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The Canadian Horticulturist

MAY, 1907

Volume 30, No. 5

TORONTO

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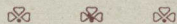
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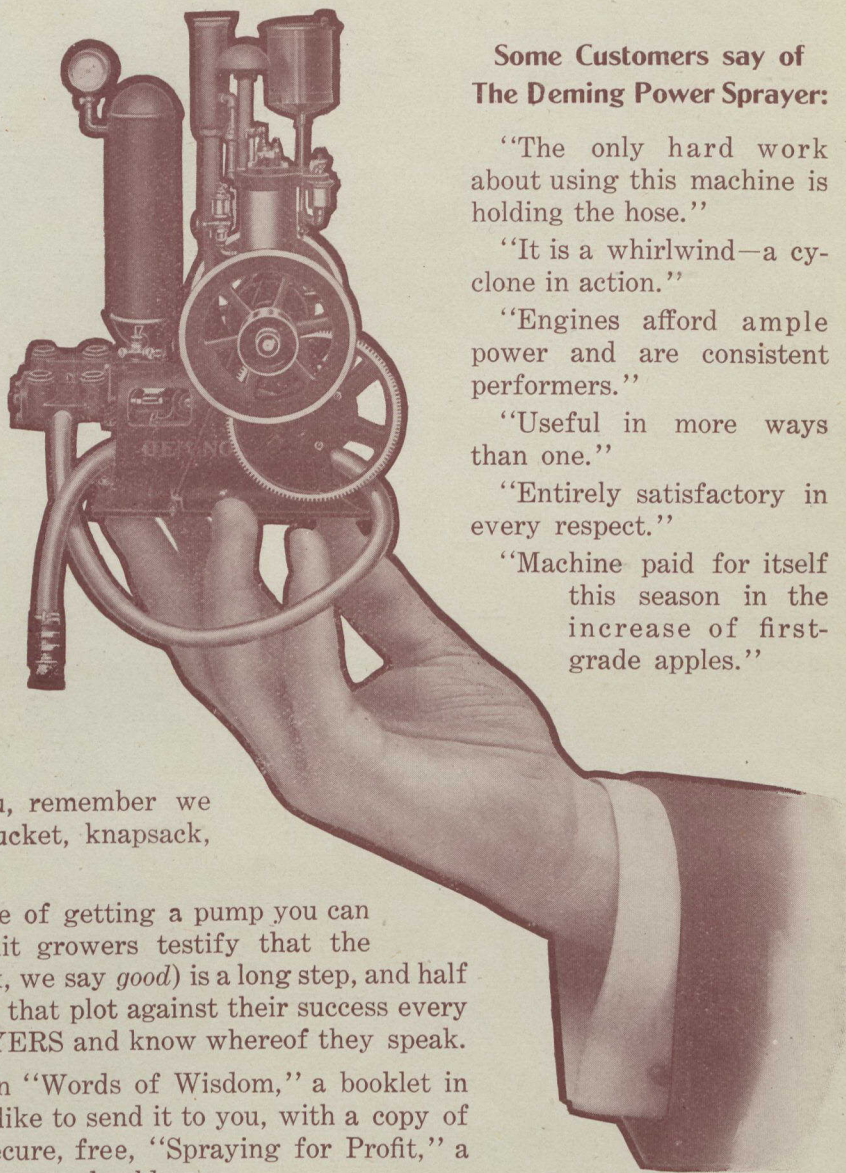
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THE CANADIAN HORTICULTURIST

Rooms 506-7-8 Manning Chambers, Toronto, Ontario

The Canadian Horticulturist

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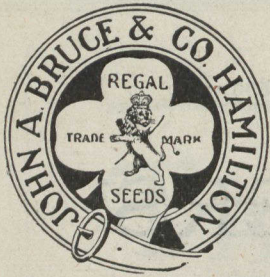
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D. M. STEWART,
General Manager

Toronto, 30th March, 1907

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The Canadian Horticulturist

Vol. XXX

MAY, 1907

No. 5

Improving and Originating Varieties of Apples

B. S. Pickett, Plant Breeder, Champaign, Illinois

SO much has been written of late regarding the need for improved varieties of almost every sort of cultivated plant that it will be unnecessary to devote any space at this time to a discussion of this phase of the subject. THE CANADIAN HORTICULTURIST has itself frequently urged the need for better sorts of orchard and garden fruits, and growers everywhere are constantly on the lookout for kinds better adapted to their particular conditions. I shall, therefore, proceed at once to a discussion of the control of the factors which make for improvement in varieties of apples.

The control of the varied agencies employed by the originator of improved races and varieties requires, first, an intimate knowledge of their nature, and, second, ability and method in their application. The first of these is by no means fully understood. The most learned men in botanical science are still struggling with the problems of variation and hereditary transmission of acquired characteristics, and so forth; and, until these secrets of plant life are actually laid bare, an absolutely definite system of breeding is not possible. But with regard to improved methods of applying such truths as we do know to the problems of breeding, much may be said of an exceedingly practical nature.

Method implies definiteness of purpose. Modern plant breeding is very largely characterized by definiteness of purpose, idealism in effect, for in no branch of art or science are ideals and unswerving adherence to them of greater importance in the attainment of success than in the improvement of plants. Methods depend upon purposes. The ideal in mind will decide the varieties to be used, the line of experiment and the standard by which the new productions will be tested.

The purpose of improving varieties of apples, summed up as briefly as possible, is to produce plants that are more *efficient* for specific uses and specific localities. Efficiency ideals may be thought of under the following headings: (1) yield ideals, (2) quality ideals, (3) seasonal ideals, (4) physical con-

formation ideals, (5) regional adaptation ideals (as to climate, soil, altitude, etc.), and (6) resistant ideals (as to insects and diseases). (Bailey, Proc. American Philosophical Society, Vol. 43, (1903), pp. 62-68.) The attainment of each of these ideals may require different methods of procedure. Each may under certain circumstances, assume paramount importance, or several of them may need to be considered in the course of one experiment. Moreover the breeder should endeavor to see that his ideals lie within the possible variability of the race, a matter which may

Meets the Needs

I have observed with pleasure the many improvements in THE CANADIAN HORTICULTURIST during the past two years. It comes nearer to meeting the needs of the fruit grower and gardener than any other publication in America. May it continue to prosper.—C. D. Jarvis, B.S.A., Storrs Agricultural Experiment Station, Storrs, Connecticut.

of course, be difficult to judge accurately without definite experimental evidence. A very complete acquaintance with his varieties and species will, however, help the worker to mold his ideals correctly and save efforts which otherwise might be wasted in attempts to accomplish the impossible.

The writer knows of no new or magical principles in the improvement and origination of varieties of apples. Selection of natural variations, whether they be small or great (fluctuating variations or mutations), crossing and individuality of the plants themselves are the bases of the art. Orchardists generally have shrunk from attempts to develop tree fruits because of the time and room required to test seedlings. But a moment's consideration will show that the testing of seedlings on a large scale is an infinitely smaller problem than the solving of transit refrigeration for fruits, the control of insects and plant diseases

or the development, even, of power spraying, all of which are matters that the apple grower has attacked fearlessly and confidently. Success depended simply on the perfection of the methods applied in each particular instance. So, too, will the production of improved varieties of apples be made successful through the perfection of the methods applied.

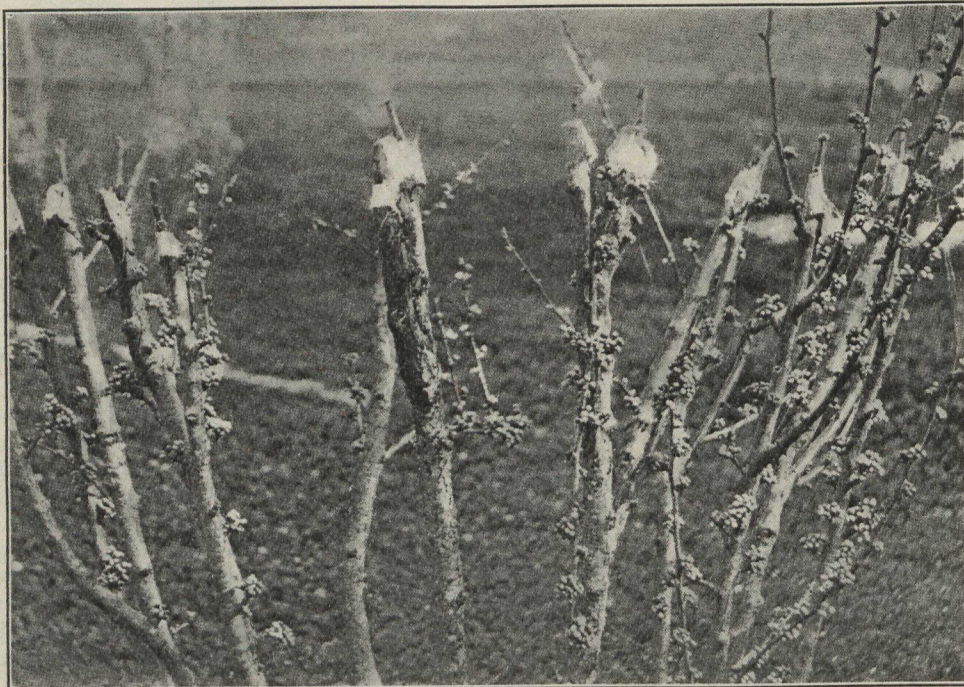
It is manifestly impossible in an article of this kind to give detailed suggestions or directions for the conduction of experiments designed to originate new varieties to meet any considerable number of ideals. Hence, I shall take one example and supplement it with suggestions of a general nature for other lines of experiment.

The apple breeder is presumed to have supplied himself with the necessary collection of varieties, either on the premises where the experiments are to be conducted or within easy reach, and to have at his disposal a large number of orchards from which scions can be selected. In accordance with the principles already laid down, he outlines the ideal variety which he wishes to produce. To take an actual case, perhaps the most frequently expressed ideal of the American commercial apple orchardist is this, an apple of the size, color, hardness, productiveness, keeping and shipping qualities of Ben Davis or Baldwin, together with the flavor and dessert quality of Northern Spy, Spitzenburg or Fameuse. The tabulation on next page shows the breeder's outline. Each point referred to is given a certain valuation which represents the breeder's ideal in that regard; and by this standard, actually a score card in practice, his selections and crosses will be judged as they come into bearing.

It will be noted that this score card takes into account a great many of the characters desirable in apples. I have endeavored to have it cover all the points of *functional* importance, that is the points representing the *performance* of tree and the *value* of its fruit, and those only. This is immediately apparent in every instance under the heading, "Tree," except possibly the one defined as "Habit of growth."

Straightness of trunk is desirable for convenience in cultivation, and cleanliness of trunk because it affords no shelter for insects. A dense branching habit prevents the free entrance of sunlight, is inconvenient in harvesting and adds to the expense of pruning.

cause orchard trees are planted at regular distances apart. In scoring the fruit, stress is laid on form, size and color because these are very important in packing, grading and marketing, representing, as they do, true money value; but it will be noted that the



Upper Part of a Tree Bearing Many Grafts

This illustrates how the fruiting of seedlings is hastened

Low trees are desirable in picking the fruit and in spraying, and an upright branching habit because drooping branches interfere with cultivation. Symmetrical heads are convenient be-

cause orchard trees are planted at regular distances apart. In scoring the fruit, stress is laid on form, size and color because these are very important in packing, grading and marketing, representing, as they do, true money value; but it will be noted that the

Plant Breeder's Score Card

APPLE (Ideal, No. 1)		Points	Score of
Purpose—Winter, dessert, market.		Perfection	Seedling
Plant			
Rootage—Vigorous, resistant to rot and aphids, deep.....		25	.....
Habit of growth—(a) Trunk, straight, strong, clean.....		8	.....
(b) Branches, moderately numerous only, not willowy....		8	.....
(c) Form, low rather than high, but not drooping, head open, symmetrical.....		9	.....
Foliage—Plentiful, large, free from disease, dark green.....		25	.....
Blossoms—Self-fertile; blooming late.....		25	.....
Hardiness of tree as to climate....		15	.....
Earliness of bearing.....		25	.....
Productiveness—(Taking Ben Davis or Baldwin as standard).....		60	.....
Total.....		200	.....

Fruit

Form—Regular, round or roundish-oblately, with regular cavity and basin, calyx closed.....	20	.....
Size—Should average 2 3/4 inches horizontally and 2 1/4 vertically..	20	.....
Color—Handsome, almost covered with rich red on golden yellow ground.....	30	.....
Freedom from disease or blemishes.	20	.....
Uniformity in size (not over 10% below 2 1/2 inches).....	20	.....
Quality—(a) Dessert, say equal to Spy or Spitzenburg.....	40	.....
(b) Shipping, carrying well without bruising or slacking, skin not tender.....	25	.....
(c) Keeping, natural season January to 1st April, cold storage till June.....	25	.....
Total.....	200	.....
Total for tree and fruit.....	400	.....

(To be Continued.)

Poisoned Bordeaux Mixture the Summer Spray

T. B. Revett, Department of Agriculture, Toronto

IF the fruit grower means to make any profit from his apples, and to produce a clean crop, he must spray. He must use poisoned Bordeaux mixture and it must be applied at the proper time. As soon as ground is dry enough, and before the buds are out, go through the orchard and spray it thoroughly with copper sulphate—the proportion of which should be four pounds of copper sulphate to 40 gallons of water. This mixture is the most important in the treatment of the apple scab, and should, in no case, be omitted.

The poisoned Bordeaux mixture is so called because poison is added to the Bordeaux to kill the biting insects. The Bordeaux itself affects the scab. The formula of this mixture is four pounds of copper sulphate, five pounds of good, unslaked lime and five ounces of Paris green to 40 gallons of water.

MAKING BORDEAUX MIXTURE

To prepare the mixture, dissolve the sulphate with boiling water and dilute

to about 20 gallons. Then slake the lime gradually. Be careful not to drown the lime by adding too much water while slaking. If hot water is used, slaking will be done more easily and thoroughly. When lime is slaked, dilute to about 15 gallons and pour it into the copper sulphate solution and mix properly. Measure five ounces of Paris green, mix to a paste with a little water, and when the paste is properly made, dilute with water enough to enable it to pour. Fill the spraying tank with the copper and lime solution, agitate well, then pour in the Paris green.

Test the mixture by taking a little of it in a cup and dropping one or two drops of potassium ferrocyanide into it. If the mixture does not change color it is all right; but, should a reddish color appear, the copper sulphate has not been neutralized, not enough lime has been used, and the mixture, if applied in that state, will injure the foliage by burning.

To avert this, more lime must be put in until the test is satisfied.

The average grower cannot afford to use anything but Paris green to poison his mixture. The only objection to it is that it is very insoluble and settles rapidly. Therefore, continuous agitation is necessary.

A poison that gives good results is lead arsenate. It is harder to mix, but is more soluble than Paris green and stays in suspension longer. It has to be used in larger quantities, four pounds in a 40 gallon mixture, and it is more expensive. One application is sufficient.

Spray just when buds are opening, to kill bud moths and cigar case borers. The second application should be given as soon as the petals fall and while the young apple is upright. This spraying is of special value in combatting the codling moths. The third spraying should be applied when the apples are the size of a five cent piece. This spraying is chiefly for scab and leaf-eating insects.

New Forms of Kerosene Emulsion

Frank T. Shutt, M.A., Chemist, Dominion Experimental Farms

IN an investigation carried on about a year and half ago, to ascertain the emulsifying effect of certain materials (more particularly lime, as advocated by Professor Close) in the preparation of kerosene emulsion, it occurred to the writer that flour might answer for this purpose of holding coal oil in suspension. Experiments proved this to be the case, a very satisfactory emulsion for immediate use resulting. Eight ounces of flour were found sufficient to hold in perfect suspension one quart of coal oil. The emulsion is simply and easily made as follows:

The requisite amount of coal oil (kerosene) is poured into the pail or barrel, and flour added in the proportion of eight ounces to one quart of coal oil, the mass thoroughly stirred and the water added—two gallons for every quart of coal oil. The whole is then vigorously churned, say, for five minutes, by means of a pump and coarse nozzle or a wooden paddle or dasher, as used in upright churns, and the emulsion is ready for use. The spray is smooth, easily atomized and does not clog the nozzle.

