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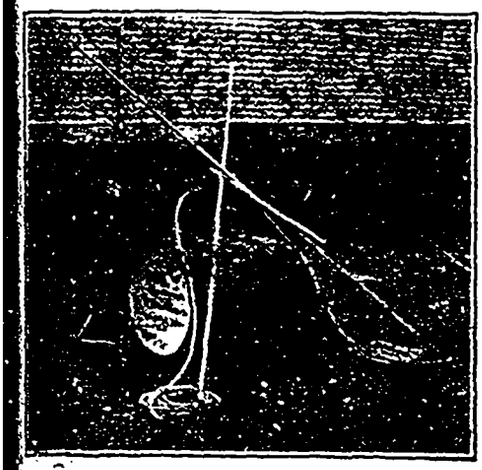
A Few Spraying Notes for Beginners

A. G. Turney, Provincial Horticulturist, Fredericton, N. B.

THE initial cost of a pump and outfit deters many persons from spraying their orchards although it is very small as compared with the profits obtainable as a result of intelligent spraying. In purchasing be sure and



A Barrel Outfit, Unmounted

secure a pump of large enough capacity to do all the work required in the least possible time. Remember that the extra amount of time and labor required to spray an orchard with a small pump may in one or two years more than exceed the extra first cost of a larger pump. An outfit such as is itemized below is large enough for an orchard of one hundred to one hundred and fifty trees. The catalogue prices, on which there may be a small discount, are approximately as follow:

No. 2, all brass pump (extra if porcelain lined)	$15 00
80 ft. ½-inch hose, with connections, stop cock, 9 ft. bamboo extension rod and double nozzle	7.60
Brass wire strainer	.50
	$23.10
Mounted on barrel on skids, extra	2.50
	$25.60

This amounts to about twenty-five cents a tree first cost for an orchard of one hundred trees. This cost may be charged to the orchard for six years, the life of a pump under fairly favorable conditions, and allowing four dollars forty cents for repairs during that time, then the cost only amounts to five dollars a year for the whole orchard. Spray materials cost about as follows in New Brunswick:

RETAIL PRICES IN FREDERICTON (APPROXIMATE)

Concentrated lime-sulphur per 40-gallon cask	$8 75
Concentrated lime-sulphur per 20-gallon cask	4 75
Concentrated lime-sulphur per 5 gallon drum	1.75
Lead arsenate, per single pound	25
Lead arsenate per 5 pounds	.20
Lead arsenate per 10 pounds	.17½
Lead arsenate per 25 pounds	.15
Lead arsenate per 50 pounds	.13
Lead arsenate per 100 pounds	.12
Paris Green per single pound	25
Bluestone per single pound	.10
Bluestone per 50 pounds	08
Lime per 100-pound cask	00½

Then the cost of sprays ready for use, counting water free are as follows:

WHITE SPRAYS

4 gallons concentrated lime-sulphur at 22c	88c
36 gallons of water	00c
Total cost per barrel of spray	88c

SUMMER SPRAY OF POISONED LIME SULPHUR

1 gallon concentrated lime-sulphur at 22c	22c
2 lbs. lead arsenate (in 5 lbs. lots) at 20c	40c
39 gallons of water	00c
Total cost per barrel of spray	62c

Note.—The cost of the lead arsenate would be considerably less if purchased in larger quantities (see table of prices).

SUMMER SPRAY OF POISONED BORDEAUX

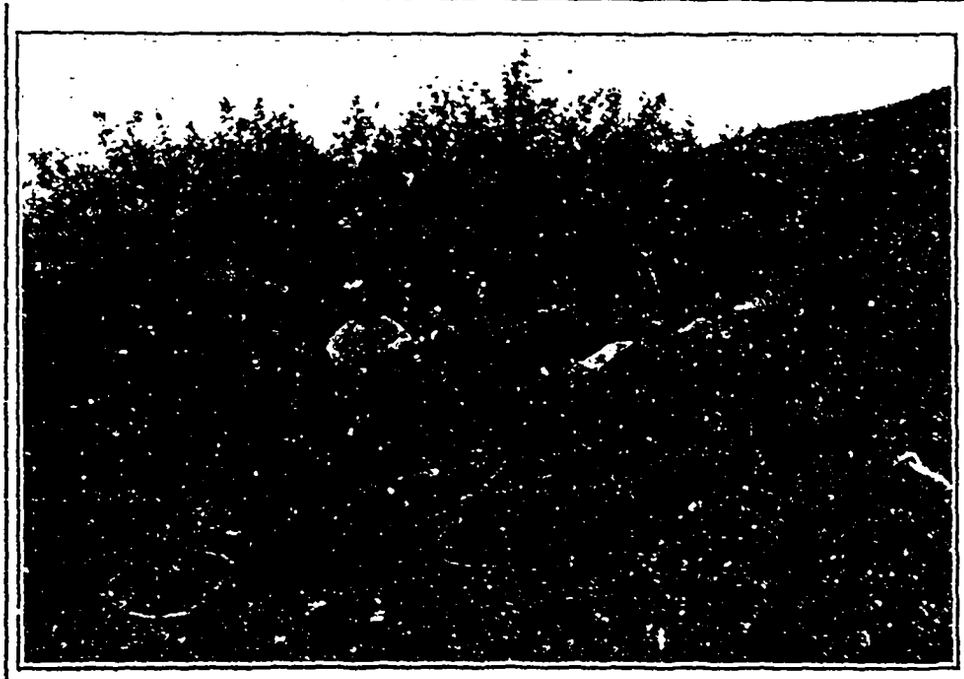
4 lbs. bluestone at 10c	40c
4 lbs. lime at ½c	02c
½ lbs. Paris Green at 25c	13c
40 gallons water	00c
Total cost per barrel of spray	55c
Time applying spray 1½ hours per barrel. Two men and horse 1½ hours	66c

No provision is made in the foregoing for the cost of mixing solutions and filling up the barrel. In spraying very large trees a small spraying tower of some sort will be necessary and can be very easily made at home at a small cost.

HOW TO SPRAY

Spraying should in nearly every case be done with the wind. When spraying the first side of large trees, stop the wagon or spray cart just as it comes within a few feet of the tree and spray the nearest side as far in and as completely as the spray can be driven; then, drive directly opposite and spray all the central parts thoroughly, then, move just past the tree and spray the last part as far in as possible. In this way, nearly two-thirds of the tree will be covered and when the wind changes it will be easy to complete the spraying from the other side. A very strong wind wastes a little of the mixture, but it is very seldom that there is any need of ceasing operations because of its violence. In spraying small trees it will not be necessary to stop so long at each tree.

Go through the orchard as soon as the spray has dried on the trees, and if you notice limbs or portions of the trees here and there that have been missed,



The Barrel Outfit, Mounted, Used in the New Brunswick Demonstration Orchard Work

Fruit Growers who Took Part in the Discussions at the Important Convention of the B. C. Fruit Growers' Association, at Victoria, B.C.
(See report page 39)

it is well to take out the machine and give these spots an application of the spray mixture. In spraying after the foliage has appeared, people are often misled by the advice that is given to cease spraying just before the leaves begin to drip. It is impossible to spray a large or medium-size tree thoroughly without a considerable amount of drip; hence the first rule to follow is: First, make sure that every leaf and fruit is covered; and, second, try to do this with as little material as possible. The number of trees which one barrel of spray will cover depends largely on their age and size, and also to a considerable extent on the man who is wielding the spray rod.

UNDERSTAND YOUR WORK

To spray intelligently, one should understand the life history of the more important insect and fungous pests. Unless a man knows exactly what he is trying to fight or prevent, he is apt to waste much time, labor and spraying material. Read some good bulletin on the subject.

Promptness is absolutely necessary. For those spraying applications which commence with the first signs of growth in the spring delay is fatal. In most cases at that time of the year, one might as well not spray at all as put it off for two, three, four days, or even more. The object of a fungicide is to prevent and not to cure. Practically all fungicides should be applied before the disease appears so as to prevent its lodgment, and are successful only when they prevent infection. While this is not so true in the case of insects, it is important not to delay spraying for them, since when they are well established and more fully grown, they are very difficult to control.

Absolute thoroughness in all phases of the work is a third requirement. Many growers do their work in a half-hearted way and then complain of poor results. Every portion of the tree should be thoroughly moistened with a fine mist or spray in order that a uniform coating of the same may be left on the tree. The owner of the orchard, who, presumably, is the man most anxious to get good results from spraying, should not trust the work to ordinary labor, but he should do it himself or personally supervise it, unless he has very reliable help.

WHEN TO SPRAY

For old apple orchards that have never been sprayed, and for young orchards infested with oyster shell bark louse or San Jose Scale, spray before growth starts with commercial lime-sulphur diluted one to nine. This spray may be applied any time during the dormant season of the trees. Strain the concentrate through a fine mesh before using. This mixture acts as a general cleaning spray for old trees. The addition of a little milk of lime will cause the spray to show more clearly on the trees.

Give application number two of poisoned lime-sulphur or Bordeaux mixture when the leaf buds are swelling in the spring, for tent caterpillars, bud moths, cigar case borers and apple scab.

Give the same mixture again just before the blossoms open and after the cluster buds unfold. This application is for the scab and protects the young leaves and stems of the forming fruit. The poison is added for leaf eating insects.

Repeat the application once more when most of the blossoms have fallen and the little apples are still standing upright. Do not wait until the little apples have turned downward, as it is then too late. This is the first application for codling moth and is important in fighting the scab, as it is this application which gives clean fruit.

A fifth application composed of arsenate of lead two pounds, and water forty gallons, should be given a week to ten days later. If judged necessary, lime-sulphur may be used instead of water.

All five applications are not always necessary, and the grower must be guided in their use by the prevalence of insects and fungi and the character of the season. If only one application can be made, let it be number one. If only two can be made, use number one and two. If three can be made, use numbers one, two and four.

Spraying Methods in the Peach Orchard

Prof. L. Caesar, O.A.C., Guelph, Ont.

THE chief objects of spraying are to keep trees healthy and vigorous, to prevent the fruit from falling to to preserve it from injury by either insects or diseases. The chief insects that weaken peach trees or attack the fruit in Ontario are: San Jose Scale, plum curculio, peach borers, and shothole borers, or pin borers as they are often called. Several other insects such as aphids, red spiders, tarnished plant bugs, and peach twig borers are present, but seldom require much attention.

The chief peach diseases are: Leaf curl, brown rot, scab or black spot of the fruit, powdery mildew, crown gall, gummosis yellows, and little peach. Of these insects and diseases the following can be controlled by spraying: San Jose Scale, plum curculio, leaf curl, brown rot, scab or black spot of fruit and powdery mildew. It is true that sprays will control aphids, red spiders, and twig borers, but, as mentioned above, these are seldom of much importance, and so would not in themselves justify treatment.

San Jose Scale and leaf curl can both be satisfactorily controlled by a single very thorough spraying of the trunk and branches with strong lime-sulphur, either commercial or home-made concentrated. If the commercial is used, it should be diluted about one gallon to eight, but the safest way to dilute either this or the home-made concentrated is to use the hydrometer as described on pages twelve and thirteen in bulletin 198 of the Ontario Department of Agriculture, and make the strength 1.032 specific gravity or even stronger. The spraying should be done before the buds begin to swell in spring because the leaf curl disease begins to develop with the buds and often cannot be warded off if the spraying is delayed until the buds are almost ready to burst. Damp, cold springs when the buds are swelling and the leaves coming out greatly favor this disease. No one should expect to control it or San Jose Scale unless he will take the trouble to cover every twig and bud and in fact the whole tree with the sprays. In most orchards these two pests are by far the most destructive ones controllable by spraying, therefore this application is much the most important: in fact, it is the only application the majority of our peach orchards receive.

An application of four pounds of arsenate of lead to forty gallons of water to which one or two pounds of freshly slaked lime has been added is of great value against the plum curculio if applied shortly after the fruit has set and before it is half an inch in diameter. It is also indirectly valuable against brown rot, because wherever the curculios feed on the fruit they give an opportunity to the spores of this disease to enter, hence the prevention of such insect injuries means to a large extent the prevention of brown rot.

Whenever scab, or black spot as it is often called, attacks and disfigures the fruit, this can be prevented by a thorough application of the self-boiled lime-sulphur about four weeks after the blossoms have fallen. The self-boiled lime-sulphur is a weak spray mixture, and is the only really safe one we yet know of for peach trees after the foliage is out. The commercial and home-made concentrated will burn unless diluted so greatly that they are ineffective against diseases. The self-boiled is made by putting the lime and sulphur together in a vessel, adding water and allowing the heat generated by the slaking lime to do the boiling. As the details of the method of preparation are given fully in bulletin 198, Department of Agriculture, Toronto, on pages fifteen and sixteen, readers are urged to consult that bulletin, which may be obtained free of cost.

Whenever a grower is troubled with brown rot, the use of the self-boiled lime-sulphur about four weeks before the fruit ripens will be found very valuable. Of course, as previously mentioned, he must have previously sprayed for plum curculio with the arsenate of lead if this insect is present. The self-boiled lime-sulphur clings to the pubescence of the fruit, so has to be applied nearly a month before ripening or otherwise it will remain on the fruit and render it unsaleable. This is the reason it is not applied nearer the time of ripening. Usually it is the white-fleshed and early peaches that are most subject to rot and that would be most benefited by spraying.

THE MILDEW

It is very seldom that growers spray for mildew on the leaves, but if a considerable number of trees are affected the self-boiled lime-sulphur can be used against this disease also. The mildew is a surface feeding disease and can be killed after it appears, whereas spraying for other diseases is intended to prevent germination of the spores and thus keep the disease from getting a start.

