

is room for a slight improvement, that is providing for a vertical spray to get at the insect that is on the under side, for example the aphid, because that is so destructive to the tree, and then to spray in the ordinary way, and as those insects insert their bill and suck the juice out of the leaf, Paris green is not of any use, and we have to apply something that will kill them by contact; we want something to get at them from the underside of the leaf.

MR. BRODIE: My experience agrees exactly with Mr. Caston's in regard to hogs being turned into the orchard. I turn in my cattle to eat up the refuse, and we have hardly any codling moth. The only place where we have codling moth is where we cultivate our trees. In these orchards that are old in sod, we have no codling moth whatever.

### SPRAYING FOR ORCHARD PESTS.

BY DR. JAMES FLETCHER, CENTRAL EXPERIMENTAL FARM, OTTAWA.

I heard Mr. Orr's report with a great deal of pleasure, and I believe it is a very valuable one. It is valuable because he gives us facts, and does not try to make conclusions from them; he gives us facts, which being true are scientific. I think it is a pity he was not allowed to read all the facts, giving the percentages, which would have showed fruit growers that it paid them to spray and to save crops in the best condition they could; but, of course, they know their own business best. Mr. Orr has given us this year, as he gave us last year, a report of very great value indeed, and if there were nothing else here to be discussed this afternoon, I think it would be one of the discussions that would mean more money in the pockets of the fruit growers than many other discussions which take up a great deal of time. One of the points which Mr. Orr asked about was the number of broods of codling moth in the course of a year. This is an important question, because it has been supposed that the experience of the first writers on the codling moth was going to be the experience of every experimenter or fruit grower in other parts of the country. Mr. Caston speaks of what the entomologists had told us. The entomologist, he told us, said there was one brood of codling moth in a year, and they told us perfectly correctly. The writer who made the first statement, which has been copied by thousands of writers since, was a New York man who wrote with perfect accuracy about New York. A few years later, Mr. Saunders wrote about London, and he wrote perfectly correctly fifteen years ago, when he said there were two broods, practically continuous after the middle of June, of codling moth. Later still, Prof. Cook, of California, says there was three broods; and they are all perfectly correct. According to the climate this insect changes its habits. The appearance of the moth brood all during the season is only apparent and not actual. There are but two broods, and if Mr. Orr would look through his notes, or if some one else would make notes carefully next year, you will find that the first brood of the codling moth that lays the eggs appears just about the time when the young apples are formed. Mr. Caston's criticism about the egg being laid in the calyx, unfortunately is not founded on fact. The eggs are not laid in the calyx, and there is no reason why they should be. The eggs are laid anywhere, and unfortunately on the leaves, but the insects crawl on the apples, and the nearest channel by which they can obtain access to the interior of the fruit is through the calyx and into the pips, which they generally try to get at first, and where they do a great deal of their harm. The second brood, which appears in August and lays its eggs, which give all the after trouble, is there prolonged in the appearance of the moth. It is very much like the peach borer. The moths begin to appear after mid-summer, and keep on appearing right up till cool weather. It is all one brood; it is not a succession of broods. Some people say, "Why, how should eggs laid one time produce insects at another?" We cannot tell why, but we have proved it over and over again that that is the case. I know only one, namely, the caterpillar, where