During the last few weeks, this investigation, at the suggestion and with the assistance of Mr. Macoun, has been extended to the preparation, with flour, of certain sprays that might prove useful both as insecticides and fungicides—winter washes to be employed on dormant wood only and sprays that would combine the properties of Bordeaux mixture and kerosene emulsion for summer use. The following notes give, briefly, information regarding the emulsions which it has been thought might be serviceable to the fruit grower:

Winter Washes

"A" BLUESTONE, 1%

Bluestone.....	4 pounds
Flour.....	8 "
Kerosene.....	4 gallons
Water.....	36 "

Mix the flour with the kerosene, as before described, the bluestone being dissolved in the water. Pour about one-half of the solution (the exact quantity is a matter of no moment) on to the kerosene-flour mixture and churn for five minutes. Pour in the remainder of the bluestone solution, stir, and the emulsion is ready for use. On standing, this spray separates into two layers, which, however, are readily re-mixed by stirring. Free oil does not appear, if the churning has been efficient, for at least 20 hours.

"B" CAUSTIC SODA 2%, KEROSENE 10%

Caustic soda.....	8 pounds
Flour.....	8 "
Kerosene.....	4 gallons
Water.....	36 "

"D" CAUSTIC SODA 2%, KEROSENE 5%	
Caustic soda.....	8 pounds
Flour.....	8 "
Kerosene.....	2 gallons
Water.....	38 "
"E" CAUSTIC SODA 1%, KEROSENE 5%	
Caustic soda.....	4 pounds
Flour.....	4 "
Kerosene.....	2 gallons
Water.....	38 "

It will be noticed that these three emulsions contain the same ingredients, but differ in strength; that is, in proportion to caustic soda and kerosene. The preparation is alike in all. The flour and the kerosene being mixed in the desired proportion, the solution of

a viscous fluid which is eminently adapted for holding the coal oil in suspension.

Summer Sprays

"H" BORDEAUX AND KEROSENE

Bluestone.....	4 pounds
Lime.....	4 "
Kerosene.....	4 gallons
Water.....	36 "

This is the usual Bordeaux mixture, plus 10% kerosene. It is best made as follows: To the freshly slaked lime add one-half the total volume of water and pour in the requisite amount of coal oil, emulsify for five minutes, then pour in the remainder of the water, in which the bluestone has been dissolved, and stir



Do not Spray when Trees are in Bloom—it is against Nature and the Law

the caustic soda (lye) is poured on and the whole churned for five minutes. They are all remarkably stable, no free oil appearing after standing for four days, save traces in the case of "E," which contained but four pounds flour for 40 gallons in this emulsion. The stability or permanence of these emulsions is undoubtedly due to the action of the caustic soda on the flour, making

well for one minute. Though on standing a thick, creamy layer forms, there is no separation of oil for at least 24 hours, and simple stirring is all that is necessary within a few days of making to bring about a perfect mixture.

"K" BORDEAUX, FLOUR AND KEROSENE

Bluestone.....	4 pounds
Lime.....	4 "
Flour.....	4 "

Kerosene..... 4 gallons
Water.....36 "

This, it will be observed, is the Bordeaux-kerosene emulsion just described, plus flour. To the diluted slaked lime, the kerosene containing the flour is added and the whole emulsified for five minutes; the solution of bluestone (ap-

proximately one-half of the total volume) is then poured in and the whole well stirred. This is a particularly stable emulsion, no free oil showing after five weeks. The thick layer that had separated at the end of this period, and which contained the oil, readily mixed again, forming a perfect emulsion. As

a spray furnishing at once Bordeaux mixture and coal oil—a combined fungicide and insecticide—one simply made and of excellent keeping quality, this formula gives great promise. From the standpoint of preparation and the laboratory tests it leaves nothing to be desired.

Destroying Aphis with Flour-Kerosene Emulsion

W. T. Macoun, Horticulturist, Central Experimental Farm, Ottawa

IT having been discovered and demonstrated at the Central Experimental Farm that kerosene emulsion could be made with flour instead of soap for holding the kerosene in suspension, this form of emulsion was used successfully in a practical way in 1905 and 1906. As the emulsion made in this way is much easier to make than with soap, it was desirable to learn what percentage of oil was necessary to kill the aphis, as soap, in addition to its value in holding the kerosene in emulsion, is an insecticide itself and without it more kerosene might be required. The following percentages of kerosene were, therefore, used on July

With 11% kerosene: Practically all aphis destroyed.

In the kerosene emulsion made with soap scarcely seven per cent. kerosene is recommended. There was no injury to the foliage of the trees in any case. Apple trees in nursery were sprayed on July 12, with very good results, the insects being nearly all killed. Plum trees were sprayed July 12, with 11 per cent. kerosene emulsion. Many aphis were killed without apparent injury to the trees.

Experiments had been conducted in the chemical laboratories with Mr. Frank T. Shutt, chemist, who discovered the

pieces of wood crosswise to one end of a pole, the other end being used as a handle. A piece of sacking with a hole in the centre for the pole to go through, held in place on the barrel by a hoop, prevented the emulsion from splashing out of the barrel.

To make an emulsion having approximately 11 per cent. of kerosene (or to be exact 11-9 per cent.), it was necessary to have five gallons of oil to 40 gallons of water.

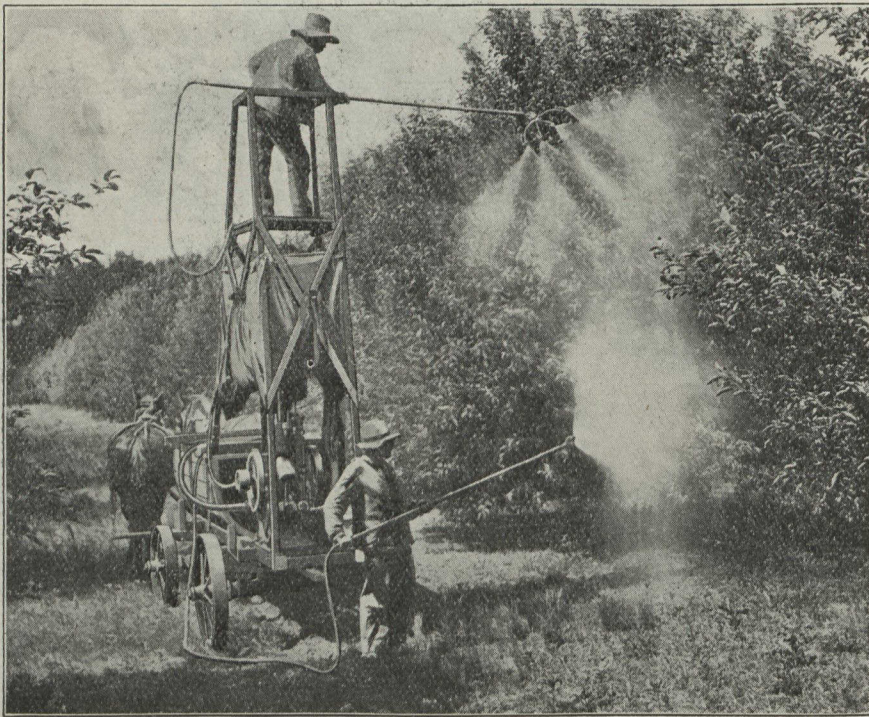
From these experiments it was clearly demonstrated that a satisfactory emulsion containing approximately 11 per cent. of kerosene could be made by using only five pounds of flour to the barrel, in other words only five pounds of flour are necessary, when an emulsion is formed, to hold in suspension five gallons of kerosene for two hours. A poor grade of flour answers the purpose well. The cost of one barrel of emulsion would thus be five pounds flour at \$1.75 per 100 pounds, 8 $\frac{3}{4}$ cents; five gallons kerosene at 16 cents, 80 cents; total, 88 $\frac{3}{4}$ cents.

When the emulsion is not to be used at once or within two hours, twice the quantity of flour should be used with which quantity the oil will not separate in 12 hours and more.

FORMULA FOR APHIS

The formula recommended for kerosene emulsion made with flour for destroying aphis on apple and plum trees is five pounds of flour (or 10 pounds, if emulsion is not used within two hours), five gallons of kerosene, and 40 gallons of water. Pour the kerosene in the barrel, put in the flour and stir thoroughly, then pour in 20 gallons of water and churn violently for from four to five minutes; now add remainder of water and the emulsion is ready for use.

Experiments were tried recently in conjunction with Mr. Frank T. Shutt, chemist, to determine if a satisfactory Bordeaux mixture and kerosene emulsion could be made which could be mixed together and sprayed on the trees at the same time. The results of these experiments are given by Mr. Shutt in an article written by him. One of the mixtures appears so satisfactory that it will be given a trial in the orchards at the Central Experimental Farm this year. The mixture is made by churning



Spraying Large Trees with a Deming Spray Pump

16, 1906, in spraying apple trees badly infested with aphis.

Percentages used — approximately: six per cent.; seven and a half per cent.; nine per cent.; 11 per cent. The following notes were made:

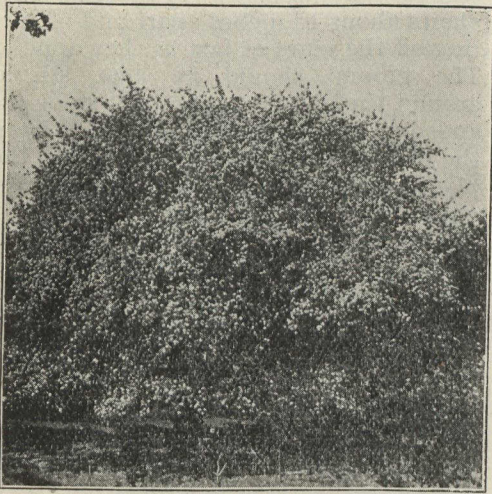
KEROSENE EMULSION

With 6% kerosene: Aphis not affected.
With 7 $\frac{1}{2}$ % kerosene: Aphis not affected.
With 9% kerosene: Not so effective as 11%, but most of the aphis destroyed.

value of flour in making kerosene emulsion, to determine the weight of flour necessary to hold in suspension certain quantities of kerosene. Experiments had also been tried in different methods of preparing the emulsion and the amount of churning necessary. This work being done with small quantities, it remained to determine the best method when made by the barrel.

A dasher was made by nailing two

the kerosene with Bordeaux mixture, flour being added before churning at the rate of four ounces to each quart of kerosene which has been used. It will be necessary in preparing by the barrel to do the churning with about half the necessary amount of water in order that the mixture will not splash over, adding the requisite amount of water afterwards. This kerosene emulsion and Bordeaux mixture made in small quantities has



A Patriarchal Apple Tree

This splendid apple tree, shown as photographed when in bloom, stands on the property of Mr. George Head, of Oakville, Ont., and is reported to be 70 years old. The trunk, two feet from the ground, measures nine feet four inches around. The branches spread fifty-nine feet six inches. It appears to be of the Blenheim Orange variety. According to Mr. D. Robertson, of Oakville, who has known the tree for many years, it has never had any proper care, not even the suckers having been cut. Fifty years ago it yielded 26 barrels of apples, including 19 barrels of XXX fruit, and more might have been picked.

remained for five weeks without any appreciable separation of kerosene. The mixture is a smooth one and after standing mixes readily again. While this has not been tested sufficiently to recommend unreservedly it gives promise of being a very desirable combination.

Handy Devices

A simple but effective method of cleaning a vineyard of the trimmings and other rubbish which they contain in the spring of the year has been adopted by Mr. Murray Pettit, of Winona, as well as by several other leading fruit growers in that section. A pole about 16 feet long and three to three and a half inches in diameter is used. About six feet from one end of the pole is a clevice, to which a chain is attached. The chain is about 12 feet long and connects with a whiffletree so that a horse may be used to pull the pole. The end of the pole near the horse is so cut on one side that it will run along the ground readily. When the orchard is being cleaned, the driver holds one end of the pole up from the ground, while the end near the horse runs along the ground picking up the canes and rubbish as it goes along. In

this way, the rubbish is carried to the ends of the vineyards where it is dumped in piles, and later burned or carted away, as the case may be.

FOR THE FRUIT ORCHARD

For cleaning the orchard, after the trees have been pruned, two poles are used instead of one. The poles are fastened together by a heavy piece of iron about two and a half feet long. The man operating these poles, holds the ends in the same way he would the handle of a plow. The two ends of the pole on the ground sweep up the branches and rubbish like a broom. An editorial representative of THE HORTICULTURIST, who visited Mr. Pettit's vineyard and orchard shortly after this work had been completed last year, was astonished to find how clean the ground had been swept.

With a device of this kind, which costs almost nothing, it is possible to clean the vineyard or orchard as quickly as a horse can walk up and down the various paths. Mr. Pettit states that two men and a team will take out as much rubbish in less time than it would take 10 men and five teams to pick up the same rubbish and draw it out on sleds.

Orchard Implements

That the value of good tillage in fruit orchards is appreciated, is evidenced by the efforts and achievements of in-

ance of heading their trees low, particularly peaches, the manufacturer has had to produce an implement that will meet the need required by the change.

To trace the history of orchard implements is practically to record the beginning and development of the culture of fruits. Various and interesting have been the changes in the plow from that of earlier times to the modern types. The old-fashioned drag became a harrow and it has assumed various forms. The introduction of the spring-tooth-harrow marked another advance in construction. Following this came a series of harrows and cultivators that have proven great helps in the cultivation of the orchard. For cultivating under low-headed trees, extension and reversible disc harrows have been invented.

Some fruit growers object to low-headed fruit trees on the ground of expense and labor at the time of cultivating. This trouble can be overcome by the use of the modern extension harrow. With it, the soil under the trees can be stirred without injuring the branches. The horse, or horses, walk in the space between the limbs and one arm of the harrow extends under the limbs of the trees. Not only is the extension disc harrow of value in this particular, but, also, it pulverizes the soil much better than other kinds of harrows. It leaves the soil in the best possible condition for



A Friend Spraying Outfit at Work in an Orchard

ventors and manufacturers in producing implements and machines that will render the work less exacting and tedious for the grower and that will perform it more thoroughly, expeditiously and economically. When fruit trees were grown with trunks five or six feet high, most of the ordinary implements for tilling the soil in the field could be used in the orchard. Now that up-to-date orchardists are recognizing the import-

the conservation of soil moisture and for the benefit of the trees.

Experiments conducted in 1905-06, at the Illinois Expt. Sta., with various mixtures for treating San Jose scale, show that the simple lime and sulphur washes prepared by boiling are superior to all others. Applications made in spring are twice as efficient as those made in January.

Planning and Planting the Strawberry Patch

J. C. Black, Truro, Nova Scotia

MOST any soil, if properly manured and cultivated, suits the strawberry; but most varieties prefer either a sandy or clay loam. Low land is very good, but there is always the danger of late spring frosts killing the blossoms on locations of that nature. Since frost is like water and runs down hill, it is wise to plant only late flowering varieties on relatively low ground, and leave the early flowering kinds for the higher land.

The chief factors in strawberry culture are manure and tillage. In manure, four things are essential: humus, nitrogen, potash and phosphoric acid. Humus, or decayed vegetable matter, makes the soil mellow, so that air will readily circulate through it, and spongy, so that it will hold moisture. All four is found in good stable manure, which, in my experience, has proved to be the best fertilizer for strawberry soils. It may be applied in large quantities by itself, or in small quantities and supplemented with bone meal, wood ashes or poultry droppings. Ashes should not be mixed with manure until applied to the land, as it sets free the ammonia of the manure and causes it to be lost in the air.

Stable manure is best applied in the fall and plowed in at once. When necessary to apply it in the spring, particularly if raw or green, see that it is thoroughly mixed and incorporated with the soil, so that no green manure will come in contact with the roots of the plants.