The different sprayings that peach orchards may receive and the object of each have now been outlined. Each grower will have to be his own judge as to how many of these applications it

A Power Sprayer at Work in a Huron County Apple Orchard

will be desirable for him to use, but no grower can afford to omit the first application. This should be given to every peach tree on the farm even though it be just freshly set out from the nursery, for such trees are subject to leaf curl, and there is also a possibility that once in a long while a live scale may chance to be found in one of them, whether the nursery stock was grown in Ontario or in the United States.

OTHER THINGS NECESSARY

The value of spraying any kind of orchard is increased by good pruning, cultivation and fertilizing of he orchard. The pruning allows the air to circulate more freely and the sunlight to get through the branches better, consequently the leaves and fruit dry off rapidly after a rain. This drying off is unfavorable to fungus diseases, most of which thrive best where the air is stagnant and moisture abundant. The removal of all dead and dying branches and trees and burning these along with any brush heap and rubbish there may be nearby before May helps against several insects and is the best means known to keep orchards free from shothole borers. Cultivation if continued up to about August 1st, will destroy numerous pupae of the plum curculio and leave no good hiding place for the adults over winter. Moreover it, along with fertilizers, helps to give vigor to the trees and render them less susceptible to attack by either insects or diseases.

NO CURES KNOWN

There is not space to discuss the best methods of combating the different insects or diseases that spraying is ineffective against, but it is perhaps desirable to utter a word of warning here to growers against placing much faith in the so-called cures of peach yellows and little peach. The writer has probably given more careful thought and study to these diseases than any other man in Canada, and would welcome any remedy that would be even partially helpful. He has seen the cases that have been supposed to have been cured and believes that there is not sufficient proof yet that any diseased tree has been cured. It is even doubtful whether the substances used have helped the trees at all; at any rate, at least another year must elapse before any conclusions can be drawn. There is at present only one known way of combating these diseases, namely, to take out the diseased trees promptly, and burn them.

Phosphates promote fruitfulness and early ripening. Furthermore phosphate is far more necessary in the garden and orchard than on the average farm, and an application of phosphates every year is a step in the right direction.

Fertilizer Discussion Continued

B. Leslie Emslie, C. D. A., Toronto, Ont.

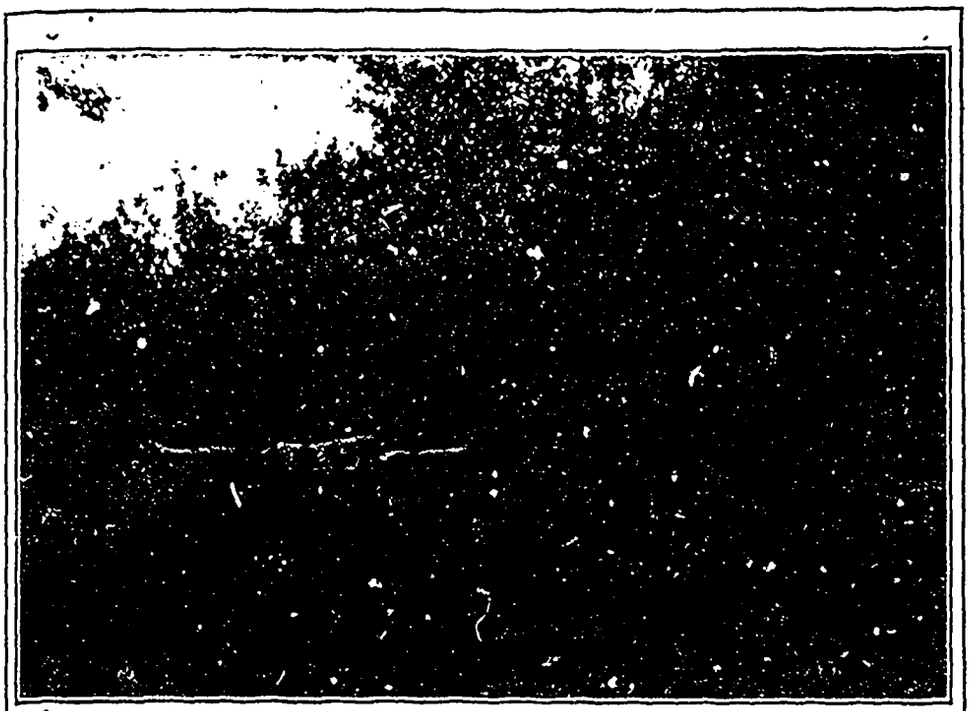
A portion of the valuable space of The Canadian Horticulturist is again solicited to allow me to comment on Dr. Dandeno's letter anent "Commercial Fertilizers," in the January issue. Dr. Dandeno repudiates my assertion that he clings to "old and discredited theories" and states that his conclusions are "the result of thirteen years of research work on soils and plants, after eight years of University training for the work." With all due regard for the value of such a training, I still maintain that the old theory of "plant excretion" in its bearing on soil fertility, which Dr. Dandeno espouses, was long ago discredited. True, it has lately been revived by one or two chemists who, it would seem, desired to obtain notoriety from the promulgation of a theory in opposition to the generally accepted one.

Dr. Dandeno refers to my "definition" of "plant food," but if he will again read my previous letter on the subject, he will find that I refrained from undertaking the definition. It is obvious that plants and animals feed differently, since the latter can only utilise elaborated food substances, whereas plants possess the faculty of building up food substances from simple inorganic compounds. Since Dr. Dandeno likes exactitude in the statements of others, I cannot forbear a criticism of his statement as to the supply of oxygen in the soil; he says, "Now, oxygen will, under these conditions, produce a better crop, and yet it does not enter the plant at all." This statement is, to say the least, ambiguous. If a plant is deprived of oxygen all vital processes are suspended. Oxygen enters the plant through the stomata of the leaves, in the form of carbon dioxide (a compound of carbon and oxygen), and through the roots in the form of water (a compound of hydrogen and oxygen). These two compounds are manufactured into starches or sugars in the chlorophyll cells of the leaves, the product being then transported to the various parts of the plants. For the sake of exactness, it may be mentioned that the prevailing theory is that formaldehyde is first formed from the carbon dioxide and water.

In his reference to the orchard experiments conducted at the Geneva, N.Y., Experiment Station, Dr. Dandeno quotes an isolated case ,which has lately received prominence, on account of the fact that the results obtained were in direct contrast to those from other similarly conducted experiments at other stations. Dr. Dandeno takes exception to my statement that "the majority of

A Well Sprayed Mann Apple Tree that Yielded Large Returns

This tree, in the orchard of R. O. Fowler, Burlington, Ont., had a spread of seventy-five feet and yielded fifteen barrels of No. 1 apples. Two barrels of fruit were blown off by the wind. Only one per cent of the fruit had worms and there was no fungus. It was sprayed with the Niagara Brand lime-sulphur and arsenate of lead



Oxen as Motive Power in a Nova Scotia Orchard. A Barrel Sprayer at Work

fertilizers are of mineral origin," to which statement I still adhere. Mineral phosphates are more extensively employed than any other fertilizer material, and then basic slag, the potash salts, sulphate of ammonia and nitrate of soda are all mineral fertilizers. Although the latter may have been produced partially through the agency of organisms, it certainly contains no organic matter.

Dr. Dandeno's assertion that I referred to the soil constituents as "hash" is not correct. I did not do so—not even metaphorically.

Like my opponent in this controversy, I am quite willing to allow the plant to "pronounce upon the value of a fertilizer." If the farmer finds that the use of fertilizers increases production, he will continue their use, even though he may never be able to define "plant food."

The Use of Commercial Fertilizers Defended*

R. Innes, B.S.A., Manager Sandside Fruit Farm, Coldbrook, N.S.

FERTILIZERS are to feed plants those elements found by analysis to enter into their composition and which they do not obtain in sufficient quantity from the soil or air; to feed the soil as well as the plants and in the feeding of them to furnish those forms of 'plant food' which experience has shown to be best adapted to perfect growth and yield.

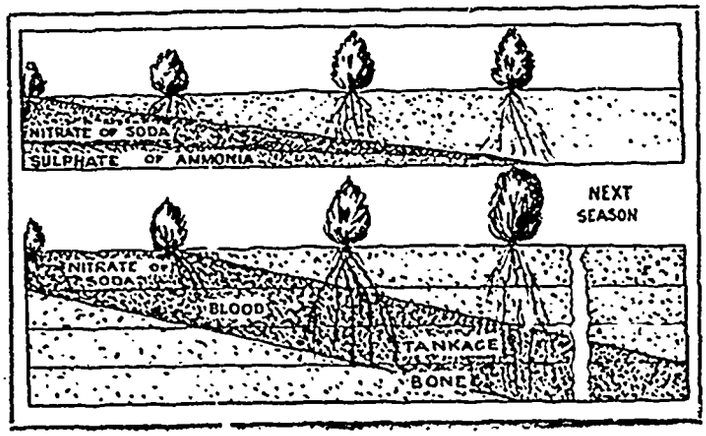
A 'plant food' may be defined as any material applied as manure, whether it is derived from natural or artificial sources. Its value is determined by its percentages of the three essential elements, nitrogen, phosphoric acid and potash, and the state of combination in which these elements are held over or in other words—their degree of availability.

The "degree of availability" of the plant foods contained in any mixture is the most important factor to be taken into consideration, when comparing the value of two fertilizers of the same analysis. The guaranteed analysis does not in any way signify what materials are used to obtain the percentages of nitrogen, or ammonia, available phosphoric acid or potash claimed to be present. It is generally admitted by those who look at the matter in a fair and square way that a mixture in which the various plant foods (with the exception of potash) are derived from different materials furnishing the same essential element but with varying degrees of availability is by far the most satisfactory and most economical for general use. The adjoining cut will illustrate this point:

In the upper section of the cut the reader will notice that two materials, nitrate of soda and sulphate of ammonia, are indicated as sources of plant food nitrogen. These materials are purely nitrogenous in nature, so far as 'plant food' is concerned. No matter whether these are applied singly or together they are very readily available: that is, the plant food furnished by them is in such a state that it is taken up by the plant almost immediately the material is applied to the soil. A plant or crop is indicated in four stages of its growth while the shading graphically represents the amount of 'plant food' at the plants' disposal during the whole season.

Owing to the high degree of availability of the two salts, nitrate of soda and sulphate of ammonia, they will give the plant a good start; but, as the season progresses their effect is gradually diminished (as indicated by the shading) and as a result the plant has to do without one of its most important foods—nitrogen—at the time it is filling out, or producing its fruit. A fertilizer furnishing nitrogen solely in this form as a good many of the home mixtures which are recommended by those solely interested in the sale of certain raw materials do, cannot be considered an economical or satisfactory one to use, not only on account of the lack of desired plant food at certain stages of the plant's growth as already pointed out, but owing to the obvious necessity of having to apply such materials regularly either during the growing season or year after year in order to receive any benefits whatever. No beneficial effect is carried over from one season to the other when such materials as the above are used alone.

On the other hand you will notice by glancing at the lower section of the same cut, that it is quite possible to remedy the above state of affairs providing we demand our mixtures to be composed of certain materials. Here we have represented a mixture in which the nitrogen instead of being derived solely from the in-organic sources, nitrate of soda and sulphate of ammonia, is obtained from a mixture of organic mater-



*This article by Mr. Innes is intended as a reply to the article on "Common Fertilizers," by Dr. J. B. Dandeno, of Bowmanville, Ont., that appeared in the November issue of The Canadian Horticulturist.

ials with a sufficient quantity of inorganic salts, to make the effect of the whole equally as immediate.

The reader knows that the nitrogenous materials such as blood, tankage and bone are not so readily available as the nitrogenous chemicals, owing to the fact that they must necessarily decompose to varying extents in order that their contained plant food may be liberated in forms that may be readily assimilated by the plant.

Bearing the foregoing points in mind, the reader will appreciate at once the economic and permanent value of a mixed fertilizer in which an essential 'plant food' element is derived from different materials which liberates same gradually and at all times needed, which ceases to liberate it when not required by the plant and which carries the natural surplus, that is what is not taken up by the crop to which it is applied, safely over till the next season for the benefit of crops which are to follow:

In brief, the process is as follows: The nitrate of soda owing to its immediate effect, gives the plant a good start and, during the time it is exerting its beneficial influence, the blood goes through the necessary stages of decomposition, whereby its plant food is liberated and when the effect of the nitrate is about over, assumes the responsibility and carries the plant through the second period of its growth, abundantly supplied with essential food until the time when the tankage present is ready to continue the good work and eventually place the plant safely in the hands of the bone, which gives it the finishing touches and ensures it giving the bountiful harvest we farmers so greatly appreciate. The small amount of nitrogen in the bone while sufficient to furnish the maturing plants full requirements is not in excess and will not retard maturity. Owing to the cessation of decomposing processes in the soil the liberation of the plant food in the mixture is discontinued until the next season.

The reader will see that by making a number of applications of a mixture containing the above materials you will year by year gradually raise the level of the excess fertility that is carried over to the next season and thus eventually restore your soil to the original high state of fertility, and only small applications of fertilizer will be required to ensure the constant production of maximum crops, where soil fertility is a deciding factor.

The writer is aware of at least one brand of ready-mixed fertilizers prepared from materials such as the above, which is manufactured in Ontario, and for sale at very reasonable prices to farmers in all parts of Canada. The results farmers are reporting from their use go to prove the truth of the foregoing assertions regarding their superiority over the home-mixtures which as stated above are advocated mostly by those who are only in a position to offer the farmers raw materials.

