

that has been done, but nothing could be done until the statute became law; the action then taken could not have been hurried more than it was.

Some nurserymen, we believe, kept careful watch of the proceedings of the Ontario Legislature, and as soon as the bill was introduced into the House began to make preparations. If they were ready before some of the others, it was simply because they were keeping track of the legislation proposed, and not because they got any special information from this Department. Yours very truly,

C. C. JAMES,
Deputy Minister of Agriculture.

ENTOMOLOGY.

The Worst Insect Injuries to Farm and Garden Crops During 1898.

BY DR. J. FLETCHER, OTTAWA.

It is always useful to look back over past experience to see what lessons can be learnt for future guidance. This is very true with regard to the insects which attack our crops to such a serious extent every year. There is hardly a year passes which is not characterized by some new or special outbreak, the effects of which are felt for two or more seasons, and the grower of farm or garden crops who is widest awake profits much by keeping himself informed as to the various enemies which have occurred or are likely to appear on his crops, and as to the latest discoveries in the way of remedies.

Every province of the Dominion has recently suffered to a considerable extent from insect injuries. Perhaps the most serious of these were by:

1. The Pernicious or San José scale (*Aspidiotus perniciosus*, Comstock), which has attracted so much attention in the Province of Ontario, where strenuous efforts have been put forth by the Provincial Government to stamp out this dread enemy. The whole of Canada is to be congratulated on the wise and efficient manner in which this work has been carried out. Unfortunately, some even of those directly interested do not yet appreciate the magnitude of the calamity which will fall upon the whole of the fruit-growing districts of the country, where this scale is able to propagate, if it is not controlled. This is a matter which affects not only the comparatively few who own fruit trees in the districts where the scale is known to occur, but every business man and every citizen interested in the welfare of Canada. Frequent inquiries are made as to the best remedies for the San José scale. For several reasons, I consider the plan adopted by the Ontario Government of insisting on the destruction of all infested trees as the only one which was safe and advisable under the circumstances. The San José scale must still be acknowledged to be the worst pest which entomologists have ever had to fight against. It is so inconspicuous that it would certainly be overlooked by most people even on badly-infested trees. It is so difficult to destroy that the ordinary fruit-grower would not exercise the necessary care to destroy it thoroughly on all his trees, even if he possessed the skill and if we had a perfectly reliable practical remedy, which I maintain is not yet the case. The remedy which has given the best results is fumigation with hydrocyanic acid gas, an operation requiring skill, care, and great thoroughness to secure success, and the use of some of the most poisonous substances known. Moreover, even in the hands of the most experienced there have been sufficient failures to show that the prosperity of the whole country must not be left at the mercy of the assumption that the ordinary fruit-grower could and would use this remedy properly. Splendid work has been done by the inspectors in hunting out the scale, and if the owners of trees infested, or liable to be infested from the trees of their neighbors, could only be made to understand the gravity of the case and would all help in this matter by reporting promptly every occurrence of the scale, I feel convinced that this enemy could be stamped out.

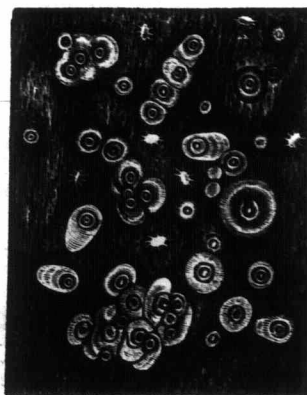
2. The Rocky Mountain Locust (*Melanoplus spretus*, Uhler).—Considerable injury was done in Southern Manitoba last summer by the Rocky Mountain or Hateful locust, an enemy which will long be remembered in the West from the extent of its ravages in 1888 and the early seventies. The remedies which experience has taught are effective are: (1) The plowing down of the eggs in autumn or before the young hatch the following spring. This has been practiced most successfully in Minnesota and the Dakotas. (2) The burning of the young locusts as soon as they hatch, by spreading rows of dry straw across areas where they are numerous. The young grasshoppers gather into these shelters at night in large numbers, and myriads of them can be killed by firing the straw after night-fall. (3) The use of hopper-doers or tar-pans. These are light implements eight or ten feet in length, turned up one inch in front and one foot behind, leaving the bottom two feet wide. The sides may be made of wood, with hooks in front at both ends for the attachment of ropes. Into this a layer of coal tar or water and coal oil is placed, and the implement can be drawn over land where the insects are numerous by a boy at each end, or by a horse, and thousands of the young locusts will be destroyed. All land which was under crop in the parts of Southern Manitoba which were infested last year, which were not plowed last autumn, should this year be plowed without fail before the first of June. A full account of this outbreak of

locusts in Manitoba appeared in the FARMER'S ADVOCATE for Oct. 5th, 1898.

