

rolling stones, than would pay for having the stones crushed and the roads kept in first-class condition, to say nothing of the damage to fruit being carried, and the extra time spent in going to and coming from market. The effects of well-kept roads, with grassy sides and hedges or trees, upon our country, would be to create a more patriotic feeling among the people, and keep many farm boys and girls from going to the towns and cities to find more pleasant surroundings.

HOLDING OUR MARKETS.

Prof. C. C. James, in an address, pointed out the necessity of united action to develop and hold our markets, as the Australians and others are wide-awake to the matter of markets; although they are 8,000 miles farther from the British markets than we, they are equipping refrigerator vessels, and adopting every advance to enable them to supply that market with desirable produce. There is at present a great variation in the quality of our fruit, especially apples, as the prices of our exports in Liverpool markets have varied this year all the way from thirty cents to \$3.35 per barrel, according to the condition in which they were received. Quality must be improved by spraying, etc., and by a better system of packing. He made the following suggestions, which were adopted by the association:—1st. That all apple barrels should be of a uniform size. 2nd. That each barrel should contain a uniform quality of fruit. 3rd. That all barrels should be labelled, 1st, 2nd, or 3rd, according to the quality of the fruit, and that all No. 1 fruit should have the packer's name stamped upon the barrel. The object of such a course is to establish a reputation for our fruits in the best markets.

"FRUIT GROWING IN THE BEAVER VALLEY" was the title of a paper written by John G. Mitchell, which awakened considerable interest. Beaver Valley is a section traversed by the Beaver River in the County of Grey. It is peculiarly adapted to the growing of plums, which was shown by the fact that the output of last season was about a car-load daily during the plum season. Mr. C. W. Hartman, a fruit grower of Clarksburg, mentioned that he had realized \$5 each from sixteen plum trees for a number of years. These trees were given every attention, which all trees may profitably receive. Plums, cherries and peaches do well in that locality.

STRAWBERRY GROWING.

Mr. W. W. Hilborn, of Leamington, gave a talk on strawberry culture, which brought out many valuable points. A mellow, moist soil is essential. The importance of constant cultivation, in order to retain moisture, was emphasized. Mulching and irrigation were also mentioned as good practices. Spring planting was recommended, which should be done by opening a hole for the plant, with a spade, without lifting any of the earth. The roots are then dropped in, and the soil pressed so firmly about them that a leaf may be jerked off without disturbing the plants. Mr. Hilborn recommended cutting off all blossoms and runners of new plants until many runners are thrown out, when they may be allowed to remain. New plantations should be made each season, from which two crops of berries may be taken. In setting out, it was recommended to plant four rows of pistillate and two of staminate, in order to obtain perfect fertilization of the flowers. The second year, after the fruit season, the plants should be burnt off, and the rows cultivated between by a plow and harrow, or by cultivator alone, if the season is dry. If the plantation is not mulched, it should be cultivated in the spring in order to obtain good fruit.

FERTILIZATION OF FLOWERS

In orchard and vineyard was discussed by Prof. Beach, Geneva Experiment Station, N. Y. In commencing, the Professor referred to a fifty-acre apple orchard, set in blocks of different varieties, that had almost always failed in producing a crop of fruit. The trees were set only thirty feet apart, which may be taken as one cause of failure, but we understood from what he said that the failure was largely due to lack of cross-fertilization from one variety to another, a process necessary to the production of fruit with some varieties of apples, pears, grapes, etc.

A series of experiments have been conducted by Prof. Beach which teaches some valuable lessons. Out of 117 varieties of grapes, 27 were able to fertilize themselves; 34 were able to produce a partial crop of fruit; 14 were able to set fruit which never developed, and the remainder could not fertilize themselves. Hybrids, especially, require to be set among other varieties, or fertilization cannot occur satisfactorily. One remarkable lesson from the experiment showed that sterile blossoms can respond to pollen of some other vine, as pears have been fertilized by apples, peaches by cherries, but the fruit was often seedless. With many others and apples there is no difficulty, but with others and with many varieties of pears, sorts that blossom at the same time should be planted together. Prof. Beach warned fruit growers not to consider every failure due to lack of cross-pollination, as there are many other conditions necessary to a successful yield of fruit, among which he mentioned manuring, cultivating, pruning, and careful use of fungicides and insecticides.