My experience with commercial fertilizers is limited, except with ground bones. A complete commercial fertilizer for strawberries should contain, it is said, 3 to 4 per cent. nitrogen, 10 to 12 per cent. pure potash, and 12 to 14 per cent. available phosphoric acid. Commercial fertilizers are better used in connection with stable manure, or with leguminous cover crops for turning under. I have found it a good plan, however,

to sow a little fertilizer along both sides of the row just before the vines begin to run, and work it into the soil.

PLANTS AND PLANTING

Plants should be selected from a plot that has not fruited, so as to get them strong and vigorous. It is best to dig up the whole row with a fork, shake out the dirt and select only the best plants, rejecting tip plants and all that are not well rooted or well matured.

For planting, use a tool something like a cooper's adze or a grub hoe. It can be made by any blacksmith. The blade should be about eight inches long and four inches wide with a shank turned on the end of it, bearing a handle about 15 or 18 inches long. Strike this into the ground and draw back, then place the plant in the hole with roots as near fan-shaped as possible, withdraw the tool and firm the soil around the plant. The crown of the plant should be on a level with the surface of the ground. Do not expose plants to sun and wind. A boy should drop the plants only as they are wanted by the planters. By this method a large area can be planted in a day.

The number of plants required to plant an acre depends, of course, upon the distance apart. When 30 by 24 inches apart, approximately 9,000 plants are required; when 30 by 30 inches apart 7,000 plants; when farther apart a smaller number, etc.

INTERPOLLINATION

In strawberry varieties, there are two kinds of flowers, perfect and imperfect, or male and female. The perfect or bisexual flower is the only one that produces pollen; the imperfect or pistillate flower is barren unless fertilized by pollen from a perfect flowering variety. When planted alone, imperfect varieties produce no fruit, nothing but deformities in the shape of nubbins. To insure a crop from an imperfect variety, it is necessary to plant second or third rows with plants of a perfect variety for cross

fertilization. This must be borne in mind when selecting varieties.

SYSTEMS OF CULTURE

There are three methods of growing strawberries, viz., hill culture, hedge rows and the matted row system. Hill culture is probably the best for small gardens. It consists of setting the plants about 15 inches apart and of cutting off the vines as fast as they appear. The ground should be kept stirred around the plants so they will stool out and develop many fruit crowns. Keep the blossoms off the first season, and the plants will produce fruit of superior quality and size the second season.

The hedge row system is comparatively new, and is suitable for either garden or field culture. For the garden the rows may be made about 18 inches apart; for the field, about 30 inches apart or more, with plants about 24 inches apart in the row. On both sides of the mother plant, one vine is trained in a straight line and two or three plants are allowed to set on a vine, all others being pinched or cut off. This keeps the rows narrow so that a cultivator may be run close to the rows, leaving little work to be done by hand.

The matted row system is the old reliable for commercial plantations. Have the ground level and smooth, then mark out rows 36 to 42 inches apart and set the plants 18 to 24 inches in the rows. The rows should be perfectly straight for ease in cultivating without disturbing the plants. When the vines begin to run train them into the spaces between the plants and keep narrowing up the cultivator, always going the same way so as not to disturb the new plants that have rooted. By this system a larger yield per acre can be secured than from the other systems described, but the fruit may not be as fine in quality. One objection I have to the matted row system is that the rows are liable to get too thick in places and thus prevent a proper development of the fruit.

Herbaceous Borders that Bloom for Seven Months

E. Byfield, Toronto

PLANT lovers, people who know, and feel, and appreciate the beautiful in home surroundings, realize that the ordinary floral effect, even in our best gardens, is inordinately dull, commonplace, and wholly unsatisfactory. A few beds cut in the lawn, and hopelessly destroying the repose and restfulness that an unbroken stretch of green grass produces, these beds laid out in stiff, formal rows

of cannas, geraniums, coleus and a few other greenhouse productions, such as the ordinary, orthodox gardens of Ontario, one exactly like another, monotonous in arrangement, monotonous in ever recurring uniformity, and monotonous in never varying colors for the few short months between early summer and early fall that our short, free-from-frost season will permit. With the first light frost in fall the

plants are changed in a night to pulp, and the beds become unsightly mounds of bare earth to still further disfigure the lawns until the next June, then another stock of greenhouse plants to be bought to stand in unchanging stiffness for three or four months in the broken and disfigured lawn, then as before to disappear with the first frost, and thus on with unvarying annual recurrence.

Why do Canadians go on, year after year, putting in this expensive and unsatisfactory stock when a similar expense would provide a greater number of the choicest hardy perennial plants and shrubs, plants that would furnish a continual but ever changing display of color, of form, and of grace from the passing of the snow in spring till its return late in the fall! And even then there is the assurance that your plants are not dead and done with, as in the other case, but are simply taking a well-earned rest in order to make a showing next year far in advance of what they have done this year.

England has long ago discarded, and our neighbors to the south are fast discarding, the formal beds and bedding plants that still obtain here. The old-fashioned plants of their grandmother's gardens are taking again their rightful place, or rather the descendants of those plants, descendants so improved, however, through the hybridist's skill and the collector's zeal, that the common flowers of their grandmother's time are scarcely recognizable in the magnificent aristocrats of to-day that bear the names of the old favorites, changed in all but name. Imagine a well-laid out garden comprising hardy phlox, English delphiniums, oriental poppies, irises, columbines, pæonies, pyrethrums, bleeding hearts, Canterbury bells, foxglove, coreopsis, gaillardias, lychnis, heucheras, hollyhocks, bocconias, anemones, Iceland poppies, campanulas, lilies of various kinds, helianthus, rudbeckias, all of medium height or stately, while the space beneath might be filled with low growing plants such as Sweet William, cinquefoil, vinca, coronilla, creeping phlox, lily of the valley, anemone, Scotch pinks, armerias, veronicas, alyssums, cowslips, narcissi, arabis, and so forth. The range of suitable and appropriate plants is so large that one scarcely knows where to stop. Such a garden gives everything desirable, an inexhaustible wealth of color from earliest spring till the coming snow of latest fall, constant variety and change, gracefulness and ease in the growing plants, a natural background to the unbroken lawn flanked by such flowering shrubs as spiræas, viburnums, weigelias, mock orange, rhododendrons, lilacs and the lower growing berberis, deutzias and hardy azaleas. The constant interest and ever present joy and delight felt by the owner of such a border can only be dimly understood except by those who have had the pleasure of growing these kinds of plants.

To obtain these results, there must be no haphazard arrangement of plants. The owner should have a definite plan for the season's bloom, and plants should be arranged in the border so as to carry out this plan. A few general rules might

here be applicable in the laying out of the border:

1. As a rule, if the border runs along a fence or path so as to be viewed from one side, the taller plants should be in the rear; if seen from both sides, the taller should be in the middle of the border.

2. Plants should be so arranged that colors in close proximity may harmonize.

3. Plants should be selected and placed in such a position that no part of the border is at any time without bloom. As one kind of plant is through blooming another kind beside it should be coming into bloom, thus keeping up a succession of bloom the season through.

4. The most striking effects are pro-

duced by large masses of color. For this reason, it is better to plant together several of one variety than one each of a number of different varieties.

Tender bulbous plants such as dahlias, cannas, gladioli, tritomas, and Hyacinthus candicans lend themselves admirably to effective display in the hardy

border. After the frost has cut down the tops, the roots should be taken up and stored in a cool, frost-proof cellar to be replanted the following spring. Showy annuals, such as asters, pansies, Phlox drummondii, dianthus and nasturtiums are also effective, and tender bedding plants find here congenial surroundings, while their objectionable features when planted in beds by themselves are entirely absent. Of course, the above rules should be carefully followed in placing these latter plants in the border, and especial care must be taken to place plants beside hardy ones of similar colored bloom.

To assist the amateur, a scheme is appended giving a list of hardy plants



Corner of a Home Where Flowers Abound

In the garden of Mr. P. G. Keyes of Ottawa. In the foreground is the climbing rose, *Prairie Queen*.

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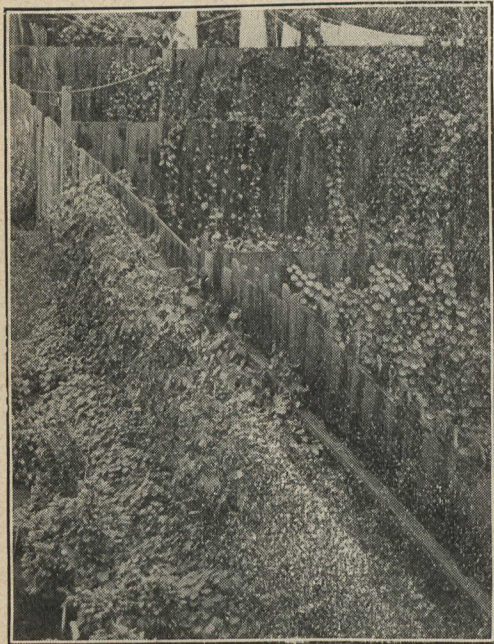
Perennials Recommended for Canadian Gardens—Tabulated in Order of Blooming and According to Color

	WHITE	YELLOW	ORANGE	RED	PINK	PURPLE	BLUE	
APRIL	Crocus, 4 in. Grape Hyacinth, 6 in. Snowdrop, 3 in. Hepatica, 5 in. Arabis alpina, 7 in.	Crocus, 4 in.				Hepatica, 5 in.	Crocus, 4 in. Grape Hyacinth, 6 in. Scilla Sibirica, 3 in. Glory of the Snow, 6 in. Hepatica, 5 in.	
MAY	Early Tulip, 6 in. to 10 in. Trumpet Narcissus, 12 in. Narcissus Poeticus, 15 in. Hyacinth, 8 in. Moss Pink, 6 in. Phlox subulata Lily of the Valley, 6 in. Early Pæony, 2 ft. Double Daisy, 6 in. Bellis perennis Pyrethrum, 20 in. Trillium, 12 in. Candytuft, 10 in. Iberis sempervirens German Iris, 2 ft.	Early Tulip, 6 in. to 10 in. Trumpet Narcissus, 12 in. Golden Tuft, 12 in. Alyssum saxatile Leopard's Bane, 2 ft. to 3 ft. Doronicum Lemon Day Lily, 20 in. Hemerocallis flava Lady's Slipper, 12 in. Cowslip, 6 in. German Iris, 2 ft.	Early Tulip, 6 in. to 10 in. Narcissus Orange Phoenix, 12 in. German Iris, 2 ft.	Early Tulip, 6 in. to 10 in. Early Pæony, 2 ft. Double Daisy, 6 in. Bellis perennis Pyrethrum, 20 in. Cowslip, 6 in. Bleeding Heart, 2 ft. German Iris, 2 ft.	Early Tulip, 6 in. to 10 in. Hyacinth, 8 in. Moss Pink, 6 in. Phlox subulata Lady's Slipper, 12 in. Early Pæony, 2 ft. Double Daisy, 6 in. Bellis perennis Pyrethrum, 20 in. Trillium, 12 in. Cowslip, 6 in. Coronilla Varia, 12 in. Sea Pink, 9 in. Armeria maritima German Iris, 2 ft.	Wild Sweet William, 18 in. Phlox divaricata Moss Pink, 6 in. Phlox subulata Early Pæony, 2 ft. German Iris, 2 ft.	Blue Bells, 16 in. Mertensia Virginica Spiderwort, 2 ft. Tradescantia Virginiana Hyacinth, 8 in. German Iris, 2 ft.	
JUNE	Wind Flower, 18 in. Anemone Pennsylvanica Sweet Rocket, 2 ft. to 3 ft. Canterbury Bells, 30 in. Campanula media Columbine, 20 in. Aquilegia Iceland Poppy, 12 in. Scotch Pink, 10 in. Dianthus plumarius Late Pæony, 2 ft. Achillea, The Pearl, 20 in. Peach-leaved Campanula, 2 ft. Campanula persicifolia Lupine, 2 ft. Lupinus polyphyllus Bell Flower, 18 in. Platycodon Iris tectorum, 20 in. White Day Lily, 2 ft. Funkia subcordata Jacob's Ladder, 1 ft. Polemonium Tall Phlox, Miss Lingard, 3 ft. Branching Larkspur, 2 ft. Delphinium Chinensis Tall English Larkspur, 4 ft. to 6 ft. Delphinium Foxglove, 2 ft. to 3 ft. Digitalis Sweet William, 12 in. to 20 in. Dianthus barbatus	Canadian Wild Lily, 2 ft. to 3 ft. Lilium Canadense Columbine, 20 in. Aquilegia Iceland Poppy, 12 in. Gaillardia, 20 in. Coreopsis, 20 in. Downy Yarrow, 12 in. Achillea tomentosa Asphodel, 3 ft. Asphodelus luteus Flowering Spurge, 1 ft. Euphorbia corollata Black-eyed Susan, 3 ft. to 4 ft. Rudbeckia hirta	Flame or Wood Lily, 2 ft. to 3 ft. Lilium Philadelphicum Orange Lily, 18 in. Lilium Elegans Butterfly Flower, 2 ft. Aclepiastuberosa Orange Day Lily, 4 ft. Hemerocallis fulva Iceland Poppy, 12 in. Gaillardia, 20 in.	Oriental Poppy, 2 ft. to 3 ft. Coral Lily of Siberia, 18 in. Lilium tenuifolium Columbine, 20 in. Aquilegia Maltese Cross, 2 ft. Lychnis Chalcedonica German Catchfly, 9 in. Lychnis viscaria Late Pæony, 2 ft. Fire Pink, 18 in. Silene Virginica Coral Bells, 18 in. Heuchera sanguinea	Oriental Poppy, 2 ft. to 3 ft. Scotch Pink, 10 in. Dianthus plumarius Canterbury Bells, 30 in. Campanula media Columbine, 20 in. Aquilegia Late Pæony, 2 ft. Tall English Larkspur, 4 ft. to 6 ft. Delphinium Foxglove, 2 ft. to 3 ft. Digitalis Sweet William, 12 in. to 20 in. Dianthus barbatus	Sweet Rocket, 2 ft. to 3 ft. Meadow Rue, 2 ft. Thalictrum aquilegifolium Columbine, 20 in. Aquilegia Tall English Larkspur, 4 ft. to 6 ft. Delphinium Foxglove, 2 ft. to 3 ft. Digitalis	Forget-me-not, 4 in. Scabiosa Caucasia, 2 ft. False Indigo, 3 ft. Babstia Australis Canterbury Bells, 30 in. Campanula media Columbine, 20 in. Aquilegia Jacob's Ladder, 1 ft. Polemonium caeruleum Peach-leaved Campanula, 2 ft. Campanula persicifolia Lupine, 2 ft. Lupinus polyphyllus Bell Flower, 18 in. Platycodon Iris Sibirica, 20 in. Delphinium Chinensis, 2 ft. Tall English Larkspur, 4 ft. to 6 ft. Delphinium Blue Larkspur, 3 ft. Delphinium formosum	
JULY	False Chamomile, 3 ft. to 4 ft. Boltonia asteroides Baby's Breath, 1 ft. Gypsophilla paniculata Hollyhock, 5 ft. to 7 ft. Japanese Iris, 4 ft. Phlox, 2 ft. to 4 ft. Shasta Daisy, 18 in. Spanish Bayonet, 4 ft. to 6 ft. Yucca filamentosa Lilium Longiflorum, 2 ft. to 3 ft.	Yellow Chamomile, 18 in. Anthemis Kelwayi Helenium, Grandiflorum, 2 ft. to 3 ft. Double Hardy Sunflower, 4 ft. Helianthus multiflorus Japanese Iris, 4 ft.	Helenium autumnate superbum, 3 ft. Beard tongue, 2 ft. Penstemon barbatus Torrey Turk's Cap Lily, 5 ft to 8 ft. Lilium superbum Japanese Iris, 4 ft. Tiger Lily, 5 ft. Lilium tigrina	Bergamot, 3 ft. Monarda didyma Rose Campion, 2 ft. Agrostemma flosadonis Red Valerian, 2 ft. Centranthus ruber Gas Plant, 2 ft. Dictamnus fraxinella Hollyhock, 5 ft. to 7 ft. Phlox, 2 ft. to 4 ft.	Cardinal Flower, 3 ft. Lobelia cardinalis Japanese Iris, 4 ft. Hollyhock, 5 ft. to 7 ft. Phlox, 2 ft. to 4 ft.	Stone Crop, 15 in. Sedum spectabilis Mallow, 3 ft. Hibiscus moschentos Milfoil, 2 ft. Achillea millefolium	Joe Pye Weed, 6 ft. to 8 ft. Eupatorium purpureum Kansas Gay Feather, 4 ft. Liatris pycnostachya	Monkshood, 28 in. Aconitum napellus Pentstemon Ovatus 3 ft. Japanese Iris, 3 ft.
AUGUST	Plume Poppy, 5 ft. to 7 ft. Bocconia cordata Flowering Spurge, 1 ft Euphorbia corollata Crimson Eye Marsh Mallow, 3 ft. Hibiscus Golden-banded Lily, Lilium auratum Lilium Speciosum Album, 2 ft. to 3 ft. False Dragonhead, 2 ft Physistegia Virginica Alba Giant Knotweed, 6 ft. to 8 ft. Polygonum cuspidatum	Hardy Sunflower, 7 ft. to 8 ft. Helianthus mollis Helianthus Orgyallis 5 ft. to 6 ft. Heliopsis Pitchenana, 3 ft. to 6 ft. Golden Glow, 8 ft. Rudbeckia Cone Flower, 2 ft. to 3 ft. Rudbeckia speciosa	Helenium Hoopsei, 2 ft. to 3 ft. Blackberry Lily, 3 ft. Pardanthus Chinensis	Cardinal Flower, 3 ft. Lobelia cardinalis	Queen Charlotte Wind Flower, 2 ft. to 3 ft. Anemone Japonica Hardy Asters, 3 ft. Deer Grass, 1 ft. Rhexia Mariana	New England Aster, 3 ft. Aster Novæ Angliæ Meadow Beauty, 1 ft. Rhexia Virginica	Sea Holly, 3 ft. to 4 ft. Eryngium Stokes' Aster, 18 in. Shokesia cyanea Ironweed, 1 ft. to 3 ft. Veronica Blue Day Lily, 2 ft. Funkia caerulea	
SEPT.	Wind Flower, 2 ft. to 3 ft. Anemone Japonica Hardy Asters, 3 ft. Giant Daisy, 4 ft. Pyrethrum uliginosum	Hardy Sunflower, 6 ft. Helianthus Maximiliani					Hardy Asters, 3 ft Plumbago Larpentæ, 8 in.	
OCT.	Pompon Chrysanthemums	Pompon Chrysanthemums	Pompon Chrysanthemums	Pompon Chrysanthemums	Pompon Chrysanthemums			

