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Thorough Cultivation of the Orchard

Is an essential process in the production of first class fruit. Now that the war is over and the embargo on export shipments practically lifted, the outlook for the fruit industry of Canada for the next few years at least is bright. Progressive fruit growers who are planning to take advantage of the situation will do well to give special attention to the cultivation of their orchards this spring.

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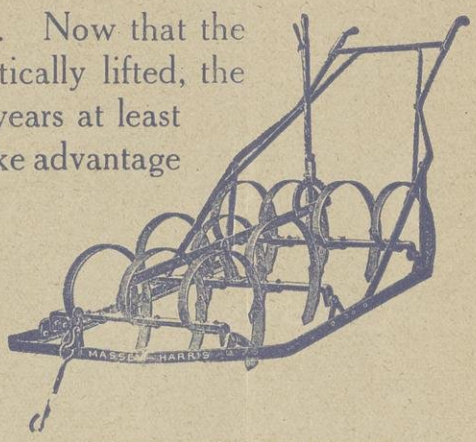
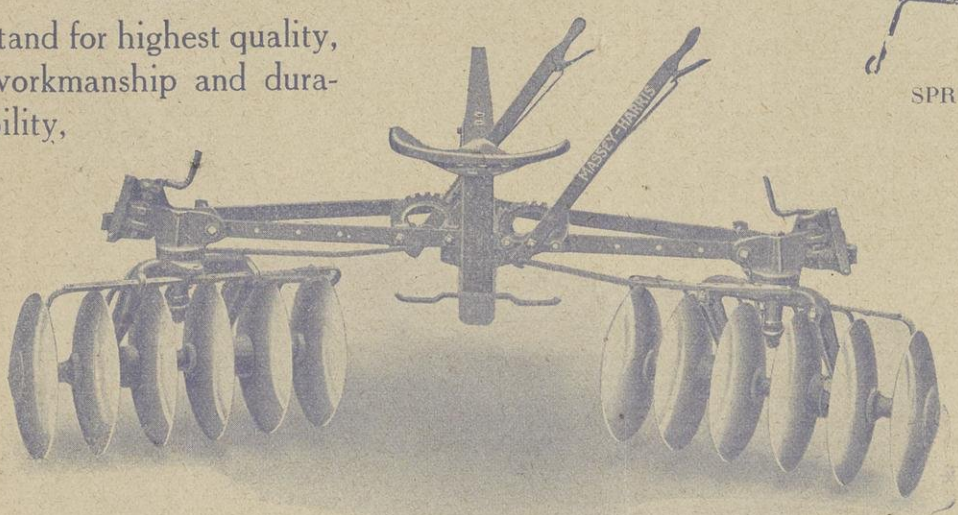


SPRING TOOTH HARROWS



ORCHARD DISC HARROW

Orchard Disc Harrows

The Massey-Harris Orchard Disc Harrow is both reversible and adjustable. The Gangs are interchangeable in their position on the frame so as to throw the soil to or from the trees and vines. An extension can be furnished for working under branches. It is adjustable to any depth in the middle or at the end, levers adjusting each Gang separately, thus regulating the amount of dirt thrown. This Disc Harrow has ten 16 inch discs. It cuts 5 ft. 6 in., and when the long extension frame is used it measures 10 ft. 1 in. in width.

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Our scufflers are especially adapted for flat cultivation among garden vegetables and strawberry alleys. It is rigged with five steel standards, 5 Oval Points, 2 short hillers, and 17 inch shovel point and gauge runner.

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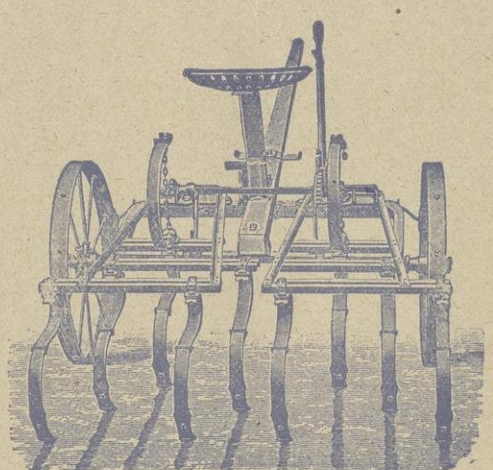
We carry a great variety of cultivators for cultivating small fruits, vineyards and orchards. The Massey-Harris 9-tooth cultivator is adapted to a variety of work both for field work and in vineyards. With attachments it can also be used for furrowing or ridging.

Wheels are 29 inches high with 2½ inch face and are on extension axles. One lever raises and lowers both sections. Extension frame can be furnished for orchard cultivation.

Spring Tooth Harrows

Ten, fifteen or seventeen teeth. The ten tooth size is in one section and can be furnished with handles for vineyard work when so ordered, as per illustration.



9-TOOTH CULTIVATOR

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The Canadian Horticulturist

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Vol. 27 TORONTO, JANUARY, 1919 No. 1

Controlling Factors In Small Fruit Culture*

Prof. T. G. Bunting, Macdonald College, Que.

THE importance of small fruit culture, including raspberry, black and red currant, the gooseberry and the strawberry, cannot be overemphasized and too often has taken a very secondary place compared to the tree fruits and in some cases is even neglected.

Small fruit culture has many advantages over tree fruit culture and these may be considered in the following order :

First : Early returns. In the case of strawberries a full crop is secured in the second year and in the case of the others three to four years after planting. Tree fruits, even with the early bearing varieties, require a period of four to six years, and with some varieties a much longer period.

Second : Low cost of establishing a plantation compared to tree fruits due to the few years required to bring the plantation into bearing. However, the initial cost of plants, labor, planting, cultivation, etc., is proportionally high.

Third : Comparative hardiness of the strawberry, raspberry, currants and gooseberry where a proper choice of varieties has been made and where care has been exercised as to their location under proper soil conditions.

Fourth : Productiveness and regularity in their bearing habit. They can usually be depended upon to produce a fair to good crop of fruit every year, a failure in crop is seldom experienced and is due only to some unforeseen circumstance.

Fifth : Our cities and markets are not adequately supplied. Fresh fruits and preserved fruits are shipped in from outside in large quantities. Consumption could be increased many times over with advantage to the consumer. Quebec province with 27.2% of the total Canadian population only has 10.3% of the total acreage of small fruits ; the acreage of these actually having decreased 40% between 1891 and 1911. During the same period Nova Scotia's acreage decreased 70%. The acreage of small fruits would have to be increased by 270% if this province were to raise the average acreage based on population.

Sixth : The use of women and children in the summer vacation for much of the labor in harvesting and caring for the fruit. This labor would probably not be otherwise profitably utilized on the farm.

Seventh : Considering the regularity of bearing and general productiveness and the prices prevailing during the past these fruits are among the most profitable of all farm crops.

Montreal Muskmelons, two-thirds to three-quarters grown, as produced at Macdonald College, Quebec. These are the kind that bring big money.

A careful consideration of the foregoing factors would clearly indicate that small fruit culture should be a much more important industry than at present.

SUCCESS REQUIREMENTS.

Some of the requirements for successful culture might be considered under the following headings :

Soil—These fruits are fairly widely adapted to a variety of soils. In general, any deep fertile, well drained soil will grow these fruits successfully. A loam, sandy loam, gravelly and even clay loam soils are all satisfactory providing the drainage is good. Strawberries require a more fertile soil than do the other crops.

FERTILIZING.

If the soil is naturally deep and fertile, bush and cane fruits require only moderate applications of fertilizers and stable manure would be the best form. Our plan is to manure these fruits about every third year with 18 to 20 tons of well rotted manure. This is applied in late fall, winter or early spring. Strawberries being shallower rooted require heavy applications of manure for best success. Applications of twenty to thirty tons of rotted manure are applied in the fall before planting and a strawy manure mulch is used for winter protection and affords a considerable source of additional plant food for the second year of the plantation.

Thorough and frequent and early cultivation during the establishment of the plantation, and until a few weeks before harvest, after the plantation comes into bearing, is essential and this method is followed by all successful fruit growers. Deep plowing or cultivation is not desired except before planting when the ground is being made ready.

The fruiting season is in the hottest season of the year, at a time when the plantation is liable to suffer from drouths. Frequent cultivation to conserve soil moisture will do much to tide the crop over these periods of drouth.

A single horse plow, a cultivator, and a hand hoe are sufficient implements for the proper care of any of these fruits.

PRUNING.

The bush and cane fruits require annual prunings. In the cane fruits all bearing canes should be removed and burned immediately the crop is harvested and some of the weaker or diseased new canes may be removed at the same time. In the spring before growth commences the remaining canes should be thinned out to at least five to six inches between canes and not more than ten or twelve to every three feet of row. These canes can be cut back to three inches to three and a half inches for convenience in harvesting the crop.

The bush fruits require annual prunings either late in the fall after the foliage

*A paper read at the recent annual meeting of the Quebec Pomological and Fruit Growing Society.

has dropped, or better, early in the spring before growth commences. It consists of thinning out the new growth, leaving four to six of the stronger ones well distributed through the plant and cutting out the oldest set of canes or those that have reached five years of age. By this method a constant supply of young bearing wood is coming on and the older wood is removed to make way for it. Pruning cannot be neglected even for a single year without serious ill effects being shown.

SPRAYING.

Unlike the tree fruits comparatively little spraying is necessary. The strawberry is sometimes seriously attacked by the leaf spot, but as a new plantation is usually established each year this is seldom serious enough to require spraying. The anthracnose and cane blight of the raspberry are serious and do much damage, but spraying is hardly practical for these diseases. Good cultivation and prompt removal of diseased canes is the most satisfactory way of dealing with them. With the red currant and gooseberries the saw fly larvæ may do much damage but they can be easily destroyed by spraying with arsenate of lead or paris green.

The black currant is attacked by leaf spots and the white pine blister rust, and in some sections where pine is very valuable black currants and gooseberries are being removed under Government requirements.

Harvesting is the most expensive operation in handling small fruits. The fruit is highly perishable and in the case of strawberries and raspberries pickings must be made every other day. However, school children can be utilized in part for this work during the school vacation. Also as these small fruits follow one another in ripening a smaller total number of helpers is required. The prompt and frequent picking of fruit just as it reaches the proper state of maturity cannot be too strongly emphasized because the better its appearance on the market the more saleable it will be. Overripe fruit soon gets mushy and wet and molds and entails large losses and causes dissatisfied customers.

MARKETS.

Markets near at hand are undoubtedly the most satisfactory from the standpoint of both the grower and consumer and it is partly for this reason that the writer so strongly recommends the culture of small fruits in the neighborhood of all our towns and cities, particularly Montreal, because in this province these markets are not adequately supplied with home grown fruits. In this connection it is interesting to note, however, that during the past season several carloads of strawberries were shipped from the Montreal district to the Ontario canning factories. As has been said on so many occasions and as past experience has proven, the public will pay a fair to good price for an almost unlimited supply of high quality fruits and it is our home markets that afford our greatest opportunities and that require to be developed.

As in tree fruits for commercial plantings one should confine himself to those standard varieties that have proven their merit and only try out the new or little known varieties in a small way and with care until such time as experience has shown their merit. The following varieties are grown successfully in the College plantation, and it is believed they will do equally well over a wide area of the province :

Raspberry—Herbert, Cuthbert.
Black Currant—Lee's Prolific, Black Champion.
Red Currant—Pomona, Fay's Prolific.
Gooseberry—Am : Downing, Red Jacket.
Eng. : Keepsake, Victoria, Industry.
Strawberry—Senator Dunlap, Warfield. Parson's Beauty, Sample, Bederwood.

SMALL FRUITS.

Small fruits are, comparatively speaking, expensive crops to grow. The initial cost of plants, cultivation, pruning, etc., the wait of two to four years for a full crop and cost of harvesting is high and certainly in many cases is in excess of $100 an acre a year, but in spite of this apparent high cost, prices have been such that these crops can be rightly said to be among the most profitable on the farm.

Of course there is a limit to the quantity or acreage that one can successfully handle but this is largely a limitation dependent on labor supply more than on markets. However, where labor is plentiful considerable areas of these different fruits can be handled.

To the present fruit grower—to young men and women, to the returned soldier and to the would-be city farmer here is an opportunity convenient to our centres of population, affording a congenial, pleasant and profitable occupation that needs great development.

Control Fire Blight

Watch for fire blight when you begin to do your winter and spring pruning. Fire blight causes apple twigs to die away quickly and is the same organism that causes the blight on pear trees but it is much more severe on pear than on apple trees.

The disease has been found to live through the winter in cankers on the larger limbs or on the diseased twigs. If these are removed by the orchardist the dangerous source of infection will be removed, although methods of control must be used frequently to prevent the spread of the blight.