The mechanical condition of any fertilizing material simple or compound deserves the serious consideration of farmers when articles of a similar chemical character are offered for their choice or when they contemplate "trying" to do their own mixing. The degree of pulverization controls almost without ex-

A Well Sprayed Tree---Not Much Chance for Insects Here

ception under similar conditions the rate and solubility and the more or less rapid diffusion of the different articles of plant food throughout the soil. The poor mechanical condition a farmer obtains with a shovel and a sand screen is without a doubt a great deal to do with the poor results obtained by home-mixing. The fertilizer manufacture is a necessity the farmer cannot do without, and let me say here that it is not necessary for the farmers of Ontario or other parts of Canada to go outside of their own province to obtain their fertilizers. Conserve the fertility of Canadian farms by using fertilizers prepared from materials which have come direct from the farms themselves, including pork packing house by-products, and so forth.

Some of the statements made by Dr. Dandeno deserve special attention. For instance, "the value (of a commercial fertilizer) depends chiefly upon whether the original bacterial life has been preserved and whether the constituents of the fertilizer are favorable to the development of nitrifying bacteria of the soil and to those organisms which prey upon plant excretion."

To the writer this seems a very rash statement. Materials that are recommended for use in home mixing certainly have no bacterial content, but it would be hardly fair to say that the shortcomings of this practice are altogether due to this fact. In the manufacture of high grade mixtures such as indicated in the illustration here published, the raw materials have necessarily to be heated to high temperatures in order to extract the fat, which would be a decidedly harmful ingredient in a fertilizer, and are then dried in such a state that insures them from spoiling due to bacterial action. When the mixture is applied to the soil, however, it becomes subject to bacterial action, depending upon the bacterial content of the soil, and these organisms render the essential elements in the fertilizer available as plant food. Other than the method of supplying cultures of bacteria for inoculating the seeds of legumes there is no practical process at present in use for providing the right kind of bacteria for soil inoculation. It is questionable whether the 'original bacterial life,' even though it were preserved, would have any beneficial effect in a fertilizer, and most certainly the value of a fertilizer which is primarily a source of 'plant food,' does not depend upon its own biological characteristics.

"The use of commercial fertilizers has been one of the most baffling questions with which the farmer and fruit grower has had to contend." The writer thoroughly agrees that it is a 'has been.' The farmers of Ontario particularly have been slow to realize the advantages to be derived from the use of such materials, but it is evident that they are awakening in this regard as more and more commercial fertilizer is being used each and every year. We need to bear in mind when placing our orders for fertilizer that it is the analysis of the material offered that should be taken into consideration and not the brand name or so many dollars and cents. The brand names, "Potato Special," Early Vegetable, etc., do not amount to anything and the amount of dollars and cents will vary according to the amounts of plant food in the mixture. For instance, a three-eight-six (meaning three per cent. ammonia, eight per cent available phosphoric acid, and six per cent. potash) will not cost as much as a four-eight-six or a three-eight-ten, but more than a three-eight-five or a three-six-six.

(To be continued)

A Garden Where Beautiful Effects are Produced

F. Brooks, Barrie, Ont.

STANDING almost, if not quite, without a rival among the gardens of Barrie is that of Mr. J. H. Bennett, who has evidently adopted as his motto the maxim so often heard but not always followed, "Beautify your home." In doing this he has achieved three telling results: He has found pleasure in the work, he has delighted his neighbors, and he has caused the town to pride itself on having such a burgess in its midst.

The Home of Mr. Bennett. No. 1.

Mr. Bennett is an enthusiastic student of floriculture. He is a master of detail in the selection of his plants, and in everything, indeed, that pertains to flowers. Lavishly liberal in the distribution of the choice products of his garden, he is an example of the true horticulturist.

His garden, which covers a large area, two hundred and sixty-four feet by one hundred and ten feet, is so situated that it obtains plenty of sunlight, and yet possesses many a shady spot. It affords a splendid opportunity for making experiments with various novelties, and of these there is a large collection.

In the layout of the grounds, landscape lines have been closely followed. The beds are arranged in an irregular yet most attractive manner, with shrubberies and borders surrounding the lawn. In the garden proper, however, there is little attempt at scenic effect, save that which is given by the beauty of the blooms, which are in many cases the finest that can be produced.

As one walks through the garden, many a choice variety of the different plants is encountered. Here the majestic beauty of numberless peonies—there being nearly two hundred varieties, including Baroness Schroeder, La France, Mignon, Primevere, and many other rare ones—stand out distinct. There a mass of the most delicate irises catch the eye, while the campanulas and larkspurs rivet one's attention as they unfold their glorious blooms in unrivalled excellence.

It was with an entry of nine exhibits at the Toronto Horticultural Society's Show last July in the classes for peonies, larkspurs, and campanulas that Mr. Bennett scored a remarkable success, winning seven firsts, including two silver medals, a second, and a third—abundant evidence of the excellence of his blooms.

A small green house has proved a great success It is used for the propagation of annuals and other plants in the spring without heat, thus supplying the place of hot beds and cold frames; and when everything is planted out it is stocked and used for the growing of tuberous begonias, gloxinias, and such plants as will do well under these conditions.

Tulips, hyacinths, narcissus, iris (both German and Japanese), paeonies, roses, larkspur, phlox, asters, sweet peas, gladioli; in fact, almost every well-known perennial and annual, are found in the garden; for only a small portion of the garden plot is used for vegetables.

Mr. Bennett has set an example to others that they might well imitate and that he may have still further success and pleasure in his efforts is the sincere wish of all who enjoy the privilege of a visit to his beautiful garden and home.

A speedy and convenient hedge effect can be produced by posts, painted green, planted six feet apart, with strong wire fence, four feet high, between. Plant Virginia Creepers at foot of each post, and at two feet centres between.

Peonies, Iris and other Flowers in Mr. Bennett's Garden. No. 2.

Mr. Bennett Superintending Operations in His Garden.—No. 3.

The Window Culture of Bulbs

R. S. Rose, Peterboro, Ont.

EASTER bulbs should now be in and coming forward. Watch them; if they are coming along too fast take them out of the warm sunny window, and place them in a cooler window. They will then remain stationary. When you want them to come into full bloom bring them back to the full heat and sun of the window, which will bring them out to perfection.

The varieties that have given us the most satisfaction for pot culture, are:

Daffodils: Von Sion, Incomparable, Poeticus (Pheasant's Eye.)

Hyacinths: Single or Double (all mixed colors.)

Narcissus: Paper white.

Jonquils: Common single, sweet scented or common double.

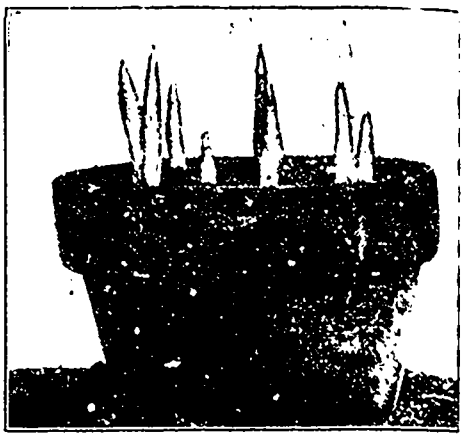
Chinese Sacred Lily.

All of these we grow in pans, with the exception of the Chinese Lily, which is grown in a bowl of water and pebbles. Narcissi can be grown the same way, and Hyacinths in water, using the regular bottle. We personally like the pan culture the best, one reason being that it is easier to give them to our friends when grown that way. The shallow pan I think gives better results than do the ordinary pots. I do not mean by this that the bloom will be any better, but that the plant will appear to better advantage, and also have a more natural look.

Any good florist's bulb catalogue will give you an idea as to how many bulbs will go to each sized pan. From these you can judge for yourself. On no account put in more bulbs than what the catalogue calls for, for as a rule it will be the limit, and the pan cannot furnish nourishment for more.

As to the soil it is well to make as good a compost as possible. Old decayed turf or virgin loam mixed with some leaf mould, sharp sand and a little bone meal, suit all varieties of bulbs very well.

After planting put pans in a dark, cool place, free from frost, such as a dark corner of the cellar. Water when needed, that is when the soil seems dry. Do not bring pans to the light until well started, the leaves being from one to three inches high. This will take six weeks or more. One can have bloom throughout the whole winter by bringing your bulbs forward in relays.



A Pot of Bulbs Ready for the Window

Flower Jottings

About fifty years ago one might travel all day long, up and down our concessions, and hardly see a flower growing. Now you will hardly find a farm without some flowers, many of them with very pretty gardens.—Chas. Jas. Fox, South London, Ont.

The rose is a gross feeder, and will quickly respond to generous treatment, in fact, all roses to do themselves justice must have a rich soil. A deep rather heavy loam, on a dry well drained subsoil is most suitable, but ordinary garden soil if properly worked and well manured with good substantial manure, grows them very well.

A Section of Mr. Bennett's Greenhouse Showing Gloxinias and Other Flowers.—No. 4.

Everlasting Flowers*

F. E. Buck, B. S. A., Experimental Farm, Ottawa

In our experiments with annuals at the Central Experimental Farm we included this year a collection of Everlasting Flowers. The collection included the most important of the everlast-

Helichrysum (Golden Globe)

ings. We found that these everlastings when judged on a comparative basis had to be rated high amongst the several hundred annuals which were this year tested at Ottawa. Besides this, they have to be allowed points on account of their usefulness for bouquets during the winter. They may be dried for winter use by methods of the simplest kind and when cut at the right stage they retain their attractiveness for long periods.

The seed used was obtained from two firms, Messrs. Sutton, of Reading, England, and Messrs. Vaughan, of Chicago. It was sown on the twelfth and eighteenth of April, and the plants put out into their permanent positions during the first and second weeks of June. The soil in which they were planted was sandy in character, but owing to the large amount of rain that fell it appeared to suit them remarkably well.

All varieties made good growth and were flowering freely before the end of July, many of them by the middle of July. The length of the flowering season for most of them was an average of ten weeks, while some varieties of the Helichrysums bloomed during twelve weeks, and would have probably continued in bloom two weeks longer had it not been that they had to be pulled up early in November to make room for other things. The Gomphrenas succumbed to the early frosts, but the Ammobiums and Helichrysums were but slightly affected by frosts ranging from four to eight degrees.

*An address delivered at the recent annual convention of the Ontario Horticultural Association.

The following order in which they are here discussed coincides with that in which they should be placed with regard to merit. It should be mentioned that the Gomphrena (Globe Amaranth) is the only one of these Everlastings which has a common name.

Helichrysums: These included Sutton's Golden Globe, Silver Globe, Fireball, pink and cream shades, and large flowered mixed. In our opinion the best three are the Golden Globe, Fireball and a white one from the mixed packet. They grew to heights ranging around four feet six inches to five feet, and were encouraged to further growth by repeated cutting. It is generally considered that these plants do best in sandy loam, and judging from the fact that they grew with us this year much higher than usual, it is safe to assume that they will do well in soil of even less than average quality if it be well watered.

Acrocliniums: The acrocliniums are often placed under the genus Helipterum. These both for bedding and for cutting are in some ways superior to the Helichrysums. The varieties are, double rose, single rose, and single white. There is very little difference between the single and doubles, both being as a matter of fact mostly semi-double. The variety single rose is of a particularly pleasing shade of pink, and either by itself or mixed with other everlastings is really attractive and pleasing. These plants are benefited by judicious cutting, and used either for that purpose or for bedding they are eminently satisfactory apart from the fact that they are everlastings.

Rhodanthe (Maculata)

Gomphrena (Globe Amaranth)

Rhodanthe is the second of these everlastings, which belong to the genus Helipterum. More accurately stated, Rhodanthe is used as a synonym of Helipterum. It is graceful in habit of growth and the nodding heads on long pedicles retain their grace when dried. Its rose pink color is pleasing. Its blooming season is not quite so long as the two former plants. It grows about one foot high and is rather fragile in appearance.

Ammobium is our fourth everlasting, and this variety is known as alatum. Its habit of growth as a plant is straggling and the broadly winged branches gives it a distinctive appearance. The flowers are pure white, rather small, but pleasing in the effect they produce in bouquets.

Gomphrenas: Our fifth flower does not belong to the family Gompositae, as the four former Gomphrenas known as Globe Amaranths, and belong to the family Amaranthaceae. We grew six varieties and recommend these three. G. globosa roseo, G. globose rubra, and G. Haageana aurea superba. These are tender to early frost, which takes all the color out of the flower heads. Both growing and when cut the flowers have a rather stiff appearance.

Helipterum Sandfordii is the only other everlasting tested and cannot be recommended to the same extent as the others. When growing it very much resembles a dwarf type of golden rod, and is not at all attractive. It has, however, some value in a bouquet of dried flowers, as its bright golden color is pleasing. Its blooming season was not more than eight to ten weeks, and its height about one foot.

An Everlasting Flower, Acroclinium

My Favorite Flower*

Mrs. A. R. Muir, Port Dalhousie, Ont.

It is most difficult to decide which flower is the ideal of my fancy—there is such an extensive range and galaxy of floral beauties distinctively attractive in color, form and growth; they display such artistic excellence, such superior traits of loveliness and refinement of expression. Every flower has its own distinct character and facial expression, its own questionings and contentedness —or, if not suited to its environments, it will show its discontent immediately: Is it not so? Have you not noticed a neglected plant with its expression of dejection? It has given up trying to be bright and cannot thrive on starvation and non-support. Plants and flowers tended with thoughtful care by one who loves their every habit, form and hue will not refuse to flaunt their beauty in thankful gratitude.

I hesitate to single out one special flower, as my heart yearns to enfold them all as especial favorites. However, my choice is the fragrant violet, with its royal hues. It is a much-loved flower and a greatly-sought-after and popular addition to one's toilet. It is adpated for the decoration of the palace and the cottage, the sick room and the garden-of-rest. Our deferential thanks are due to the "One who paints the wayside flower." In sickness and health, in poverty and wealth, the violet comes as a peaceful and tender messenger.