If the flower stems of English Delphiniums and July flowering Phlox be cut back after blooming, the former to the ground and the latter just below the flower panicle, they will each produce a second partial bloom in September.

Lawn and Garden Hints for May

MAY is the month of active garden operations. Seeds and plants of most kinds of flowers, fruits and vegetables may be planted. Select varieties of fruits and vegetables that



Great Results from a Small Beginning

This illustration shows the effect of one enthusiast fixing up the back yard. The neighbors soon "caught on" and the result was that every back yard on the street was transformed into a veritable flower garden.

are not hard to grow and those that stand for quality. Plan to have a better garden than ever before. Watch its growth and development and when the season is past tell THE CANADIAN HORTICULTURIST how you did it.

THE VEGETABLE GARDEN

In the vegetable garden the soil should be broken fine and as deep as the plant roots may be expected to grow. When digging, work in a liberal application of well-rotted barnyard manure. If you have some wood ashes, they also should be worked into the soil. The time for planting can only be learned by experience. Onions, peas, spinach and other hardy vegetables may be planted as soon as the ground is fit for them. Seeds of tender plants such as cucumbers, corn, squash and so forth, should not be planted until all danger of frost is past. If beet, carrot, parsnip or bean seeds are soaked over night, they come up a day or two earlier. Do not plant the seeds too deeply in spring, but be sure and sow them in moist or freshly stirred soil. If frost threatens, young seedlings should be covered with paper, large leaves or even with earth. The cover should be removed as soon as the danger is past.

An early crop of peas may be obtained by planting between rows of onions.

Radishes will thrive in any good soil, but to be crisp and tender they should be grown quickly. If a continuous supply is wanted, make a sowing every 10 days or two weeks. Good varieties are Scarlet White-tipped Turnip and French Breakfast.

The best variety of beet for small gardens is the dark Egyptian. For an all-season carrot there is none to beat the Chantenay. Two of the best onions are Yellow Globe Danvers and Large Red Wethersfield. The best parsnip is Hollow Crown. There are many excellent varieties of peas, including Gradus, Heroine and Stratagem. For early squash, plant the White Bush Scallop; for later varieties in order, Summer Crook Neck and Hubbard.

A good sowing of lettuce should be made early in May. Good varieties are Big Boston and Black-seeded Simpson. For parsley, sow Double Curled.

Have you ever grown salsify in the garden? It is a most delicious vegetable. Try a packet this spring. The seed should be sown as early as possible. Handle the same as parsnips in every way. The best variety is Sandwich Island.

place in the amateur's garden. Plant them in rows three feet apart, with plants 15 to 18 inches apart in the rows. Buy varieties that have perfect blossoms, so that they will fertilize themselves. Imperfect ones must have perfect ones planted alongside to insure fertilization and a crop. There are many excellent varieties. It is difficult to recommend a list that would grow in all localities, as a sort that does well in one county or province may be useless in another. When choosing, seek the advice of a neighbor who has had success.

In the spring, when the plants begin to grow, the mulching should be raked into the spaces between the rows and remain there until after the berries are picked. If there is danger of frost after they have commenced blossoming turn this mulch in over on the plants for a single night, and thus a good share of the crop may be saved.

If the garden does not already contain them, plant come currant and gooseberry bushes. Plant them about five feet apart. Raspberries and blackberries deserve a place also if there is room for them.



Lantana delicatissima, a Nice Plant for a Hanging Basket

Stir the surface soil and cultivate the soil around all growing crops. It kills the weeds almost before they start to grow. It saves moisture and assists plant growth in many other ways.

AMONG THE FRUITS

Are you going to start a strawberry patch this spring? These fruits are easily grown. They deserve a prominent

This is the season to watch your currant bushes for the currant worm; gooseberry bushes too. No matter if there is no fruit on them. The loss of foliage weakens the plants; and a dusting with powdered hellebore will make matters right.

PRUNING ROSES

The best time to prune most roses is just as the buds are starting. Cut out

all dead and weak branches. Head back the remaining branches to a few inches of the old wood. Shoots that spring from the base of the bush and from a point above the old union made by grafting when the tree was young, should be cut back to within 15 inches or so of the ground. Suckers that spring from points below this should be removed. Remove the dead and weak wood from your climbing roses. Cut back the remaining branches to about five feet, unless you wish the bush to cover the screen or fence more quickly. By shortening each year, however, a more compact climber is secured. Of course, all roses must be pruned with judgment. More buds may be left on the strong shoots than on the weak ones.

IN THE FLOWER GARDEN

Seed sowing and transplanting will be the first work in the flower garden. Plants that have sprung from seeds sown earlier in the house should not be transplanted from the house to the open ground without first going through a hardening-off process. This is done by gradually introducing the plants to the changed conditions of outdoor life by exposing them for a few hours a day at first to outside influences. A cold frame is a good place in which to harden tender plants. It can be done, however, by standing the plants out where they can be either lifted indoors again or protected until they become accustomed to the changed conditions.

Nasturtium, balsam and portulaca seed usually can be sown outside with success about the second or third week in May. Sow sweet peas in May. Do not plant where they will be shaded by trees. If you can, make the rows run north and south. Dig the soil deeply and work in well-rotted stable manure. The manure should be sufficiently deep not to touch the seed. Plant the seed in trenches at first, covering only with two inches of soil. As the plants develop gradually hoe in more soil. If the soil is sandy, the seeds will stand more earth over them than will those in soil that is of a clayey nature.

Corms or bulbs of gladioli can be planted towards the end of May and even earlier in some localities. Plant the bulbs three or four inches deep and about six or eight inches apart, whether they are planted in clumps or in rows. Dig the ground thoroughly before planting. Dahlia roots also may be planted towards the end of the month. Canna roots should not be planted until after the middle of June.

There is not a better annual climber for covering trellis work, fences or rockeries than *Cobea scandens*. Sow a few seeds at once and keep them in the window or a hotbed. About three seeds in a three or four-inch pot will be sufficient.

They will not need re-potting before planting out as they do not transplant readily if separated. Use rather light, sandy soil to sow the seeds in and cover them with about a quarter of an inch of soil. Keep the soil in the pots moist. They will be ready to transplant outside some time in June. A rich, light soil suits best. Plant the whole pot of plants together, whether there be one, two or three plants in the pot.

If it is necessary to dig up the spring flowering bulbs when they are out of flower so as to set out other plants, the bulbs should be lifted and heeled in, just below the ground in some place out of the way, and left there until July. The bulbs should then be lifted and kept in a dry, cool shed until they are required again for planting in the fall.

If you intend planting some herbaceous perennials in the border, consult the table on another page. It will tell you the kinds of perennials with the color of their flowers that bloom in each month during the season. By selecting judiciously, you may have a succession of bloom from early spring until frost comes in the fall.

LAWN-MAKING

Do you intend making a lawn? If the lot is small have the surface of the lawn level. Soils from excavations and cellars should be removed and replaced with a rich, retentive loam. If the soil does not need replacing, dig it deeply and, when digging, do so evenly. Do not dig to a depth of a foot in one place and only a few inches in another. Such a practice is noticeable later on in the character of the grass that grows. Before sowing seed, have the surface as fine and smooth as possible. The creation of a good permanent sod depends as much upon the preparation of the soil as on anything else. Sow the seed while the soil is freshly disturbed. Sow early in the morning, or on a still day. Sow liberally and evenly. In another column, a lawn mixture is recommended. After sowing, rake and roll. Particular care should be given to all details in lawn making. The lawn is the basis of the whole scheme of decorative gardening.

Lantana Delicatissima

The illustration on the preceding page represents a plant which has been growing in a wire hanging basket for about three years, at the home of Mr. A. Alexander Hamilton. The basket is lined with about two inches of sphagnum moss and filled with a light soil finely sifted and kept carefully watered. It hangs with the other hanging baskets of begonias, *Asparagus sprengeri* and so forth, under the apple trees in the garden all summer. The flowers are of a delicate rosy pink color.

Repairing Lawns

No matter how well cared for, dead patches and bare spots will appear in the lawn. They may be the result of accident, of tramping in beaten paths, of damage by footwear under hammocks and near settees, or they may be the result of lack of attention and care in the management of the turf. The time to repair such spots is in spring. When worn completely bare and if the area is not too large, the repairing is best done by the use of sods. Cut a square area about the injured patch and remove the old sod surface and soil from within this square to the depth of a sod. Roughen the surface of the soil with a rake. Lay the sod in strips closely together. Pound firmly with the back of a spade, water immediately and continue to water until the new sod has made a union with the earth beneath.

When not necessary or desirable to use sod, clean and loosen the soil with the rake and sow seed. The best seed for lawns is Kentucky blue grass. It is the mainstay of a durable greensward. In a lawn mixture, Red Top is valuable, but it does not do so well when sown alone. White clover grows closely to the ground, fills up the spaces between other grasses and should have a place in a lawn mixture. A good combination for lawns in this country is made up of these three grasses, equal parts by weight. Sow at the rate of about one quart to a square rod.

The Night-scented Stock

A hardy annual that gives off a delicious fragrance at night is the Night-scented Stock, *Matthiola bicornis*. It has a straggly habit and inconspicuous pink flowers that are scentless by day and very fragrant by night.

Sow the seed in the open ground just as soon as the soil is in good condition to work. Later on, thin them somewhat, but not enough to prevent them growing in a compact mass. As they are rather weak-stemmed, the plants require the support of each other.

You will not be interested in the flower until it reaches maturity. When growing, the plants with their inconspicuous grayish-green foliage are not beautiful, and, therefore, they are best planted in a mass in some retired spot. An excellent place for them is near the verandah where you are accustomed to sit. Their delightful odor will add another charm to the evening hours.

Some everlastings should be planted for making winter bouquets and decorations, and for filling vases. They never fade. These delicate, graceful flowers will last for years if cut in bud and bloom and dried in the shade.—N. S. Dunlop, Floral Dept. C.P.R., Montreal.

Mushrooms and Toadstools: How to Know Them

Prof. Wm. Lochhead, Macdonald College, Ste. Anne de Bellevue, Quebec

IN the popular mind, mushrooms differ from toadstools in the important particular that the former are edible and of commercial value,



The Smooth Lepiota—Edible

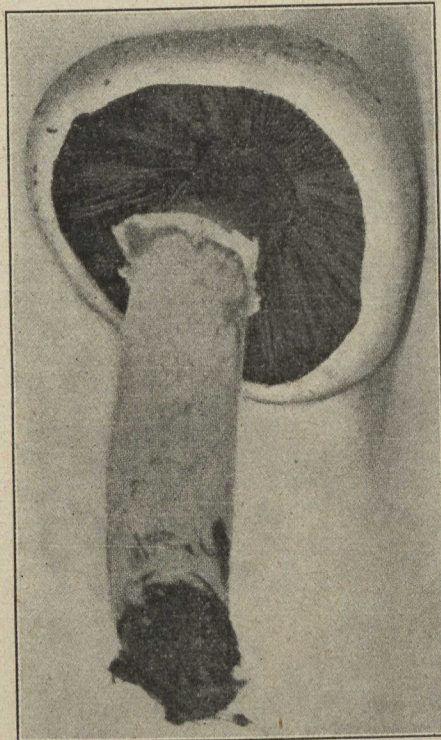
while the latter are poisonous and of no value whatever. To the botanists, however, the terms are usually synonymous, and the word "mushroom" is used to comprise all forms whether poisonous or not. For example, Professor Atkinson, of Cornell University, calls his book on the subject: "Mushrooms, Edible and Poisonous." The fact remains that there are poisonous forms, call them what we will, many of which look so much like the non-poisonous forms that only experts can distinguish them. The number of edible mushrooms is large. The *connoisseur* often is in a position to enjoy in safety many a delicious mess when it would be dangerous for the uninformed to indulge for himself.

HOW A MUSHROOM GROWS

When the spores find suitable conditions they sprout and produce a mass of white threads and cords called the "mycelium." This mycelium when grown in compost and dried forms the "spawn," as sold by seed dealers. Under suitable conditions the mycelium grows and feeds on the decomposing organic matter in the soil. Small growths appear after a time on the mycelium as "buttons," which soon shoot up above the surface and take on the umbrella form of mushrooms. The "umbrella" is in reality only the fruit-

ing portion of the mushroom. It grows and develops very rapidly. A new crop is ready every morning, but it must not be supposed that the entire mushroom plant develops in a single night. It has had a considerable period of growth in the soil invisible to the ordinary observer.