The fungus attacks "water sprouts" or "suckers" frequently so that in pruning these should be removed to prevent the disease from producing hold-over cankers on the trunk or roots of the tree.

What appears to make the disease difficult to control is that each wound made by pruning must be disinfected ; but by using a solution of mercuric chloride, 1 to 1,000 parts of water, this can be accomplished. In pruning trees affected with blight, tie a small sponge saturated with the solution to your pruning tool and daub each cut. This prevents the fresh cuts from becoming infected or otherwise pruning would greatly spread the fungus.

Ontario Orchard Conditions

IN the greater part of the province of Ontario an apple orchard may be neglected for a number of years and still live, and while it might not be possible to get it back to normal condition again, one could with care and considerable expense, make a paying proposition of it, if the kind of fruit and land were suitable.

Many of the apple orchards, both large and small, have been neglected during the past four years. The scarcity of labor, and the doubt of being able to market a crop if produced, and the high price of more necessary food products, which required all the attention of the available help, was the principal cause. With many of these orchards, probably no effort will ever be made to redeem them.

Some orchards that have had good care, lost a great many trees through the severe winter of 1917, although they did not suffer as much as the neglected ones. I do not know of any orchard being planted in this section, so that through neglect and natural causes, the decrease in apple orchards will be considerable.

Except in the Niagara Peninsular, I believe apples to be the best line of fruit production in the province. They can be shipped to distant markets more easily, and the season for marketing is long.

As the growing of good apples requires a great deal of care, the average man is apt to neglect the orchard and grow a small crop of poor fruit, therefore, I do not believe there is much danger of overproduction of good fruit, except in occasional years.

Demonstration orchards showing profitable results, and numbers of orchards through the country operated by the owners, showing good returns, would be the best inducement for others to try and do likewise. Also if the fruit situation were discussed at the many Farmers' Clubs throughout the country, with some outside talent to assist, it would be, I believe, the best means of showing the profit, and necessity, for producing more fruit after the war.

The Pear Psylla

W. A. Ross, Dominion Entomological Laboratory, Vineland Station, Ont.

THE pear psylla is frequently very destructive to pear orchards in Ontario, notably in the fruit growing sections bordering Lake Ontario from Burlington to the Niagara river. Many pear growers who have suffered from its depredations are persuaded that this pest is the most troublesome insect with which they have to contend.

It is believed that the psylla was first introduced into North America in 1832 on pear trees imported into Connecticut from Europe. Since then, it has become generally distributed over the Eastern States and parts of Eastern Canada. In Ontario it was first discovered in 1894 at Freeman, Halton county, at which place it was found seriously injuring a block of 300 Dwarf Duchess pear trees.

NATURE OF INJURY.

The psylla causes injury by extracting with its sucking mouth parts the sap from the leaves, leaf stems, fruit stems and tender wood on which it feeds. On badly infested trees, the continual sapping of the life juices by myriads of psyllas robs the trees of vitality, dwarfs the fruit, produces brown dead areas on the leaves, and in extreme cases causes the foliage to drop prematurely. Trees seriously weakened by the psylla are especially susceptible to winter injury, and in a hard winter like that of 1917-18 readily succumb to low temperatures.

Large quantities of a sweet sticky liquid, called honey-dew, are excreted by the psylla nymphs, and on attacked trees the foliage, fruit, twigs and branches may be covered with this sticky material and with a sooty fungus which grows in it. This coating of honey-dew and sooty fungus not only makes the trees and fruit very unsightly, but it is very probable that it is also detrimental to the physiological functions of the leaves.

DESCRIPTIONS.

ADULT.—The adult psylla is a tiny, four-winged insect about one-tenth of an inch in length. The transparent wings slope roof-like over the abdomen and the legs are adapted for jumping. The summer form is reddish with dark markings whereas the winter or hibernating form is dark brown or black.

The egg is a minute, sub-oval, yellowish body just visible to the naked eye. It is attached to the leaf or bark by means of a short stalk near the basal end.

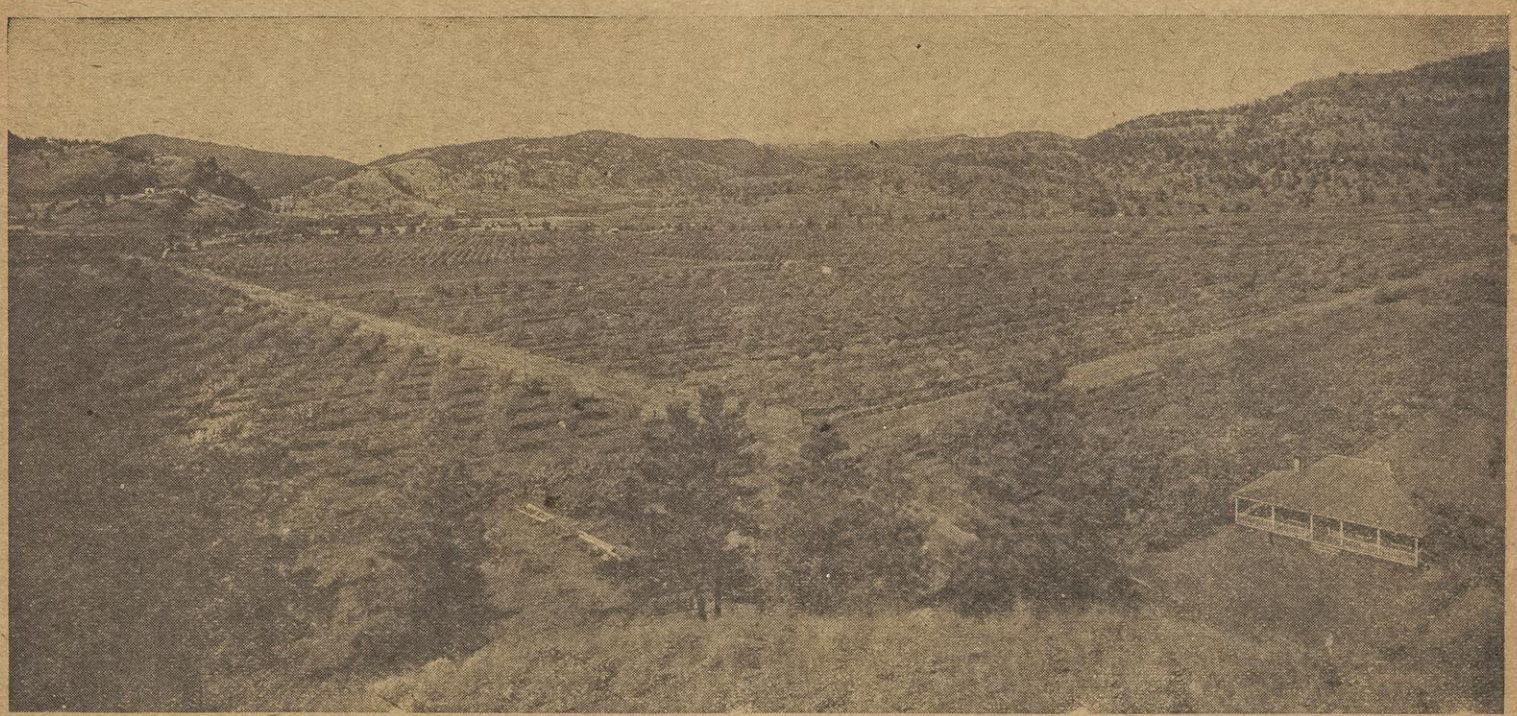
The nymph is oval and very flat in shape. In growing, it passes through five stages or instars. In the first three instars it is yellowish ; in the last two it is dark brown or black and has conspicuous wing pads.

The winter is passed in the adult stage. The adults hibernate under the rough bark on the trunks and main limbs, and under grass, leaves and rubbish near the infested pear trees. In late March or early April, the insects leave their winter quarters, congregate on the twigs and fruit spurs and, in a short time, provided the weather remains propitious, commence to lay eggs. Each female is capable of laying from 200 to 400 eggs. Oviposition may continue until about the time the petals drop ; however, the vast majority of the eggs are laid by the time the fruit buds have burst. The eggs are deposited on the twigs, fruit spurs and smaller branches, chiefly on the under surface. They commence to hatch when the fruit buds are beginning to break and nearly all have hatched by the time the petals drop. The period of incubation varies, according to temperature, from nine to thirty-two days, the average being about three weeks. The newly hatched nymphs migrate to the opening buds where they feed chiefly on the petioles and blossom stems. They grow rapidly and after moulting five times reach the adult stage in about one month. This first brood is then succeeded by three other broods and the life-cycle is finally completed in the fall by the appearance of the winter adults--the hibernating forms.

The summer adults are more prolific than the hibernating forms. Their reproductive capacity according to our observations may vary from an average of about 500 to a maximum of nearly 700 eggs per female. Their eggs are laid on both sides of the foliage, principally along the midrib. They hatch during warm weather in about eight to ten days and the nymphs derived from them reach maturity in two to four weeks.

NATURAL CONTROL

Several species of insects, notably lady-bird beetles, attack the psylla and check its rapid multiplication to some extent ; however, undoubtedly the most important control agency afforded by nature is the weather. Our observa-



The chief difference between the Okanagan and Niagara tender fruit sections is that the former is located in a semi-arid district. Note the character of the vegetation on the hills in the background of this illustration, which shows fruit land at Summerland, B.C. Under the combined influence of irrigation and the hot weather fruit here makes a very rapid growth.

Members of the Quebec Pomological and Fruit Growers' Society are here shown, the annual meeting of which was held recently at Macdonald College, Quebec, where this illustration was obtained.

tions indicate that protracted periods of cold, wet weather in spring may be disastrous to the eggs and newly hatched young and that long spells of hot dry weather are fatal to many nymphs.

According to our experiments in Ontario and to more extensive experiments in New York State the most economical and satisfactory method of combatting this pest is to make the following modifications in spraying practices in the pear orchard :

1. Postpone the so-called dormant application of lime sulphur (winter strength) until shortly before the trees bloom, and then thoroughly drench all parts of the trees including the under side of the twigs and branches. This application destroys the newly hatched nymphs and the eggs about to hatch.

2. Add nicotine sulphate (40 per cent.) at the rate of three-quarters of a pint to eighty gallons of spray mixture—to the spray applied just after the blossoms fall and again spray with great thoroughness. This application kills the nymphs which at this time of the year are situated chiefly in the axils of the leaf petioles and blossom stems.

It cannot be too strongly emphasized that in spraying for psylla thoroughness is more than half the battle.

Combatting the Apple Maggot

Prof. Glenn W. Herrick, Ithaca, N.Y.

THE apple maggot is an old pest which originally lived upon the wild thorn apple and did not force itself on the attention of fruit growers in a serious way until probably about the middle of the last century. Since that time, however, it has steadily increased until it has become one of the important pests of the apple in the northeastern United States and is committing more injury to-day than ever before. It is worse on summer and fall varieties, although of late years, complants have been made regarding it on winter varieties of apples, especially the Northern Spy. It has been recorded as attacking over 70 varieties of apples. In New York State it is particularly injurious to the Red Astrachan, Early Harvest, Maiden Blush, Talman Sweet, Fameuse, Twenty Ounce, Mackintosh, King, Northern Spy, and Rhode Island Greening.

Life History of the Apple Maggot.

The adult flies emerge from the soil from the latter part of June through July to September and soon begin placing their eggs in the apples just beneath the skin. Wherever an egg is placed a dimple is produced in the apple and a tiny black spot at the bottom of the dimple shows where the skin of the fruit was punctured. The larva will grow rapidly if the apple is mellow, but very slowly in hard winter apples. In soft summer apples the maggots may attain their growth in two weeks, while in Fameuse and Mackintosh, for example, the fruit may show no signs of attack when picked out, but some time after storage when they become mellow they may suddenly go down to decay as a result of the activities of the maggots which were present at picking time but very small and inactive. The maggots do not leave apples until the fruit drops. Then they go into the ground an inch or two in depth, change to pupae, and, in most seasons, at least, remain there until the following spring.

Methods of Control.

The flies, as soon as they appear, begin feeding by sipping from the surfaces of the leaves and fruit in exactly the same manner as the cherry fruit-flies, and experiments at Ithaca during the seasons of 1911 and 1912 on Primate and Maiden Blush apples demonstrated in a clean-cut way that this insect can be controlled by spraying infested trees with the sweetened poison bait used for the cherry fruit-flies. In previously badly infested orchards the trees should be sprayed at least twice two weeks apart, the first application being made during the first week in July.

The addition of molasses to this bait is unnecessary, because the ordinary orchard poison sprays control the pest equally well if an application is made about the first of July.

