

evaporate; he then exposed it to the sunlight for a portion of 124 hours, at 85° to 90°. At the end of the period he found them still alive. He found that it took 45 minutes to kill them at a temperature of 208° to 210°. By using steam it was done in 10 minutes. In dry heat they live for 1½ hours at 150° centigrade. He found bacilli in honey and bee bread. Formic acid retards the growth of the bacilli, but not of the spores, but does not kill them.

In answer to a question, Mr. Harrison explained that the bacillus was the vegetable form, while spores are found when the bacillus ends its existence. Spores are a form of reproduction to tide the bacilli over adverse circumstances. When bacilli are excluded from oxygen they are purer. In hydrogen the germs grow well. He found bacilli alive in combs that had been exposed to the atmosphere for eight months.

He had tried feeding bees with honey in which spores had been placed. At the end of one month none seemed affected; but flies fed on sugar and water in which spores had been placed all died. He was now conducting experiments with formic acid and naphthalene, feeding the former to bees to see if that will counteract foul brood.

A motion was passed that it was desirable to have an order-in-council passed determining the per cent. of water which must of necessity be found even in pure honey. A recommendation was also passed that the Canadian Bee Journal be the bonus given to members for the coming year.

What is the best remedy for the prevention and destruction of the small wax worm, principally on section honey? was asked.

There seemed to be some doubt among the members as to whether this was the larva of the ordinary bee moth or a new kind of pest. According to Mr. Heise, it was a worm three-sixteenths of an inch long. Mr. Switzer had had experience with a small worm, pinkish in color, which has a web and works on the face of the comb. It was recommended to remove sections with pollen and there would be no trouble, also to keep comb in the house where the moth cannot get to it. If there are dead bees in the comb the moth feeds on them. Live specimens of the worms should be sent to the Entomologist at Ottawa, who could then determine if they were a new species.

Wintering Bees.—Here Mr. Hoshal again gave some valuable information as to his method of wintering. His system was simple and yet successful. Bees wintered in single stories wintered more uniformly than those in double.

Election of Officers.—President, J. K. Darling, Almonte; 1st Vice-President, N. B. Holmes, Athens, 2nd Vice-President, W. J. Brown, Chard. Directors—C. W. Post, Trenton; J. W. Sparling, Bowmanville; A. Pickett, Nassagaweya; Israel Overholt, South Cayuga; W. Couse, Streetsville; F. A. Gemmill, Stratford; W. A. Chryslor, Chatham; N. H. Hughes, Barrie; J. B. Hall, Woodstock; from Agricultural College, Dr. Mills. Secretary, W. Couse, Streetsville. Foul Brood Inspectors—W. McEvoy, Woodburn; F. A. Gemmill, Stratford. Delegates to Fair Boards—Toronto, R. F. Holtermann, Brantford; Western, John Newton, Thamesford; Ottawa, J. K. Darling, Almonte. Auditors—A. E. Hoshal, Beamsville; J. Newton, Thamesford. Revising Committee—J. D. Evans, Islington, and D. M. Heise, Bethesda.

Hamilton was selected as the place where the next annual meeting will be held.

GARDEN AND ORCHARD.

Ontario Fruit Growers' Association.

The annual meeting of the Ontario Fruit Growers' Association was held in the lecture hall of the Kingston Dairy School in the old Limestone City, opening its first session on the afternoon of Wednesday, Dec. 2nd, and closing Friday afternoon, Dec. 4th. This meeting was in some respects the most important and successful yet held by the Association since its organization. It was given a special importance by the presence at the same time of the Ministers of Agriculture for the Province of Ontario and the Dominion, and also by the presence of a number of other notable personages, among them the distinguished Principal of Queen's College. Intense interest was manifested in the proceedings.

The large display of fruit, especially apples, spread on tables stretching across the hall in front of the audience was one of the attractive and interesting features of the convention. Even men who turned in disgust from their glutted orchards, cellars and packing-houses at home, hung about the tables and studied with interest the many varieties exhibited. To this display Hon. Mr. Fisher, who had come fresh from the far-famed Annapolis Valley of Nova Scotia, paid a high compliment, acknowledging, as did also Principal Grant, that the apples of Ontario could not be surpassed in the world.

The first paper read was from Mr. C. E. Woolverton, one of the original settlers of the Niagara district. It dealt with the early times when only natural fruit from trees grown from seed was known in that now fruitful district. The paper pointed out that not until the year 1830 was there any grafting done or any effort made to improve the native fruit then grown. Shortly after that the Fruit Growers' Association was formed at St. Catharines, and the result of its labors and influence since that time were referred to in graphic terms, tracing its humble beginning and limited opera-

tions to what it has accomplished and what it is to-day.