The common field mushroom, *Agaricus campestris*, of the late summer and autumn, is a form that is easily recognized even by the amateur. The cap is nearly smooth, white or brownish white, and the flesh is white; the gills underneath the cap do not quite touch the stem, are white when young, then pink, and later brown when ripe. There is a thin



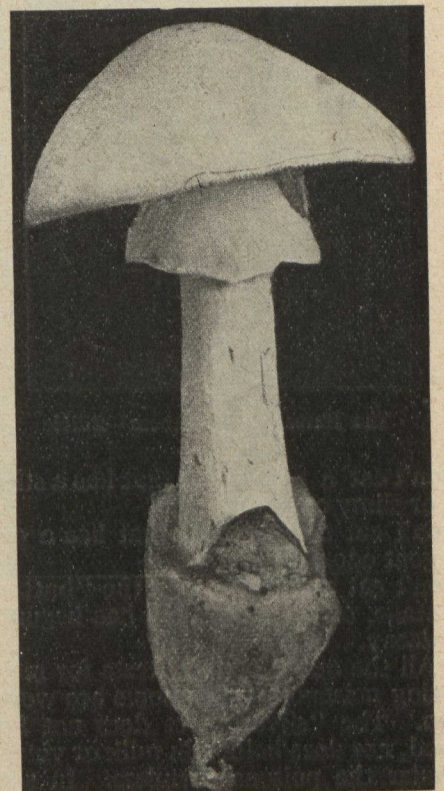
The Common Mushroom—Edible

"collar" or ring on the stem; the stem is white, tapers slightly to the base, and is solid, though less firm at the centre. If the stem is cut off and the cap laid with the gills down upon a sheet of white paper away from drafts of air a "spore-print" can be obtained in a few hours. When a mushroom is ripe the spores fall readily from the sides of the gills where they are formed, so the spore-print is nothing more than the fallen spores.

The color of the spores is of importance in the identification of mushrooms, for there are mushrooms with black spores, some with brown spores, some with pink spores, some with reddish-brown spores, and some with white spores. For example a species, the

Smooth Lepiota, *Lepiota naucina*, is very common, and is picked and eaten in large numbers. It has white spores, and the stem is somewhat hollow and slightly swollen at the base. Another species, the Deadly Amanita, *Amanita phalloides*, resembling both the common mushroom and the smooth Lepiota in color and general appearance, is deadly poisonous. It is largely responsible for the many cases of mushroom poisoning. It has white spores; sometimes the gills have a pinkish tinge, but the main difference is the presence of a "cup" at the base which holds the stem. Sometimes this cup is left in the ground when the mushroom is picked, and the novice has nothing to distinguish it from the Lepiota. Most of the other species of Amanita are highly colored, so that they are not often eaten by mistake. But all highly colored forms are not poisonous. In fact there seems to be no absolute rule for distinguishing the poisonous from the non-poisonous forms.

Of the more common edible fungi are the Oyster Agarics, *Pleurotus spp.*, the Horsetail Agaric, *Coprinus comatus*, the Chanterelle, *Cantharellus sp.*, the Fairy-ring Fungus, *Marasmius oreades*, the Milk Fungus, *Lactarius deliciosus*, the



The Deadly Amanita—Poisonous

Edible Boletus, *Boletus sp.*, the Beefsteak Fungus, *Fistulina hepatica*, the Common Morel, *Morchella esculenta*;

but space forbids any attempt at description of these forms.

OBSERVE THIS WARNING

If mushroom-eaters will observe the following "Don'ts," little danger need be feared in eating the forms that stand the test:

- Don't eat a mushroom that grows out of a little cup at the base.
- Don't eat a mushroom that is highly colored.
- Don't eat a mushroom that changes color soon after its surface is bruised or broken.
- Don't eat a mushroom that has a milky juice.



The Horse-tail Mushroom—Edible

Don't eat a mushroom that has a sticky or slimy cap.

Don't eat a mushroom that has a pungent odor.

Don't eat a mushroom in the "button" stage, or after the flesh has begun to decay.

All the many popular tests for recognizing poisonous mushrooms are worthless. The "silver" test does not hold good, nor does boiling in milk or vinegar render the poisons harmless. In some mycological societies for the study of fungi, there is an important officer called the "mycophagist" whose duty is to sample all the new forms found by the members as to whether they are poisonous or not. Unless a mycophagist is

available, the amateur should err on safety's side and give heed to the "don'ts" above mentioned.

Planting Trees and Shrubs

When buying trees and shrubs for planting on the lawn ask the nurseryman to supply specimens of good quality and of medium size for the variety. Very large trees should not be moved only in winter. When the trees are received from the nursery, plant them at once, or if that cannot be done, heel them in so that the roots will not be exposed to the air, and leave them there until it is convenient for planting. This practice is particularly necessary in the care of young evergreens. By heeling-in is meant the temporary covering of the roots of plants in order to preserve or protect them till in permanent quarters.

When planting dig the hole large enough to take in the roots without cramping. Have the hole as large, if not larger, at the bottom than at the top. Do not plant too deeply. Set at about the same depth as the trees stood in the nursery. This may be determined by the markings of earth at the bottom of the trunk. Allow about two inches for settling. Work the fresh earth around the roots and under them. Shake the tree backwards and forwards to fill all the spaces, then tramp and pack the soil firmly layer by layer. Air spaces cause decay, and eventually death. Plant in the evenings or on damp days. If the trees when set are exposed to strong winds or to injury by animals, it would be well to tie them to stakes, and to protect them by means of tree guards.

Hardy Climbers

The following list gives a few of the most suitable kinds of climbing plants. Those marked with an asterisk are particularly recommended where the number must be restricted to fewer kinds. All are perennials, growing 10 to 20 feet. The list was prepared by Mr. Wm. Hunt, Florist at the Ontario Agricultural College, Guelph.

- *Ampelopsis quinquefolia (Virginia Creeper).
- *Ampelopsis hirsuta (Virginia Creeper), clings to brick and stone walls.
- Aristolochia siphon (Dutchman's Pipe).
- Clematis coccinea, large-flowering, coral red.
- Clematis Duchess of Edinburgh, large-flowering, double white.
- *Clematis Jackmanni, large-flowering, violet purple.
- Clematis montana grandiflora, white.
- *Clematis paniculata, small-flowering, white.
- Clematis Ramona, large-flowering, lavender.
- Clematis Virginiana (Virgin's Bower), small-flowering, white.
- Clematis vitalba (Traveller's Joy), white.
- Dioscorea batatas (Cinnamon Vine).
- Euonymus radicans (Climbing Spindle Tree).
- *Lonicera Halleana (Japan Honey-suckle).
- *Lonicera Belgica (Dutch Honey-suckle).
- Lycium Chinense (Matrimony Vine).
- Tecoma or Bignonia radicans (Trumpet flower)

A Planting Table for Gardeners

CROP	DISTANCE APART IN ROWS	DEPTH TO PLANT	SEEDS OR PLANTS FOR 100 FEET OF ROW	TIME TO MATURE
Artichoke, globe...	2 1/2 feet	1 to 2 inches	1/2 ounce	15 months
Artichoke, Jerusalem	1 1/2 feet	2 to 3 inches	2 quarts tubers	6 to 8 months
Asparagus plants	1 1/2 feet	3 to 5 inches	60 to 80 plants	1 to 2 years
Beans, bush	24 inches	1/2 to 2 inches	1 pint	40 to 65 days
Beans, pole	36 inches	1 to 2 inches	1/2 pint	50 to 80 days
Beets	2 inches	1 to 2 inches	2 ounces	60 to 80 days
Brussels sprouts	20 inches	1/2 inch	1/2 ounce	90 to 120 days
Cabbage	20 inches	1/2 inch	1/2 ounce	90 to 130 days
Cardoon	15 inches	1 to 2 inches	1/2 ounce	5 to 6 months
Carrot	6 to 12 inches	1/2 inch	1 ounce	75 to 110 days
Celery	6 inches	1/2 inch	1/2 ounce	120 to 150 days
Chicory	6 inches	1/2 inch	1/2 ounce	5 to 6 months
Citron	8 to 10 feet	1 to 2 inches	1 ounce	100 to 130 days
Corn, sweet	4 to 7 inches	1 to 2 inches	1/2 pint	60 to 100 days
Cucumber	5 feet	1 to 2 inches	1/2 ounce	60 to 80 days
Eggplant	22 inches	1/2 to 1 inch	1/2 ounce	100 to 140 days
Endive	10 inches	1/2 to 1 inch	1 ounce	90 to 180 days
Horseradish	17 inches	3 to 4 inches	70 roots	1 to 2 years
Kale or borecole	21 inches	1/2 inch	1/2 ounce	90 to 120 days
Kohl'rabi	6 inches	1/2 inch	1/2 ounce	60 to 80 days
Leek	6 inches	1 inch	1/2 ounce	120 to 180 days
Lettuce	3 to 10 inches	1/2 inch	1/2 ounce	60 to 90 days
Muskmelon	6 feet, hills	1 to 2 inches	1/2 ounce	120 to 150 days
Onion seed	3 inches	1/2 to 1 inch	1 ounce	130 to 150 days
Onion sets	3 inches	1 to 2 inches	1 quart	90 to 120 days
Parsley	3 to 6 inches	1/2 inch	1/2 ounce	90 to 120 days
Parsnip	2 inches	1/2 to 1 inch	1/2 ounce	120 to 160 days
Peas	15 to foot	2 to 3 inches	1 to 2 pints	40 to 80 days
Pepper	15 to 18 inches	1/2 inch	1/2 ounce	100 to 140 days
Potato, Irish	16 inches	4 inches	3 to 9 bushels per acre	80 to 140 days
Pumpkin	8 to 12 feet, hills	1 to 2 inches	1/2 ounce	100 to 140 days
Radish	1 inch	1/2 to 1 inch	1 ounce	20 to 40 days
Rhubarb, plants	3 feet	2 to 3 inches	33 plants	1 to 3 years
Salsify	2 to 4 inches	1/2 to 1 inch	1 ounce	120 to 180 days
Spinach	2 inches	1 to 2 inches	1 ounce	30 to 60 days
Squash, summer	3 to 4 feet, hills	1 to 2 inches	1/2 ounce	60 to 80 days
Squash, winter	7 to 9 feet, hills	1 to 2 inches	1/2 ounce	120 to 160 days
Tomato	3 or 4 feet	1/2 to 1 inch	1/2 ounce	100 to 140 days
Vegetable marrow	8 to 9 feet, hills	1 to 2 inches	1/2 ounce	110 to 140 days

Pointers for Market Gardeners

A. McMeans, Ontario Agricultural College, Guelph, Ont.

THE best early varieties of beans are Keeney's Rustless and Wardwell's Kidney Wax. For medium, nothing is better than the Davis White Wax. The green beans are not appreciated as they should be by the people of Ontario; a good variety is Valentine.

BEETS

I used to grow Egyptian for transplanting and Eclipse for early; but, having tested 55 varieties at the college this season, I would add to these, Model. Its shape is globular; size and season, medium; color and quality, good.

CABBAGE

Early Jersey Wakefield is best for early, to be followed by Early Summer or All-Head. For winter, Danish Ball-Head is an improvement. Half Head, Hollander and Diamond Winter are all good. For an extremely late one, the Houser is good, but inclined to be a little coarse.

BRUSSELS SPROUTS

This is a vegetable that will bear booming. Cultivate your market for it. Boom it. Get people to try it, till it is appreciated as it should be. On the other side of the line they are growing it extensively. The wholesale price in New York city is from 6 to 10 cents a quart.

CARROTS

It is hard to beat the Chantenay; but in our variety tests, Rubicon outyielded it. It seems to be an improved Chantenay. In size, it is larger.

CORN

Early Cory, Crosby's, Kendell's Early Giant, Early Evergreen, Stowell's Evergreen and Country Gentleman will give a succession for the private or amateur gardener. Grow, also, Golden Bartam and Black Mexican. They are both good in flavor. Be careful not to plant them near your other sweet corn or they may pollenize some of it, causing some grains to be of yellow or black color.

LETTUCE

For under glass, Grand Rapids; out doors, Hanson. This latter variety is also sold under the following names: Gardener's Favorite, Nonpareil, and Hamilton Market. Toronto Gem and Excelsior are too well known to need description. Unrivalled is about the same as Big Boston, slightly lighter green and without that brownish tinge on the borders. For quality, Deacon is good; it is sold also under the names of Big Head, Golden Heart, Summer Gem, St. Louis Butter, Triumph and White Russian. It is a buttery cabbage, mid-season, slow to shoot to seed; head, globular, or slightly flattened; color,

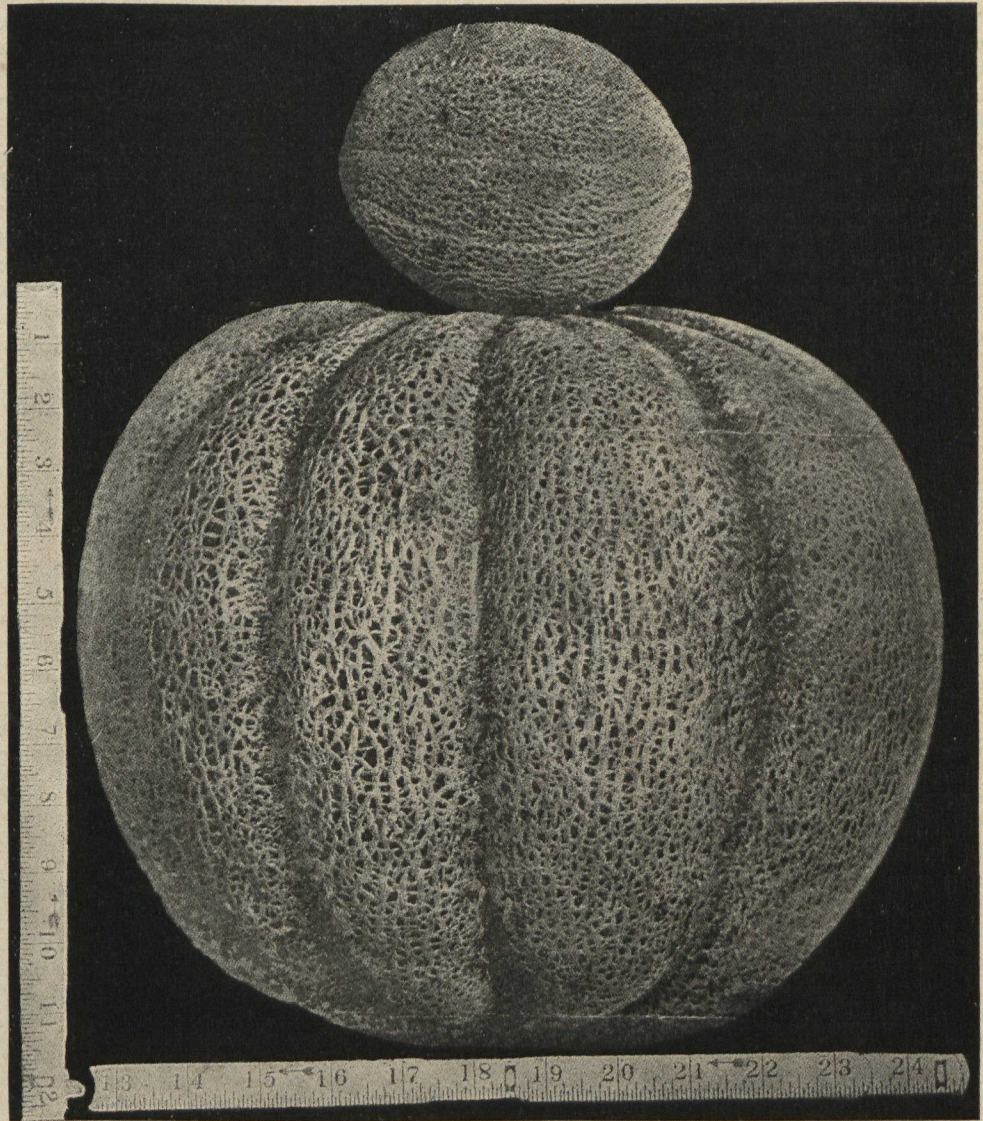
light grayish green; quality, excellent. Black Seeded Simpson should not be forgotten if you prefer the loose-leaf or cutting lettuce.

PARSNIP

Hollow Crown is preferred by most people; personally, I prefer the Guernsey. It is about the same circumference as Hollow Crown, but is shorter and holds its size; that is, it does not taper off as much as the Hollow Crown. It

shape and, in olive shape, Scarlet Conical; out doors, Scarlet Turnip White Tipped, French Breakfast, Chartier, Long Scarlet Short Tip in the reds; White Box, Long White Vienna and Icicle in the white; and Delicious, in golden. China Rose and Black Spanish for winter.