More conclusive experiments have been carried on over a series of years on a wide scale in the provinces of Nova Scotia and Ontario in Canada. Brittain, of Nova Scotia, says: "We have been able, by spraying with arsenicals, to check apple maggot injury in orchards in which the crop of susceptible varieties has been almost, if not entirely, a total loss for several years, while other infested orchards near at hand, which were left untreated were infested as before." Caesar, of Ontario, says: "Until this year we have added a small amount, usually half a gallon of molasses, to each 40 gallons (American 50 gallons) of the poisoned water; but this year in four small but previously badly infested orchards we omitted the molasses and secured just as good results."

Rejuvenating the Orchard

Many of the neglected hill orchards in south-eastern Ohio, some of which are more than twenty years old, are being rejuvenated by a process of fertilization worked out co-operatively by orchard owners and the Department of Horticulture at the Ohio Experiment Station. Tests which now cover a five-year period show that an average increase of $123 per acre in fruit was brought about by the application of five pounds each of acid phosphate and nitrate of soda and two and one-half pounds of muriate of potash to the tree. The fertilizer was applied early in April of each year.

Various tests show an average yield per tree of 317 pounds of fruit where the complete fertilizer was used, a gain of 193 pounds, as the untreated trees have produced an average of only 124 pounds of apples. The gain per acre in barrels was 53. Other combinations of fertilizers have not proven so effective as the complete mixture ; nitrate of soda alone at the rate of five pounds to the tree showed a net increase of $112 for a five-year average ; stable manure at the rate of 250 pounds to the tree brought an increase of $110 per acre ; tankage, bone-meal and muriate of potash used together were unsatisfactory.

Prospects for Fruit Growing in Canada

REPRESENTATIVE fruit growers throughout Canada appear to hold the view pretty generally that in spite of certain disappointing factors the prospects for fruit growing in Canada now the war is over are encouraging. The following expressions of opinion have been obtained from men of wide experience.

F. A. J. Sheppard, manager of the St. Catharines (Ont.) Cold Storage and Forwarding Company, writes: "The scarcity of labor due to war conditions decreased the planting of small fruits in this section fully 40 to 50%, and the planting of the orchards of tender fruits such as peaches, cherries, plums, pears and grapes fell off 60%. This could not be altogether attributed to war conditions, as over-production and low prices in 1913 had checked planting and high cost of labor and implements, etc., coupled with poor crops in 1914-15-16, made fruit growing somewhat unprofitable, therefore very little planting was done. Last winter extreme cold weather cut big inroads into all varieties of tender fruit trees, especially peaches and cherries, and it looks as though this should be a good time to get back in fruit-growing. The grower who will confine his planting to the variety of fruit his soil and location is adapted to, and will take good care of it, should find it a profitable branch of agriculture. There are no large fortunes to be made in it on account of the many partial failures due to weather conditions over which we have no control. A lot of the trouble in the past was caused by some growers booming the industry beyond its limit, with the result that a lot of land was bought at a high price and planted with trees that were totally unsuited for the variety of fruit planted. There is quite a demand for peach trees for next spring's planting, but trees are very scarce and hard to get."

A CONSERVATIVE VIEW

G. H. MITCHELL, Clarksburg, Ont. "The past few years have been discouraging to fruit men, particularly apple growers, and it is very hard to say what the future has in store. The cost of fertilizing, pruning, cultivating, spraying and harvesting, has doubled, and is more than an ordinary orchard will stand, and pay a dividend, no matter if the crop results are good. If a grower is fortunate enough to have an orchard with nothing but select varieties such as Spy, it is likely that the results would justify the increased cost, but these orchards are few and far between. It would appear that the old orchards of many varieties had better be cut down and made into wood. There are large plantations of young orchard of selected varieties that will soon be in full bearing, and these will be so much more profitable that the old orchards, particularly the small farm orchard, will be a back number. In this immediate vicinity there are nearly three thousand acres of orchard, which have not yet produced a crop. We believe these will mostly be profitable, even with changed conditions, as they are the best known varieties. The most of these young orchards are receiving fair attention, while old orchards generally are being neglected.

"I do not think it would be wise to plant apple orchards at present. It looks like a good proposition on the surface, but when figured out in cold cash, the investment up to the time of production would be so high that unless prices for apples are still higher (which we cannot expect) it would not pay a dividend sufficient to warrant the venture. The orchards that are coming into bearing now, or within the next few years, will be money makers, but they were planted when it required only about half the capital it would at present. We cannot predict any great reduction in labor cost for some time, so unless one is especially favorably situated, it would be better to leave the apple industry alone.

"This may seem a little pessimistic, but with freight rates to Liverpool nearly $7.00 a bbl. from shipping point, the prospect for export is not very bright. This kind of thing makes apples a luxury, instead of a necessity. If fruit should arrive in poor condition the results would be ruinous, so it is simply a gamble to ship on consignment in face of such conditions. The rates will have to be reduced to their old pre-war level before apple men dare undertake an export business on any large scale, and then, after all is said and done, we must make the apple business profitable.

"Of course, the crops have been so short these last few years on account of neglect, that we do not appear to have overproduction, but with the acreage of young trees that must be coming into bearing there does not seem to be very good prospects unless we have wide open markets. This in my mind is the all important question at present. Although the total shipments from this district this year will not be over 10,000 bbls., yet fruit has been hard to market at prices that would show a reasonable profit per acre. What will happen when we have from 200,000 to 300,000 bbls., which should be inside of the next ten years, unless shipping facilities are very much improved.

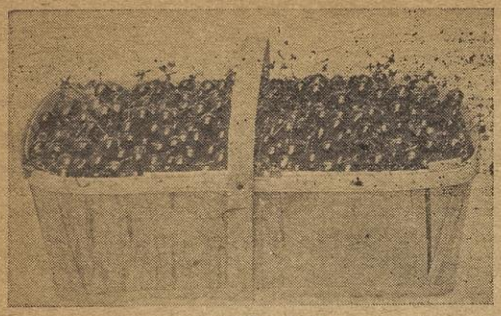
"This is the end the big fruit men want to devote more attention to—"Markets."

A NOVA SCOTIA VIEW.

President F. H. Johnson, of the Nova Scotia Fruit Growers' Association, Bridgetown, N.S., writes: "Since the start of the war very few apple trees have been set out, but now that the war is over I expect to see quite a boom in planting, as many of the growers are looking forward to good times in the fruit business.

"During the past four years many of the growers in their efforts to produce more of the essential food products have

In the peach orchard of F. H. Gallinger, of Stamford, Ont., during the picking season. The peaches are hand-picked into baskets and gathered from the pickers onto the light waggon here shown and handed to the sorters. A double team hauls the fruit as finally sorted and packed to the loading station. During the height of the season from one to three cars are filled in a day.



An 11-qt. basket of English Morello cherries as grown at Macdonald College, Que.

somewhat neglected their orchards. Fortunately the last two seasons have been very favorable for the orchards, so that the neglect will not be as serious as we might expect. With care and good weather conditions next spring we can look forward to a good crop of apples.

"Now the embargo has been lifted apples will be our main fruit crop. With our short rail haul and open winter port, so that we can ship at any time in the winter, we are in a better position to export to the British market than any other province in the Dominion.

"At our annual meeting of the Fruit Growers' Association this year we plan to put on a campaign for increased production in the apple business, and by any other means to boost apple growing. From the growers I have talked with, I look for greater care of the orchard next season than ever."

Winter Orchard Foes

J. A. ANDERSON.

As soon as there is a sufficient snowfall to make winter feed somewhat scarce, rabbits and mice will attack young apple trees and damage or entirely kill them by feeding on the bark at the ground or on the snow line.

Such injury can be prevented by wrapping the trees to a height above the snow line with tar paper or burlap, or by placing a lath screen protector around them. If the drifts around the trees are very high it may be advisable to break the snow drift around the trees so that the rabbits can not reach the branches. Washing the trunk with whitewash containing copperas or sulphur is also effective. Hunting and trapping rabbits in the snow break or orchard during the early winter months is helpful, too.

Young fruit trees are greatly benefited during the winter by a heavy mulch of strawy manure. This should be spaded in in the spring as it will stimulate growth and development. During the winter it will help to prevent root-killing.

Enriching Orchard Soil

Experiments conducted in connection with orchard rejuvenation by the Horticultural Department of the Ohio Experimental Station, covering five years of continuous treatment, have given an average yield of 3,458 pounds of mulch material to the acre. This was produced with an annual fertilizer treatment of 350 pounds of acid phosphate, 175 pounds of muriate of potash and 350 pounds of nitrate of soda to the acre. Where no fertilizer was applied only 840 pounds of mulch material was grown, and this was mainly weeds and poverty grass which are of but little value to the orchardist.

One peculiar result of the fertilizer treatment was that the poverty grass and weeds were soon crowded out by timothy, red top, blue grass and orchard grass, although no seeding of any kind was done. The fertilizer was applied on the original sod. This indicates that the better grasses so valuable to the apple grower will take the lead when the proper plant foods are given to them, a condition which may also be expected to give similar results when pastures and meadows are fertilized.

Fighting the Codling Moth in British Columbia

Chas. L. Shaw, Victoria

BRITISH Columbia has so far narrowly escaped serious depredations by the codling moth, the Washington and Oregon fruit-growers' worst enemy. According to Dr. A. L. Melander, entomologist of the Pullman Agricultural Station, the codling moth exacts an annual tax of $200,000 on the yield of 1,500 carloads of apples in Washington, and Professor H. F. Wilson, formerly of the Corvallis Experiment Station, estimates that the annual loss in Oregon amounts to 25 per cent of the total crop.

While British Columbia has not yet been seriously affected, the similarity of conditions has caused horticultural officials some anxiety as to the possibility of the advent of the codling moth plague into this province. For that reason efforts are being made to arouse British Columbia fruitgrowers to the danger of the codling moth and to encourage them to enforce a policy of preparedness.

There is marked similarity between the larva or caterpillar of the lesser apple worm and that of the codling moth, but the two larvæ, when full grown, are easily separated. In the case of the lesser apple worm, the shape is tapering towards each end, being broadest along the middle segments. The color is pink in the young stages and gradually turns to flesh color when nearly full grown. When fully grown the larva is about three-eighths of an inch long. The codling moth, on the other hand, is usually about three-quarters of an inch long and at the stage when it is of the same size as the lesser apple worm larva is dirty white in color, marked with black dots. When fully grown it is pinkish white, with more or less prominent tubercles. The shape of the codling moth is more even throughout than the lesser apple worm.

Both larvæ feed on the fruit of the apple, entering through the calyx or through the side and burrowing to the core. The larva of the lesser apple worm generally feeds extensively in the flesh of the apple as it penetrates towards the core, while the codling moth forms a more direct channel. The lesser apple worm, it is indicated, develops a trifle later than the codling moth in the spring and continues feeding a little longer on the fruit in the autumn; otherwise the life histories of the two moths are very much the same. The lesser apple worm develops more "side-hole" entries than the codling moth, which, especially with the first spring generation, enters more particularly through the calyx. This variation of habit in the two worms is not to be regarded, however, as a definite rule in all sections of the province, inasmuch as in color and moister sections the number of "side-hole" entries equal, if they do not exceed, the calyx entries.

The lesser apple worm is not a serious pest, especially where the orchard is systematically sprayed. Its importance to the growers of British Columbia lies in its closer resemblance to the codling moth, which is a pest of first magnitude in apple and pear growing sections. Fruit growers who are unable to determine whether the larvæ on their fruit is that of the lesser apple worm or the codling moth are being advised to send in specimens to the Department of Agriculture, as the province is determined to ward off serious attacks by this pest.

The Open Ditch

H. B. ROE

Don't shy at the open ditch. It is a dividend producer. If it is a field ditch, make it broad and shallow so you can farm right across it. It helps a lot where you have no outlet for tile drains. Tile drains are, of course, better. The two together are best. They can be used in co-operation. Make your open field ditches with a side-push road grader in the fall after the crops are harvested.

Keep open outlet ditches clean. Weeds, brush and mud banks in ditches ruin your drainage. Remove obstructions in the district ditch in the fall when it is dry. Then you can expect early drainage in the spring. A little work at frequent intervals will keep a ditch clean and working, and prevent the recurrence of heavy maintenance expense with its consequent discouragement every few years.

The Double Walled, Insulated, Cork Packed Hive

J. F. Dunn, Ridgway, Ont.

SINCE my article on the double-walled hive appeared in the November issue of THE BEEKEEPER, I have received a good many letters all of which I have answered promptly, most of them by return mail. To all who have written asking about construction, I have sent sketches giving directions how to build them and to those who wish to purchase I reply I do not make any sort of bee-supplies for sale. I doubt if it pays any one engaged in honey production to spend any time at any other business than bee-keeping. If one has more time on his hands than he can afford to devote to necessary leisure or recreation, better get more bees.