Flowers are said to be "God's smile upon earth." It is said that in time our expert scientists will perfect the Corollaphone, and that our garden flowers will sing to us their shades of color, giving out various notes, each separate colored petal a distinct tone. With the perfume of our garden, the musical harmony will be complete. "Come and hear my garden sing" will then be our friendly invitation.

CULTURAL METHODS.

In the spring the soil in my garden is dug and pulverized and mixed with wood-ashes, and ashes from the burnt garden refuse, and decayed leaves. The violets are planted and frequently watered until established in growth, the beds kept free from weeds and the soil, a sandy loam, stirred occasionally. This is all that is required for an abundant bloom. The bed, being permanent, is left the rest of the *year until the autumn, when a few leaves* are spread over the bed.

When spring ushers in her balmy days I remove the covering and renew the wood-ashes as a fertilizer. I grow many varieties of the wood violet also with the greatest success, treated as the English kinds in every instance. The last plant to bloom is a wild white perennial violet flowering in August. The violet plants are grown on a southern exposure.

Treat your floral friends with thoughtful attention and they will return that kindness a thousandfold.

*One of the essays that competed for the special prizes recently offered by Messrs. Hermann Simmons, of Toronto, and R. B. Whyte, of Ottawa, for the subject, "My Favorite Flower and How to Grow It."

Varieties of Paeonies

R. B. Whyte, Ottawa, Ont.

The following is a list of the best twelve varieties of pæonies, regardless of cost. In this list, P. after the name, means that the variety has a sweet perfume.

Marguerite Gerard, P.: flesh color, creamy white centre.

Marie Crousse, P, P.: globular flower. salmon-pink.

Festiva Maxima: white, tipped with carmine.

Asa Gray, P.: salmon-flesh and carmine-lilac.

Therese: flesh-shaded pink, very large, flat flowers.

Mlle. Leonie Calot, P.: soft flesh color.

Marie Lemoine: sulphur-white shaded chamois, slightly tipped with carmine.

Martin Cahuzac; crimson-red to maroon, very dark.

Mons. Jules Elie: pink, shading darker at base of petals, very large.

Albert Crousse: deep pink, large.

Madame d'Hour: carmine-pink, very free blooner.

Grandiflora Nivea Plena: white, centre sulphur and salmon, carmine stripes.

The foregoing twelve varieties can be laid down in Ottawa from France for ten dollars.

TWELVE FIRST-CLASS VARIETIES

Festiva Maxima: white, tipped carmine.

Mlle. Leonie Calot, P.: soft flesh color.

Madame de Galhau, P.: flesh-pink, shaded salmon.

Livingstone, P.: soft pink.

La Tulipe, P.: flesh-pink to white, carmine tips.

Duc de Nemours, P.: sulphur-white.

Charlemagne: creamy-white, shaded chamois.

Felix Crousse: bright carmine.

Modele de Perfection, P.: pink, shaded rose.

La Rosiere, P.: creamy-white, straw colored centre, very sweet.

Avalanche, P.: milk-white, creamy centre.

Couronne d'Or: creamy-white, some petals bordered ermine.

The above twelve varieties can be laid down in Ottawa from France for six dollars.

Good varieties of Paeonies, which can be bought locally for twenty-five cents each, include:

Rosea Elegans: soft pink, shaded salmon.

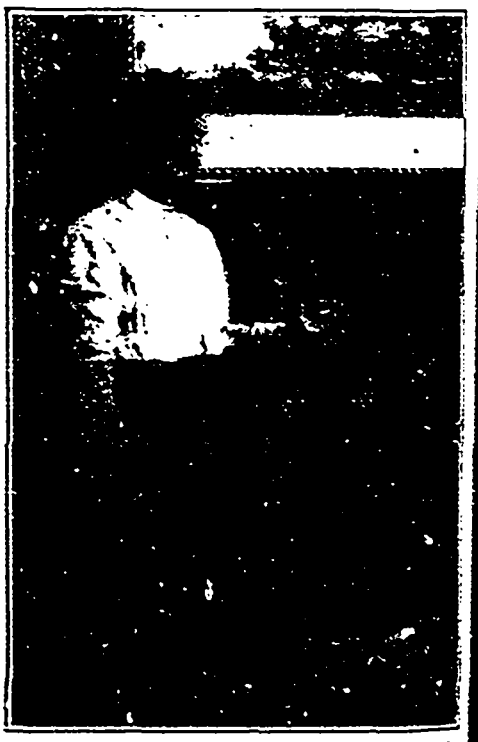
Duke of Wellington: sulphur-white fragrant, free bloomer.

Queen Victoria, P.: white, cream centre.

Festiva Maxima: white, tipped carmine.

Officinalis rubra: crimson.

Officinalis rosea: pink.



A Night-Blooming Cereus

The plant here shown, grown by Mrs. W. H. E... of Peterboro, bore several blooms which came into flower one at a time, several nights apart. These flowers are very beautiful but ephemeral, lasting only a few hours. They begin to open between six and eight o'clock in the evening, are fully expanded by eleven and by three or four in the morning are closed.

Floral Hints for February

R. S. Rose, Peterboro

Above all things, now is the time to send for all the catalogues. Look at the back of any of the magazines, such as The Canadian Horticulturist, The Ladies' Home Journal, Saturday Evening Post, and others, for addresses, and get all the floral catalogues they advertise. It won't cost you anything and they will more than amply repay you for the trouble of sending for them. After looking through the catalogues, put down what seeds, plants, and so forth, that you want, then draw out a plan of the garden, and stick to it. If you have kept notes of last year's garden, look them up. Have them before you always. By doing this you will know what you have failed with, and will not make the same mistakes over again. Always keep a copy of your order so that you can refer to it each year, as you order fresh seed. Opposite each item on order copy make notes as to how your seeds have done, how tall they have grown at full height, and color and bloom, and when and how long the bloom lasted. If this has not been done, try it this year and you will see how much easier it will be to order and plan out the garden next year.

Here are a few don'ts that I saw in an article written by Miss Frances Duncan for February, which I cut out and always refer to. This is pasted in front of my garden scrap book. This book is full of all kinds of odds and ends regarding flower culture. These don'ts are not only for beginners but for all amateurs:

1.—Don't try for bargains in plants; get good, carefully packed stock from a trustworthy, well-established firm.

2.—Don't begin your garden experience with extraordinary novelties. Such plants usually require expert care to bring forth anything but disappointment.

3.—Don't send in your order the last minute and expect to get the choicest stock.

4.—Don't try too many sorts, nor plan too large a garden. A few plants well grown and a small garden well cared for are better than many unhappy plants or a large area.

5.—Don't slight the preparation of the ground.

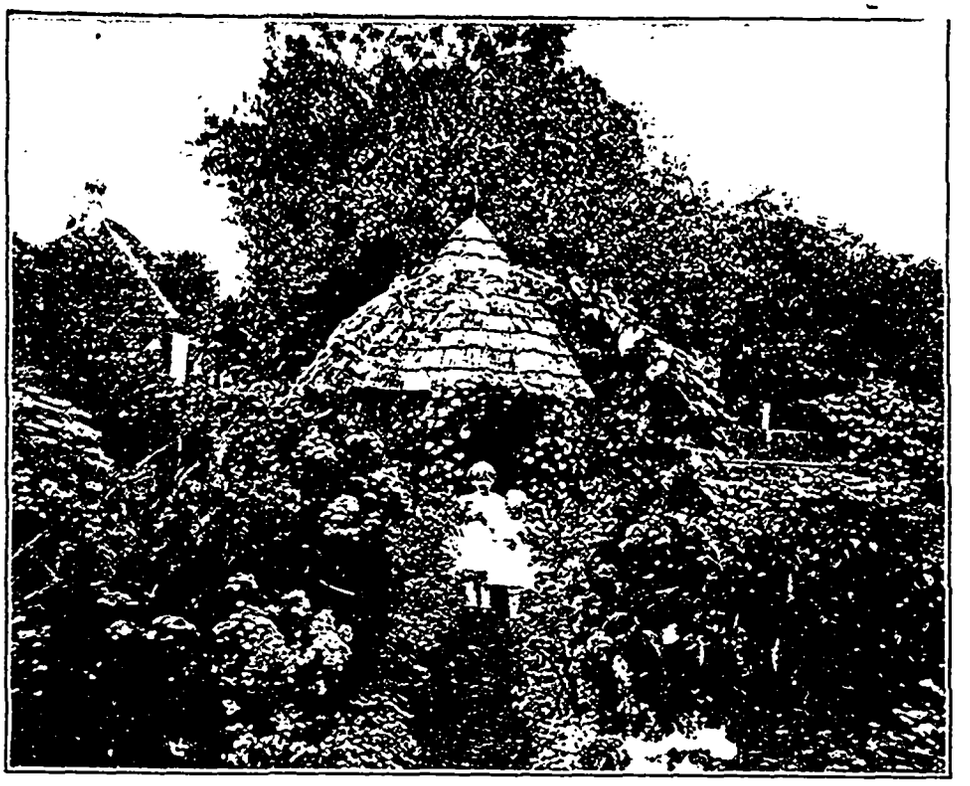
6.—Don't economize on manure.

7.—Don't use any but well rotted manure. If that is not available get commercial fertilizer.

8.—Don't fail to find out all you can about the soil.

9.—Don't forget to order manure. Get it as early as you can

There is not much time left to make your plans, so get busy. March is the time for cold frames, and once these are started things will come along so fast and crowd you with work that you will not have time to think how to plan your garden. So, do it now.



A Glimpse into the Prize Garden of R. W. Rewbotham, St. Thomas, Ont.

Simple Sprays for Flowers

A. V. Main, Ottawa

The flower catalogues are nearly all overflowing with sprays, insecticides, and the latest spraying devices, yet fine young fruit trees, shrubs and plants suffer considerably from the injudicious application of some timely solution. This is especially the case with city people, and enthusiastic suburbanites, although the grower who is engaged in commercial gardening also often suffers in this way. The best sprayer I can recommend for amateurs, small growers, and even those who have only a few plants in the house is the garden syringe.

It is a good old stand by, and could well afford to be lauded a trifle more. Bucket spray pumps, the sprayers and others have not as yet altogether supplemented the effective and reliable syringe. It is convenient, works well, and is of moderate price It is best to buy a good one. One having heavy brass and a nozzle spray, with two other fine sprays attached, may be obtained for from two dollars to four dollars and a half. Just get one and find its value for spraying your rose bushes, the fruit trees, and keeping the green flies that molest your house plants in check. With a can and your mixture and the syringe in your hand, you will find it a pleasurable gardening duty to rid some infested bush or climber of insects. Sulpho-tobacco soap is splendid for foliage house plants and Nikotexn is recommended as a good cleanser and preventative of insect life.

I am sometimes asked what I consider the best home made spray for house plants, and outdoor plants that are attacked by red spider, thrip, caterpillars, aphis or green fly, plant louse, mealy bug, or other similar pest. For convenience and economy I would recommend as a preventative to the amateur grower, one ounce of any ordinary kitchen soap dissolved in a gallon of water. To this add a wineglassful of coal oil or paraffine. Keep this well irritated with the syringe while application proceeds. In the town or city, or where gardens are polluted with the refuse from smoke stacks this simple remedy is a wonderful cleanser of foliage. It adds much to the benefit of the smaller fruit bushes.

In my experience I have found the mixture given by Mr. R. S. Rose in the January issue of The Canadian Horticulturist, of one cupful of coal oil to a gallon of water, too strong for sprinkling house plants. With a syringe and a pail of solution keep at bay these insects that disfigure plants, particularly your half-dozen fruit trees or currant bushes. If you are an enthusiast get this old time sprayer. The more you use it the more you will value its assistance.

Vegetables and Their Sprays

Prof. E. M. Straight

WHAT is new in sprays? Not much, and yet everything is new. We sometimes fail to realize the newness of spray science! During the past year, despite our eagerness for that which is new, we have found little, actually belonging to the year, upon which the stamp of genuine worth may be placed.

Bordeaux mixture and paris green, the oldest of our spray compounds, date back only a few years. True there were spray mixtures before that time, and for some of these, remarkable properties were claimed; but they were poorly adapted to the purpose for which they were designed. For example: Hemery, a French nurseryman, made a compound which was intended to kill mildew on peaches. It was made as follows:

Aconite branches and tubercules	1 kilogram
Water	4 liters
Pigeon dung	25 liters
Urine	1 hectolier

Again, that of Mr. Yates of Albany, N.Y.:

Wormwood	1 handful
Rue	1 handful
Virginia tobacco	2 handfuls
Water	2 pailfuls

Such mixtures as these were abundant enough, but it was not until 1885 that there appeared unmistakable evidence, based upon experiment, that a substance had been found which was a specific against the grape mildew and other fungous diseases.

The following from Dr. Lodeman is of especial interest: "In south-western France, in the maritime department of Gironde, is situated the city of Bordeaux. It lies near the western border of a large horticultural district of which the grape is by far the most important fruit. It is here that the downy mildew of America first made its appearance in Europe, probably in 1878, and here also it became most severe. It was noticed that a few vines escaped the general attack. These were situated along the highways. It was also noticed in the autumn of 1882 that certain vines retained their foliage in an almost perfect condition. Vineyards in these localities had suffered considerable loss from the stealing of grapes by children and travellers. It had formerly been the custom to sprinkle verdigris upon a few rows of the vines nearest the road, for the purpose of giving the fruit the appearance of being poisoned. Several years before the the appearance of the mildew, this substance was replaced by a mixture of the milk of lime and some salt of copper. The mixture was of the consistency of cream and of a light blue color. It was then applied to the vines by means of brooms. The design was to apply enough of the mixture to each vine to give it the appearance of being well poisoned. The vines thus treated were the ones that retained their foliage, while the vines further removed from the road lost their leaves. This was the beginning of the Bordeaux mixture."