"To prevent onion smut, I soak the seed, previous to planting in coal oil. A



Outrement Beauty Muskmelon

It is a matter of pride to Canadians to see their products received with favor and preference in the markets of the United States. One of the largest and finest of all muskmelons, the Outrement Beauty, grown largely in the vicinity of Montreal, is being offered to the trade, in competition with Rocky Ford and other standard varieties, by seed firms in the United States. Montreal growers get high prices for the fruit in the New York markets. Indications point to a big market in the future for Canadian melons in the United States. The illustration shows a specimen of this melon with an ordinary Rocky Ford melon placed on top for contrast, also a two-foot rule on bottom and side.

will crop equally as well and, when you take into consideration how much easier it is to harvest, it is an extra inducement to grow the shorter variety.

RADISH

For forcing, Rosy Gem, Ruby Pearl, Scarlet Turnip Forcing, in the turnip

teaspoonful of oil is sufficient for one pound of seed. I pour it on the seed, stir well, and allow to dry before planting."—J. W. Rush, Humber Bay, Ont.

Surprise, Nott's Excelsior, Gradus and Stratagem will give a nice succession of peas in the market garden.

How to Start a Plantation of Onions

E. G. Malcolm, Scotland, Ontario

TO grow onions successfully, it is necessary to have a good loam or sandy loam soil. It should be made rich by the application of well-rotted stable manure, at the rate of 40 to 50 tons an acre. I do not use any of the onion fertilizers, but use a large amount of wood ashes and salt, from 400 to 600 pounds to the acre, applied after plowing and sometimes just before sowing.

Plow as early as possible in the spring to preserve moisture. Prepare the seed-bed by rolling with a heavy roller (unless it is clayey, when rolling should not be done). Then put on your planker, as it gives a nice, mellow seed-bed.

Last year a few growers plowed early in the fall and worked the ground well, and in the spring top-dressed with manure, but of course it was well-rotted and fine, so that it would not interfere with cultivation. Out of four experiments, three appeared to produce a better crop than by plowing in the spring. The one had the appearance of being an exceptional good crop early in the

season; but, from some cause, the onions did not "bottom up" well. They were small in size and contained a great amount of picklers. The previous year, this piece of ground produced the best onions in the vicinity. So great a change I am unable to account for.

The choice of the variety or kind of onion to grow has to be determined by yourself, as some markets seek one kind and some another. In our section we grow mostly the yellow varieties. Some Southport, but a greater amount of Globe Danvers. There is a growing demand for Red Globes. For our market, I would recommend the Yellow Globe Danvers and Red Globes.

After choosing the variety comes the buying of seed. In that, a person should be very careful; for, upon the seed, depends the crop to a great extent. The very best seed that can be procured is the cheapest in the long run if it does cost more. Poor seed is dear at any price. Get seed that is sure to germinate.

Do not be in too great a hurry to get the seed in the ground. The soil should

be thoroughly warmed up before sowing, or the weeds will get started before the onions.

We use hand-drills, Little Giant Iron Age, and sow in rows 14 inches apart. When the onions make their appearance through the ground, start harrowing. By that means, you will loosen up the ground and kill weeds. The more you work the harrow the less weeding you will have to do by hand. The harrow that is used is made from light material, pine or elm strips, three-quarters of an inch by two inches. It is three feet by four feet in size and has common spike nails for teeth. A strap or rope is attached to pull it with. One man will go over a couple of acres in a half or three quarters of a day. For horse-power, have the harrow 12 to 15 feet long and 3 feet wide. One would think that this way would be injurious to the crop. A few onions would be destroyed by the horse, but the amount of time saved far exceeds the loss. When the crop is ready to harvest, you would not know that a horse had been on the ground.

The Culture of Late Cabbage

S. B. Courtis, Toronto, Ont.

HAVING been gardening in the vicinity of Toronto for a number of years on soil varying from light sand to the stiffest clay, I beg to offer a few suggestions on growing late cabbage from my experience and observations. I usually select a high, comparatively poor piece of land for my seed bed, and sow the seed rather thickly about May 10, in rows about 12 inches apart. I keep the soil clean until ready. The first week in July should find them in good shape for planting. Should any part of the bed show too much growth, I insert a fork under them, give it a sharp lift, and let it fall back. This will check them.

My idea of a good plant is one rather slim, drawn up six inches in the leg and of a dry, hard appearance. My reason for this is that, when planted out with the crown well out of the ground, the ease of working, especially with a cultivator, is a very great consideration. My observations for over 25 years has convinced me that such plants will make equally as good heads as the short ones.

Preparing the ground is a matter that depends almost entirely on circumstances. It does not matter when or how as long as the ground is in the condition required. My own plan generally is to set apart the piece wanted, give it a good coat of

manure and plow twice. The method of treating land that has been cropped to something else, by just turning it over once for late cabbage, is accountable for such a large amount of rubbish brought in by our gardeners. Occasionally, I have raised a good second crop, but every condition must be favorable, and for the average gardener, it cannot be depended upon.

The time to plant is, say, from July 10 to 15. Prepare the land and mark it 30 inches from row to row (in the case of a large patch, mark it both ways). At this date, the weather is usually hot and dry. I never wait for showers, but plant right ahead until finished. In case the plants need water, I put three or four barrels in a wagon, drive in the patch 50 or 60 feet, and water before putting in the plants. Plant about two feet apart in rows.

As to varieties, the following are best: St. Denis, German Brunswick, Danish Bald Head, and Chester Savoy. These can be bought at any seed store. The St. Denis is a fine all-round cabbage. It requires land in good condition to develop it properly. The German Brunswick will form the largest and most even heads on poor soil of any variety that I know. The Danish Bald Head is one of the best for rich, sandy soil. It

grows rather long in stem, but the solidity and good qualities are perfect. The Chester Savoy is good in every respect. The object of the grower should be (at least it has been mine) to have, by the middle of November, a healthy, clean, medium-sized, compact cabbage. That is what the trade requires. I think these are the most profitable to the grower as they are usually sold by the dozen and not by weight.

I would say to a farmer who intends to plant a patch for the first time that ground that will grow a good crop of potatoes will produce a fair crop of cabbage. Gardeners are aware of the fact that Canada is made a dumping ground for the whole continent, and the way matters stand to-day they cannot help themselves in many lines. I see no reason, however, why every winter cabbage that is used in Toronto cannot be raised in the vicinity. There are hundreds of acres of land in easy distance of the market that is second to none for the market gardener. With the abundance of manure that can be obtained for nothing, the good roads, and the splendid prices prevailing I think it is a pity that so much money should be sent out of the city and in some cases, out of Canada, that could be easily kept here if an effort were made.

OUR QUESTION AND ANSWER DEPARTMENT

Readers of The Horticulturist are Invited to Submit Questions on any Phase of Horticultural Work

Site for Apple Orchard

I have a piece of land that is low and flat, yet rich and fertile. It has never been cultivated. On one side is a spring pond, and on the other runs a river. In the event of ice jams in spring, the land is submerged for a few days only. It is well protected by hills on all sides. Would such be suitable for growing apples?—W.A.W., Brampton, Ont.

From the description given we should not consider the site a very suitable one for an orchard. Standing water, even for a few days, in an orchard may cause serious loss from root killing, as when the soil becomes saturated with water and freezes, the roots of the trees are very liable to be destroyed. Such low lying ground would probably also not drain well in summer, and apple trees will not grow well where there is a wet subsoil.—Answered by W. T. Macoun, C.E.F., Ottawa.

Apply Ashes in Spring

How heavily should wood ashes be sown in orchards, and will they hurt a growing cover crop such as vetch or crimson clover; or should they be applied just before turning under, and if so would they not be too late to benefit the existing crop?—R.R., St. Catharines, Ont.

W. T. Macoun, Horticulturist, Experimental Farm, Ottawa.—Wood ashes are usually applied at the rate of 75 to 80 bushels to the acre. Applied at this strength they would not hurt a growing cover crop. In some spots where the ashes might be applied too thick, slight injury might be done, but on the whole it would not cause injury. We should prefer applying ashes the following spring, after the cover crop has been turned under, as while the ashes might increase the crop of vetch or crimson clover, it would probably do more good if applied in the spring.

H. L. Hutt, O.A.C., Guelph.—I would not hesitate to apply 100 bushels an acre if they could be obtained for not more than five or six cents a bushel. Fifty bushels an acre is considered a good application. There is not much danger of applying too large quantities, as the potash and phosphoric acid is mostly retained in the soil and not lost in the drainage water, as is often the case with soluble nitrogenous fertilizers. The best time to apply ashes is just before turning under the cover crop in the spring. The trees would then get the full benefit of the application for their season's growth, and cover crops following would also be benefited by the potash and phosphoric acid still held in the soil.

L. R. Taft, Michigan Agricultural

College.—Wood ashes can be used with good results at the rate of 50 to 100 bushels an acre, according to the condition of the soil and age of the trees. In old orchards they should be spread broadcast, and with young trees they should be applied over a circle somewhat larger than the head of the tree. If scattered evenly, they will do no injury to cover crops, but if a shovelful is thrown in a place, the plants with which it comes in contact will be destroyed. To get the best results the application should be made quite early in the spring.

A Border of Roses

I have a flower border, 30 x 3 feet, on the south side of a lattice fence. Would it serve for a rose bed? If so, what kinds should I plant and how many bushes?—M. M., Toronto

The flower border mentioned should be quite suitable for a rose bed, providing it is not overshadowed by trees or buildings. Roses like an open, airy, sunny position, and a rich, clay-loam, well-drained soil. Hardy hybrid perpetual roses on their own roots would be the best kind of bush roses to plant. Ten bushes planted about 32 inches apart in a row in the centre of the bed would be sufficient, the first bush to be planted 20 inches from end of bed. The following are good, hardy, well-tested varieties: Baron de Bonstetten, Prince Camille de Rohan, Gen. Jacqueminot, Mme. Charles Wood, Marshal P. Wilder, all dark red or crimson; Mrs. John Laing, Mme. Gabriel Luizet, Anna de Diesbach, pink; and Margaret Dickson, white. A moss rose or two could be substituted for any of these; Blanche Moreau or Henry Martin are good varieties. Climbing roses could be trained on the lattice fence. Crimson Rambler, Baltimore Belle, Yellow Rambler and Caroline Goderich are good climbing roses, the two first named being the best.—Answered by Wm. Hunt, O.A.C., Guelph.

Rex Begonias

I have a fine rex begonia. It has ten large leaves and about a dozen small ones. Do they need any special kind of fertilizer? Do the plants need much sunlight?—B.T., Mount Vernon, Ont.

Any of the ordinary commercial plant foods or fertilizers can be used for rex begonias. Use the fertilizer at about one-half the strength usually recommended. Rex begonias do not like direct sunshine. Partial shade suits them best.—Answered by Wm. Hunt, O.A.C., Guelph.

Planting Sugar Maples

I intend setting out a number of sugar maples this spring. Kindly advise when to transplant, what size of tree is most likely to grow, and how they should be trimmed.—R.T., Prince Albert, Ont.

Sugar maple trees should be planted as soon after the ground is dry in the spring as possible, although they may be planted successfully any time before the leaves expand. Trees from two to three inches in diameter are the most satisfactory to plant, as they are thick enough to withstand the wind and are not too old. Much larger trees than these can be planted with success, but the larger the tree the more difficult it is to transplant. Instead of pruning to a bare pole, as is so often done, we prefer pruning back the branches of the top very severely, but not removing them, and leaving some small twigs to enable the tree to make leaf growth as soon as possible.—Answered by W. T. Macoun, Horticulturist, C.E.F., Ottawa.

Mite on Roses

A nice rose tree I have is not doing well. What is good to put on rose trees?—Mrs. J.A.G., Durham, Ont.

It is probably the red spider or mite that is attacking the under side of the rose leaves and that is causing the trouble. Sprinkle the plant, especially on the under side of the leaves, with water every day. A little finely powdered sulphur or flowers of sulphur sprinkled underneath the leaves before the leaves are dry will also help to keep down this pest. The plant mentioned may perhaps require some fertilizer. Roses require liberal treatment in the matter of fertilizers to secure the best results possible.—Answered by Wm. Hunt, O.A.C., Guelph.

Sorting Seeds

I have some flower and vegetable seeds that I wish to sort so as to sow seeds that are even in size. How is it best done?—H.L., Peterboro, Ont.

Use sieves having meshes of a size to suit the different varieties of seeds to be sorted. These sieves can be made very easily by tacking a piece of muslin, cheese cloth, wire mosquito netting, or wire having a larger mesh, to the bottom of a light wooden frame about 10 or 12 inches square and two inches deep. The sides and ends of any small light box of about the size mentioned will answer very well.—Answered by Wm. Hunt, O.A.C., Guelph.

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FRUIT INSPECTION

In a letter to THE CANADIAN HORTICULTURIST recently, Mr. J. A. Ruddick, Commissioner of Dairying and Cold Storage, including fruit, takes exception to an editorial that appeared in our April issue in which we stated that the Minister of Agriculture at Ottawa had seen fit to dispense with, temporarily, the services of two of the fruit inspectors. Mr. Ruddick writes:

"A number of inspectors have always been employed temporarily during the apple season. These men are laid off during the period of the year when there is absolutely nothing for them to do. The staff of fruit inspectors is not being reduced, but, on the contrary, has been increased during the past year."

In reply we beg leave to say: First, that the number of inspectors is not nearly large enough to watch the fruit interests of the Dominion; second, that when the men were laid off this winter, there was something for them to do; and third, that the increase in the staff during the past year to the extent of one man is commendable, but not nearly sufficient. The percentage of export apples seen by the fruit inspectors is infinitesimal. Hundreds of thousands of barrels leave the country unseen and uninspected. During the past winter, practically all the inspectors in Ontario were employed within a

radius of fifteen miles. 'Tis true, that the larger percentage of stored apples in the province was there, but in other districts there were stored apples also. During the winter, some 30,000 barrels were stored west of Toronto, not including the city. When the inspector employed in that district was laid off, there were at least 10,000 barrels west of Toronto still to be inspected. Does this not indicate that there was something for him to do? Had all the lots of export apples stored in Ontario last winter been only partially inspected, a staff of at least twenty inspectors should have been employed. Instead of that, the present small number was decreased by two.

Now that this question has been referred to, we desire to state that while the inspection of fruit has accomplished splendid results, and while the provisions of the Fruit Marks Act have been enforced in a most commendable manner by the Dominion Department of Agriculture, yet there has been a feeling for some time that a decided extension of the work is required. The inspectors are doing good work, but they cannot begin to cope with the situation. The permanent staff should be greatly enlarged. Additional inspectors are needed in the west. Requests have been made frequently for a special inspector for the Niagara District. The cooperative movement in Ontario has reached the stage where one inspector might be detailed with advantage to oversee the packing done by these associations, and to assist them in securing a uniform pack. They have requested that this should be done. More assistance is needed at Montreal and in the Maritime Provinces. In slack times these inspectors, or many of them, might be utilized to attend meetings and assist otherwise in encouraging the cooperative handling of fruit. Some of this work has been done this year with most beneficial results. It would be better that some of these men should be comparatively idle for a few months of the year, than that the inspection of fruit should not be performed thoroughly when shipping is in progress.

The salaries paid the inspectors, in most cases, are inadequate. It is a wonder that the department has been able to retain such an excellent staff of inspectors. Unless a decided increase is given soon, some of the best men will leave the service and it will be a most difficult matter, if not impossible, to refill their places at the prevailing rate of remuneration.

Mr. Ruddick concludes his letter to us, by saying:

"Your mention of the attempt to evade the Fruit Marks Act by re-marking the apples in a foreign country, outside the jurisdiction of the Fruit Marks Act, is not a very good argument in favor of increasing the staff of inspectors. It seems to me that the fact that the exporters were obliged to attempt this sort of thing is very good proof of the close inspection which prevented improper marking of the packages in Canada."

