

APPENDIX No. 1

and that is the Warble fly, or Bot fly, which is known scientifically as *Hypoderma lineata*, Villers, as the species occurs in America. I have brought here a specimen maggot of this Warble which is responsible for the injury. The life history of this insect is interesting. The female fly which is very little larger than the house-fly, but very hairy in character, lays its eggs on the hair of the cow, or the yearling—it is found that yearlings and two-year old cattle are far more liable to attack than the older cattle. There seem to be two methods which the young maggot, when it emerges from the egg, which is attached to the hair of the animal, may take. One species, the *Hypoderma bovis* appears to have a different method of attaining its final position below the skin. The warble fly to which I refer appears to lay its eggs on the hair of the cattle when they are changing their coat. The eggs are laid in the early spring, and on account of the animal licking the hair the egg gets into the mouth of the cow or yearling. The maggot then bores its way through the œsophagus, as that region of the throat is called, into the spinal canal or other tissues, and after wandering through the tissues of the cow for eight or nine months, it works its way to the flesh immediately under the hide, and lies in the underlying skin. Having reached that place it changes its skin and becomes spiny and feeds for the remaining few weeks of its life on the pus that is formed. It makes a little hole through the hide, and through this it obtains air and forms for itself a tumour-like cavity in the inflamed region. It is, naturally, a source of great irritation to the cow, and it grows until it attains the size of the specimen I have passed around, and at that time it forms a perfect cavity or 'warble' under the skin of the cow. When full grown it perforates the hide by a much larger hole and then the full grown maggot drops into the ground where it changes into a dark brown pupa, out of which emerges the fly in three or four weeks.

By Mr. Smith (Middlesex):

Q. On which part of the body do they lay these eggs?

A. They lay these eggs usually on the legs. That has been found to be generally the case. In the case of the other species, the *Hypoderma bovis*, it has been found by experiment that the larvæ probably do not enter by the mouth, but they work their way directly into the skin. Thus you have the two methods of entrance, direct and indirect.

Q. That kind usually attack cattle and the other kind may usually be found on horses?

A. No, both these species attack cattle.

By Mr. Henderson:

Q. There is a disease in this country known as anthrax, is that disease produced in somewhat the same way?

A. No, that is a disease which is produced by a bacillus—the *Bacillus anthrax*. It is a bacilliary disease just as tuberculosis is a bacilliary disease.

The losses which are caused by this insect may be classified in three categories, first you have the injury to the hides; by these larvæ boring through the hides you get a perforated hide, and if an animal is infested, as they often are, by a number of these maggots you have a much perforated hide which results in considerable loss. It was calculated by Professor Osborne that in the United States in 1880 the loss was \$90,000,000 on account of this insect alone; in England the annual loss was estimated by Miss Ormerod at \$10,000,000 to \$35,000,000.

Q. In hides alone?

A. Professor Osborne, in his estimate of \$90,000,000 included the loss which results from the effects on the milch cows; you see these cattle are terrified by the fly; the presence of the fly would immediately send a herd on the stampede, and also the warbles in the animal causes great irritation and loss of vitality which affects the milk supply and also the beef, because wherever the warble has been the beef imme-