

large numbers and proceed with their boring operations until the vital portions of the cow are touched and death ensues."

None of these statements are founded on fact. As stated above, the complete life-history has been worked out. I had the good fortune to be in Washington, staying with Mr. Howard, in August, 1889, and was courteously permitted to join in his investigation of this matter. Together we visited some of the infested stock-farms in Virginia and secured living flies and eggs from which, later on, the perfect insects were reared.

The life-history is briefly as follows:—

The eggs (Fig. 1. *a.*) are laid singly on the freshly-dropped dung of cattle, chiefly during the warmer hours of the day. They are  $\frac{1}{20}$  of an inch in length, brown in colour from the very first and from this fact are not easily seen where laid. The young maggots hatch from the eggs in less than twenty-four hours, and at once burrow a short distance beneath the surface of the dung. Here they remain until full-grown, feeding on the liquid portions of the manure. This is their only food and all stories about their boring into the horns, brains or flesh of living animals are untrue. When the maggots are full-grown, which takes about a week, they are  $\frac{2}{3}$  of an inch in length, shaped as shown at Fig. 1. *b.*, and are of a dirty white colour. They descend a short distance into the ground to pupate, and the dark-brown pupa-cases (Fig. 1. *c.*) are  $\frac{1}{2}$  of an inch in length. During the hot weather of summer the pupal state lasts only four or five days, but the last brood passes the winter in this condition a short distance beneath the surface of the ground, and the flies emerge the following spring. The perfect insect (Fig. 1. *d.* male) is shaped much like the common cattle-fly\* or the house-fly; but it is smaller, being only  $\frac{1}{6}$  of an inch in length, that is, about one-third the size of those insects.

The colour of the Horn-fly is dark gray with a yellowish sheen, and the body is covered with black bristles. The head consists almost entirely of the dark-red silvery-edged eyes, but bears on its lower surface the black dagger-shaped tongue which is the cause of so much torture to cattle. When not in use this is carried projecting forward in front of the head.

\*NOTE.—*Stomoxys calcitrans*, sometimes called the "Biting House-fly," from its annoying bite and frequent occurrence in houses. The true House-fly (*Musca domestica*) never bites having only a sucking tongue.