The History of Gardening and its Relation to Civilization was the title of a paper given by Prof. Short, of Queen's College. It contained many interesting and instructive lessons. The writer placed much stress on the value and effect of landscape gardening in our own day and in our own land.

Fertilization of Fruit Trees and Plants was the subject of a paper given by Prof. Fowler, of Queen's. This paper was accompanied by illustrations showing the process of fertilization and the causes of unfruitfulness at times in both tree and vine. For example, if a season of rain and fog should occur while the pollen of some particular tree or plant was ripe, and the winds, bees, and various insects were unable to scatter it on the pistils of the female blossoms of the same, or some other tree or plant of the same class, there would be no fruit. Indian corn produces pollen only at the summit of the stalks, with the female blossoms at the base, so that the former has only to drop to insure fertilization and a crop. Plants requiring the agency of bees and other insects to carry the pollen possess special attractions for those little creatures, such as attractive colors, honey or peculiar odors. Without those agents of nature there would be no fertilization of many plants and flowers.

Overplanting (by Mr. G. H. Patterson, of Grimaby).—If planting went on, what must we look for in the years to come, when we have such an overproduction now? At the rate that trees are being planted, the writer claimed the crop of this year would not be a circumstance to the crop of 1900. Mr. Patterson questioned if the Fruit Growers' Association was not doing more harm than good in encouraging the planting of trees and overproduction of fruit. The discussion that this paper provoked went to show that the difficulty this year was not so much a matter of overproduction as a matter of under-distribution. The present transportation rates are so high, that instead of the apple being a household necessity in the great West, it is a very costly luxury. The statement was made from reliable data, that if two barrels of apples could be got into every household in Manitoba and the Northwest, there would not remain in Ontario, of the present heavy crop, more than three barrels for every household in the Province. When transportation rates to the Old Country and to our Western market are down to a reasonable figure, so that fruit may become a general necessity and an article of common consumption, instead of a luxury, overproduction will be a rare thing in this Province. This is a matter, said one speaker, which will right itself in time. The first evening session was devoted to

Floriculture.—Mr. H. Graff, of Simcoe, gave a valuable paper on canna and gladiolus, and Mr. R. B. White, of Ottawa, a paper on the sweet pea. The latter was valuable in that it dealt with a popular flower, very generally grown and not any too well understood. While the number of varieties of the sweet pea have increased in number from seventy-five to about one hundred and eighty in recent years, the writer claimed that not more than a dozen well-selected colors should ever be sown together for a good effect. He advocated sowing in the fall in a well-drained soil, claiming that blossoms could be obtained from two to three weeks earlier by that means.

The Outdoor Cultivation of the Rose was dealt with in an excellent and exhaustive paper by Mr. O. G. Johnston, of Kingston. This paper was liberally discussed by Prof. Saunders, of Ottawa, and Mr. L. H. Race, of Mitchell. In the discussion it was brought out that the most damaging pests to rose culture was first the leaf-roller caterpillar and later the little green fly or louse. The best remedy for the former is a spray of weak Paris green water, and for the latter tobacco water or common soap suds. For winter protection the shoots should be bent over and covered with leaves or clean straw, and the shoots should be well cut back after the covering is removed in the spring, leaving not more than from 12 to 18 inches to send out blossom buds.

A very instructive paper was read by Mr. Harrington, of Napanee, on the general improvement in that town since the organization of the local horticultural society. The society numbered about seventy members, and they were all stimulated more or less in the cultivation of shrubs and flowers, the laying out of lawns and the general beautifying of their homes. Previous to the formation of the society little effort of a general character was made to brighten or beautify the streets and home surroundings, but recently all had been changed, and as a result the town had much improved in appearance, and its citizens had likewise improved in taste, culture and refinement. He thought the Fruit Growers' Association should devote more of its attention to floriculture. On Thursday morning the first subject taken up was a paper by Mr. Rud-dick, Superintendent of the Kingston Dairy School,