One of my correspondents who wrote me a very kind letter is decidedly critical as to my comparison of re-granulated cork as compared with sawdust. In conducting my experiments I "put it up to the bees." If a two or three frame nucleus, crowded on say three or four frames and packed in 3 inch sawdust with a foot of packing on top will die, while a little colony no stronger crowded on the same number of frames in a properly insulated double walled hive, a piece of thick insulating paper laid flat on the honey board and the flat hive cover also insulated over the three-eighth inch bottom and under the metal cover and packed with two and half or three inches of cork crowded down lightly over it, will winter, and become one of my best colonies the following season, I naturally pin my faith to the double walled hive. But that hive must be properly insulated or it will be no better than the single colony clamp packed with sawdust or worse still with planer shavings, which showed but 55% in the tests at the O.A.C. I have before me as I write the percentages of insulation as conducted by Prof. Graham, and which will undoubtedly be given to the public at the proper time. I believe they wish to make further tests before publishing results. I may probably be permitted to say that chopped straw is next highest to re-granulated cork.

In answering enquiries I have advised those who wish to make some of those hives to allow space for 2-inch packing. Fasten in the bottom so that it can be removed, first filling with finely chopped straw and substituting cork when obtainable, which will undoubtedly be when ocean transportation is not so congested. For those who wish to purpurchase re-granulated cork I would advise to get their local association to purchase from Robinson Bros., Cork Works, Pt. Colborne, in ton lots. Have it put up in sacks and distribute to members. It cost me $34 a ton in 1916 The price may now be higher—"a little higher in price but worth the price."

I hope my readers will understand that I have no prejudice against the four colony packing case. My bees wintered splendidly in them, especially when packed in forest leaves, one of the best of insulators. Use them year after year as the older they are the better. I would like to see them ground into powder as fine as the finest re-granulated cork, and tested.

NOT COMPETENT JUDGES.

Mr. Chrysler, in the November BEEKEEPER, says : "When discussing the subject of double walled hives with different beekeepers of note and others, they have frequently presented arguments against their use and yet ninety-nine out of every hundred beekeepers never used them." Well, if they have never used them could they be considered good authority ? How do they know ? Mr. Chrysler has been a beekeeper thirty years. He has wintered bees in all sorts of clamps and now prefers the double-walled hive. I have been a bee-keeper thirty-three years and have kept my eyes open half of that time. One has to have some sleep. It is too short a time to learn all there is to know about bee-keeping and really not long enough to learn very much about this fascinating pursuit. We have wintered bees in one, two, four and six colony cases right alongside double-walled hives, and have some three-eighths lumber probably twenty-five years old, thanks to care and good paint still in service. We have discarded all clamps but the single colony case, and are scrapping those as fast as we can change our single-walled hives into double ones by putting a thin shell around them. We have done some cellar wintering, too, and know of nothing finer than those light double-walled hives (weighing very little more than single walled ones) for cellar wintering. They take up but little more room in the cellar and are protected from chilling of the brood on cold nights.

I have never been satisfied that cellar wintered colonies consume less honey. True, they will winter up to the time of setting out with a smaller consumption of stores, but will consume more honey after being placed on summer stands than those protected. To get best results bees in single walls from the cellar should be packed after being set out. I am not advocating placing double-walled hives in the cellar, as I think it would be a waste of time, but it would be easy to do so with such a light hive, and the protection afforded would, after setting out, be a big factor in rapid brood rearing and it is possible some stores might be saved.

Quite a number think one inch of cork packing not enough for our Canadian winters. It is plenty for the Niagara district. I think with properly insu; lated walls less than one inch would do. It is certainly better than the old style double hive, seven-eighths walls with three inch between and packed with sawdust and weighs about one-sixth as much. If I was further north or in a higher altitude I would give as much again of packing material.

A view of the apiary of Mr. Geo. E. Moss, Souris, Manitoba.

The Rendering of Beeswax

E. T. Bainard, London, Ont.

MR. R. F. Whiteside had an article in the May BEEKEEPER on wax rendering and from the number of suggested changes in his equipment and also the number of small mishaps he had I am of the opinion that his building and equipment are not properly constructed or operated for doing good work. For instance, where mention is made of dirt and wax filling up the slatted follower board it is quite evident that not enough hot water has been used, and may be the room and press were too cool for good results. What suggestions I have to offer in this article are from actual experience in rendering cappings and old combs into first-class wax.

With the exception of the capping melter all wax is melted in hot water heated by steam generated by natural gas in a small steam boiler. The steam is carried on overhead pipes to the steam uncapping knife, steam capping melter, wax melting tank, and a large reserve hot water tank.

The steam capping melter is twenty-four inches by thirty inches and six inches deep, made of heavy galvanized iron with a double bottom one inch apart. Three partitions between this double bottom well riveted in compels the steam to take a zig-zag course while passing through. Very little steam is required. The front end of the melter is about one inch lower than the back end. The opening for the wax and honey is the full width of the lower end. It is not intended to melt cappings into wax, but rather into a mushy condition, which is sufficient for the honey to separate and the wax to float on top. A heavy piece of cotton strap is loosely suspended in the wax and honey separator. This assists in removing the wax when cold.

AN EASY METHOD.

The hot water and steam (mostly hot water) that comes from the capping melter is now conveyed to the double bottom of the honey extractor. This heating of the honey makes it easier to pump and strain. There is no pressure on the capping melter or the extractor as the steam and water is allowed to flow through by gravity.

The wax melting tank is twenty-four by thirty inches and fifteen inches deep. For steam make it of two-inch plank. Heat this with two branches of half-inch pipes with twelve or fifteen small holes. The pipe lies in the bottom of the tank.

For melting combs out of wired frames we divide this tank in the centre with a partition with a small opening under it. Five or six combs are melted in one end, shook free of wax and the wax or combs are dipped over the partition to the other apartment. The water flows back under the partition.

THE WAX PRESS.

The wax press is made big and strong and well braced to the floor. Two inch plank is the best material for making the press tank, which is about eighteen inches square and ten inches deep inside. A small opening at the bottom draws off the water, and a wide opening at the top allows the wax to overflow. One board seventeen and a half inches square slatted on top side with slats three-eighths inch square and three-eighths apart, covered with heavy galvanized wire

Who said they'd sting? Mr. Walker Fleming of Brantford and some of his bees.

cloth, lies in the bottom of the tank. When ready to operate a bottomless box or form about 14 inches square and eight inches deep, made of thin lumber, is placed inside. Over this spread out a sugar sack which has been opened out. Into this sack put eight or ten quarts of melted combs or enough to make one large cheese. The sack is then folded up and pinned tight together with three-inch wire nails, the bottomless box or form is removed and enough hot water thrown in to cover the cheese. A follower board with slats and wire cloth on under side is used on top of cheese. Between the follower and the screw of the press there is a space of sixteen or eighteen inches. This space is filled in with a block of wood square on each end. The object of this space is to give more room to work when filling and emptying the press. As the screw of the press is tightened down on the cheese the wax and water overflow. An iron bar three feet long is used to turn the screw with. Each cheese is pressed three times and each time the press is released the top follower is removed; (keep it in a warm place over the melting tank), and the cheese is loosened up with the iron bar. It will in this way take up a lot of water. When the cheese has been pressed down the third time it is left there and hot water poured on towards the back of the press to flow off the wax. The bottom plug is removed and water taken out, and the press rinsed out with hot water. The cheese is then removed and shaken out. We have proved by experiments that the raising and lowering of the pressure on the cheese is of little use unless the cheese is loosened up and turned over in hot water, so that when pressing two or three cheeses together all the wax that might be got out is not removed. It has also been proven that by releasing the press and compelling the cheese to take up more water that more wax is secured.

The best method is to use but one fair-sized cheese at a time, turn it over and press three times. Before commencing operations with a press put everything in and fill with hot water to warm it up.

The wax and water from the press goes into a separator or settling tank which is made of two-inch plank, four feet high and ten inches square inside. This has a honey gate about ten inches from the bottom to draw off the water. Several half-inch holes near the top allow the wax to be drawn off into sap pails. I believe that a heavy wooden trough with divisions in it would be better than tin for cooling the wax in.

Random Observations of a Beekeeper

S. Bisbee, Canfield, Ont.

IN the winter of 1901, before there was any railway into New Ontario I drove through the northern part of Quebec across Lake Temiscamingue to Haileybury and up to New Liskeard, which lies at the mouth of the Wabi river. In the month of May I was joined by my family and here we lived the following six years.

My business took me over a considerable portion of the country, and in no other place have I seen such a luxuriant growth of clover, particularly the white or alsace variety, which seemed to spring up as if by magic, along the roads and trails, wherever hay had been teamed into the lumber or mining camps.

Just one mile north of New Liskeard I found several colonies of bees. I think about nine, belonging to a Mr. John Bowman. These were in various styles of hives, but mostly in box hives and were

wintered outside with an old coat or blanket tied around them. The temperature was 52 below zero on the morning we crossed the lake. Mr. Bowman had been keeping bees for several years previous to this. They were, I believe, the first bees to be taken into that north country. I have often wished to see more reports in THE BEEKEEPER telling of the success or otherwise of those who have taken up beekeeping in that country during the last ten years.

During the season of the white clover blossom the weather is usually very wet. Sometimes showers occur almost every day, often lasting for only a very short time. Otherwise the weather would be very warm with the sun shining very brightly. I have often wondered just how successful beekeeping might be under such conditions. In the fall there is an unlimited amount of willow herb, or fireweed. This grows two or three feet high and has a purple flower which is later covered with a white down looking very much like small balls of white cotton. This willow herb produces a very large quantity of the choicest honey, and I have often thought that it might well pay some beekeepers in Ontario to move their bees to that district for a fall flow, providing a special transportation rate could be secured from the railway company.

A RECENT EXPERIENCE.

How much nicer it is to tell of our success than to record our failures. Two years ago, having sold my home and purchased a farm, it was necessary to move all my bees about twenty miles. Some were moved in the fall, but about 150 colonies had to be moved at Christmas time, on the sleigh, and were at once put into the cellar to winter. They wintered well and were put out about the 10th of April. I placed them where I thought they were fairly well protected fom the north and east winds. However I found later that our prevailing winds here were from the southwest. They had a flight the day after they were put out, then it rained for a couple of days followed by a fairly warm day and a very high wind. The bees did not have their location properly marked and began drifting. Interest seemed to centre around one hive at the south side of the yard, and by night this hive, three shallow stories, was covered all four sides about four inches deep with bees clustered from the ground to the top.

I left them until morning, when after making two large wire cages I shook the bees into them and placed them in the cellar, where I left them about thirty-six hours, then took them out in the evening and put about a pint of bees in front of each hive that seemed short of bees. They fought for a couple of days. It was the worst case of failure I have ever seen.

Treatment of Foul Brood

Warrington Scott, Wooler, Ont.

I HAVE chosen Foul Brood for my subject as I believe it is the most important of any subject that could be chosen. The loss of bees from the effect of this disease has been very great in Canada during the past eleven years, and is still the cause of considerable loss every year, principally by the carelessness and indifference of the smaller beekeepers and those who keep bees for a side line. I have found when travelling as inspector that the beekeepers who are making a specialty of the business, are pretty wide awake and are constantly on the watch for the disease and when they find it breaking out a great many of them are in doubt as to the type of the disease, not being able to distinguish between European and American foul brood. Being in doubt they usually ask for a visit from the inspector, which is the proper thing to do under the circumstances, as the inspector can inform them as to the type and the best treatment to apply for the time of the year, the kind of bees (whether black, hybrid, or pure Italians). In this he will consider the progress the disease has made, as these all have a bearing on the treatment of European foul brood. This cannot be said of American foul brood, as the variation of the seasons and the honey flows do not figure as much in the treatment.

Honey exhibited at Nelson Fruit Fair, British Columbia, Sept. 25-26, 1918.

The appearance of the two types of foul brood have been described so often in print it seems unnecessary to go into a complete description here, but for the benefit of the inexperienced with both types I will give some of the symptoms as they are found in a colony. I will commence by describing the way the germs develop in European Foul Brood. In the dormant state they are very small, in fact it is necessary to magnify them 600 times in order to make them visible to the naked eye. They are in the form of a single spore and will remain dormant for years, even on the ground outdoors, and still germinate when fed to a young larva. I believe the way they reach the larva is through the feed. The development is similar to a kernel of corn as it germinates, sprouts and grows, only the dormant spore develops into a living germ in three days and as the germs multiply and feed the larva begin to turn yellow, and the skin to appear smooth and to take on the appearance of being melted. A little later, as it becomes partly consumed and as it becomes partly decayed, it takes on a brownish color. The growing germs have thickened the watery part of the bee so that it becomes quite ropy, in fact, sometimes nearly as ropy as that in American foul brood. A little later it becomes dry and loose in the cell and can be removed by the bees. The spores becoming active germs in three days accounts for nearly all the larvæ dying before it is sealed, as very few larvæ are found sealed or dead in a sealed cell. The odor of this disease after it gets into the brownish color stage is difficult to describe : probably decayed fish is as much like it as anything.