We admit that the incident referred to is proof that the inspection, where the exporter implicated was in the habit of doing most of his packing, was thorough, but that does not prove that it is equally thorough elsewhere. The fact is, that the exporter referred to has broken the law time after time, and in such a flagrant manner that the department of late has made his work the object of unusually close supervision. There are other exporters, however, who are breaking the law constantly. Were these men watched as carefully, they too might find it necessary to attempt to conduct their fraudulent practices elsewhere. We know of exporters who have instructed their packers to pack dishonestly because they have known that for every barrel on which they might be detected and fined there would be hundreds of barrels that would leave the country without being inspected. As long as this continues to be the case, reason will remain for the belief that our system of fruit inspection is not as thorough as it should be, and that the staff of inspectors instead of being re-

duced temporarily should be increased permanently. It is probable that were the work of inspection under the control of a fruit commissioner, it would be conducted more thoroughly.

ATTORNEY-GENERAL SHOULD ACT

Definite charges have been made, by the Toronto News, against the Canadian Cannery, Limited, of Hamilton, to the effect that it operates in restraint of trade and that it should be proceeded against as a combine by the Attorney-General for Ontario. The News has stated repeatedly that this company, through its control of the majority of the fruit and vegetable canning factories in Ontario, shuts out the independent canner from doing business with the wholesale houses; that it gives the wholesaler a discount or rebate of five per cent. as a reward for refusing to handle goods made by the independents, and that it arbitrarily lowers or raises the price, to suit its desires—whether to crush its competitors or to make half a million dollars by its mere fiat on prices.

This means, if these charges are true, that the thousands of fruit and vegetable growers in Ontario, who grow for canning factories, are at the mercy of this company, and that they are not receiving fair prices for their products. This condition has been suspected often by the growers, who have complained bitterly of the manner in which they have been treated in the matter of prices. The matter is so serious, we feel that the Ontario fruit and vegetable growers' associations should deal with it immediately by requesting Hon. Mr. Foy to conduct an investigation of the charges that have been made.

THE BONUS FOR SPRAYING

The bonus offered by the government of Ontario to fruit growers for the purchase of power sprayers will do much to benefit the industry in that province. Not only will it lessen the cost of orchard operations and help control the spread of orchard pests, but indirectly it will teach the growers the value of cooperation, which is just as important.

In Ontario the necessity for thorough spraying is becoming recognized generally. This is due in no small measure to the excellent educational work that has been accomplished by the Ontario Department of Agriculture. The department for some years has borne part of the cost of furnishing spraying material, and in some sections has operated spraying machines of its own. This latest move, therefore, is only the culmination of its previous pioneer work. Through the action of the department the growers are to be helped to help themselves, and that is the best form of assistance. Hon. Nelson Monteith, Minister of Agriculture for Ontario, deserves credit for the action he has taken. A similar move might be made with advantage by the Departments of Agriculture in one or two of the other provinces, notably Nova Scotia.

THE SAN JOSE SCALE SITUATION

The fact that fruit growers in Ontario are willing now to admit the presence of San Jose scale in their orchards and throughout their vicinity, is the best proof of how serious is the situation. As long as the growers would blind themselves to the fact and refuse to admit it for fear that they would injure the value of their property, it was impossible for the government or any person else to do anything to bring about an improvement, as none are so blind as those who will not see.

Now, however, the situation is changed. The growers in a number of sections are awake to the fact that if their orchards are to be saved, immediate action must be taken and the work be followed up persistently. The San Jose Scale Act should be revised. The government should have greater power to act and it should not hesitate to use that power. As in many other matters of a similar nature, it has been proven that it is useless to leave such a law to be en-

forced by local inspectors, subject, as they are, to local influences.

One of the excellent features of the grant that has been made recently, through Hon. Nelson Monteith, to assist growers in the purchase of power sprayers, is that it will assist the growers to fight the scale. It has been announced that the Department of Agriculture intends to do what it can to further combat this pest. We would suggest that it might make a further grant to assist in the building and equipping of plants for boiling the lime-sulphur wash. Many growers, in San Jose scale-infested districts, feel that the cost of installing a well-equipped boiling plant is beyond their means. Were the government to grant a bonus of, say, fifty per cent. of the cost to organizations of five or more growers who desire to build, it would aid greatly in the suppression of scale. It would be necessary to fix the minimum capacity of such plants and to regulate the cost per barrel of the mixture to growers. Assistance of this nature should receive favorable consideration by the Minister.

SAN JOSE SCALE ON SHRUBS

It is not generally known that San Jose Scale, the dreaded pest of the fruit orchard, is found on many ornamental trees and shrubs as well, but such is the fact. As the time for spraying is at hand, all who have trees or shrubs in their charge should look them over at once to find out their condition, and then, if necessary, have them sprayed. For the large fruit plantation, probably the lime-sulphur wash is the most effective remedy, but for city lots, parks, school grounds and so forth, there are other compounds that are more or less effective in checking the scale, so there is no difficulty on that score. The best of these is advertised in this issue of THE CANADIAN HORTICULTURIST. The Japan Quince, *Pyrus Japonica*, appears to be a great favorite of the scale, and the pest has been observed in this country on hawthorn, dogwood, mountain ash, privet, lilac, and various other kinds of ornamental trees and shrubs.

To prevent the scale spreading in cities and elsewhere in Canada, it has been suggested that all shrubs liable to become infested, or which have become so, be cut down every spring. This would be a good way to check the spread of the scale; it would answer for nurserymen who wish to propagate the stock or to sell it, but it would not suit those who wish to have shrubs and trees well established on their lawns. It is gratifying to know, therefore, that the numerous spraying compounds now obtainable render the treatment of the scale much less of a task to be feared than generally it is thought. Persistent and systematic work in the fruit orchard or on the lawn with efficient remedies is about all that is necessary. In addition, it would be a good thing if each person would report to his provincial agricultural college or to THE CANADIAN HORTICULTURIST the various trees and shrubs on which he finds the scale, and also the results of experiments that he may have conducted towards holding the pest in check.

In the enforcement of the Fruit Marks Act, the prevailing practice of the inspectors has been to lay the blame for fraudulent packing on the apple operators rather than on the man who actually did the work. This has remedied the situation to a noticeable extent. Often, however, the shipper or owner is only indirectly to blame. He may desire to handle apples that are packed according to law and, though instructed accordingly, his men will not do the work properly and honestly. These are the men—the packers—who do most of the damage. Recognizing this fact, the Fruit Division recently prosecuted a number of them. The department does not desire to put a hardship on the workingman, but, in the greater issue at stake, it is necessary to make him bear his portion of the

responsibility. The packers are as liable to prosecution as the employers. When they learn this fact, they will do proper work for employers who have good intentions and be less liable to take "crooked" instructions from those whose intentions are dishonest. The Fruit Division is to be commended for the stand it has taken.

Much delay and annoyance has been caused fruit growers this spring by the railway companies. Some growers who bought spraying machines and other equipment for work this season have suffered loss through the non-delivery on time of the goods ordered. It is said that thousands of cars are being held for grain when "empties" are seriously lacking for the transportation of other commodities. Something should be done by the Railway Commission to bring about an equalization of the means for transportation, so as to ensure a better dispatch for all kinds of merchandise. We realize that the shortage of cars is general and affects many other commodities besides fruit, but this serves only to emphasize the necessity for adopting heroic measures, if necessary, to prevent the trade of the Dominion being seriously injured.

In our last issue we advised fruit growers to be on the watch for new insect and fungous pests. We have been informed since of an instance of the occurrence of the Brown-tail moth in a district not far from Kentville, Nova Scotia. As this is the only insect found on fruit trees, the larvæ of which occur inside silken nests in colonies at this time of year, there will be little trouble in fruit growers destroying all that they find. The nests are nearly always at the tips of the branches. Every nest now destroyed means the removal of several hundreds of destructive enemies from this year's crop, and possibly may prevent the establishment of this most pernicious enemy of the fruit grower. Specimens for identification and requests for information will be gladly received by Dr. James Fletcher, Dominion Entomologist, Central Experimental Farm, Ottawa. Every diligence should be used in stamping out the pest.

Fruit growers in British Columbia who buy nursery stock from eastern Canada, are caused much annoyance and loss by their orders having to be inspected at the coast rather than at a point on or near the eastern border of the province. Trees consigned to growers living in the eastern portion of British Columbia are carried to Vancouver, inspected and then returned to destination. This is an unnecessary and expensive procedure, that entails a hardship and a loss on both the growers and the nursery firms. The trouble can be remedied easily by establishing a station at Revelstoke. The Provincial Government has been petitioned frequently, by the growers, to take such action. Their requests should be granted at the earliest possible date.

A western United States fruit publication states editorially that one of its editors is the only editor of a fruit paper who is connected with the management of an organization of growers. While giving that editor full credit for his work, we wish to call attention to the fact that that statement was not founded on accurate information. While we do not like to blow, neither do we like to have our claims for fame ignored and denied in this manner, and therefore rise to remark that one of the editors of THE CANADIAN HORTICULTURIST, as secretary-treasurer of the Ontario Cooperative Fruit Growers' Association, is intimately in touch with the management of an organization that is composed of commercial fruit growers, and that is connected with the business side of fruit growing in Canada, the United States and in Europe. The managing editor of THE CANADIAN HORTICULTURIST is secretary-treasurer of the Ontario Vegetable Growers' Asso-

ciation, the Ontario Horticultural Association, and the Ontario Horticultural Exhibition. The management of THE CANADIAN HORTICULTURIST is connected directly with organizations that represent not only the fruit interests, but all branches of horticulture. There now! We wonder if he will take it back or will we have to call him names?

The Ontario Government has formulated a plan for the teaching of agriculture in a number of high schools. The scheme, presumably will be carried into effect as soon as the necessary legislation is obtained. High School boards wishing to establish one of these courses may appoint a teacher recommended by the Ontario Department of Agriculture, as a member of its teaching staff. Districts that are devoted almost entirely to the growing of fruits, vegetables or to some other horticultural product, should take advantage of this opportunity to further agricultural education. These should demand, however, that teachers be appointed for such localities who are specialists in horticulture rather than in general agriculture.

The Ontario Vegetable Growers' Association this year is going to endeavor to obtain and publish a full report in regard to the vegetable canning industry of the province. This industry is largely in the hands of one of the best organized and tight-mouthed combines in the Dominion. The individual growers have no organization, and are in absolute ignorance of conditions in the canning sections where they do not reside. The association has a large contract on hand, but if its efforts are successful, or even only partially so, they will result in great benefit to the growers.

The time is ripe for a national movement looking towards a more general observance of Arbor Day in the schools of Canada. Unfortunately, the custom, of late years, has been waning in public favor, although need for its continuance never has been so great. Its revival might well be embodied in the agitation for reforestation. The ornamentation of school grounds, public parks and the home, as affected by the planting of trees, should be sufficient in itself to make the holiday one of national importance. Let the children in cities plant largely of the maple, so that Arbor Day enthusiasm may be infused with the spirit of patriotism.

In this column, in February last, we directed attention to the need for the appointment of a number of fumigation sub-inspectors in Ontario during the shipping season, to superintend the work at the nurseries. The need for this move on the part of the Provincial Government is greater than ever, as the San Jose scale is spreading with alarming rapidity. The present season is almost past and nothing has been done. In their own interests, fruit growers should urge the government to take action in this important matter.

For work and equipment at the new fruit and vegetable station in the Niagara district, the Ontario Government has granted \$15,000. Part of this amount is for buildings, and a part for the salary of the man who is to be appointed as director. As yet, no suitable man has been found to fill the position. On one or two occasions it was thought that a man had been secured, but circumstances willed otherwise. Until a director is appointed, the work carried on at the farm will be to prepare it for his arrival. It is to be hoped that the Government will be able to make an appointment at an early date; for, unless a director is secured soon, the work will be delayed another year.

Our cover illustration this month was made from a photograph taken in the Hillcrest Orchards, Kentville, N.S.

The Buyers and Growers to Blame

Ed. THE CANADIAN HORTICULTURIST: Care-taking apple growers feel that their line of business in Norfolk county will be hurt if Mr. McNeill's letters in the Jan., Feb. and March issues of THE CANADIAN HORTICULTURIST are not answered. I do not think that Mr. McNeill's intentions were to harm any district in Ont., but to give the facts as he thought them to be. The only answer I can give, is that he was not familiar with this part of District No. 1. The whole trouble is the careless grower and the buyer, not the climate nor the varieties of trees planted.

This District No. 1 is the oldest settled part in Ont. Apple trees were set out here in advance of any other district, and up to the year 1900 our orchards, as a whole, bore the very best quality of fruit that could be expected from self-caretaking trees. The older an apple-growing district gets, the more insect enemies and fungous diseases the growers have to fight to protect their trees. In the year 1900 I knew of only one sprayed orchard in this locality. All other orchards required very careful sorting in order to put up a good quality of fruit. In 1901 and 1902 the fungous diseases in unsprayed orchards were still worse, and 1903 was the worst year ever seen. Orchards not sprayed did not show 5% of clean fruit, while the well-sprayed orchards showed 95% clean. By this time we had a few more growers spraying their orchards. The years 1904 and 1905 were repetitions of 1903. In 1906 we had a few more spraying outfits in use, and the year was not nearly so favorable for fungous growth as the years mentioned before, owing to our having very little moist weather during the fore part of the apple season. Therefore, the unsprayed orchards were the best they had been since 1900. However, there was certainly a marked difference in favor of the sprayed orchards, and we, this spring, have several more spraying outfits at work.

Apple dealers who have had experience with fungous apples, know that they are dangerous to handle, especially if picked and packed in barrels early in the season during warm weather, before the apple is matured. I have seen fungous Greenings and Snow apples show rot in 3 days' time when picked and packed early in Sept. There are 2 reasons for this early picking. The buyer, after buying his apples by the lump, begins picking long before the apples are matured so as to catch the early markets. He is also very uneasy in anticipating high winds, which would put a large quantity of the fruit to the ground. The quantity of two-thirds grown apples shipped from this district early last season to catch the early European markets was shameful. Our orchards in this county, taken care of by orchardists, have a season too short instead of too long. Careful spraying and cultivation has lengthened our season considerably, compared with our neglected orchards that are infested with fungous diseases and insect enemies. These self-caring orchards are the cause of Mr. McNeill's ideas, and it should not be said it is unfortunate that so many Spys, Baldwins, Russets and other winter varieties of trees were planted in this section. But it is unfortunate that the growers, as a whole, did not take better care of their orchards, and with our cooperative association we will certainly make a big improvement in our orchards in this county in the near future.

My experience is that Greenings, Kings, and Snows should not, in well-cared-for orchards, be picked before Oct. 1 to 10; Russets and Baldwins, Oct. 15 to 20; Spys, Oct. 20 to Nov. 1, and in this locality it would be unwise to leave picking later than Nov. 1, as last season the freeze of Oct. 23 hurt our crop to quite an extent. I will admit that all fruit from the diseased orchards, which have been in the majority for the past few years, should have gone to the evaporator, canning factories and cider mills instead of being

packed into barrels and shipped to outside markets, giving us a name for being able to produce only an inferior quality of fruit.

I would advise, in other districts in Ont., where apple growing is younger, and only had the fungous diseases for a season or two, that the growers get busy and spray their orchards and not lose their reputation as a fruit-growing district, as, when the fungous disease gets with you, it is there to stay, and with the right weather conditions, will ruin your fruit crop. Spraying with the right solution at the right time, with proper care, will insure your crop free from all fungous diseases. The spending of a little money, and the unpleasant work of spraying, is generally accountable for an uncared orchard.

In 1900 and 1902 I bought apples in this county; also bought apples in another district of Ontario, with the result that the apples shipped from here sold on an average at \$1 a bbl. more than the apples bought in the other district, owing to size and color of fruit. These apples sold from April 1 to July 1 the following years.

I have shipped apples from this county nearly every year since 1896 with a handsome profit each year. Mr. C. E. Stewart, Cottage Grove, Ore., who was employed by the Govt. to give the fruit growers exhibitions in box packing, visited this locality the last on his list last fall, and he stated when he looked in some of our sprayed orchards, that he had never seen, in all his travels, any better fruit; and he seemed puzzled, when looking at some unsprayed orchards, to find the ground covered with apples, that these careless growers did not follow such an object lesson.