Dairying and Fruit Growing.—This paper, and the discussion which followed it, brought out some practical and valuable hints in feeding cows for dairy purposes. The writer of the paper suggested that the qualities necessary to success in fruit-growing would also qualify and fit a man for a successful dairyman. If the two were joined together there would in a year like this be no loss in the fruit crop, as apples can be fed to milking cows with good results; even in ordinary years all the inferior fruit could be

utilized as food for milking cows. At first apples should be fed to cows only in limited quantities, a few quarts at a time and gradually increasing to half a bushel per day. Cows will readily eat an overdose of apples and thereby derange their digestion and affect the flow of milk. It was safe to say, the paper concluded, that every injurious effect from feeding apples to cows was the result of injudicious feeding rather than from any unsuitability of the food. The feeding value of apples was given as 13 cents a hundred pounds, or about 10 cents a bushel. Apples judiciously fed certainly increased the flow of milk and improved the condition of the animal, was the general testimony of all those who spoke from experience. But it was not conceded that apples would wholly take the place of roots, though they might be an excellent substitute. Prof. Hutt, of the Ontario Agricultural College, read a paper on

Strawberry Culture, in which he gave Lovet's Early and Van Deman as the two best early perfect-blossomed varieties, and Warfield, Afton, Edgar Queen, and Bisel, in the order named, as the best four imperfect-flowered varieties. The first named in each of these classes ranked highest in productiveness on the Guelph experimental grounds. During the discussion on this subject it was stated that hardwood ashes as a top dressing between the rows had produced better results than a top dressing of barnyard manure. The ashes retained the moisture better, and produced a healthier plant as well as a brighter and better berry.

Mr. W. M. Orr submitted his report on experiments in spraying during the past season. He claimed that spraying had become a necessity, and had proved so immensely beneficial that it was now a question whether the Government should not by legislation compel every fruit-grower to spray his trees as a protection to his neighbors. It had been shown beyond a doubt that to grow apples successfully spraying had become a necessity. In discussion some long experienced fruit-growers doubted whether spraying would destroy the coding moth, though it would, without doubt, prevent scab or black spot.

Small Fruits were dealt with by Mr. J. L. Haycock, M. P. P., in which he strongly advanced the principle of protection to home industries. He said that from \$15,000 to \$20,000 had been expended by the city of Kingston last year in bringing small fruits from the Niagara district and other western points, and urged that the money should all have been spent within a radius of ten miles of that city, so that it would have been spent at home instead of going to enrich other sections of the Province. It was the policy of "Canada for Canadians" reduced down to Kingston for Kingstonians. Mr. Haycock quoted from statistics, showing that the consumption of sugar had increased three-fold within the last few years in consequence of the increased production and consumption of small fruits. The discussion which followed this paper pointed out that the two most profitable gooseberries to grow in this district were the Pearle and Whitesmith, while the best market currant was the Fay's Prolific and the Moore's Ruby, the least acid and best for home table use.

Packing and Shipping Apples for the British market was ably dealt with in papers by Mr. R. Wartman and Mr. L. Woolverton. Their experience had been in barrel shipments, and they drew attention to the fact that apples were sold by weight in England and that every package should weigh 165 lbs. Mr. Wartman, in speaking of the damage to fruit in transportation, said that all railway and steamship companies should have flat sacks filled with sand or sawdust to roll the barrels on when making transshipments. He anticipated a change from barrels to cases in the near future if the former could not be handled more carefully. Mr. Woolverton believed it would not be long before we would be shipping our apples to the Australian market. Mr. R. J. Sheppard, a large shipper in Montreal, had been shipping Fameuse, Duchess, and Wealthy to the Bristol market in cases, and had netted \$1.25 a case on Duchess, \$1.80 on Wealthy, and \$1.10 on Fameuse, while the same apples were selling for about 90 cents a barrel in Montreal. He declared these three varieties to be the best and most profitable shipping apples that can be grown if properly handled.

Hon. Mr. Fisher was introduced to the Association on the afternoon of the second day, and he told the meeting that he came to learn their needs as fruit-shippers, as the Government was anxious to provide better facilities for getting their perishable products into the markets in the best possible condition. He had just come from Nova Scotia, where they wanted cold storage warehouses and cold storage during transportation to the Old Country markets. He came to learn what was wanted in Ontario, and to receive suggestions. In Nova Scotia they complained that the fruit heated on the railway trains on its way to the sea ports, and unless an open barrel or case was used he doubted whether cold storage would penetrate to the center of the package sufficiently to prevent injury. It was a pretty big undertaking, he said, but the Government was determined to provide the very best facilities in the way of refrigerator cars, cold storage warehouses, and low transportation rates that could be secured. He asked the Association to appoint a committee to consider the matter and report to him at some future date.

Principal Grant, of Queen's College, presided at the Thursday evening session, and by his happy