THE AMERICAN FOUL BROOD.

The spores of the American foul brood are said to be attached together like a chain and when fed to a larva will germinate and develop into active germs in 15 days. This accounts for all the dead larvæ being capped. After the colony is badly diseased the capping will all, or nearly all, be perforated. As the larvæ does not hatch in the usual time the bees will gnaw a hole in the capping, and look in. If a toothpick is inserted in the brownish colored matter left in the cell at this stage it will string out for nearly an inch and break and fly back like rubber. The odor of American foul brood has a decided glue-pot smell.

METHOD OF TREATMENT

The owners of bees found diseased, upon inspection, always wants to know the best treatment to apply. The treatment all depends on the conditions that surround the case ; if the bees are blacks, or of a low-bred hybrid strain and the disease has made a start the previous season, the case would be a hard one to

manage, as it spreads very rapidly during the spring months and usually ruins the apiary before the main honey flow begins. If I had an apiary in the condition described, I would treat them as fast as I found the disease appearing, I would take away the combs that the colony was occupying and give them super combs or combs that hadn't been used for brood since the disease had appeared in the apiary. Then I would feed sufficient sugar syrup to make them rich in stores. I would prefer to feed them enough at once to last ten days rather than give a daily feed. For early feeding I would use a thick syrup, say two parts of sugar and one part of water, but later, say in May, a syrup mixed half and half would be better. If drawn combs are not on hand I would use full sheets of foundation instead. The colonies thus treated should be Italianized as soon as possible. Usually brood combs removed from diseased colonies of black bees had better be melted into wax.

In an apiary that has been Italianized during the past season, should the disease show up during the following spring it usually can be treated and the combs saved. This is one form of treatment that works especially well if the spring season is favorable for bees, that is, if the blossoms as they come in rotation, yield some nectar so that the colonies are stimulated into active breeding.

ANOTHER METHOD.

Should the spring season be unfavorable, as they have been the past two seasons, cold and backward, the following treatment will work in proportion as the weather is favorable, and according to the strength, and the disease resistant qualities of the bees so treated.

The treatment at the approach of warm weather is as follows : Remove one comb of brood and queen from the brood chamber and place it in a super along with enough empty combs to fill the super. Place the super above a queen excluder on the brood chamber you have taken the frame of brood and queen from. Leave the hive in this position till the opening of the main honey flow, when the under set of combs can be taken out and placed above the queen excluder and used for storing honey in. Feed the colonies thus treated when there is no honey coming in from the field, as this will help to offset the bad weather that may prevail through the spring.

Usually, during the honey flows, colonies of Italians do not become much affected by European Foul Brood. If colonies of Italians are affected very much I would cage the queen for from three to six days and if the queen is old, or not of the best strain, I would replace her with a young one. If the race of bees were blacks, I would cage the queens and replace them with Italian queens. "Even if I had to leave the colonies queenless for ten or fifteen days, uniting the colonies if they were weak at the time of Italianizing.

Passing on through the honey flow we come to the fall months. I saw apiaries of blacks and hybrids last August when the buckwheat flow was nearly at a close and European foul brood had made quite a start. Some colonies were pretty well used up, and it is somewhat of a puzzle to prescribe a treatment at this juncture, as the honey flow is liable to stop within a few hours, making it unsafe to use the McEvoy treatment.

The treatment that appeals the strongest to me is to remove all the combs from diseased colonies ; give them from two to four frames containing full sheets of foundation or starters, according to their strength, and leave them in that condition for three or four days, then unite them. In uniting I would try and have about four quarts of bees per colony after uniting, selecting the most desirable queen and destroying the rest, placing the united colonies on sealed combs of honey free from disease, or empty combs and feed for winter. The combs taken from the bees, when putting them on foundation, can be placed over a diseased colony ; two or three sets can be placed over one colony, and the brood allowed to hatch ; that is where the brood is worth saving and the colony treated later. Finally the combs should be looked over and where the bees have done a good job in cleaning them up, I would save them and use them for super combs for a year or more before using them in the brood chamber again. Any combs not well cleaned should be melted into wax.

There is not the same opportunity to apply a variety of treatments to the American type of foul brood, as in the European type, owing to the fact the decayed matter left in the cells after it runs its course and becomes dry actually becomes a part of the cell, owing to the extremely adhesive nature of the ropy matter left in the cell. It cannot be removed by the bees, making it necessary to destroy the combs even if there are only a few diseased cells in them. Colonies found diseased early in the spring had better be carried through until the main honey flow, as this type makes very slow progress owing to the spores requiring fifteen days to develop into living germs. I am speaking of colonies only slightly diseased. If they are badly diseased in the early spring they should be treated according to the McEvoy treatment or destroyed. During the honey flow all colonies affected with American foul brood should be treated according to the McEvoy treatment and the combs melted into wax. It is too risky to advise saving the brood when colonies are only slightly diseased, but I believe it can be when in the hands of a careful and experienced beekeeper.

After the honey flow is over for the year the McEvoy treatment should not be used, but there are other forms of treatment that can be successfully applied. One is to select fully capped combs of honey during the extracting of the last honey flow from healthy colonies. After the flow is over exchange these combs in the broodnest of diseased colonies. As there are no empty cells for the bees to store the honey in they have in their honey sacks they have to consume it, and are thus free from any disease spores.

THE STARVATION PLAN.

Another plan known as the Starvation Plan is as follows : The best time to treat is in the evening. Begin by selecting two or three colonies and pound on the hives alternately to disturb them and cause them to fill up with honey. This usually takes fifteen or twenty minutes. Take out all the combs from the brood chamber and shake or brush the bees off into empty hives on the old stands, giving them a few top bars to cluster on and let them hang until you find them dropping plentifully on the bottom board ; it is then time to give full combs of honey or combs filled with sugar syrup. Combs should be well sealed and have plenty of pollen for spring. Care should be taken in selecting honey from healthy colonies. This plan has to be used after the honey flow stops in the fall, just after the frost has killed all the flowers. As they have their sacks full they will begin to drop about the same time, and it is necessary to watch each colony each day till they begin to fall on the bottom board. This treatment if carefully carried out should be successful.

Toronto Beekeepers Discuss Important Subjects

At the regular meeting of the Toronto Beekeepers' Association, held in Toronto on December 12, interesting papers were read and discussed. During the demonstrations so many members volunteered hints and suggestions gained during their own experience that there was nothing "cut-and-dried" about the lessons taught.

Candy for Winter Stores.

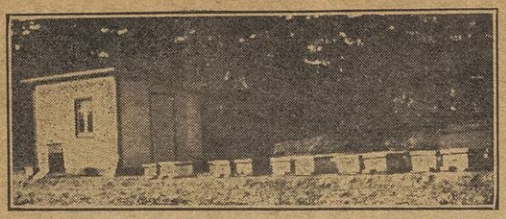
Mr. Temple, who spoke on the methods of making and using candy as winter stores, made it clear that candy was an "emergency ration," something that, while not quite as good as the regular methods of feeding, could be depended on to be helpful if the fall feeding of honey or sugar syrup had not been accomplished. In this particular year many beekeepers had not been able to secure a sufficient allotment of white sugar, and were hoping to help out their colonies now that sugar was easier to procure, the restrictions having been lifted. It was explained that it would be impossible to expose a colony long enough for them to take down syrup, no matter what type of feeder was used, and that some plan had to be devised that would mean opening the hive for only a few moments, and then sealing it up again, and being through with the job. The food must be readily accessible to the bees and in a form that they can use freely.

"Soft candy" made from granulated sugar has a high food value, is easily handled, for it is firm enough to hold its shape in a large flat cake, and it will become softer still with heat from the hive, and is quite acceptable to the bees. Take six parts of granulated sugar and one part of water, hot or cold, all by measure, and heat to boiling slowly; keep it hot for half an hour, and then take it from the fire and beat it with a large spoon till it gets light in color, granular and stiff, and pour into a shallow dish (a paper pie plate will do) into a cake about an inch thick and allow to cool. Most of us have seen the girls around the house make "fudge." This process is very similar, and the final product looks like this well known confection, and tastes pretty good, too.

With the candy ready, take off the top cover of the hive, raise the blanket or cushion and lay three or four thin pieces of wood across the top of the frames to make a beeway; lay on the cake of candy, replace the blanket and the top, and the bees will do the rest.

A member spoke of making candy from three parts of yellow or white sugar and one part of honey, kneading the mixture as a housewife kneads dough till it was well worked together. The mass should be set aside till the next day, and then kneaded again; and if it is not then quite ready it may be necessary to set it aside till a third day and to knead it again, using more sugar each time. This form of candy can be put between two sheets of paper and put on strips over the frames, the same way as mentioned before. It would be a good plan to slash the paper on the side next to the bees with a knife so that the bees could easily work their way up into the food.

This was followed by a talk by Mr. Chas. Kitchin on packing bees for winter, which he looked upon as one of the most essential factors in succeesful beekeeping. He said that he had seen it written that most anyone could keep bees in the summer time, but that it required a good man and a lot of attention to winter them. Too much care could not be given to keep the heat generated from being lost, for every care given would be amply repaid by the bees. A small model was used to show a method that had proven itself, for by this plan hives wintered well last year, when the weather was unusually severe for so long a time. Fourteen hives had been put into one tenement or case, two tiers high, and had been taken out in the spring without a single loss due to cold. His case, made of rough lumber, was wide enough and deep enough to allow lots of room to work inside it as the hives were



Apiary of Mr. Walter Fleming, Brantford, Ont. This apiary is sheltered from the prevailing winds by a thick hedge and grove of pine trees on the north and west sides.

put in place. It was made deep enough to allow plenty of packing on top. All the hives faced the one way, to the south, and the lid or roof had a slope to the north. After the hives were packed, earth was banked up against the north side and wide windbreaks were nailed outwards from the ends to give shelter from the east and west winds. The holes for the entrance were ⅜ inch by 1½ inch, and were made up and down. This gave ample opening and allowed a little if the hive entrance were not on an exact level to start, or if it shifted a little during the winter.

His method of packing was to put in a row of hives—seven in all—and fix the entrances so that the packing would not block them, take off the hive covers and put on two or three layers of sacking, and pack well front, back, ends and between with chaff. Then lay two boards on top of the hives—one near the front and one near the back—right on top of the packing, and put in another tier of hives, seven more, and fix up their entrances, and pack all around them, the same as was done to the lower row, and about eight inches or more on top. The packing used had been planer shavings, leaves and chaff from the fanning mill. All the covers were left off and packed away along the back wall till wanted in the spring.

A question was asked if this plan of grouping the hives in one case and then spreading them again in the spring did not cause a considerable loss of bees through drifting. The answer was that although the bees flew about in a confused way they all seemed to find a hive to suit them, and that the actual loss, if there was any, could not be detected, for a hive, for instance, that came out of the case strong was still strong when the bees had settled down.

Middlesex Beekeepers Hold Annual Convention

By D. Anguish.

There was a large turnout considering conditions as the Flu was raging severely and weather was very bad and the roads were almost impassable. The London daily papers stated that there were 100 in attendance. I will not vouch for that but I know that we had to get a great many seats out of the other chambers of the building. There were a great many leading beekeepers from outside counties: Mr. Armstrong of Haldimand, Mr. Dunn from Welland, Mr. Newton from Oxford, Mr. Lun and Mr. and Mrs. Tellford from Elgin, and Mr. Rumford and Mr. Langstroth from Lambton. There were also a large number of ladies present.

Controlling of Swarms.

The first speaker was Mr. Armstrong. He took for his subject, "Controlling of swarms," and gave us an outline of his method by having a few small models to show how he succeeded by tearing up. He claimed that if the tearing up method was done as it should be there would be very little swarming. But he said, that he liked to see a season that in which it was not hard to control swarms for then he knew that he was going to have something for his labors, for bees never prepared to swarm if there was not honey coming in. Mr. Armstrong also gave a lecture on foul brood. He stated that a beekeepers' Convention would be a failure without some foul brood, even worse than a Methodist meeting without a collection. He urged every beekeeper, large or small, to be on the alert and always on the lookout. The question was asked, if there was much in the province. He stated, that it was decreasing; but there were some doubting ones present who thought it would never be gotten rid of as long as there was just enough money spent to hunt it up.