COLD STORAGE.

Mr. A. H. Pettit's experience with fruits in cold storage at the World's Fair, enabled him to speak with a good deal of authority upon that subject. Owing to the perishable nature of many of the most

luscious fruits, there is great need of cold storage stations here and there throughout fruit sections, in order that the markets may be supplied more evenly, thus saving a glut at any time. Many varieties of fall apples, pears and grapes can be kept till spring, if placed in cold storage as soon as taken from the tree or vine.

Prof. Craig, of Ottawa, has been experimenting with cold storage during the last summer, and up to the present time. Early peaches kept well for eighteen days, plums for two weeks, grapes and pears are still in splendid condition, as well as Duchess and other perishable fall apples. Mr. Pettit, in referring to the keeping quality of fruit after coming out of cold storage, said that apples kept perfectly in a warm temperature for six weeks after being removed from 35 F., cold store-house.

NOTES OF TRAVEL.

Prof. Hutt, as a result of a tour through the Province, mentioned some improvement which he deemed needful. It is very important to know that a soil is adapted to the class of fruit to be planted upon it. Apples do well on a variety of soils if rich and well drained; grapes require a light, loamy soil, peaches light soil, plums heavy, but well drained, and strawberries on light, moist land. Fruit trees should be set in the hexagonal plan, as by it six more trees can be planted to the acre than by the square plan; that is, when the trees are set thirty-three feet apart, which is considered the best distance for apple trees. Cultivation of the soil between the rows is necessary, except when trees are producing wood at the expense of fruit. Thinning fruit, especially on young trees, was highly recommended when very heavily loaded. The idea is to hinder undue exhaustion of the tree, and to produce a better sample of fruit.

CODLING MOTH AND PLUM CURCULIO.

Prof. Fletcher, Central Experimental Farm, in referring to the codling moth, said it came out in the spring and fed for some time on the bark and wood of young twigs, and that spraying with Paris green just as soon as the flowers fall, and before the apples turn down, was all that was necessary to deal successfully with that pest at Ottawa. Spraying with Arsenites was the remedy given for Curculio. Flea louse of the pear was also referred to as a destructive insect in some sections. They do their damage by puncturing the stems of the leaves, causing them to fall prematurely. The remedy is kerosene emulsion in the spring. The bud moth has been quite destructive in places, but can be destroyed by kerosene emulsion. For borers the Professor recommended washing the tree trunks in June with a solution of soda and soft soap diluted to paint-like consistency. The ravages of the Canker worm can be very much lessened by hindering the worm from crawling up the tree trunk. To sum the whole matter, thorough spraying is the great insect destroyer. Half-hearted work will only result in disappointment and disgust. Therefore, be careful as to the proper time, and apply the proper remedy, and do it well. Should a rain-storm follow an application within a few days, it had better be done again as soon as dry.

"BULBS."

by Rev. W. Bacon, Orillia, was a paper of importance to floriculturists. We give a few general principles. Any well managed garden is suitable for the growth of bulb flowers. The bulbs should be stored in a dry, cool place, and must be planted before any root action takes place. Shady locations are most suitable to their growth and flowering. The most common mistake made in setting bulbs is to set them too near the surface. His experience has taught him that four or five inches is shallow enough in most cases. Care should be taken not to remove any leaves before flowering time.

ROSE CULTURE

was discussed by T. H. Race, the out-going President of the Association. Mr. Race has one of the largest and finest collections of roses of any amateur in the Province. In the course of his talk, the most suitable varieties for a beginner were given as follows: General Jack, Fisher Homes, White Madam Plantier, Perpetual White Moss, Glory of Mosses, and Magna Charta. These will give a variety of colors very suitable for the most lovely bouquets. The best location is entirely away from shade, and in nice, warm, mellow earth. They should be well protected in winter and well trimmed back in spring. Then keep them free from insect pests by spraying with Paris green, 1-3 oz. to a pail of water, and splendid blooming is insured. The bushes should be well pruned after the first blooming, and a second flowering season will result. Mr. Race advised cultivators of house roses to plant them right out in the garden, and by careful culture they will bloom till snow buries them.