The currant worm in the east and the potato beetl in the west made the necessity for paris green, or something like it, imperative. To whom the honor of first using paris green belongs is not known It made its appearance somewhere between 1860 and 1870. Its use as a standard insecticide began in the western states. Applications of paris green, mixed with water, do not appear to have been made during the first few years following the introduction of the poison. It is thus seen that the introduction of spray mixtures and their use are of recent date.

VEGETABLE SPRAYS

The spraying of vegetables is even newer than the spraying of the orchard or vineyard. After much experience in different parts of the country we are forced to admit, barring the potato, vegetables are little sprayed—much less than is supposed by the experiment station. We are learning, however, that quality counts, and that the spraying of vegetables is a factor which may not be neglected if quality is to be secured.

Paris green and Bordeaux mixture still form a combination not surpassed as an insecticide and fungicide in the vegetable world. Paris green has one competitor in arsenate of lead, and bordeaux mixture and paris green or arsenate of lead are the great weapons the gardener has in his fight against insect pests and fungous diseases. With these he is able to wage effective warfare.

Nothing that we have here said is meant to throw discredit on the use of lime-sulphur in the apple-orchard. There it has a place and is destined to replace other fungicides; but even we believe that bordeaux mixture is the better fungicide. It is because of the insecticidal value of lime-sulphur and because there is less danger of spotting the fruit when used as compared with bordeaux mixture, that lime-sulphur is coming into common use. In the vegetable world however, lime-sulphur has little or nothing to recommend it.

BEST SPRAY FOR POTATOES

Our experiments with the various sprays on potatoes at Macdonald College have already been reported in The Canadian Horticulturist. Any person seeing the plots could not fail to be convinced that Bordeaux was the proper spray for potatoes. Lime-sulphur for potatoes was much worse than no spray The yields told the same story as seen by the illustrations. Between paris green and arsenate of lead for potatoes, we have little choice. Paris green is cheaper and is the poison we use and recommend in our work.

A great deal of exact and interesting work has been done by the experiment station, Storrs, Connecticut, in the spraying of cucumbers and melons. The table shows the result with cucumbers. Melons gave similar results, so that the figures may be taken as an example of spraying vine crops.

YIELD OF CUCUMBERS

Date of Harvesting.	Bordeaux 4-4-50	Check.	Self-boiled Lime-Sulphur.	Commercial Lime-Sulphur 1 to 50
July 11	72 (fruit)	74	102	68
" 14	97	187	177	128
" 18	111	289	160	54
" 21	160	371	112	23
" 25	281	410	91	
" 29	412	711	44	
Aug. 2	875	977		
" 6	1,124	1214		
" 9	1,490	841		
" 13	1,807	679		
" 17	1,881	115		
" 22	1,645	92		
" 27	1,316			
Sept. 1	874			
" 5	605			
" 10	365			
	13,115	5960	686	275

The conclusions arrived at by the station are as follow:

1. Bordeaux mixture is the best remedy for the spraying of melons and cucumbers, but it will not completely control the common diseases of cucumbers and melons.

2. In seasons favorable to the spread of the disease plants that have received three or four applications of bordeaux mixture may be kept alive and in a productive condition from two to three weeks longer than unsprayed plants.

3. In seasons when the disease is not troublesome, or when it appears late in the season, unsprayed plants are usually more productive than those that have been sprayed with Bordeaux.

4. Bordeaux mixture applied to cucumbers has an injurious effect upon the foliage. Applied to melons, the injury is chiefly to the foliage, but seems to retard the maturing of the fruit.

5. Strong Bordeaux is more effective in keeping the disease in check than weak Bordeaux. As might be expected, it also causes greater injury to the plants. Half-strength Bordeaux causes less injury than the full strength mixture.

6. Spraying with a very fine spray and avoiding the formation of puddles on the foliage gives the best results.

Tomato Plants Growing in a House 60 x 200 feet, owned by R. H. Ellis, Leamington, Ont.

7. The sprayings made early in the season seem to cause greater injury than the later sprayings.

8. The various sulphur preparations, even when used at very weak strengths, caused serious burning of the foliage. It is remarkable that the self-boiled lime-sulphur which may be safely used on the tender foliage of the peach, causes serious injury when used on melons and cucumbers. On the other hand, Bordeaux mixture that causes serious injury when used on the peach is the best fungicide for melons and cucumbers.

We have already reported our work with the spraying of celery at Macdonald College. Spraying makes all the difference between success and failure with that crop. Celery is commonly attacked with an early and a late blight. Sometimes both are working on the same plant at one time. These diseases are held in check by Bordeaux mixture. The diseases are very persistent so that the plants must be kept covered with the spray from the seedling stage to the harvest.

The writer carried on a set of experiments in New Brunswick seeking to control the Tomato Leaf Spot. Leaf Spot may be controlled by Bordeaux mixture. If amount of fruit is the only consideration spraying would abundantly pay. We have demonstrated to our own satisfaction that leaf spot tends to hasten fruiting, however, so that where a premium is placed upon earliness, nothing is gained by spraying. The problem seems to be: Does a limited amount of fruit pay as well or better than a larger amount later on?

The most of what we have said is concerning plant disease. Remember that all remedies used in dealing with these maladies are preventive. They cannot cure. In spraying we simply cover our plants in an armor of copper or iron and thus shut out the spores of plant disease. If we spray a plant after diseased, we simply shut the disease in, where it flourishes until the host plant is exhausted.

Bacterial plant diseases, such as cause soft rots, cannot be easily controlled. They are within the tissue and cannot be reached by sprays. Treating a plant so affected would be like spraying a patient suffering from consumption with tuberculin. Mechanical methods, such as digging out the plants and burning them must be employed. The plants cannot be saved, but such drastic methods may hinder the spread of the disease to the remainder of the field.

Plant lice cannot be poisoned. They do not eat, and, therefore, cannot be reached by a stomach poison. Lice suck up their food. They are usually very difficult to control. We may only hope to reach them by means of a contact poison, that is, one that will kill the insect by coming in contact with its body.

The biting insects are legion and have been met by every one. They eat foliage and can, therefore, be poisoned. For these insects arsenic in some form is used and is effective. To sum up, we have: Fungous diseases, bacterial diseases, biting insects, sucking insects. Fungous diseases, controlled by sprays; biting insects, controlled by arsenical poisons; sucking insects, controlled by contact poisons. A description of all these maladies attacking the garden cannot be given at this time.

The best we know for the treatment of vegetables is given in the accompanying spray calendar:

Spray Calendar (Vegetables)

What to Spray	For what to Spray.	With what to Spray	1st Spraying	2nd Spraying	3rd Spraying	4th Spraying	Remarks and Conclusions.
Asparagus	Rust and Beetles	Arsenate of Lead. Bordeaux	After cutting season is over.	As required			A sticker may be necessary.
Bean	Anthraccanose	Bordeaux	As required				Seldom pays
Cabbage	Cabbage Worms	Paris Green or Arsenate of Lead	On appearance of Butterfly	Every 10 days, as required			Sticker necessary Treatment for root maggot not satisfactory
Cauliflower	Cabbage Root Maggot						
Celery	Early and Late Blight	Bordeaux	Seedling Stage.	Every 10 days			Plants must be kept covered.
Cucumber and Melons	Bacterial Wilt	Bordeaux					
	Cucumber Beetles	Various powders	Seedling Stage.	Every 10 days, as required			Plants attacked by Wilt should be burned
Onion	Onion Maggot	Found nothing satisfactory					Various compounds have been recommended for pouring in soil. Not effective
Potatoes	Early and Light Blight Beetles	Bordeaux. Paris Green or Arsenate of Lead	When first necessary	10 Days later	10 Days later		Don't use Lime-Sulphur
Squash	Cucumbers and Squash Bug		Seedling Stage.	Every 10 days, as required			
Tomato	Leaf Spot. Early and Late Blight	Bordeaux	Seedlings	Every 10 days, as required			Does not pay for very early fruit
Radish	Club-root Maggots		Applications of lime to soil are useful for club-root. Rotation necessary. Do not rotate with cabbage, turnips or cauliflower				

The Canadian Horticulturist

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H. BRONSON COWAN, Managing Director

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4. The Law is that subscribers to newspapers are held responsible until all arrearages are paid and their paper ordered to be discontinued.

5. Change of Address—When a change of address is ordered, both the old and the new addresses must be given.

6. Advertising rates $1.25 an Inch. Copy received up to the 18th. Address all advertising correspondence and copy to our Advertising Manager, Peterboro, Ont.

7. Articles and Illustrations for publication will be thankfully received by the Editor.

CIRCULATION STATEMENT

The following is a sworn statement of the net paid circulation of The Canadian Horticulturist for the year ending with December, 1912. The figures given are exclusive of samples and spoiled copies. Most months, including the sample copies, from 11,000 to 12,000 copies of The Canadian Horticulturist are mailed to people known to be interested in the growing of fruits, flowers or vegetables.

January, 1912	9,988
February, 1912	10,437
March, 1912	10,877
April, 1912	11,788
May, 1912	12,112
June, 1912	10,946
July, 1912	10,986
August, 1912	11,148
September, 1912	10,997
October, 1912	10,971
November, 1912	11,162
December, 1912	11,144
	132,566

Average each Issue in			1907,	6,627
"	"	"	1908,	8,695
"	"	"	1909,	8,970
"	"	"	1910,	9,867
"	"	"	1911,	9,541
"	"	"	1912,	11,045
January, 1913				11,243

Sworn detailed statements will be mailed upon application.

OUR GUARANTEE

We guarantee that every advertiser in this issue is reliable. We are able to do this because the advertising columns of The Canadian Horticulturist are as carefully edited as the reading columns, and because to protect our readers we turn away all unscrupulous advertisers. Should any advertiser herein deal dishonestly with any subscriber, we will make good the amount of your loss, provided such transaction occurs within one month from date of this issue, that it is reported to us within a week of its occurrence, and that we find the facts to be as stated. It is a condition of this contract that in writing to advertisers you state: "I saw your advertisement in The Canadian Horticulturist."

Rogues shall not ply their trade at the expense of our subscribers, who are our friends, through the medium of these columns; but we shall not attempt to adjust trifling disputes between subscribers and honourable business men who advertise, nor pay the debts of honest bankrupts.

Communications should be addressed

THE CANADIAN HORTICULTURIST,
PETERBORO, ONT.

EDITORIAL

SPRAYING EXPERIMENTS

The increased attention being given by our agricultural colleges and experiment stations to the prosecution of extensive experiments in spraying (both in the orchard and greenhouse) is only one of the many indications of the great advances that have taken place in this practice during the past ten years. This is not to be wondered at. The increased financial returns which invariably follow thorough, well-timed spraying have been demonstrated so conclusively, the practice is becoming well night universal among our leading orchardists.

This is a season during which the fruit grower who has not already done so should aim to post himself in regard to the latest results obtained by the experiment stations of both Canada and the United States. Speaking generally it may be said that no fungicide has been found that holds diseases in check as well as Bordeaux. One of the chief objections to the process, however continues to be the fact that when showers follow soon after an application of Bordeaux the leaves are likely to be spotted and the fruit russeted by the fungicide. When the apples are sold in barrels this injury is seldom great enough to be of importance.

Lime-sulphur has in most cases proved a satisfactory substitute for Bordeaux. It caues little or no injury and in some seasons controls the disease as well as Bordeaux. Experiment conducted by the New Hampshire experiment station show that commercial lime-sulphur, diluted two to fifty, has been repeatedly used on foliage without injury although a weaker spray is probably desirable. Arsenate of lead is the only insecticide that has proven satisfactory for use with lime-sulphur. For such diseases as the leaf spot the self-boiled lime-sulphur has given good results, but in most cases it has not held other diseases in check as well as Bordeaux and commercial lime-sulphur.

Helpful bulletins and pamphlets dealing with spraying that have reached The Canadian Horticulturist during the past few months and which our readers might well write for, if looking for information on these subjects, include the following among others: "Concentrated Lime-Sulphur Spray," bulletin 115, of the State College, Centre County, Pennsylvania; "Fungicides in the Apple Orchard," by Chas. Brooks of the New Hampshire College, Durham, N.H.; "The More Important and Insect and Fungous Enemies of the Fruit and Foliage of the Apple," by A. L. Quaintance and W. M. Scott, being Farmers' Bulletin 492 of the United States Department of Agriculture, Washington; "Tests of Summer Sprays on Apples, Peaches etc.", being part five of the annual report of the Connecticut Experiment Station, New Haven, Conn., "Orchard Spraying Experiments," being bulletin number 198 of the Maine Agricultural Experiment Station, Orono, Maine; "Some Common Spray Mixtures," by O. S. Watkins, of the Agricultural Experiment Station, Urbana, Ill.; and "Injurious Insect Pests, Fungous Diseases, and Spray Formulae," being circular 58 of the Department of Agriculture, Albany, N.Y.

ADVERTISE THE APPLE

The value of the apple as an article of diet should be advertised more widely. Fruit growers have not awakened to the possibilities of an intelligently conducted campaign of this character. The explanation of the comparatively small home demand for our unequalled Canadian apple, with the consequent prevailing low average prices paid in the home markets, is due to the fact that the Canadian people are not as yet familiar with the value of the apple for dessert and cooking purposes.

For years the milk of the Holstein cow was considered to be lacking in nutritive value. On the other hand the word Jersey carried with it an implication of the highest possible quality in milk. Of recent years the Holstein breeders have been conducting an intelligent, persistent educational campaign through magazines and other mediums. They have advertised that the milk of their cows is more evenly balanced in the nutritive elements of milk than the milk of any other breed of cow. To-day many hospitals are using Holstein milk for infants in preference to other kinds.