3. THE WHEAT MIDGE OR WEEVIL (*Diploris tritici*, Kirby).—This enemy of wheat, which of late years has been heard little of, was the cause of considerable loss during the season of 1898 in the Niagara Peninsula, attacking particularly, fall wheats. Spring wheats, such as Goose or White Fyfe, were little or not at all affected. Injury by this insect was also reported from Nova Scotia and Prince Edward Island. The remedies for the wheat midge are the careful destruction of all rubbish or screenings from the threshing machines, and the plowing down deeply of stubble where the crop has been attacked as soon as possible after the crop is carried.

4. GREEN FRUIT-WORMS (*Xylina*).—In addition to the San José scale, several other pests reduced the profits of the fruit-grower. An unusual outbreak was by caterpillars of the Grey-pinion Moths, known as green fruit-worms. These were abundant and troublesome in the Niagara Peninsula, injuring apples and pears by eating large, irregular holes in the sides of the young fruit. The same caterpillars, but possibly of a different species, stripped maple trees of their leaves both at Niagara and in the Ottawa district. The only remedy which can be recommended is the spraying of all fruit trees very early in the season with arsenical spray, but as the caterpillars seem especially attracted to the fruit as soon as this forms, efforts should be made to check them as early as possible. When the foliage of maple trees is attacked, it is also well to spray early, so as to destroy the caterpillars before they have done much harm. The codling moth, plum curculio, and oyster-shell bark-louse all claimed their share and were the cause of much loss in the older provinces. In British Columbia much harm was done by the woolly aphis and apple aphis, as is there frequently the case, as well as by two special enemies which for the present have not attracted attention as serious pests of fruit crops in the Eastern Provinces. These are the apple fruit-miner (*Argyresthia conjugella*, Z.), and the lesser apple-worm (*Grapholitha prunivora*, Walsh).

5. TENT CATERPILLARS (*Cistiocampa*).—These common pests, which were very prevalent in almost every province of the Dominion last year, and which, judging from the numbers of eggs on trees in the districts where they occurred, promise to be



SAN JOSÉ SCALE.

enormously abundant again this year, have been treated of in a late number of the FARMER'S ADVOCATE. The remedies are the collection of the egg-masses, the destruction of the young colonies soon after they hatch from the egg (this is from April 20th to May 1st in this part of Canada), and the spraying of infested trees with Paris green and other poisons.

VETERINARY.

Black Leg or Anthrax.

To the Editor FARMER'S ADVOCATE:

I am glad to have the opportunity of still further differentiating to Dr. Mole the clinical symptoms of anthrax and black quarter. He evidently knows very little of either disease, and in all probability bases his knowledge of veterinary science on ideas long ago abandoned. He uses the term anthracoid, a term used long ago, when speaking of such fatal diseases as hog cholera, rinderpest, Texas fever, anthrax and black quarter, by writers who were ignorant of their true nature or pathology.

In the *Journal of Comparative Medicine and Pathology* for June, 1898, Prof. McFadyen, in an article on black quarter, says: "In this country [meaning Great Britain] long before the discovery of their infective organisms, anthrax and quarter evil were recognized as diseases so different as to merit different names." He also says the "two diseases have scarcely a feature in common, and in face of this fact one cannot help being struck with the curious perversity of reasoning which led the older veterinary authors to regard them as manifestations of the same morbid condition." In describing the symptoms of black quarter he says: "There are few diseases in which the clinical picture is more characteristic than in black quarter."