ELECTION OF OFFICERS.

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Director No. 1	W. S. Turner, Cornwall.
" 2	R. B. Whyte, Ottawa.
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" J. H. Smith, Guelph.

It was decided to hold next year's annual meeting in Woodstock.

Winter Pruning in the Orchard

BY PROF. E. E. PAVILL, VICE-CHIEF, SCHOOL OF HORTICULTURE.

The pruning of orchards, aside from any stated time, presents many perplexing problems, for the reason that no conclusions have been reached as yet, or at least recognized, sufficient for the establishing of a perfect science of such practical importance that its application may be easily understood and followed. Although the art of pruning has been conducted from time immemorial, no set rule has as yet been evolved and adopted, and perhaps never will, as to how much or how little, when and how, our fruits should be properly pruned. The clearest solution is the application of judgment acquired by practice or the observation and enforcing of a few general principles which are attended with the best results. If in the pruning of any plant these principles are wrongly applied, it resolves itself into one of the most injurious operations that can take place, but if, on the other hand, they are well directed, it becomes one of the most useful operations for the mutual benefit of the plant and pruner. The winter pruning of fruit trees tends to encourage the growth of wood and the building up of the tree generally, while summer pruning, usually carried on in the month of June, when the leaves are two-thirds formed, assists greatly in the production of fruit. So at this season of the year we are confronted with the often repeated query: "Is the winter pruning of apples and other fruits advisable, and under what conditions should it be done; when and how?"

In pruning the apple in winter, warm days should be selected during the latter part of the season, after the severity of the young winter has passed away, especially in climates where the thermometer is liable to register several degrees below zero. The exposure of cut surfaces may cause it to become injured, and would fail to heal over as readily or as perfectly. Large limbs in orchards that have been neglected are best removed during the warm winter days, enforcing judgment so as not to make too large a removal, as it is liable to bring about too great a shock to the vitality of the tree, and should be practiced only when necessity calls for it. This removal of large limbs is delicate work, and may be avoided in the orchard by inspecting the trees every winter during their young days, removing cross limbs or overgrown abundant shoots. These shoots occur generally where orchards are pruned the following season, and should be removed by breaking off. In pruning, remove the limbs or branches close to the trunk or stem, making the surface smooth with a knife, cutting away ragged edges of bark to prevent liability to decay.

The wound should then be treated with a composition material, serving the purpose of preserving the wood, excluding the air, preventing injury to cell structure and cracking of the surface of the wound, and assisting the new bark in forming over the cut made. Any surface of an inch in diameter should be treated. An efficient composition is alcohol and gum shellac, mixed to form the consistency of paint, applied with a brush. Common white lead paint is equally as good. Coal tar may also be used. Winter pruning of enfeebled trees will give them a stimulating vigor, if done judiciously, causing the cell development to become larger by increasing the nourishment in a less number of branches. If young trees are pruned in the early part of the winter, especially in a north latitude, the ends of the shoots will die back, and if wounds are exposed, will not heal over as readily as if treated later on in the season. The best time is the latter part of February and the first half of March.

The pear is treated the same as is the apple. Winter pruning in of great value, as the wounds heal over perfectly.

Where it is necessary to prune a plum, it should be done in the middle of the winter season, as it is dangerous and very injurious to prune after the sap has started in the spring. The cutting or heading back of the shoots which have made an over-luxuriant growth during the season, should take place usually in February, about the time peaches are being cut back. These shoots should be pruned back from one-third to one-half of their growth, making the cut as small as possible, just above a bud, not too close or too far above, bearing in mind that leaving a bud on the inside tends to produce a straight top, while the outside bud moves of a horizontal growth.

The cherry should be pruned but little, pinching and shortening in being practiced to produce a compact, spreading top. If pruned in winter, it is apt to form gum in the wound and cause decay.

In the vineyards in the north, grapevines should all be pruned and laid down by this time. Those who have only a few vines in the garden, who have not done this, should now do it at once, and prune severely, as the frost has to some extent checked the growth, and should be pruned back to at least three lateral buds, from which new bearing vines will form. If left on the trellis over winter, the vegetation will weaken the vines, as winter decaying is very great. In consequence of winter pruning in peaches, only carried on, pruning should not be looked for