Our Fruit Growers' Association might well take a leaf from the book of the Holstein breeders. Attractive, well colored advertisements of certain brands of apples were they to appear in our magazines and similar mediums would create a surprising demand among our more wealthy class of citizens for this product of our Canadian orchards. We have not begun to develop the home markets as we might.

The Hamilton and St. Thomas Horticultural Societies are to be congratulated upon the success of their efforts, in cooperation with some of their local newspapers, to publish several pages of illustrations of beautiful gardens and streets. The St. Thomas Daily Times and The Hamilton Spectator have both issued splendid illustrated sections showing the homes and gardens of representative citizens. The effect on the public of such enterprise is always beneficial. Officers of other horticultural societies would do well to write to these papers for extra copies of these editions in order that their local papers and their own members may be encouraged to follow these worthy examples.

The citizens of Toronto through their Boards of Trade and similar organizations have been conducting investigations with the object of ascertaining the cause of the increased cost of living. At the same time they have prosecuted a fruit grower who undertook to sell apples in a market stall in quantities smaller than one bushel. We realize, of course, that the by-laws under which such prosecutions are conducted were passed with the object of protecting local taxpayers from competition by non-taxpayers; but nevertheless, the citizens of Toronto should recognize the fact that all such restrictions strengthen the middlemen at the expense of the consumer and thereby add to the cost of living. The elimination of a few by-laws such as the one referred to would have some effect at least towards lowering the price of food products.

For a year or more an agitation has been in progress in Canada which has for its object the placing of traction ditchers on the free list. In December Mr. A. B. McCoig, M.P., of West Kent, gave notice of a resolution in the House of Commons declaring that traction ditchers should be

admitted into Canada duty free. As far as we know there is no opposition to this proposal. These machines are not manufactured in Canada, nor are they likely to be for many years. The Canadian Manufacturers' Association favors the suggestion. As the underdraining of hundreds of thousands of acres of land in Canada is a crying necessity, the Government will serve the best interests of the country if it consents to the adoption of the resolution.

Ontario's Provincial Market Commissioner in Western Canada has reported that Ontario fruit is better in quality than any other offered in Winnipeg and on other mid-central western markets, but that its grading and packing frequently leaves much to be desired. The Canadian Horticulturist long advocated the appointment of a market commissioner for Ontario in order that the defects of Ontario's methods of packing might be brought home more forcibly to the growers by an impartial agent. Now that the facts are being laid before the growers steps should be taken as speedily as possible to ensure Ontario's fruit being laid on the markets in Western Canada in better condition. Ontario is behind British Columbia in this respect, and will continue to be until more energetic efforts are made to bring about an improvement in the apple pack of the province.

The suggestion has been made to The Canadian Horticulturist, and we pass it along with pleasure, that the Dominion Parliament, now in session at Ottawa, might fittingly recognize and advertise the fruit industry of Canada by the adoption of a resolution accepting the apple as the national fruit of Canada. The apple is grown to perfection in Canada from the Atlantic to the Pacific. The quality of the Canadian apple is not surpassed anywhere else in the world. What do our readers think of this suggestion?

That the fruit growers of Lambton county are awakening to their opportunities may be gathered from the fact that they have cooperated recently in the formation of the Lambton Publicity and Development Association which has for its object the development of the latent resources and opportunities of the county. The association has issued an attractively worded and illustrated pamphlet showing fruit and farming scenes in the county. It is entitled, "Come to Lambton County in Sunny South-Western Ontario." Other fruit sections in Ontario might well follow this example. They are not likely to attract settlers and capital until they themselves appreciate their own natural resources and the opportunities which they have to offer to others, and then make them known.

PUBLISHER'S DESK

The front cover illustration of this issue of The Canadian Horticulturist was obtained from a photograph taken in the orchard of Mr. Brimmingcome, of Goderich. Mr Brimmingcome is one of a number of orchardists who are helping to bring Huron county to the front by their up-to-date orchard methods. An evidence of the success which is attending their efforts was shown by the illustration on the front cover of The Canadian Horticulturist for January.

This issue of The Canadian Horticulturist breaks several records. It contains more pages than we have ever before published, and the volume of advertising carried establishes a new high water mark. We have endeavored to make this issue also of special interest and value to our readers. It is our desire that every success as it is achieved shall only prove a spur to increased efforts for further improvement. Our plans for our March issue are such that we can assure our readers that they will be delighted with it when it reaches their hands. Help us to make The Canadian Horticulturist a credit to the fruit and floral interests of Canada.

SOCIETY NOTES

We invite the officers of Horticultural Societies to send in short, pithy reports of work that would interest members of other Horticultural Societies.

SEAFORTH

At the annual meeting of the Seaforth Horticultural Society the following resolution, which contains a suggestion for other societies, was passed: "Believing that the condition of the property on Main street, between Stewart's blacksmith shop and Kerslake's feed store ,to eb a disgrace to the town of Seaforth ,we urge upon the Mayor and Council to take whatever steps are necessary to have this eyesore cleaned up."

MONTREAL

A prosperous year's record was shown in the report presented at the annual meeting of the Montreal Horticultural Society held recently. Votes of thanks were tendered to residents who had opened their conservatories during the months of February and March. Resolutions of sympathy were tendered to the families of Sir Edward Clouston, Messrs. Wm. M. Ramsay, G. M. Hays and R. Wilson Smith.

The following officers were elected:

Honorary President—Hon. Senator Mackay; Hon. First Vice-President—Jas. Morgan, Esq.; Hon. Second Vice-President—Jonathan Brown; Hon. Botanst, Rev. Robt. Campbell, D.D.; President—D. Lorne McGibbon; Vice-President—Charles B. Gordon.

Directors—Sir H. Montagu Allan, Henry Birks, Esq., B. Hal. Brown, Mortimer B. Davis, H. A. Ekers, Chas. Meredith, Sir Thomas Shaughnessy, A. E. Ogilvie, A. J. Dawes, Sir Hugh Graham, John Stewart, James R. Wilson, L. Payette, C. P. Beaubien, K.C., W. G. Ross, Hon. Nathaniel Currie, D. Forbes Angus, J. C. Macdiarmid and His Worship Mayor Lavalee.

The executive committee were elected as follows:

Robert Burrows, chairman, W. J. Wilshire, Joseph Bennett, C. A. Smith, Geo. A. Robinson, H. Schoning, R. T. Pinkerton, George Trussell, F. J. Hayward, I. Rubenstein, A. Ferguson, W. G. Pascoe, J. Luck, J. Turner, Wm. Ewing, Jr., Geo. Bayles.

Secretary-treasurer A. J. Bowles.

TORONTO

As a result of the change in the Horticultural Societies Act for Ontario, made last year, which enables Toronto to form two Societies, a meeting of the High Park Ratepayers' Association was held, at which the Association was re-organized as The High Park Horticultural Society.

The Society starts off with a membership of one hundred and fifty paid members and a considerable number of associate members ready to continue under these auspices the work formerly carried on without assistance by the High Park Ratepayers' Association. The organization of this horticultural society enables it to procure from the Government in the first year of its operation a grant of $75, and after that a grant as high as $500 dependent on the membership. The plan of campaign including the giving of shrubs, trees and flowers, and awarding of prizes will be put in operation by the officers elected.

The officers elected are as follows: President, D. G. M. Galbraith; vice-president, A. Chamberlin; first vice-president, Wm. H. Reid; secretary, J. H. King; treasurer F. R. Snow. Directors—William Morman, John Harris, R. W. Scadding, W. H. Price, Wm .McTavish, George Stevenson, R. J. Buller, D. Paterson, George Birdsall.

British Columbia Fruit Growers Wide Awake

Matters of not only provincial but of national importance were discussed and dealt with by the members of the British Columbia Fruit Growers' Association at their 23rd annual convention held in Victoria, B.C., January 6 7, and 8. These included increases in the duty on fruit, the inspection of fruit, transportation problems and similar subjects.

Hon. Price Ellison, Provincial Minister of Agriculture and Finance, congratulated the fruit growers on having the cleanest fruit producing country in the world, a result he attributed to the services of Mr Thomas Cunningham, the provincial fruit inspector. The cost of fighting infection was too heavy an impost for the industry to bear, and they were justified in their endeavors to prevent infected fruit being brought in. But they must bear in mind that their aim must be to give the wholesaler, and through him, the consumer, the goods he wants when he wants them, and this would be enormously helped by the establishment of cold storage. The growers were urged to encourage the establishment of cold storage plants by subscribing for stock, in which event the provincial government might be induced to give financial assistance.

The growers, the Minister said, had a right to demand a higher import duty on United States produce, in fact to be protected as much as those engaged in any other industry, and the consumer would never notice the difference in fruit. They must keep on asking for what they wanted and what they had a right to ask for till they got it.

PRESIDENT'S ADDRESS

Mr. W. C. Ricardo, president of the Association, declared that the time had arrived to press for better protection for orchards against infected countries and when the home and Canadian markets generally should be kept for Canadian fruit and free from the dumping of produce from other countries. While lower prices must be expected, profits could be raised by closer attention to the manufacture of by-products and the reduction of the cost of production. He connected an idea that had got about that poor organization had been

(*Continued on page 50*)

Quebec Fruit Growers' Annual Convention

THE annual meeting of the Pomological and Fruit Growing Society of the Province of Quebec was held at Macdonald College, Que.

Apples of all sorts, sizes, shapes, and flavors decorated the platform, and a long line of tables at the front of the assembly room of the college. Among these was a plate of freak apples brought by Mr. Peter Reid, Cateauguay Basin, Que. They were Red McIntosh apples secured from a graft on a Ben Davis tree. The result was that the fruit took on the shape and appearance of a Ben Davis apple but maintained the taste and quality of a McIntosh.

About fifteen plates of seedlings that promise a great deal for the future of the apple growing industry in Quebec were shown by Mr. W. T. Macoun, of the Central Experimental Farm, Ottawa. These were mostly from Northern Spies, which so far have not grown very well in Quebec, but these new seedlings, which are really hybrids with another variety, have so far proved themselves much hardier than the ordinary Northern Spy.

Of the varieties of apples shown, the most prominent were the Alexander, Fameuse, Wealthy, McIntosh, Wolf River, American Golden Russet, Scott's Winter, Baxter, Pewaukee, Canada Baldwin, Canada Red (Pomme de Fer), Northern Spy, Blue Pearmain, Bethel and about thirty other varieties.

The president, Mr. C. P. Newman, Lachine Locks, reviewed the results of the discussion at the Dominion convention of fruit growers at Ottawa, saying that he hoped the Government would look into the Cooperative Credit Association system in Europe as it had been asked to do by resolution.

He spoke of the work of the demonstration orchards in Quebec as object lessons to the districts where they are situated. To show the necessity of stimulating fruit production in Quebec he said that less than half the fruit consumed in the province was produced within its borders, although there was a good home and export demand for Quebec varieties. Nova Scotia, Ontario, and British Columbia were all showing greater activity in this direction. "Fruit growing was too much of a side line in Quebec."

EXHIBITION PROPOSED

Dr. F. C. Harrison, principal of Macdonald College, advocated the holding of a fruit and flower exhibition in Montreal.

He introduced Prof. T. G. Bunting, a former assistant of Mr. W. T. Macoun at the Central Experimental Farm, who had taken Prof. Blair's place; Prof. F. M. Clement, lecturer in horticulture, and Mr. W. M. Aikenhead, assistant in the same department, all of whom, he said, had made good records for themselves in their former spheres of work.

Rev. Father Leopold of the Trappist Monastery, who was received with applause, spoke on "Establishing Canneries and Their Advantages in Connection with Cooperative Societies." He made the text of a large part of his address the work done by the recently formed Cooperative Society of Kamouraska which he saw while on a visit to Ste. Anne de la Pocatiere to establish a demonstration orchard.

He told of the cannery at Ste. Anne de la Pocatiere undertaken by the Cooperative Society after it had sold eight thousand gallons of the plums in a fresh state, and found that this was the only method of saving the rest of the crop which were a glut on the market. Very quickly, with the help of Father Athanase, of La Trappe, they organized a canning plant in the old college and preserved in a few days ten thousand pounds of plums, making something like six thousand gallons of preserves. The fruit was put in tin cans processed mostly by hot water, the processing vat having a capacity of five hundred gallon cans at a time. The very best grade possible was put up. The preserving was done with pure white granulated sugar, six pounds of sugar to one gallon of syrup. Mr. Dupuis, the secretary, expected to sell these Damas plums in large cans at five dollars forty cents a dozen, and small cans at two dollars forty cents a dozen. Without the improved cannery the crop would have been a loss to the growers. The speaker insisted on the importance of pure fruit being used, and a label being put on the tins to show who was behind the work as a guarantee of quality.

In the evening an address was given on the "Commercial Handling of McIntosh and Fameuse," by Prof. T. G. Bunting, Macdonald College.

Prof. W. S. Blair described the development of the Annapolis Valley in Nova Scotia as an apple growing centre, and gave it as his belief that it would become a still greater factor as an apple exporting centre in years to come, although they were not now taking any more trees from Canadian nurseries on account of the introduction of the San Jose Scale.

The election of officers resulted as follows: Patrons, Hon .Martin Burrell, Hon. J. E. Caron, Hon. S. Fisher, G. A. Gigault and A. Dupuis. Honorary president, Prof W. S. Blair, honorary vice-president, C. P. Newman; president, Rev. Father Leopold; vice-president, C. P. Byers; Secretary-treasurer, Peter Reid. Directors: G. B. Edwards, Covey Hill; J. Crossfield, Abbotsford; G. P. Hitchcock, Massiwippi; Rev. H. A. Dickson, Rectory Hill; A. D. Verreau, Village des Aulnaies; N. E. Jack, Chateauguay Basin; F. X. Gosselin, W. H. Thompson, Hudson Heights; R. Brodie, Montreal. On the committee charged with demonstration work Prof. Blair's departure necessitated another appointment, and Prof. Bunting was elected in his place.

