

that the fly does not pierce the skin of cattle with its ovipositor at all, but merely glues its eggs to the hairs, while the grubs, when hatched, eat their way under the skin; while Reaumur asserts, on the contrary, that the mother fly deposits her eggs in the flesh itself. At all events, the grubs are found in large open tumours on the backs of horned cattle, making for themselves, says Reaumur, "a place where food is found in abundance, where they are protected from the weather, where they enjoy at all times an equal degree of warmth, and where they finally attain maturity." Those parts of the animal's body in which the larvæ are lodged can be easily recognized, as above each larva can be seen a tumour or bump, which has been, not inaptly, compared to the swelling produced on the forehead by a smart blow.

In these larvæ we find a double modification of structure admirably in accordance with their habits. Residing immoveably in a fixed spot, they do not require the strong mouth hooks which the horse bot employs to retain it in its station in the stomach, where it is, of course, subjected to a variety of action, the parts of their mouths are therefore soft and fleshy: on the other hand, the extremity of the body being exposed at the orifice of the tumour, it is in this part of the insect that the large spiracles or breathing pores are found. It is, therefore, very essential to the grub that the hole of the tumour should remain constantly open, for by this aperture a communication with the air necessary for respiration is preserved, and the grub is thence placed in the most favourable position for receiving air.

It is commonly on young cattle of two or three years old that these tumours are found, it being very rare to find them on very old animals.

The larvæ when young are white, but become brown by degrees, attaining at maturity a very deep colour. They are furnished with transverse rows of minute hooks, which are probably used in moving about, and are, doubtless, a source of great irritation. The larva when mature is about an inch long. The bumps are scarcely perceptible before the beginning of winter, and the larvæ live in them during the entire winter.

Reaumur tried to discover how the larva, when arrived at its full growth, succeeds in leaving its abode, for the opening of the tumour is smaller than its body.

"Nature," says Reaumur "has taught this worm the surest, the gentlest, and the most simple of methods, the one to which surgeons often have recourse to hold wounds open or to enlarge them. They press *tents* into a wound they wish to enlarge. Two or three days before the worm wishes to come out, it commences to make use of its posterior part as a *tent* to increase the size of the exit from its habitation. It thrusts it into the hole and draws it out again many times in the course of two or three days, and the oftener this is repeated, the longer it is able to retain its posterior end in the opening, as the hole becomes larger. On the day preceding that on which the worm is to come out, the posterior part is to be found almost continually in the hole. At last it comes out backwards and falls to the ground, when it gets under a stone or buries itself in the turf, remaining quiet, and preparing for its last transformation. The skin hardens, the rings disappear, and it becomes black. Thenceforth the insect is detached from the outer skin which forms a cocoon or box. At the front and upper part of the cocoon is a triangular piece which the fly gets rid of when it is in a fit state to come into the open air."



Fig. 30. Imago of bot fly emerging, and ovipositor of female.

Fig. 30, taken from Reaumur's drawings, represents the fly emerging from its cocoon. The ovipositor or instrument by which the eggs are laid is also shown. This instrument, which is attached to the anus of the female, is a tube composed of four pieces which, like the joints of a telescope, are retractile within each other.

Reaumur, whose theory is, as we have seen, that the fly pierces the flesh when depositing her eggs, states that the act is not attended with much pain unless some very sensible fibres are touched.

"It ought to be remarked," says Rennie, from whom we quote, "that cattle have very thick hides, which are so far from being acutely sensitive of pain that in countries where they are put to draw ploughs and waggons they find a whip ineffectual to drive them, and have to use a goad in form of an iron needle at the end of a stick. Were the pain inflicted by the bot-fly very

acute, it would find its way into the system by the strokes of the whip, enough to choose its tail upon a party of commoned, therefore, with in the same way ordinary effects produced by the fly.

Virgil gives a translation :-

We might add that and horses, by insect is therefore most him by piercing has understood, and in to deposit the eggs.

According to of this fly is often able, and whether season when it infers that they may easily.

The number one cow only three or forty. They are ner: commonly the ers. The grub be must of necessity allowed for the gr upon putrescent m their food, are alth bumps upon its ha in the extreme if every appearance regarded from being animal, since these tanners prefer those always the best and

Although these numbers may occur

Mr. Verrill states being taken not to may be enlarged will soon heal.