The next on the programme was Mr. Dunn, of Ridgway, who spoke on the subject, "Beekeeping as a Business." As Mr. Dunn had done some very accurate figuring on finances before coming to the Banner Beekeeping County, we got some very pleasant and happy information. Mr. Dunn thinks there is no other pursuit so profitable, with the same money invested, as beekeeping. No one in the hall disagreed with Mr. Dunn after hearing his figures explained. Of course, there were a few persons who thought it would take quite a fortune to start if they had to buy bees from Mr. Dunn at the price he thinks a colony is worth. He had it figured out that if a colony produced from 100 to 160 lbs of honey that colony should be worth from $100 to $160. There were quite a lot of happy beekeepers in the hall when they thought how wealthy they had got in such a short time, especially those who had a few hundred colonies. Mr. Dunn also gave us some information on packed hives. He happens to be situated close to a cork mill, and from his experience believes that nothing can equal cork for packing. That is similar to the beekeeper who thinks that the only place to winter bees successfully is in a limestone side hill. These methods are both very good, but it would be a rather difficult undertaking to move those things close to our yards. My advice is to use forest leaves, for they are equal to cork and are handy to get near most every yard. Cellars also can be built more easily than moving a limestone ridge, and bees can be wintered a great variety of ways, providing the beekeeper has his bees in good shape before they go into any kind of winter quarters.

Another view of Mr. Fleming's apiary. The hive with the two supers on is packed for the winter (Demuth Plan).

At this juncture there was a short intermission in order to give those present a chance to become members of the Middlesex Beekeepers' Association. A large number of those present availed themselves of the opportunity.

Mr. Newton was the next to be called on. As nearly all of those present knew Mr. Newton, they were all expecting something of interest, but as he had to hurry out to catch his train, he promised to be with us at our spring meeting and give us something very interesting. So you see we have something to look forward to in the spring.

Mr. Langstroth, of Forest (not the Langstroth the inventor of the movable framed hive, but one equally as good as a honey producer), was called on. He just passed out some humorous remarks, as he was so surprised to see so many present and to see that we had such a large number to take an interest in beekeeping.

Mr. Chrysler, of Chatham, was the last man to address us, and as it was getting late, he just gave us some brief outlines of his methods. He does not feel that he knows all about the bees yet, so is still experimenting. He is anxious to get rid of a lot of work, as he believes he can get large returns and not so much labor. He is trying the permanent packed hives with a large frame for the brood nest. There was quite a discussion on this point, and a few variations of opinion as to what constituted a perfect comb. Mr. Armstrong wanted one that was built right down to the bottom bar with no holes in the corners, but Mr. Chrysler did not want his that way; so you see that experts disagree as well as the novices. It seems to me that every successful beekeeper must be either a hobbyist or a crank on some peculiar method.

The former officers were again brought back into office for the coming year, due to the good results they had been experiencing.

Reminiscences of Canadian Beekeeping

By J. R. Black

MY memory of beekeeping and beekeepers in Canada goes back a generation, for it was at the beginning of the 80's, in the last century, I began to keep bees. When I left the university, in 1875, I had a nervous breakdown which disturbed me chiefly in the prevention of sleep. When the medicine man had diagonised my case he said, to my surprise, "Keep bees." I asked him, "Why?" He answered, "Keeping bees will take you out of your study, away from your books and give you a sun bath. For it is only when the sun is shining that you can handle them. And, besides, you will be so interested in them that you will forget your books, and the result will be favorable to your getting sleep." In a few days the doctor came with a colony from his own apiary and I made a beginning in beekeeping.

Forty years ago the late D. A. Jones was easily the most prominent apiarist in Canada. Jones was in Canada what Quinby and Langstroth were in their day in the United States. Not that Jones had anything like the inventiveness characteristic of the two Americans just named, for in the line of invention he left nothing perpetuating his memory. It is true he invented a hive having a frame 14 inches deep and about 10 inches wide, and later a hive called the "combination," the frame of which was simply the deep frame of the first turned on its side. Both of these hives attained a con-

siderable degree of popularity, but for years now they have been back numbers. Jones also devised an uncapping knife which is still on the market and widely used. But if he didn't invent, he "boosted." His first big sensation was in a widely heralded 75,000 pounds of honey from Canada thistles. This was certainly a proud day for the much-despised thistle; but, alas! for the reputation resulting to the farmers of Beeton, the locality of the apiary where Jones' bees did such a fine piece of work. This result for a time furnished Jones with a text from which he undertook to urge on audiences, large and small, the importance of keeping bees to collect the honey not only from thistles, but from clover, basswood, buckwheat and the numerous wild flowers abounding in many sections of the country. The thing caught fire. The people were stirred deeply on the question of keeping bees, with such large possibilities as Jones was able to picture with the intake from thistles always, of course, in the background. For the next few years the demand for bees far exceeded the supply. Indeed, the demand did not require to be large to exceed the supply. For the latter was small. The would-be purchaser was practically confined to Canada. Shipments from the Southern States in nuclei and pound packages had not yet begun.

Mr. Jones, if not inventive, was certainly enterprising. He published a bee journal, and though his English in speaking and writing may not have been to the queen's taste, he generally succeeded in making himself understood, while his practical knowledge of all in his day pertaining to the bee industry gave to what he said and wrote, special value.

His big undertaking, however, was a visit to the East for the purpose of investigating beekeeping there, and to secure new races of bees for Canada, in case he met with any indicative of superior merits over those of our own native bees. These, he believed, he found in Palestine and the Island of Cyprus. From these countries he brought back a number of colonies whose progeny secured some popularity for a few seasons subsequent to their arrival. But in competition with the Italians, which had been previously introduced to America they eventually failed to make good. The Cyprians were irritable and struck out vigorously when disturbed, giving all who interfered with them far from agreeable reminders of their power of self-defence. I secured queens of both importations. I found that the Palestinians had nothing to recommend them over the Italians, while they were inferior as honey gatherers, and in prolificness.

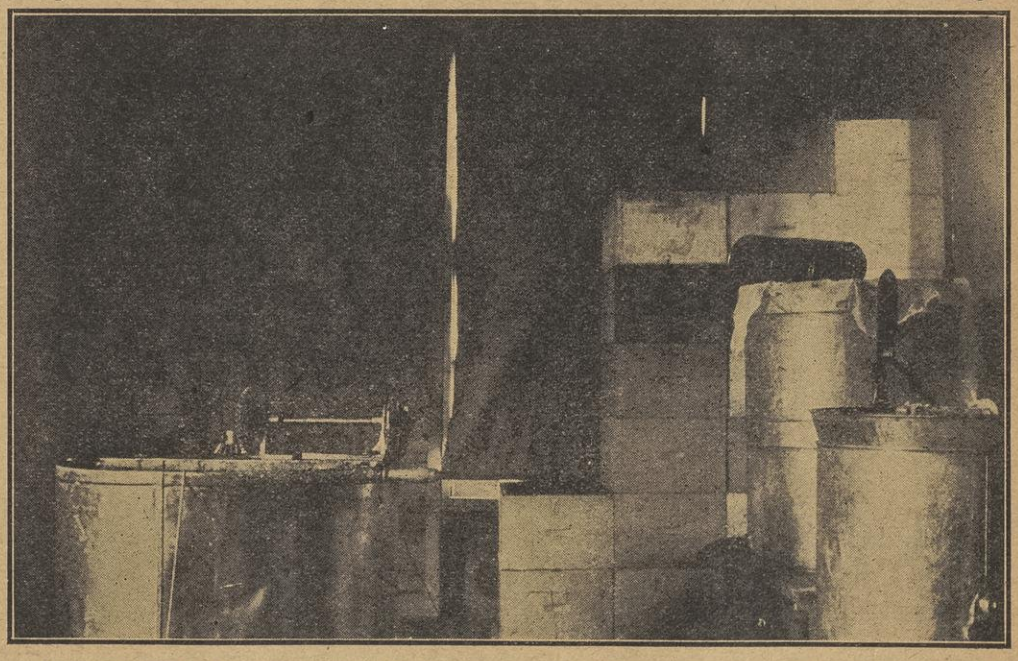
The following story is told of Jones in connection with the Palestinian shipment of bees at Joppa. When the consignment arrived from the interior of the country the ship on which they were to be taken to the West lay out a distance in the offing. The space between the vessel and the shore had to be covered in row-boats. The time for the vessel's departure was near. Hence, if the bees were to go they must be placed on board the vessel without delay. The Arab porters knew the situation and united in a demand for much bigger pay or they would do nothing. The strikers stood by the freight and, through an interpreter, listened to its owner's appeals to take the colonies to the ship. But all in vain. Then an attempt was made to secure others. But the first gang would let no one touch them. At this juncture Jones seized a colony, and, lifting it high, let it drop on the rough stones composing the pavement. The impact freed the bees, and they proceeded to make themselves felt by the recalcitrant porters, who fled in all directions, and left the owner free to engage other workers on fair terms.

At the beginning of the period under review, the bee diseases of later times were not at all widespread. Indeed, an attendant at a beekeepers' convention, though listening to all that was said, might not hear a word touching American or European foulbrood, black or sacbrood. American foulbrood was, doubtless, present and doing its destructive work before much was said or even thought of it. But wherever it projected itself it could not long be left to do its fell work in quiet. Later came the European variety, and in presence of these evils a remedy was sought. Many experiments were made before an effective cure was discovered. This became known as the starvation process. The application of it has greatly checked the spread of the disease and lessened the area of its operations. Mr. Todd, of British Columbia, would have us believe that the application of fire to a diseased colony is the only effective cure and makes bold to aver that owing to the sparing application of the red flame foulbrood is more prevalent than formerly. In this contention, however, he will find few supporters. Those seized of conditions, as they are, know that foulbrood, whether American or European, has greatly decreased in volume, relatively to the number of colonies, during the past 25 years. No doubt some credit in the improvement is due to the displacement of the native black bee by the Italian. For while the claim that a purely mated Italian queen will cure any colony infected with European foulbrood may be more than is warranted in the actual issue, it is certain that once such a stock appears in a clean colony its immunity in future is one of the things to be confidently expected.

In a comparison of beekeeping forty years ago and now, mention should be made of the increase in the number of colonies and the decrease of the number of those who keep them. In the early period bees were mostly kept on farms. The number of colonies kept by each person ran from three to thirty. They were kept in boxes to which there was no access, by their owners, once the bees had taken possession. No manipulation was attempted other than getting the bees to enter at swarming time, and smothering them by sulphur fumes to take the honey away. They might be queenless, storeless, preyed on by moths, or in process of destruction by disease—their owner knew nothing, and, of course, did nothing. This primitive method, however, had this advantage, it did not require much experience or time to keep bees; hence, many farmers kept them. If the income was not large, neither was the capital and labor invested. But, when with the invention of the movable frame and the extractor beekeeping entered the realm of the sciences, the habits of the beehive could be studied and the results utilized so as to secure the largest possible profit to the apiarist. Therefore, to keep bees with a view to securing a satisfactory profit on the capital and labor invested required expert knowledge and time to be given to their management. Thus beekeeping passed into the hands of experts—men who owned from fifty to several hundred colonies, and who spoke of their honey crop in terms of tons instead of hundreds. Some of the farmers, to obtain like results, adopted the scientific method. Their bees, too, must be kept in movable frame hives, and the extractor displaced the sulphur and straining in the removal of the honey. Yet in this very change came disaster to beekeeping on the farm, for the average farmer had neither the experience nor the time to give proper effect to the modern methods, and his bees died.—American Bee Journal.

Ontario Beekeepers' Association Annual Convention

Just as we go to press the dates for the annual convention of the Ontario Beekeepers' Association have come to hand. The convention will be held in the Parliament Buildings, Toronto, from Tuesday, Feb. 4th till Thursday, Feb. 6th. Morning, afternoon and evening sessions will be held on each day at 9.30 a.m., 2 p.m. and 8 p.m. respectively, with the exception of Thursday when no evening session will be held. The speakers will include the Hon. Geo. S. Henry, Minister of Agriculture for Ontario. Mr. Chas. Stewart, Inspector of Apiaries, New York State, and Dr. Berton N. Gates, the new Provincial apiarist.



A honey house, showing extracting apparatus. Extraction from the combs takes place by centrifugal force, not by straining through cloth.

Niagara District Notes

By F. G. H. Pattison, Winona, Ont.

THE latter part of November and first half of December have been most remarkably mild in the fruit belt. One short cold snap there was with sleighing for a couple of days, otherwise plowing has not been stopped at all. Most of the time it has been quite pleasant to work out of doors, and at the same time there has been sufficient moisture to make plowing easy and to ensure fruit trees entering the winter under favorable conditions, as far as the soil is concerned. The lengthened mild weather, however, has brought some of the buds well forward, a condition which, in the event of a sudden, severe cold snap, might prove dangerous.