DEMONSTRATOR WANTED

A resolution was passed requesting the Provincial Government to appoint a competent man to act as demonstrator of each experimental orchard. This officer would also accept the office of local secretary of the society's branch in the district, thus combining the two offices. A resolution asking the railroads to look into the matter of trying to induce their employees to handle fruit in transit more carefully was also adopted.

Addresses were delivered by Mr. F. X. Gosselin, Ste. Famille, Que., on "Strawberry Culure," and by Mr. J. C Chapais, St Dems, on "Two Orchard Enemies" These led to an interesting discussion. Reports made by Messrs. Ben. Richardson and Henri Cloutier, superintendents of the Demonstration Orchards, as to the results of careful experiments they had carried out, contained helpful information concerning spraying.

Mr. D. Johnson, Forest, Ont., president of the Ontario Fruit Growers' Association, spoke on "Cooperation," and Mr. T.L. Kinney, South Hero, Vt., on "Why I Love the Apple Business." The first address showed that the cooperative societies in Ontario were making great progress. There the growers stuck together and did not allow their societies to become too large. They made large profits for the members and increased their yield of No. 1 apples. A description of how he had gone a step further, cut himself loose from the cooperative societies, and got closer to the consumer by selling to the retailer rather than the wholesaler, and keeping his own travelling man out west to sell his product, created a great deal of interest.

The Jordan Harbor Station

Editor, THE CANADIAN HORTICULTURIST,—Being a former resident of Ontario and of the Niagara District, I was interested in your recent editorial with regard to the Jordan Harbor Station. I have always admired The Horticulturist for the fearless way in which it defends the horticultural interests of the Dominion and the way in which it attacks injustice and inefficiency whenever the opportunity presents itself. Your criticism of the administration of the Jordan Harbor Station, in my opinion, is timely and commendable. The institution has been running long enough to prove its value and has been found wanting.

I have made frequent visits to the station,

and during the first few years I was well pleased with its development, and a great results. Last summer I drove over the farm and had an interesting and illuminating talk with a young man well acquainted with the institution. I was greatly surprised and disappointed at what I saw and heard, for the institution on which I had expected so much, had largely failed. The buildings, orchards and gardens, compared with the prosperous farms of the neighborhood, presented an untidy appearance. Cover crops that were intended to be turned under in the early spring were being ploughed under late in June. Experiments that had been started in previous years had been discontinued, and there seemed to be no well defined program for the future.

It should be understood that this criticism is directed at a condition rather than at any person or persons connected with the institution. I have great personal regard for Mr. P. W. Hodgetts, who at long distance is directing the work of the station, and who has done so much in the interests of horticulture. I agree with you that the lack of efficiency is due largely to the failure of the government to appoint a competent and experienced resident director. The Ontario government in the past has liberally supported the horticultural interests, and it is safe to assume that if the Jordan Harbor Station had produced results it would have been well supplied with funds.

AN EFFICIENT STATION NEEDED

There is a real need for an Experiment Station in the Niagara District. A province so extensive and diversified as Ontario should maintain several such stations for the purpose of studying the peculiar adaptations of the various regions. These local institutions should be more than experiment stations. They should serve the community in various ways. Few farmers are familiar with the latest discoveries in agricultural science, and what is needed more than anything else and what may be aptly maintained in connection with each of these local experiment stations is a sort of demonstration farm where the latest and most approved practices may be exemplified.

Like many other Canadians in this country, I am proud of the progress that has been made throughout Ontario. We hear many flattering remarks about Ontario and her progressive institutions, and only those who are on the outside can fully appreciate her greatness. It is hoped, therefore, that the Ontario Government will act upon your suggestion and endeavor to bring the Jordan Harbor Station up to the standard of the other institutions and make it of value to its constituency and a credit to the province.—Yours very truly,

C. D. JARVIS.
Director of Horticultural Extension and Research,
Connecticut Agricultural College

The Story of the Apple

A farmer picked this apple in his orchard in the west
And put it in a barrel with some others of his best;
Because they were so splendid he declared the price must climb
And so he raised his figure on that barrel by a dime.

The man who bought that barrel stuck a label on the top,
Then told the interviewers of a shortage in the crop;

And when he came to sell it to a buyer on the floor
He added on his profit and a half a dollar more.

The man who shipped that barrel stuck his label on it, too,
And talked of early freezes and the damage that they do;
The man to whom he shipped it said the grower's price was high
And raised the price two dollars more than in the days gone by.

The man who stored that barrel told of shortage in the pick,
Of scale and other pests that make the apple orchards sick.
And he put on five dollars to the cumulative price—
And so it went, each handler taking on his little slice.

O, when you eat this apple, may it fill you with delight
To know that someone profits on each nibble and each bite.
And, O, be glad you do not live so very far away
From where the apple started, for think what you'd have to pay!

—Chicago Evening Post.

This simple, truthful story of the apple from the west,
Comes eastward with a message though it looks to be a jest.
It tells the eastern farmer if he'll grade and pack his primes,
He can safely add the dollars where the western men get "dimes."

—M. E. K.

New Brunswick

The New Brunswick Department of Agriculture has recently attempted a new method of advertising the fruit growing possibilities of that province. A splendid window display of apples grown in the St. John Valley and other parts of New Brunswick was placed on view at 757 St. Catherine Street, West, Montreal, [illegible]

New Brunswick Department of Agriculture had rented a store for that purpose. Twenty-five boxes of McIntosh Reds, Fameuse, and Yellow Bellflcurs were shown in the windows. These were of a size and quality that would not be excelled on Montreal Island, the home of the Fameuse, and where, it is claimed, the McIntosh Red grows to perfection.

In the store proper were a dozen more of boxes of King of Tompkins and Mcnts, while on the counters were display cones and plates of McIntosh and Fameuse.

Mr. R. P. Gorham, assistant horticulturist of New Brunswick, was in charge of the exhibit. He was assisted by Mr J. H. Ross and Mr. Kenneth Embeley, of Macdonald College. Literature descriptive of the fruit growing possibilities of the province was distributed and full information given on orchard planting and management. The exhibit attracted much attention and favorable comment. It opened on December 28, and closed on January 18th.

Fruit growing in New Brunswick has gone ahead rapidly during the last few years. It promises to become one of the chief industries of the province. Nearly sixty thousand apple trees were planted in 1912, and the number of orders already placed for spring delivery indicates that an even larger number will be set in 1913. McIntosh Reds, Fameuse, and Bethel are being most largely planted, as these varieties seem to attain their greatest perfection in New Brunswick and bring the best prices on the market. Land values are reasonable, and farms can be purchased in the fruit sections at from fifteen dollars to forty dollars an acre.

Major Snelgrove's Death

The members of the Ontario Horticultural Association will hear with regret of the death on 22nd December of Major H. J. Snelgrove, formerly of Cobourg, but more recently of Toronto, the former president of the Ontario Horticultural Association, and at the time of his death an honorary director of that organization. Major Snelgrove was for years an active member of the Cobourg Horticultural Society, and was largely instrumental in the formation of the Ontario Horticultural Association, with which he had been actively connected since its inception.

Major Snelgrove was an enthusiastic lover of flowers, and contributed occasionally to The Canadian Horticulturist. He was present throughout at the recent convention of the Ontario Horticultural Association in Toronto, where his friends were disappointed to notice that he did not appear to be looking as robust as usual. The sickness which terminated in his death set in early in December.

Cooperation in Nova Scotia

The United States Consul-General at Halifax has contributed to his government the following information regarding the cooperative movement among Nova Scotia fruit growers:

Three years ago, says a consul, the fruit growers of Nova Scotia found themselves hampered in many ways in disposing of their crop. All shipments to Europe were being made through commission agents, who in turn consigned to merchants in London and Liverpool. In this way expenses in some cases exceeded profits. There was also a lack of system in packing and packing, and consequently the fruit did not have the standing in the

kets it should have had. In order to ov come these difficulties local cooperati associations were organized at three point but these were not altogether successful.

Last year a central association was for ed which included the smaller ones. Th association handled four hundred thous barrels. Later a larger cooperative ce tral organization was formed known as t United Fruit Companies, with capital five thousand dollars in fifty-dollar shar The capital afterwards was raised eleven thousand dollars. Each membe his association must have one share, a no one is allowed to have more than fi shares. The fruit of each member is g thered by himself and after sorting taken to the warehouses of the associ tion, of which there are five. Here t fruit is re-sorted and properly packed und the direct supervision of a general ma ager, the discarded fruit being taken the vinegar factory. For repacking a supervision the grower is charged fi cents a barrel. In this way uniformity pack is secured and the fruit is handl in a wholesale way.

As a still further advantage supplie including fertilizers, are purchased in wholesale way as well. As a result cooperative purchasing the price af barr has been reduced from forty cents twenty-eight cents and thirty cents. La on the association expects to make own barrels. The general manager ceives four thousand dollars a year, out of this he is expected to pay the wa of the men employed in packing. Dur the present season the association handled six hundred thousand barrels.

B.C. Fruit Growers Wide Awa

(*Continued from page 39*)

responsible for the poor prices obtai in 1912. It was the breakdown of the ganization in the United States that hampered the markets. He urged the tablishment of canneries and evapora in every district and the further coperat of the growers, and was confident that considered requests of such a body as Fruit Growers' Association would rec good support from the Government were doing everything in their power help them. He referred in terms of de est sympathy to the death of the l president, Mr. R. H. Agur.

FRUIT INSPECTION

Mr. C. W. Baxter, chief Dominion fr inspector for the prairie provinces, plained the practice of officials of his partment in enforcing the Fruit Ma Act. The following resolution, moved Mr. Thomas Bulman, which had been c ried at a meeting of the directors, then presented:

"That whereas the present method enforcing the Fruit Marks Act seems tirely inadequate, and

"Whereas, owing to the difficulties enforcing the changing of the marks the package after it reaches the consig and

"Whereas it is unfair to our indus and to our shipping and marketing c cerns to allow the present conditions which they are placed to continue exist:

"Therefore, be it resolved, that we spectfully petition the Dominion Gov ment to formulate regulations m kin incumbent on United States shippers comply with our Fruit Marks Act bef their packages will be allowed in Canad

Over this a hot crossfire of ques was directed at Mr. Baxter. In the

he was forced to admit that as matters stand the interpretation of the Act by the Dominion Government does not enforce regulations on United States fruit as strictly as on Canadian produce. The law says that fruit must be marked with its grade at the place of origin, and this the shippers of Canadian fruit have to comply with, but the United States growers are allowed to ship in fruit marked with American grades which are re-marked by the jobbers at the points of distribution in Canada.

Mr. Kidston and other gentlemen made it plain that the Act gives power to insist that all United States fruit must be marked with Canadian grades before it is allowed to cross the boundary and the original marks erased.

Mr. Baxter stated that reputation was far more efficient in selling fruit than grade marks ,and that the standards mentioned in the Act should be regarded as minimum standards and disregarded if a better standard can be reached. He would prefer to see the "fancy" grade done away with, but did not believe it was possible to demand one hundred per cent. perfection in packing on a commercial scale. He would not say that the inspection of all fruit on the boundary line was an impossibility but that it would need an army of inspectors. There was also a difficulty in that the Act talked in one place of "indelible" marks and in another of erasing these.

Mr. R. M. Palmer, the chairman, in putting the vote of thanks to Mr. Baxter for the patience with which he had answered the numerous queries, remarked that after all much of his speech was an apology for the existing state of things. (Laughter.) The resolution was then put and carried unanimously.

A discussion took place over the size of box approved by the Dominion Fruit Conference, but the resolution proposing a change was withdrawn.

REFORMS ADVOCATED

Mr. Garraway, who manages the Okanagan Fruit Union at Vernon, gave statistics showing the enormous output which must be handled within the next few years, when the thirty thousand acres now planted in the province come into full bearing. The estimate is that in 1915, two thousand five hundred carloads of fruit will be shipped that; in 1920 this will be increased to ten thousand carloads. Meantime the output of the United States will probably increase to fifty thousand and one hundred thousand by the same years, unless it is found that their older orchards are diminishing their products, as is the case in the eastern and middle west states.

The disappointment of growers at their returns from the past crop was not unnatural but if they had studied the subject closer would have found no cause for apprehension for the future. With their young orchards, they had done as well as growers with fully matured trees. There was need for cheaper rates of transportation for perishable fruits but the wholesalers, in his opinion, had not been getting an undue proportion of the profits on the peaches, or, in fact, on the fruit as a whole. He believed that it was the retailer they must look for, and that they must educate the consumer to realize this. The press could do a great deal towards this by publishing daily the wholesale and retail prices in each centre.

To improve conditions, growers must co-operate, and, in formulating any plans to this end, they could save much time and money from a study of what was being

done along those lines by the Americans, who had been buying their experience for years and paying dearly for it. Their organization had broken down last year, but they were at work already on perfecting it; and British Columbia must lose no time in putting machinery in motion to procure equally efficient organization against the time when the Americans would have perfected theirs. The enormous output he had already referred to as coming would make it all the more necessary.

Storage and cold storage were things they must have as soon as possible, and he believed the same plant could be used for pre-cooling peaches and prunes in their season. In fact, he hoped that with the proper plant it might even be possible to obtain advances on fruit in cold storage as the wheat grower did on his grain in the elevators. He considered more attention should be paid to marketing each fruit at its due season and educating the consumer as to when to ask for it; also to the varieties they planted. The day of twenty-six varieties to one carload was over. But now that twenty-three per cent. of the Okanagan orchards were planted in Jonathans, there would be all the greater need of careful and scientific methods of marketing and distribution.

