

I have not seen anything like this degree of havoc by parasites among the San Jose scale, yet it doubtless has its foes among both insects and fungi. Prof. Forbes, State Entomologist of Illinois, reports in Bulletin No. 56, that he has discovered in *Sphaerostilbe coccophila*, Tul. found by Prof. Rolfs on the oak scale in Florida, an efficient fungous disease for the San Jose species. Most of the bulletins report that a little coccinellid beetle, *Pentilia mesilla*, preys actively on the San Jose Scale, and also that in some localities the twice stabbed lady-bird, *Chilocorus bivulnerus* has literally cleared the tree of the scale. Certain species of mites also prey upon it. On specimens collected in South Kent, I found a mite apparently feeding on the scale which Mr. Marlatt pronounces a species of *Rhyncholophus* and another much more common not yet determined.*

Mr. John Gordon, above cited, has been experimenting with the application of hot steam and a small proportion of coal oil. He is making use of one of his neighbor's trees that was nearly killed with the scale as an example of this method of treatment. (Specimen cuttings from this tree were exhibited. Branches cut off before the treatment still had numerous young scale larvæ running over them; while upon cuttings taken from the treated branches no surely living scale could be found.) Mr. Thonger assured me that Dr. Fletcher had reported 97 per cent. of the scale dead on the samples taken from the trees he had treated with a mechanical mixture of coal oil and water. The machine mixes the oil and water in definite proportions at the nozzles and projects the mixture as an "atomized" spray. Mr. Thonger seems to have confidence that if he had been allowed to repeat his spraying with the coal-oil mixture he could have eradicated the scale from his orchard.

Up to the present time the most successful and satisfactory method of remedial treatment is the fish-oil and potash soap solution. This is a soft-soap made with a special fish-oil and strong caustic potash, dissolved in water in the proportion of two pounds to the gallon. Accounts of the demonstration of the success of this kind of treatment on a large scale as made at Catawba Island, Ohio, under the direction of Prof. F. M. Webster and Mr. Willis H. Owen have been published and extensively circulated.

As Prof. Webster is here to-day I will leave it to him to describe the treatment and its results. The potash soap treatment was found to affect the trees so favorably there that growers who had not the scale in their orchards have used it generously. Mr. Owen said that over 17 tons were used last winter on an area considerably less than 1,000 acres. Mr. J. W. Gamble, President of the Ottawa, Ohio, Horticultural Society, for his annual address, read a paper entitled "The San Jose Scale as a Blessing in Disguise." His argument was that the scale had indirectly led the growers to discover the value of the soap as a general cleaner-up and fertilizer of their trees, and on peach-trees it had checked the destructive leaf curl.

When the scale was first discovered in Ontario, the people thought it was confined to two or three situations and within narrow limits at these places. Had that been the case no wiser course could be taken than to cut down and burn the trees. It soon became evident that it was much more widely established than at first suspected. The axe and fire is a primitive method of treatment for insects. Here is one that lives on the surface and has not the power, save in a restricted degree for a short period, of moving its position. Surely science will not remain helpless and useless to kill that exposed insect and save the valuable tree upon which it feeds. In several instances more money has been spent in going over a tree with lenses to discover whether the scale was on it than it would have cost to spray it thoroughly. Drenching with the spraying machine will reach the parts that the lens will miss. The axe and fire method is dependent on the discovery of the insect and discovery is not always possible. Several other species of scale are liable to be mistaken for the San Jose one. By the fire method mistakes are irremediable; by the spraying method no harm comes to the tree though it be drenched with soap suds for harboring one of the native species of scale.

* Respecting the last, Dr. Howard wrote on the 23rd Oct., "I have to inform you that your scale mite has been examined by Mr. Banks, and he identifies it, with some little doubt, as *Hemisarcoptes coccisugus*, Lign. If not this species it is a closely allied one and belongs to the family Canestrinidae. The species is the only one known in the genus, and is a parasite of Coccidæ, having been found in this country on the oyster-shell bark-louse, and in Europe on other scale insects.

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