

burrows towards the core. It is white, or flesh-coloured, and has a black, or brown, head. Increasing in size, it gnaws a hole to the side of the apple through which it ejects its "frass," so, making room for itself. The damaged apple falls to the ground before its time; and many thousands of bushels of the fruit are lost to the market in this way yearly.

The way to capture the insects is to bandage the trees with old cloths. The caterpillars on leaving the fruit will spin their cocoons, and, so doing, may be easily secured and destroyed.

Through waving groves where Silo's torrent flows,
And where, Alborno, thy green ilex grows,
Myriads of insects flutter in the gloom,
(Æstrus in Greece, Asilus named at Rome,)—
Fierce and of cruel hum. By the dire sound,
Driven from the woods and shady glens around,
The universal herds in terror fly;
Their lowings shake the woods and shake the sky,
And Negro's arid shore (1).

See Kirby & Spence's *Entomology*, page 82.

Est lucos Silari circa ilicibusque virentem
Purimus Alburnum volitans—cui nomen asilo
Romanum est, œstrum Graii vertere vocantes—
Asper, acerba sonans; quo tota exterrita silvis
Diffugiunt armenta; furit mugitibus æther
Concussus silvæque et sicci ripa Tanagri,

Virgil. *Geor*: III, 146.

We will now consider the insects which affect the farmer through his stock. And first we will speak of

THE BOT FLIES.

The Bot-fly of the Horse (*Gasterophilus equi*)

The Bot-fly of the Ox (*Æstrus bovis*)

The Bot-fly of the Sheep (*Cephalomyia ovis*).

Who does not know the Bot-fly of the horse? Who has not admired the perseverance with which the creature accompanies the horse for miles, hovering around its chest and fore legs, or the skill with which it darts in, at a favourable moment, protrudes its ovipositor, and glues an egg to a hair of the animal? Meanwhile the horse has shown by its uneasiness that it mistrusted the operations of its familiar.

The eggs deposited by the Bot-fly are ready to hatch in 4 or 5 days. The horse at this time licking itself, the wet tongue comes in contact with the eggs. They burst; and the active maggots adhere to the tongue, and are then taken with the saliva into the stomach of the animal. Here they fasten themselves by means of hooks, two in number and situated at the head. The maggots are nourished by the juices of the stomach. When full grown they are voided, and drop to the ground. There, they bury themselves. They then pass into the pupa state; and, in about 6 or 7 weeks the new bot-flies appear.

To prevent mischief from *G. Equi* let the horse wear a net, groom thoroughly, and make frequent use of the sponge and warm water.

Professor Pratt gives the following remedy for Bots.—

"Take oil of turpentine 8 oz., alcohol 1 quart. Mix and bottle for use. Dose 4 to 5 oz. in the horse's feed, once a day for 8 days, will effectually remove every vestige of bots."

THE OX BOT-FLY

pursues a different course. She bores a hole with her horny and augur-like ovipositor through the skin of the back of the animal, and drops an egg therein. The process takes but a few moments; but the ox does not like it. The hole thus made remains, and enlarges as the maggot grows, al-

lowing the air to reach its respiratory organs. A tumor forms, and from this the creature is at length ejected to pass the after stages of its existence as in the case of *G. Equi*. Young and healthy animals are selected by *A. bovis* as hosts for its progeny.

THE SHEEP BOT-FLY

lays its eggs in the nostrils of the sheep. The maggots crawl into the head, and feed on the mucilage produced in the maxillary and frontal sinuses. When they are full grown the sheep blows them from its nose, and they fall to the earth, there to pass into the pupa condition.

Pine-tar rubbed on the noses of the sheep is a preventative to the operations of the insect.

A few words may be acceptable concerning.

THE SHEEP-TICK (*Melophagus ovinus*).

Though it is ranked with the DIPTERA, or Two-Winged Flies, the sheep-tick has no wings. Unlike other diptera, moreover, its abdomen has no segments—it is a membranous sack.

The sheep-tick is in many respects a very remarkable insect.

It produces an offspring almost as large as itself, and that, not in the egg, but, in the pupa. This pupa is soft and white at first; but its case soon turns brown and hardens. At the front of the pupa is a notch, marking the lid. This lid in due time opens, to let the perfect insect escape.

Thorough washing, close shearing, and the application of a strong decoction of tobacco are the approved measures against this intruder.

Insects which resemble the sheep-tick in their operations are:

THE PIGEON FLIES, BIRD FLIES, LICE, &c.

Domestic poultry are troubled with various species of the genera *Argus*, *Ornithomyia* and *Acarus*. These creatures not only fret the birds, but cause irritation and disgust to those who tend them. Poultry should be well-fed. Their houses should be plastered and frequently lime-washed, and plenty of ashes and sharp sand should be provided for the birds to roll in.

Amongst the insects injurious to stock must be mentioned.

THE BEE MOTH (*Galleria cereana*).

The bee-moths belong to that group of insects called *Pyralidina* and to the family *Galleridæ* in that group.

Insects allied to them were known to the earliest writers on the subject of bees. Aristotle and Virgil allude to them. The former says, that the moths and worms are expelled by the good bees; but that the combs of idle bees soon perish.

The latter numbers "the moth's dreadful progeny" among the enemies of the hive.

In England four different bee-moths are met with, belonging to as many different genera but all in the family *Galleridæ*. They are *Galleria cerella*, *Aphomia colonella*, *Melissoblyptes bipunctatus*, and *Achroia grisella*. The first and the last are found in the hives of the honey-bee, and the second in humble-bees' nests. The habits of the third are unknown; but the structure of the perfect insect tells what it is. Twenty years ago I had abundant opportunities for observing *Achroia grisella* through all its changes. My accounts of the insects were published by the London "Zoologist," and by the "Entomological Intelligencer."

Only one kind of bee-moth is on the list of North American Lepidoptera, published by the Smithsonian Institute, Washington; and it is the species that we meet with in Canada, viz., *Galleria cereana*. In Langstroth's book on bees this insect is misnamed *Tinea melonella*. It is true that Virgil uses the term *tinea* in speaking of the bee-moth, but since the days of Fabricius it has been applied to a genus to which the bee-moth does not belong.

(1) *Negro* is the modern name of the Tanager.