MARKETING PROBLEMS

Mr. E. H. Shepard ,Editor of "Better Fruit," published in Oregon, spoke on "The Marketing Problems of the North-western States." He laid stress on the utilization of the by-products of the orchard by means of canneries, evaporators, and vinegar factories, but he warned those present that to start any of these industries it was necessary to obtain the help of the most experienced men in the world both to handle and manufacture and market the produce.

Questioned as to the possibility of eliminating the jobber, he considered this would never be possible, but with regard to excessive profits made by retailers he advocated educating the public by a campaign through the press, and quoted several instances where public opinion, once raised, had speedily settled such questions in its own favor. Too many profits were made on many articles of produce before they reached the consumer. Cooperation first of local units and then of the whole province, must be the aim, but whether the time was ripe for a central organization and distributing centre in British Columbia he was not prepared to say. Strict legal contracts between individuals and each local organization were absolutely necessary.

RESOLUTIONS ADOPTED

Among the resolutions adopted were the following:

"Be it resolved that this board urge the Dominion Government to enact such legislation as will exclude deciduous fruit, such as apples, pears, crab apples, quinces, peaches, apricots and plums, from being imported into this province from countries, states and provinces known to be infected with injurious insect pests and diseases not widely prevalent or distributed within or throughout the province of British Columbia."

"That the Government be requested to afford facilities for lending money at a low rate of interest to farmers and settlers for the purpose of clearing land for agricultural and horticultural purposes."

"That the time has arrived when express fruit trains or cars attached to express trains ,should be run for the rapid handling of perishable fruit."

"That the C.P.R. and Dominion Express Co. be urged to provide proper warehouses to protect fruit handed to them for conveyance. Much fruit is now left in the open both upon receipt, transfer and delivery."

"That the Provincial Government and the C.P.R. be and are hereby urged to have pre-cooling plants established throughout British Columbia."

TARIFF CHANGE PROPOSED

"That the tariff on United States fruit entering Canada should be at least as high as the United States tariff on fruit grown in Canada exported to the United States." This had regard to the fact that, whereas the duty on Canadian apples entering the United States is 25 cents a box, that on American apples coming into Canada is only 13 cents.

"Whereas application has been made by shippers from the United States for the privilege of partial unloading in transit of carloads of fruit, and whereas such privilege, if granted, would on many grounds tend to kill the British Columbia berry-growing industry, this convention most emphatically protests against such privilege being granted, and suggests that copies of this resolution be forwarded to the Dominion Express Company and other parties interested."

"Whereas, shipments of fruit on consignment from the United States to points in Canada have had a very disastrous effect on our market, and whereas, the present anti-dumping clause of the tariff regulations is not effectual in preventing the consigning of fruit, therefore be it resolved that efforts should be made to stop the dumping of United States fruit into the Canadian markets and that the Dominion Government be urged to so amend the Act and regulations as to effectually penalize shipments of fruit being made on consignment in Canada."

OTHER RESOLUTIONS

Among other resolutions passed were the following: One asking for an annual grant of two hundred and fifty dollars for the provincial entomological society; one asking for a change in a provincial law which would make it possible for cooperative fruit growers' associations to obtain financial assistance from the Government similar to that now given to storage warehouses; and one advocating the early completion of a telephone system between agricultural districts on the Mainland to obviate one of the chief obstacles to efficient cooperation among fruit growers.

The delegates re-elected the executive and the directors en bloc, with only four exceptions, where resignations had been sent in.

Ontario Orchard Competiti

P. W. Hodgetts, Director of Horticulture, T

The awards in the orchard compe in Ontario for 1912, are given here The judging in all districts, except ber three, was in the hands of W. F. of the Department of Agriculture, as by W. L. Hamilton, of Collingwood, lie Smith, of Wellington, and Henry mer, of Alliston. The judging in nu three, the Niagara District, was do F. M. Clement, of Macdonald Co Quebec.

In a number of the classes all o prizes were not awarded. The judg that in these cases they had good gr for withholding the money. In too instances the poor pruning alone wa ficient to bar an orchard from win Again, there were a number of exc young orchards entered that could n considered to be in bearing, as calle by the conditions of the compet Leaving this point out of the score, a ber of these would have been placed h than some of the prize winners.

Altogether the competition was ke all of the districts, except possibly t land counties included in district nu six and those in district number one, Ottawa Valley, where fruit growing in its early stages. Ninety-nine orc were entered in the six districts. number would have been much larger announcement of the competition have been made earlier in the season. funds for the work were drawn fro Federal grant to Ontario agriculture were not available until well on int summer.

THE AWARDS

DISTRICT No. 1.—Eastern O District, comprising Lennox, Addi Frontenac, Renfrew, Leeds, Lanark, ville, Carleton, Dundas, Russell, Stor Glengarry, Prescott:

120 trees up: 2nd, Andrew Fawce kerman; 3rd, G. Howard Ferguson, K ville.

60 to 120 trees: 2nd, Elary S. C man, Dundela; 3rd, L. A. Parisien, merstown.

DISTRICT No. 2.—Lake Ontario trict, comprising Halton, Peel, York tario, Durham, Northumberland, Has Prince Edward.

300 trees up: 1st, W. H. Gibson, castle; 2nd, John Brown, Brighton; D. G. Gibson, Newcastle.

120 to 300 trees: 1st W. F. Rickard, castle.

40 to 120 trees: 1st, Jonas Samis, castle.

DISTRICT No. 3.—Niagara Di comprising Lincoln and Wentworth.

1,000 trees up: 1st, Wm. Arms Queenston; 2nd, Hamilton Fleming, G by; 3rd, J. W. Bre nan, Vineland.

500 to 1,000 trees: 1st, J. Parnal Catharines; 2nd, James Aikins, Ni on-the-Lake; 3rd, Thos. E. Ba Beamsville.

300 to 500 trees: 1st, Harper Secor Catharines.

DISTRICT No. 4.—Lake Erie Di comprising Essex, Kent, Elgin, No Haldimand, Welland, Brant, Oxford, dlesex.

300 trees up: 1st, J. E. Johnson, Si 2nd, J. B. Waddle, Simcoe; 3rd, Pierce, New Sarum.

120 to 300 trees: 1st, Frank D. Ba Glanworth; 2nd, Walter E. Palmer, M ville; 3rd, Wm. H. Prudham, Fla Centre.

40 to 120 trees: 1st, Albert E. We... brook, Oakland; 2nd, Wm. Dickie, B... ford; 3rd, R. R. Davis, Burnaby.

DISTRICT No. 5. — Lake Huron ... Georgian Bay Districts, comprising Le... ton, Huron, Bruce, Grey, Simcoe.

300 trees up: 1st, K. Cameron, Lucknow; 2nd, A. J. Clark, Ravenswood; 3rd, M... Gregor & Pritchard, Walkerton.

120 to 300 trees: 1st, S. J. Hogarth, E... ter; 2nd, A. Brown, Owen Sound; 3rd, M... Arthur, Owen Sound.

40 to 120 trees: 2nd, Jos. Orchard M... nesing; 3rd, J. Rushton, Port Elgin.

DISTRICT No. 6.—Centre Ontario D... trict, comprising Victoria, Peterborough, Dufferin, Waterloo, Wellington, Perth, M... koka and Parry Sound.

120 trees up: 2nd, N. H. Black, Rod... wood.

30 to 60 trees: 1st, E. B. Hall... Petersburg.

Town Planning and Civic Improvement

A Provincial Town Planning and C... Improvement Association was formed ... cently in Ontario at a convention of rep... sentatives of municipalities called by ... citizens of Berlin, Ont., to discuss ... planning and civic improvement ... comprehensive lines. The leading to... and cities of Ontario were well repres... ed, including a large attendance of ... leading citizens of Berlin.

The provincial committee is to co... of the following ten members: J. P. J... ray, Galt, chairman; W. B. Burgoyne, ... Catharines; James P. O'Brien, Fred ... Riggs, Toronto; H. F. Holland, Sar... H. L. Hutton, Welland; A. B. Prin... Preston; C. H. Mueller, Waterloo; M... W. H. Schmalz, D. B. Detweiler, and ... J. Bowman, Berlin.

Mr. G. H. Mitchell, C.E., of Toro... Vice-President of the Toronto City G... delivered an illustrated address sho... views of leading European and U... States cities and small towns where ... planning and civic improvement have ...

most successful . In Mr. Mitchell's opinion the time has arrived in Canada for national and provincial effort, and for concerted civic activity in each community, to provide for wide and continuous business thoroughfares, convenient grouping of public buildings, rapid transit, adequate street traffic circulation, parks and squares, parkways and boulevards, children's playgrounds and gardens, clean and attractive streets, pure water supply, and efficient sewage disposal, enforcement of laws for structural building and fire safety and for tenement regulation.

The following suggestions were made by Mr. Mitchell to be embodied ultimately in legislation:

Provision for civic Improvement Commissions in smaller cities; provision applicable to cities smaller than already provided for in the Ontario Act for purchase by municipalities of land required for opening streets themselves, but for an adequate margin on each side, which, after the opening has been completed, can be resold as lots, thus producing a revenue to help meet the cost of the improvement; provision for municipalities to secure streets wider than sixty-six feet in new sub-divisions when necessary to conform to the town-planning scheme; a practical method for any necessary widening of business streets already built up; an adequate control over new sub-divisions so that the layout will conform to modern requirements and so that misrepresentation cannot be practised; provision for control by the municipality, through the Ontario Railway and Municipal Board, of the layout and street-planning features of sub-divisions outside city and town limits for a stated distance.

At a meeting of the Toronto Branch of the Ontario Vegetable Growers' Association held recently, Mr. A. H. MacLellan, of the Guelph Agricultural College, stated that the sterilizing of soil intended for the growing of lettuce, tomatoes and cucumbers, results in better production and lessens loss from disease and worms in the soil.

Cooperation Commended*

R. Brodie, Westmount, Quebec

Cooperation is no new thing among farmers. Europe for years has been far ahead of us on this side of the Atlantic. Our neighbors in the State of New York have also awakened to the importance of this matter, and Mr. John Dillon, Chairman of the New York State Committee on Co-operation, is now in Europe making a study of farming cooperation and market conditions.

Two years ago at our Winter Meeting at St. Hyacinthe we brought this matter of Cooperation before our Society for the first time. It met with a good deal of opposition from some of our members, but in spite of this, under the auspices of our Provincial Government we have five Co-operative Associations formed throughout our Province. In connection with these Associations we have five demonstration orchards that will convince the people of

*Extract from a paper read before the annual convention of the Quebec Fruit Growers' Association.

these districts that pruning, cultivation and spraying are necessary to produce healthy trees, and good first-class fruit. All these Associations in our Province are in their infancy and have a lot to learn.

Competition may be the life of trade, but more often it is the death of somebody's business. On the other hand Cooperation is the life of a community. Some city people say that the Associations will make the cost of living higher. I don't think so. They will get better goods and more value for their money. There is too great a difference between what the farmer receives and what the consumer in the city has to pay for farm products.

This is an age of progress. We have left behind to a large extent the use of the sickle, scythe, and flail. I would like to bring before you a few primary needs in which farmers could cooperate to advantage. Neighbors could cooperate in de-

stroying insect pests and noxious weeds. What avails it if one farmer keeps his land clean and his neighbor leaves his dirty with weeds and a breeding place for insects. I am strongly in favor of compulsory spraying, for what is worth planting is worth caring for.

A great many of our farm implements are very expensive, and in many cases used only for a day or two and then put away for another year. What a saving it would be if growers would cooperate in their purchase and use. I refer especially to power sprayers, ditching machines, and even in manure spreaders, potato planters, and potato diggers. Cooperative associations should assist in their purchase.

A Word for House Sparrows

R. Walter Brooks, Brantford

The common house sparrow has been condemned as being a dirty, useless, mischievous bird that is not insectiverous. I wish to defend him, as I have been taking observations for some time, having had several sparrows nest in the cornice of my barn.

A few years ago we could not raise any grapes owing to the ravages of the steel bug. Now I have not seen one for three or four years. Last year I saw a sparrow catch a yellow (cabbage) butterfly, take it to the ground, pull off both wings, pick up the body, and fly away. Another day I saw a sparrow with what I took to be a large Empress Moth. I tried to get closer to it, but it flew away.

I also saw several sparrows catch June bugs and eat them. Last summer, while sitting on my lawn, I noticed some sparrows flying and catching something. Upon making investigation, I found a nest of flying ants, which were flying straight up into the air. The sparrows were waiting for them, and catching every one. A worm also has been ravaging the Boston Ivy. I have seen the sparrows catch them. Now I cannot find one. The wasp (Yellow Jacket) is also a despised insect. I saw one attack a green cabbage worm, eat part of it, and fly away with the remainder.

Items of Interest

The Toronto Nurseries, at 1167 Queen St. East, Toronto, is conducted by Mr. J. McP. Ross, the well-known contributor of articles to THE CANADIAN HORTICULTURIST. Mr. Ross's many years of experience in the nursery business should ensure good results for the customers of this firm.

The Farmers' Club at Rednorville, Prince Edward County, Ontario, recently went on record to the effect that it did not consider the Dominion Government was exercising sufficient care in the selection of fruit inspectors competent to judge of the proper packing of fruit. The club advocates growers grouping themselves in sufficient numbers to be able to furnish buyers with several carloads of goods packed ready for shipment.

Parks Commissioner Chambers, of Toronto, recently outlined at the annual meeting of the Toronto Civic Guild an immense boulevard system extending for forty-five miles along the outer edge of greater Toronto, and involving an expenditure of $7,000,000, the plans for which have been prepared. When completed it will be one of the finest on the continent. The lighting system will be a feature of these boulevards, which will link up the city's parks.