Work of all kinds is well finished, and some improvements are being carried out, such as underground tiling and the cleaning up of old orchards and waste places. Fuel being scarce, dead plum, peach and apple stumps are being utilized for fuel, along with some hard wood. Up to just recently the roads have been good, and a good deal of hay and straw has been teamed down from the farming section lying on the mountain to the fruit growers. Hay is higher than since the beginning of the war, selling at from $19 to $24 per ton. Baskets are also higher than ever, 11-quarts varying from $90 per 1,000 old style, to $100 and over for new standard make. Pruning of grape vines, plum trees, etc., has commenced on some orchards, but not a great deal of that has been done yet in the Winona-Grimsby section, although weather conditions have been peculiarly favorable for it. Fruit growers, looking back on the season now over for the most part, concede that it has been the best season since the war broke out. Although fruit in most orchards, with the exception of plums and sour cherries, was not over half a crop, still the high prices paid for all kinds of fruit more than made up for the short crop. Tomatoes also were a fair crop in good demand at a good price, and with a long season for ripening. Potatoes and other vegetables were a fairly good crop, and prices have been more moderate to consumers, but have still afforded a fair profit to the growers. Many of the fruit growers in the Winona section have recently been drawing manure from the G. T. R. station, a quantity of cars having come in there this fall. There has been a

good deal of discussion lately as to the advisability of fall plowing orchards and vineyards. In the writer's opinion where the land is inclined to be at all heavy fall plowing is a good thing, but where the soil is sandy or gravelly as a rule it is best to leave plowing till the spring, taking care, of course, to run out drainage furrows wherever they may be needed.

The apple crop in the Niagara and adjacent districts turned out rather better than was expected. Prices have been moderate for most kinds of all fall and winter apples, except Northern Spies, which have ruled high. The demand on the part of the public has been only fairly good, and some surprise has been expressed at this by the growers. The high price of labor and barrels, as well as the uncertainty regarding outside and export markets, appeared to frighten buyers this fall, and a good many growers had to handle their own apples. Considerable quantities have gone into storage, and a great many apples went to the canning factories and evaporators, so much so, that the price fell from $1.00 per 100 lbs. to 60 and 50 cents.

The favorable weather during most of the picking season this year helped out a lot in the labor question, which was not nearly so acute as during the season of 1917. College and high school lads were fairly plentiful. School teachers and the National Service Girls also helped.

Mr. Peter Bishop, of Niagara-on-the-Lake, is conducting an experiment, bleaching and making ready for market a large quantity of fine celery. For this purpose he has converted a section of the basement of his store into a celery bed, in which over 200 dozen plants are buried, while undergoing the bleaching process. Mr. Bishop intends placing this celery on sale during the winter to supply the demand at the time other celery—chiefly imported—is off the market, but still in good demand for cooking and table use.

British Columbia

By Chas. L. Shaw, Victoria, B.C.

Nearly four million dollars has been set as the aggregate value of fruit shipments out of the Okanagan valley this season. Nineteen-eighteen will go down as one of the banner years in British Columbia's fruit industry, in spite of the unfavorable weather conditions during several periods. Late frosts made the spring a poor one for orchardists, and there was a long period of dry weather in midsummer which added to their worries, but August and the succeeding months were ideal for full harvesting and fruit picking operations. The size and color of fruit this year, as a general rule, is all that could be desired.

From the various shipping companies doing business at the various Okanagan fruit centres the following fifigures have been secured, giving a fairly accurate idea of the value of the exports this season: Vernon, $1,267,300; Armstrong, $403,000; Kilowna, $953,000; Summerland, $301,000; Penticton, $136,000; Short's Point, $21,000; Okanagan Centre, $87,000; Naramata, $21,000; other lake points, $62,000; shipments in less than car lots, $130,000; express from lake points mainly from Kelowna and Summerland, $273,000; apples still unshipped,

$6,000; total, $3,730,300.

When these figures were made out at the end of November, there remained in the valley about 106 cars of apples still to be shipped. The Okanagan United Growers, which organization is the central selling agency that markets the fruit from the various co-operative unions of the valley, estimates that the prices received this year for fruit show an increase in returns to growers of from 10 to 25 per cent. over 1917 on soft fruits, 40 per cent on crab-apples, and from 40 to 50 per cent on apples. The actual increase in the number of packages handled at the end of last month, with four weeks of the year still to run, showed shipments of 122,753 packages in excess of the whole year of 1917.

The Peachland Fruit Growers' Union is closing the season with the most successful year's business in its history. During 1918 the Union shipped 68,125 packages of fruit and vegetables, and over 50,000 lbs. of fruit in bulk.

Penticton shipped 835 cars of apples and soft fruit. Okanagan Landing shipped 168,000 packages. Summerland fruit shippers contend that the value of the produce sent out from that centre will top the half million mark. It is probable that the foregoing figures in respect to Summerland are conservative. Other districts may also do considerably better than the figures would indicate, by the time the total returns are counted.

News that Canadian apples can again be shipped to England was welcomed by B. C. fruit growers. Nova Scotia will be more directly benefited by the order, but British Columbia will be aided to the extent that the eastern Canadian market will be broadened by the elimination of some of the Nova Scotia and Ontario competition. Summerland lost no time in taking advantage of the changed conditions. Well over 1,000 seven-pound packages have been sent.

POULTRY YARD

The "Flu" in Hens

Prof. M. C. Herner, Manitoba Agricultural College.

JUST now there is much trouble in poultry with the "Flu." Almost every flock has a touch of it in some form or other.

The first signs of it are sneezing or coughing, discharges from the nose and tiny bubbles in the corners of the eyes. Later, swellings appear around the eyes, and the coughing and sneezing becomes more pronounced. When the disease becomes more acute, a scab forms in the throat, and the chicken has difficulty in breathing. This stage is the worst form of the disease.

Unless the causes of it are removed and steps taken to prevent its spread, it is likely to go through the whole flock and possibly kill off quite a number. Trying to cure individual chickens is a slow job, and at best the ordinary chicken is not worth the time it takes to do it. Do not spare the axe in disease. It is the best and surest cure in the end. Kill off any birds badly affected and give flock treatment to the rest. This method will be the best. It means the least handling of sick birds and quick treatment for the flock as a whole. The simplest remedies are the best. Clean houses, no overcrowding, and plenty of fresh air without draughts should come first. Feed one pound of Epsom Salts to every hundred hens once a week in a wet or soft bran mash, and a teaspoonful of coal oil to a pailful of drinking water. The salts will clean up the system, and the coal oil prevents the spreading of the disease through the drinking water.

The best medicine, if it can be called such, that the writer has ever used is air-slaked lime or lime dust. To use it, the doors and windows should be closed and the whole flock crowded into one end or corner of the house. The lime dust is then thrown over them, a handful at a time. Use at least two gallons of dust to every 100 hens. Throw it so as to hit the birds as much around the head as possible. The more dust getting into the eyes and down the throats of the birds the better. There is no danger of suffocating them. Use it liberally and "stay with it" as long as your own eyes and throat can stand it. Repeat the dose every two days, for two weeks, and likely the "Flu" will have "flew" away by that time.

Keep Hen's Feet Warm

With eggs bringing winter prices the object of the poultryman is to get his hens to lay the largest possible number of eggs at a minimum of expense, and one way to gain this end is to keep the feet of hens warm. Hens with cold feet do not lay well, if at all. Frozen ground, snow and mud make cold feet. A dry floor in the hen house with from four to eight inches of straw in which the hens may constantly scratch will not only keep the hen's feet warm, but will help to insure good health, which is absolutely essential to egg production.

Entomological Society of Ontario

THE 55th Annual Meeting of the Entomological Society of Ontario was held at Guelph on December 4th and 5th. It was well attended, entomologists from most of the provinces of Canada and from several of the American states being present.

Mr. J. J. Davis, of the U. S. Bureau of Entomology, who has made a great name for himself in his investigations of White Grubs, spoke on "Present-day Problems in Entomology," and among others things discussed the very important matter of how entomologists can come more closely into touch with farmers and fruit growers and help them to become familiar with well tested and practical methods of controlling most of our worst insects. He also discussed the latest ways of controlling such great pests as the Hessan Fly, grasshoppers, cutworms and white grubs.

The Sprays for 1919.

Father Leopold, of La Trappe, P.Q., introduced the subject of spraying and brought up the question of what spray mixtures shall we recommend for the coming season. Prof. Parrott, of the Agricultural Experiment Station, Geneva, N.Y., and Prof. L. A. Caesar, of Guelph, stated that as a result of their experiments they saw no good reason for making any radical changes from the recommendations of last year except that they believed in most cases arsenate of lime will probably prove a fairly safe substitute for arsenate of lead with lime-sulphur. They pointed out, however, that some makes of arsenate of lime gave severe burning. It was thought that the dropping of fruit from the use of lime-sulphur in Nova Scotia must be largely due to climatic conditions there, as there was no known proof of such drop either in Ontario or in New York.

Messrs. Brittain and Caesar gave the results obtained in their respective experiments on the control of the Cabbage Root Maggot. It was seen from these results that corrosive sublimate applied as a liquid had great value against this pest and was apparently the simplest and most effective remedy yet tested. Tobacco dust and lime and also tobacco dust and sulphur were shown to have considerable merits and to be worthy of further test.

Mr. W. A. Ross, of Vineland, gave a detailed account of the life-history, distribution, importance and methods of control of the Pear Psylla in Ontario. In his experiments a delayed dormant spray applied soon after the leaf buds had burst, using lime- sulphur at the strength of about one gallon to eight gallons of water, followed up by the addition of Black Leaf 40 or nicotine sulphate to the regular Codling Moth spray, protected the fruit to such an extent even in the worst years, that very little damage was done. In some years it gave almost perfect results.

The Apple Maggot.

Prof. Caesar and Mr. W. A. Ross briefly outlined a series of experiments on the control of the Apple Maggot, conducted by them over a period of eight years, and announced that these experiments have demonstrated over and over again that this very important and destructive pest of apples can be easily and cheaply controlled by spraying with arsenate of lead and water

without any molasses or other substances and without the labor of picking up the fallen fruit. They gave a warning, however, that the directions given by them for such spraying must be followed closely or else failure would result.

The same officers as last year were reappointed, Prof. L. Caesar of the O.A.C., being elected president; Mr. Arthur Gibson of the Entomological Branch, Ottawa, vice-president, and Mr. A. W. Baker of O.A.C., secretary-treasurer.

Continue War-Time Measures*

C. W. Baxter, Fruit Commissioner, Ottawa

THE war has taught us many lessons, and not the least of these is what may be accomplished through co-operation. Huge tasks attempted individually failed, but by the application of co-operative methods, these were made possible. Therefore the fruit growers cannot afford to disregard the lessons taught by failing to apply these principles to fruit growing and marketing.

It was my privilege to be identified with the food control in Canada from its inception, and although some of the methods employed by the Canada Food Board met with some criticism, the urgent need for food for Canada and its Allies was such that reasonable means were justified to obtain the desired objective.

Shortly after the appointment of the Food Controller the Fruit and Vegetable Committee was formed. This committee was composed of men from various parts of the Dominion who were thoroughly acquainted with the many phases of the fruit and vegetable conditions from the producer to the consumer. During the course of their investigations, this committee obtained much useful information which enabled them to recommend the adoption of regulations which have been the means of practically eliminating speculation, waste and excess profits. These investigations have disclosed many imperfections in the methods employed in handling, storing and distributing and many hundreds of tons of food have been saved which in pre-war times would have been wasted. To-day the Government, through the Canada Food Board, has in its possession information which can be made of great value to the fruit and vegetable industry, and I should be very sorry if at the conclusion of peace, these regulations should be discontinued.

The means employed to enforce the regulations were the licensing of all handlers of food. This, I think, should be continued as it proved to be one of the most effective measures employed during the war period.

*Extract from an address delivered before the recent annual convention of the Quebec Pomological Society.

In spite of the embargo on fruit shipments, the Ontario Government again last fall managed to secure for export 25,000 boxes of apples to be shipped to the soldiers in hospitals overseas. These were sent forward through the Red Cross.

An idea of the volume of business in fruit handled at Okanagan Landing, B.C., may be obtained from the fact that in one day, last summer, 3,000 express packages of fruit were loaded on the train at the Landing.

