly is frequently seen dead and attached by the trunk to the glass of windows, and other places, the glass being rendered dim by a kind of white matter, which appears to be exuded from the body of the fly. This appearance having excited my curiosity, I was induced to turn my attention to the subject, with a view to discover its cause, and I now take an opportunity of laying the result of my observations before the Society.

This dimness appears to be the result of a peculiar disease affecting the fly, which manifests itself in the proboscis, the end of which becomes charged with a viscid exudation, and upon the application of the trunk to the glass of windows, &c., it adheres; death soon follows, and the misty appearance is produced in the course of a few hours, the body of the fly being always found suspended by the end of the proboscis (Plate XIII., fig. 1, *a*).

In order to obtain a knowledge of the progress of this disease from its earliest appearance, I cleared the windows, of one of my rooms, of all flies in the state I have described, and setting my children to watch, desired them to give me immediate notice of any flies that might become thus attached. As soon as this occurred, I removed them from the glass, placed them under the microscope, and commenced observing attentively such changes as might take place. For nearly half an hour there was no alteration; but after that time, some of the divisions between the scales of the abdomen began to appear white, as at *k k*, fig. 1. This went on until the whole of these divisions put on the same appearance. In some parts this white matter was produced in such abundance as to meet that from another division across the scales. In its earliest stage it appeared to be composed of myriads of round-ended cylinders, like *b b*, fig. 2; after a short time

these became elongated, and put on the appearance given in *c c c*. Their tops now began to enlarge as in *d*, and gradually assumed the form *e e*. There were two divisions in these elongated cylinders, the one across the neck, *g*, and the other lower down at *h*, the cell between these divisions, *g* and *h*, being filled with granular matter. As soon as they had assumed their complete form, circulation commenced in an oblique direction round the head. It gradually quickened, and the heads were finally driven off with violence by the bursting of the middle cell, *g h*, and were projected in every direction. They adhered strongly to whatever they touched, being surrounded with a viscid gummy matter from the bursten cell, as in fig. 3, and it is to their agency that the frosted appearance of the glass is due. Thus so many were driven off against the object-glass as to render it quite dim: I accordingly cleansed them off, and interposed a piece of thin glass to receive them, and thus enable me to ascertain their nature and form.

In fig. 4, I have represented one of these heads, with a portion of the bursten cell. Fig. 5, gives their size, being about $\frac{1}{120}$ th of an inch; *i i*, represents the misty appearance produced by their agency.

This disease is remarkably rapid in its development, for the whole time that elapsed from the death of the fly to the ripening and projection of the heads was not more than three hours.

The heads being always driven off whole, as in fig. 3, would lead us to suppose that they were seed-vessels, but I can give no opinion as to whether the disease is propagated from them or from the disrupted cells.

I do not believe this to be any casual or accidental mildew consequent on a disease, but the disease itself, for it always puts on the same appearance, and as it always commences in the proboscis, and as the death of the fly occurs before there is any appearance of the growth of these white cylinders, we may infer that the matter by which they are produced is highly poisonous.

Having thus satisfied myself as to the usual progress of this disease, I tried an experiment with these cylinders: I put some of the flies, in which this appearance had commenced, under water. In this case a considerable alteration took place, the cylinders no longer producing heads as before, but growing thin and crooked, like fig. 6.

It appears to me that the most useful practical inference that arises out of this investigation, is an inquiry how far human beings are subject to diseases produced by similar causes; and we may also ask, may not some of those diseases which attack people very suddenly, and without any appreciable cause, be occasioned by something similar to that which produces this disease in flies, the extraordinary minuteness of the germs causing such maladies occasioning them to elude our keenest observation?