Post-mortem lesions: "The blood in black quarter always forms a good firm clot, this being one of the many striking differences between this disease and anthrax." "The thoracic and abdominal viscera seldom show any alteration of structure, and, in contrast to anthrax, the spleen is nearly always normal in volume and consistence. Moderate quantities of blood-

stained watery exudate may be present in the great serous sacs." "When the autopsy is made soon after death, the escaping gas, the inflammatory oedema, and the muscular tissues are entirely free from putrefactive odor. On the other hand, the tissues of the tumor have a characteristic sour odor recalling that of slightly rancid butter." These extracts are from the pen of a teacher and pathologist of wide experience in Great Britain.

Black quarter may also easily be distinguished from anthrax by inoculating simultaneously a rabbit and a guinea pig. If only the latter dies, it is a case of black quarter; if both animals die, it is anthrax, the rabbit being naturally refractory to black quarter.

Further differential symptoms are found in Friedburger and Frohner's "Pathology and Therapeutics of Domestic Animals," one of the leading works on veterinary medicine, and in other modern works by standard authorities.

Yorkton, N.-W.T. THOS. V. SIMPSON, V.S.

APIARY.

Union Beekeepers' Convention.

(Continued from page 216.)

SEASONABLE MATTER.

Should supers be put on the hives before or after swarming; if before, under what conditions?

In reply to this question it was generally conceded by those who expressed themselves that the supers should be put on as soon as the combs commenced to whiten out on top. This may occur in fruit bloom, but it is not likely to show on all the hives at once, so that it is necessary to examine the hives frequently and put on the supers as needed. One member puts on the supers when the bees commence to hang out around the entrance, which shows they need more room. Some favored putting on shallow supers so as not to give too much room, but when the comb shows white on top and bees appear too crowded they should have a regular sized super. Mr. Holtermann objected to shallow supers on the ground that it is not well to have odd sizes of frames. His plan is to put on a less number of frames, contracted by a division board and a quilt on each side. They should be placed over the center of the brood chamber. Four such combs give the same capacity as eight shallow combs. If these have a quilt and a cushion put over them they can be placed anywhere and given to any kind of colony. By putting the supers on early, swarming can be largely held in check until the time for swarming arrives. Early swarms are gotten at the expense of strength, but too late swarms are of little value.

How can the flow from early blossoms giving inferior honey be utilized to draw out foundation?

Mr. Jas. Armstrong, Cheapside, Ont., said: "If the flow of blossom honey and inferior honey comes on together, I put on a super and take a few frames from below with some honey in them and place them in the super; then put on a couple of foundations alternately, about two sheets of foundation in full frames and two full frames of honey in the center, and a division board on each side. The bees will start to draw out the foundation and at the same time store a certain amount of this undesirable honey. Some of this honey may be used later to stimulate weaker colonies, and empty combs may be put in their place." Mr. Holtermann disagreed with Mr. Armstrong on some points, and reviewed his way of getting combs drawn out at this season. He takes combs containing brood from the brood chamber, placing them in the super so as to draw up the bees. He has found that if the bees have partially filled combs they will work on them rather than on foundation. If they have a comb of brood to draw them up and nothing else except foundation they will have to work on it or nothing. As soon as the bees draw out the foundation and begin to store honey he removes the new combs and puts others in their place. The bees will then readily go up and work. Mr. Holtermann always gives the bees free range in the upper story till the clover honey flow commences. If at that time there is brood in the super it is removed to a suitable place. Mr. Alpaugh, the chairman, raised an objection to allowing the queen to go into the super on the ground that pollen is liable to be stored there which will injure the honey.

Should queen excluders be put between brood chamber and super before clover honey flow commences?

Most of the members put on the excluders at the same time as the supers go on so as to avoid egg laying above and the deposit of pollen. Mr. Miller, of London, does not use the excluders until white honey flow commences. He believes in allowing the queen plenty of room above. He gets more brood in this way, and that is what he wants. He sometimes leaves the supers right there until the bees swarm, then put on the excluders on top and allow the brood to be removed; then divide off the brood comb from the other.

How can the beekeepers best manage to prevent the mixing of dark and first-class honey, either comb or extracted?

While the berry blossom honey is a trifle darker than clover, it mixes with it very well without injury. It was claimed that there is a great deal of honey spoiled by allowing either early honey or late honey to mix with that of good quality. The best plan is to watch the new comb, and as soon as