Varieties of Peaches

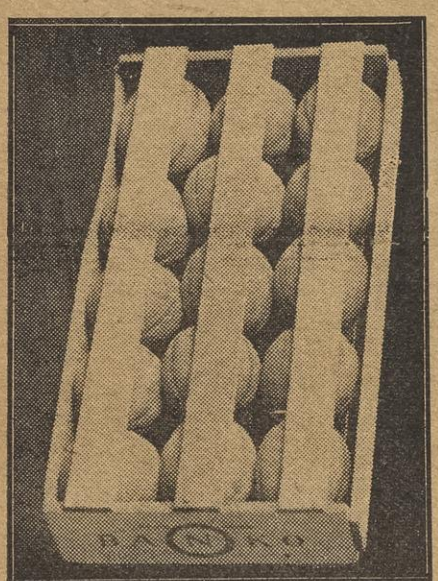
Editor, THE CANADIAN HORTICULTURIST: I note that you have published in the November issue of THE CANADIAN HORTICULTURIST my letter containing criticisms requested by you of descriptions of the following peaches: Arp Beauty, Golden Swan, J. H. Hale and Mayflower. The impression might be gathered from the matter published that these varieties were not recommended for planting in Ontario. I would like to correct any such impression as I believe that there is a distinct commercial place for all of these varieties.

The comments made by me in the letter published were simply a criticism of the descriptions submitted which, in our observation here, were incorrect in a few particulars. Some of the varieties of course have faults which I pointed out, but nevertheless they are four varieties, some of which can be recommended quite generally, the Mayflower to a limited extent only.—E. F. PALMER, Horticultural Experimental Station, Vineland, Ont.

A Well-Packed Crate

J. A. Grant, B. C. Fruit Markets Commissioner, Calgary.

We desire to draw the attention of cantaloupe growers to the accompanying illustration. By observation it will show proper



A well graded and packed box of cantaloupes.

grading and packing. The crate can be made to suit the size of the cantaloupes intended to ship. A standard crate might be too large for the output of a small shipper when graded. He can make it one-third size as per illustration or half size or full size, as he finds suited to his need. We were pleased to notice that shipments last fall were graded as to size, but regret to say that a big percentage were shipped too ripe. Cantaloupes should be picked for prairie markets when the netting seems complete or when showing the first tinge of yellow on the outside. If left till uniform yellow all over they are too ripe for the journey and will mould before sold under ordinary sale circumstances. It takes a few shipments to learn the right time to pack them.

The Spread in Prices

R. C. Abbott, B. C. Fruit Markets Commissioner, Vancouver, B.C.

We are in receipt of a communication in regard to the "great profits" made by the wholesale trade on apples. We do not know what their net profit is, so therefore, cannot discuss it. We do know that in some instances the spread is as high as 25c a box and as low as 8c., the average being around 18c a box.

The wholesale trade here pays for Jonathans No. 1 f.o.b. shipping point, $2.00 and $2.25 a box. The consumer to-day is buying the very best of these at $2.60, $2.70 and $2.85 a box delivered at his house. The transportation company gets 20c a box; this leaves from 40c to 65c of a spread to be divided between the wholesaler and retailer. These are delivered in small lots all over the city. No. 3 grades are sold at a closer margin. In some instances the spread is just 20c between the landing price on Water Street and the consumer.

There is a great deal of misconception in regard to the spread in apples. Shippers who send in on consignment some low grade, scabby stuff, receive a low price for these, and at the same time read in the paper the prices of the same varieties which are quotations on No. 1 apples of the very best, properly graded and packed without a blemish. Since receiving the above-mentioned communications we have visited all grades of grocery stores in Vancouver City and find only a reasonable margin being charged on boxed apples.

Apples in Storage

The following table shows the quantities of apples, in barrels and boxes, held in storage on November 30th, together with the quantity held in storage on the same date in 1917:

	1918.		1917	
	Barrels.	Boxes.	Barrels.	Boxes.
Annapolis Valley	240,715	.....	150,000	.....
Quebec	8,340	6,000	5,700	2,700
Montreal	30,500	19,250	32,015	17,815
Ottawa	7,550	2,000	12,250	3,500
Toronto	11,625	26,200	48,850	3,000
Georgian Bay District	8,250	.....	3,700	.....
Hamilton	1,500	1,800	4,000	1,990
Trenton	3,500	.....	.....	.....
Winnipeg	12,540	57,400	4,400	76,500
Moose Jaw	300	8,500	.....	14,500
Regina	500	15,800	.....	15,600
Calgary	.....	26,800	.....	39,000
Edmonton	....	25,200	200	28,480
Vancouver	.....	47,500		
Victoria	.....	10,500		*110,000
Inland in B.C.	.....	93,280		
	326,320	340,230	261,115	313,085

*(Total estimated in B.C. on Dec. 7, 1917).

The following figures have also been obtained for November 30th, 1918, but comparative figures for 1917 are not available :

	Barrels	Boxes
St. John	3,200	2,000
St. Catharines, Ont	625	3,500
Saskatoon, Sask	540	12,170
Prince Albert, Sask	225	800
North Battleford, Sask	....	2,000
London, Ont	100	680

On the Pacific Coast States the practice is spreading of strapping shipments of fruit. This practice has been adopted to reduce the losses in transit on trans-continental shipments. The Produce News reports that the first season this was done, the breakage was reduced about 95%.

Fruit Shipments to the West

C. M. Bonham, Supt. Pre-cooling Station, Grimsby, Ont.

ABOUT 90% of our carload shipments of tender fruits this year have gone to points west of Port Arthur. We have shipped one or more carloads each to Edmonton, Regina, Prince Albert, and Moose Jaw. These western shipments show a large increase over last season, when a considerable proportion of the pre-cooled cars were sent to Ontario markets. The cars all turned out satisfactorily with the exception of a few Lombard plums in one of the Moose Jaw cars, and a few which were slightly overripe in a Regina car, but in neither case was there any serious shrinkage, or loss, as it was only on a small percentage of the car.

We have generally advised against the shipment of Lombards to those distant markets, as it is seldom that they will stand up under a journey of eight to twelve days, although in one case a shipment of Lombards to Prince Albert, Sask., arrived in good condition. We have received a satisfactory report on a mixed car of plums, pears, tomatoes, etc., shipped by one of the growers to Edmonton. The Dominion Fruit Inspector reports that the car arrived in perfect condition and that the consignees were well pleased. They wired the shipper to this effect and were anxious to have further pre-cooled shipments made this season, but unfortunately the season was then too far advanced.

As usual Manitoba has received the greater part of our shipments, and, as far as our information goes, all cars sent to that province have given satisfaction.

We have handled a large quantity of fruit this year for short time storage, while growers were accumulating a carload or waiting for better market conditions.

Prospects for Fruit Growing*

By C. W. Baxter, Dominion Fruit Commissioner, Ottawa, Ont.

IT would be a great misfortune if in the reconstruction of our fruit industry following the war we should fail to benefit by our experiences of the past. The success of any enterprise is based upon quality and dependability. We have learned from past experience that in certain sections some varieties of fruit do exceedingly well, while others merely struggle along. The latter varieties are most difficult to market when they come in competition with the same variety grown in favorable districts. It is, therefore, necessary for us to carefully consider our markets and the competition we are to meet with from other fruit growing districts, and to plant the varieties which do best in our locality.

In the matter of marketing, fruit growers in the Province of Quebec have had very little worry because of the limited production, and they have one of the best markets in Canada at their doors.

Fruit growing in the Province of Quebec

*Extract from a paper read at the recent annual convention of the Quebec Pomological Society.

has been making some progress, but it has always been a source of wonder to me that with such excellent advantages there have not been larger plantings. This is a question I have not as yet been able to answer. Is it because we have not made it clear to our young men the importance of the fruit industry and its many bright sides compared with other walks of life, and that if followed intelligently is one of the most remunerative undertakings he can engage in? Our secretary, who has been in charge of demonstration orchards in this province, has repeatedly furnished figures showing that commercial fruit growing is a paying enterprise. In fact, I believe from the figures submitted two years ago it is doubtful if there is anything which can be produced on the farm which will bring larger returns. This does not follow that one must engage entirely in the production of fruits, but a well-balanced farm, of which fruit growing forms the major portion, should be the ambition of many of our young men.

Items of Interest

Mr. M. S. Middleton, Provincial Horticulturist for British Columbia, has resigned his position and left the Government service after ten years' connection with the Department. Mr. Middleton acted with marked success fo a number of years as a local fruit inspector. Some two years ago, when Mr. R. M. Winslow resigned as Provincial Horticulturist, Mr. Middleton was appointed to fill the vacancy. It is his intention to engage in fruit ranching.

Dr. A. J. Grant, of Thedford, Ont., Past-President of The Ontario Fruit Growers Association and President and Manager of the Thedford Fruit Growers' Association, expects to leave shortly to take a two years' course of special study in New York. He will retain his fruit interests at Thedford, but very naturally he will not be able to remain in as close touch with them and the fruit industry in general, as he has of late years.

Although the outlook for the grape growers in the Niagara District in the beginning of the season was none too promising, the returns obtained greatly exceeded early expectations, the growers realizing as high as $60.00 a ton, for a considerable portion of their crops, the highest price ever paid in the district. Firms manufacturing grape juice were large buyers.

Books Worth Having

Every fruit grower who wants a complete and valuable manual on the latest and best methods of pruning fruit trees, shrubs and vines, should read "The Principles and Practice of Pruning," by M. G. Kains, lecturer on horticulture in Columbia University. It is one of the latest and best books offered. The price is $2.00 postpaid. The Canadian Horticulturist is offering this book as a premium for new and renewal subscriptions, as follows:

1 Copy Principles and Practice of Pruning	$2.00
1 New yearly subscription to the Fruit or Floral Editions	.50
Total	$2.50
Special price for both	$2.00
1 Copy Principles and Practice of Pruning	$2.00
1 New yearly subscription	.50
1 Renewal yearly subscription	.50
Total	$3.00
Special price for all three	$2.25

FREE SHORT COURSES

FRUIT GROWING---2 Weeks---January 27th to February 8th
VEGETABLE GROWING---2 Weeks---February 10th to February 22nd
FLORICULTURE AND LANDSCAPE GARDENING---2 Weeks---February 24th to March 8th

AT THE

Ontario Agricultural College, Guelph

Fruit Growing Course covers culture of tree and small fruits for amateur and commercial growers in all parts of the Province.

Vegetable Growing Course touches on all points of interest to large growers and back-yard gardeners.

Floriculture and Landscape Gardening Course gives instruction in the growing of plants and flowers for the home and the market, and in the choice, arrangement and planting of trees, shrubs and vines for home grounds, schools, parks, etc.

OTHER SHORT COURSES ARE

Stock and Seed Judging (2 Weeks)—Jan. 14th to 25th.
Poultry Raising (4 Weeks)—Jan. 14th to Feb. 8th.
Bee Keeping (2 Weeks)—Jan. 14th to 25th.
Drainage and Surveying (2 Weeks)—Jan. 14th to 25th.
Farm Power (2 Weeks)—Jan. 28th to Feb. 8th.
Factory Dairy Course (3 Mos.)—Jan. 2nd to Mar. 21st.
Farm Dairy Course (4 Weeks)—January 27th to February 21st.

Expenses—Railway fare, board and lodging while at Guelph.

An illustrated Short Course Calendar will be mailed on application

G. C. CREELMAN, *President*

Don't let the Orchard go back!

An Appeal to Commercial Apple Orchardists in Ontario

The Great War is now practically over, the Victory won. The period of tremendous Reconstructive activities is now before us. The peoples of the earth must now take up their work as of old but with new and greater energy to meet the new conditions.

Many changes in national and political conditions will undoubtedly occur, or have already occurred, but food will always be needed by the peoples of all countries.

As a result of the world-wide shortage of meats that will likely continue for some years to come, as herds and flocks cannot be built up in a season, many thousands of meat eaters amongst the peoples of the earth have substituted fruits and vegetables in their diet and will continue to do so, and many of them permanently so.

Too many orchards in Ontario have been neglected—in many cases unavoidably so owing to the shortage of labor, the high prices for all kinds of farm produce that have ruled, difficult transportation and the lack of export markets. All these difficulties will now be lessened, with the coming of Peace, and in some cases, indeed, have already been removed.

THE ORCHARDIST SHOULD PLAN NOW FOR THOROUGH PRUNING, SPRAYING AND CULTIVATION IN 1919

Before the War orcharding in Ontario was profitable. After the War, orcharding in Ontario can be made even more profitable. Wages in towns and cities will likely continue high. Export markets should again be opened up while the supply of labor should undoubtedly be freer. Orchardists should resolutely decide to make good the ground that has been unavoidably lost so as to be in a position to profit by the years of peace and prosperity which lie ahead.

So, in planning your 1919 and future activities give your orchard another chance to prove itself a money maker for you. For suggestions upon any phase of orcharding, planting, cultivating, spraying, picking, packing, marketing co-operatively or otherwise, shipping, etc., you are invited to write the Fruits Branch, Ontario Department of Agriculture, Parliament Buildings, Toronto, Ont.

The Ontario Department of Agriculture

Parliament Buildings, Toronto

P. W. HODGETTS,
Director, Fruits Branch

HON. GEO. S. HENRY,
Minister of Agriculture

ONTARIO