In 1904, Baldwins grown in Mr. Robt. Waddle's orchard near here, were worthy of comment throughout the Dominion, as well as the Spys grown in Mr. Charles Challend's orchard in 1905. In 1906 the Norfolk Fruit Growers' Association made 16 entries in commercial packages at the Flower, Fruit and Honey Show, Toronto, carrying away 12 prizes. Other exhibitors of this county also were favored with many prizes. Well-cared-for orchards are realizing a good dividend on an investment of \$1,000 an acre in this county.

The lump apple buying has, I consider, damaged the fruit growers of Ont. to a great extent, as, in this locality, uncared, diseased orchards have been bought early with the result that in such orchards the fruit began to drop in Sept., and the buyers began to pick and pack this fruit in bbls., all of which should have gone to our canning factory instead of being shipped and branded as prime Canadian apples.

A SUMMARY

In Ontario I should strongly advise growers to form assns. and to prune, spray, cultivate and fertilize their orchards and ship only good fruit. We have never produced too many good apples any year, but if inferior fruit is shipped early in the season, it blocks the way and forces down the prices of our good fruit. When the consumer, early in the season, gets a few poor lots of apples, he is discouraged and will not buy apples, but buys oranges and bananas instead.

In Norfolk county the climate is exceptionally favorable for the growing of late fall and winter apples where orchardists have given their orchards proper care, which, in these years, is necessary to produce a good quality of fruit. I should recommend the planting of McIntosh Red, Baldwins, Spys, Russets and Greenings. This list should be large enough to choose from for the commercial orchard. Many of us careful growers had Snow apples March 1 this year in nice condition, and our Kings, Spys, Baldwins and Russets are keeping nicely.

Let it be known it was not the climate nor the varieties of trees planted, but it was the

careless grower and lump apple buyers that have been tearing down the reputation won in former years by this county as a producer of excellent quality of winter apples. Our Norfolk Fruit Growers' Assn. has a membership now of 43, who have pledged themselves to prune, also spray and make Norfolk apples a high standard of quality, and who are anxious to get into communication with buyers who are looking for a desirable lot of apples for shipment next fall. — JAMES E. JOHNSON, Norfolk County.

A Power Sprayer Device

Camby Wismer, Jordan, Ont.

That spraying by power is productive of best results and is by far the most economical method of applying spray mixtures, needs no confirmation at this age of advancement in fruit growing. I am an advocate of doing it by what is termed "traction power," because that gives one an ever present supply in abundance without a cent of cost other than the purchase of the right kind of machine.

On our farm there are a number of hillsides and slopes, upon some of which we grow grapes and other fruits. We cannot spray these successfully with the ordinary "traction power" sprayer that takes its power from the left hind wheel on account of the driver sometimes being on the upper side and constantly slipping; accordingly, I decided to apply the principle of a counter shaft with ratchets on either end similar to those of a mower, and arranged to take the power from both hind wheels, which would overcome the difficulty, and also do away with the necessity of midclaws, because of the resistance of the pump being equally divided between the two wheels. It also would make the machine run more smoothly over hard roads. The principle was applied in the following manner:

I already had an old dump cart on which were 56 inch wheels. These I used for the rear, and put a rim sprocket on each of them. I also had a pair of good wheels out of a threshing machine truck; these I used for fronts. I made a frame of two by eight inch stuff set on edge and, in this, I hung a half-round tank with the flat side up. I reserved enough room below this to permit of the counter shaft being boxed in the lower edges of the frame. I then took the deferential gearing off a Brantford No. 3 mower and reinforced its castings and got a pair of new ones made, and machine fitted on a one and a quarter inch bar of steel. I bought an unmounted Wallace power sprayer, took the sprocket off the crank shaft and used it for a pattern to get another one for the counter shaft. When I got this all ready and set up, it was a success. The two rear wheels with a driving chain from each one worked to my entire satisfaction.

Scale is Spreading

Ed. THE CANADIAN HORTICULTURIST: The time has come when every person in the fruit business must spray and spray properly. There is lots of scale in the township of North Grimsby. I know of places where scale was very bad last year, and where spraying was done properly, it is hard to find a live scale now. On the other hand, I know of a place that was only half sprayed, and now the orchard is about ruined.

If fruit growers who find scale in their orchards would spray regularly and properly, they can keep the pest in check. If spraying is not done, the township of North Grimsby will be as bad as that of old Niagara. The majority of our growers have awakened to this fact, and spraying is now being carried on extensively. — W. H. Book, San Jose Scale Inspector for North Grimsby, Ont.

Have you a copy of the Steele, Briggs Seed Co.'s handsome catalog for the spring of 1907?

Mr. W. T. Macoun, Canada's Leading Horticulturist

RECOGNITION of the services and ability of Mr. W. T. Macoun, Horticulturist, Central Experimental Farm, Ottawa, recently has been made in a material way, by his having received within the past year at least two offers inviting him to sever his connection with the department at Ottawa, and to assume similar duties elsewhere. Fortunately for the Central Experimental Farm and for the practical horticulturists of Canada, Mr. Macoun has declined these tempting offers. As his work and achievements are of great value to all branches of horticultural interest, THE CANADIAN HORTICULTURIST thinks it only proper and of general interest to publish a few words in further recognition of Mr. Macoun's services to the country. As a horticultural investigator, Mr. Macoun stands *facile princeps* in Canada to-day. Mr. Macoun's reputation has not been gained through cheap notoriety, by originating curious things in the world of fruit and flowers, but by successfully solving many of the problems of the practical commercial fruit and vegetable grower. He is recognized by all who know him as a persistent, never-tiring, painstaking worker, a close observer, and one who makes his deductions after much thought and with great caution. He has become an expert or specialist in several phases of what we might term "northern horticulture," but more particularly on the apple and potato and their culture.

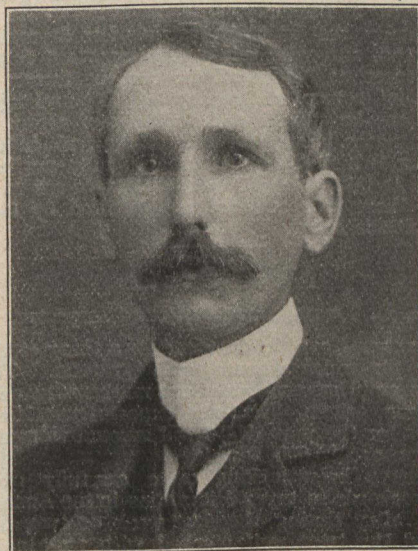
He has paid special attention to the development of a hardy winter apple of fine appearance and good dessert quality, believing that such an apple would be of inestimable value to the colder parts of Canada.

Many instructive and valuable experiments have been carried on with a large number of old and new varieties, to find how far these different sorts can be grown with profit in the different climates of the Dominion and the localities where they can be produced to the greatest advantage. Over 600 named varieties of apples and crabapples have been under test. Experiments have been conducted in shipping apples to Great Britain, in storing apples, in recording the individuality of apple trees, and in determining various other important features in the apple tree and its fruit. In cultural experiments with apples, Mr. Macoun has conducted investigations in fall vs. spring planting, in root killing of apple trees, in cover crops, in mulching the soil with green clover, in top-grafting, in the close planting of apple trees, in preventing injury from sun scald and by mice. Excellent experiments have been conducted to determine the value of whitewash as a means of retarding bud growth in spring and for destroying oyster-shell bark-louse and other insects. Valuable experiments also have been carried on with other tree fruits. With grapes, Mr. Macoun has tested the various old and new systems of training, the best means of protecting the vines during the winter and spring, and he has originated many new seedlings by cross fertilization and selection. In small fruits, much excellent work has been accomplished in the testing of varieties and in trying the best methods of culture, pruning, protection for winter, and in originating new varieties.

The experiments carried on by Mr. Macoun in the cultivation of vegetables to find out what varieties are best suited to the various climates of the country also have proved of much value. The results of these tests and lists of varieties suitable for cultivation on the farm and on the market garden have been published from time to time. For 17 years, Mr. Macoun has been carrying on experimental work with potatoes and he published an exhaustive bulletin on the subject in 1905. It

might not be going too far to say that Mr. Macoun is the best posted man on potato culture in this country—certainly we know of no one here who has, to such an extent, studied and mastered the growing of this indispensable vegetable. Innumerable varieties, both standard and new, have been tested. Work has been conducted to determine to what extent varieties change or can be improved by selection. Others have been worked out in treating various potato diseases, in learning the resistance of the various varieties to blight and rot, in recording how far varieties are affected by change of seed. In potato cultural methods, work has been carried on to gain information in regard to the best time to plant, the best fertilizers, the kind of sets to plant, best depth to plant and other points of value.

Valuable conclusions have also been arrived at by Mr. Macoun in various lines of work connected with the growing of ornamental plants,



Mr. W. T. Macoun

such as herbaceous perennials, woody climbers, flowering shrubs, deciduous and evergreen trees, and so on. Work in forestry has not been neglected as Mr. Macoun has under his care some 21 acres of forest belts.

Mr. Macoun's writings show that he keeps himself in close touch with horticultural experts in the United States and elsewhere, and that he uses the information thus obtained for the furtherance of fruit growing in Canada, so far as it is applicable or adaptable to our conditions, and this leads us to say that Mr. Macoun is one who firmly believes in the press as an excellent channel through which to disseminate knowledge. In this matter, as also in that of answering the questions of his fruit growing correspondents, Mr. Macoun is doing a most important and valuable work—one which is highly appreciated throughout the length and breadth of our land.

Besides the particular work in which Mr. Macoun is engaged at the Central Experimental Farm in Ottawa, he lends the value of his experience to horticultural matters of various kinds in all parts of Canada. He has taken a very active part in the administration of the Ottawa Horticultural Society, probably the most successful horticultural society in Canada. In both the Lady Minto and the Lady Grey garden competitions in Ottawa, Mr. Macoun acted in the capacity of judge by special request. He is a member of the board of control of the fruit experiment stations of Ontario,

and of the new fruits committee of the Ontario Fruit Growers' Association, and of the executive committee of the American Pomological Society.

Natural Species

H. H. Groff, Simcoe, Ont.

The popular theory that species breed true has no longer a place in advanced thought. There is nothing rigid in nature, all forms are in a state of flux or evolution, more or less apparent.

Species are sections of natural orders. If by breeding between species the earlier influence is made apparent by atavism, why should we expect the species, a later development, to be inflexible?

The point of difference seems to be between what are called elementary species and taxonomic species. This would class the former and more flexible sub-section as varieties during the long natural process, producing more complete isolation with increased powers of individual resistance to crossing as well as more certain forces in reproduction when crossing is attempted. When this process evolves the most complete isolation, the form is entitled to rank in the latter class.

The brief span of individual human investigation is far too short to secure the needed comprehensive knowledge and definite facts desired. In nature there is no absolute uniformity of type, and all types, no matter of what apparent fixity, are constantly, though imperceptibly, undergoing change. These constitute the elementary species.

When the evolutionary process is complete and the form stands in the last stage of its isolation as a distinct and individual concentration of vital force, it is entitled to classification as a taxonomic species. In this stage it will hold its place only so long as it may withstand the encroachments of another and more virile member of some other natural order. This is the course of nature in plant, animal and human life.

The work of the scientific plant breeder is now sufficiently progressive to supply the needed illustrations for practical use and educative purposes. The modern investigator does not expect his product to possess a rigidity not supplied by ages of natural influence, and it is well, as such inflexibility would be an insuperable barrier to our progress, on lines of æsthetic, useful and commercial value.

More and Better Apples.—It is estimated that apple orchards sprayed with Swift's Arsenate of Lead will yield a 25 to 50% larger crop and produce apples with a much higher market value per barrel. Potato crops have been found to be doubled through the protection afforded by Swift's Arsenate of Lead against the potato bug. No lime is needed, but it can be successfully mixed with Bordeaux mixture for a combined insecticide and fungicide. Any one interested in this subject may receive a very interesting and valuable book by sending a postal card request to the Merrimac Chemical Co., Broad St., Boston, Mass.

A cooperative fruit shipping association has been organized at Georgetown, Ont. At a recent meeting of Georgetown fruit growers, it was decided to form a joint stock company with a capital of \$1,000. The use of a large freight shed on the G.T.R. track has been secured where the fruit will be packed. The name of the association is "The Georgetown Fruit Growers, Limited," and the following officers were elected: Pres., Wm. Bowman; vice-pres., W. A. Wilson; sec. and manager, Frank J. Barber; treas., Wm. Bradley; directors, Jas. Harrison, Wm. Thompson, and H. A. Reed.

NOTES FROM THE PROVINCES

By our Regular Correspondents and Others

British Columbia

C. P. Metcalf, Hammond,

Spring has come again, and with it spring work. Grafting, fertilizing, spraying, cultivating, and other details of orcharding, so likely to be neglected in the rush to get the crops in, should not be forgotten. Too often this is the one season of the year when the orchard suffers from lack of attention.

Spraying is being more extensively carried on this spring than has heretofore been the case, due, no doubt, to the stricter enforcement of the provincial laws respecting the spraying and pruning of orchards. It is to be hoped that the year will be a favorable one, so that fruit growers may be encouraged to do it more thoroughly, not merely to comply with the law, but for the benefits to be derived.

Canes and bushes have come through the winter fairly well. Trees, particularly apples and cherries, suffered some from splitting of the bark of the trunks caused by the thawing and freezing of the sap content.

The B.C. Fruit Growers' Association has been holding a series of meetings throughout the interior and lower mainland, with a view to encourage local associations and individual growers to cooperate in the maintenance of prices, and in a more even distribution of the output in the markets of the west.

The local association at Revelstoke resolved to endorse the resolution of the Kamloops Fruit Growers' Association asking the Provincial Government to establish a fumigation station at Revelstoke for the fumigation of all imported trees for distribution in the interior. At present the only one is at Vancouver, an unfortunate arrangement, as nearly all the nursery stock coming from the east and south-east has to be taken through Revelstoke to Vancouver, and then back again to its destination, frequently involving a delay of a fortnight. All the interior fruit growers are agreed that such a station should be established at some interior point.

The Labor Question in B.C.

H. L. Gordon, Vernon

The severe winter in British Columbia has been followed by a burst of beautiful spring weather, causing the fruit farmer to look around for necessary labor. The farmer, who must limit the amount of wages he offers, is at a disadvantage in the search for labor in competition with lumbermen and those able to make tempting offers and recoup themselves by adding to the prices of their commodities.

There is a serious lack of immigrant laborers at present. It is said that many who start from Europe with British Columbia as their destination, are captured *en route* chiefly at Winnipeg. However this may be, the fruit farmers whose trees are as yet unproductive, and their name is legion, are unable to find the labor for their orchards, whilst the intention of the provincial government to inspect orchards rigidly for the presence of pests, threatens to place the farmer between the devil and the deep sea; he cannot keep his orchard as it should be without hired labor. It is to the provincial government that the farmer looks for the solution of the labor problem. There has been much talk and many newspaper interviews with officials, but no practical result.

The farmer has until recently depended largely upon the Chinaman; but there is a consensus of opinion among those who consider the question dispassionately, that the Oriental laborer cannot meet the requirements of the

situation, and the agitation of a year ago in favor of the removal of the import tax upon Chinamen has subsided. The permanent good of the country demands white labor, but until the fruit farmer finds work for his laborer throughout the winter as well as in the other seasons, or until industrial expansion in other directions provides winter opportunities for the laborer, it is hard to see how the farmer's difficulty and the solid welfare of the province are to be met simultaneously. A suggestion has been made that 5 acre lots might be sold or rented moderately in the fruit districts to men who would act as farm laborers in the season; but it has not taken root, although it is held that a desirable class of immigrant would be attracted.

After all, British Columbia is but going through a difficulty that is successfully, if gradually, met in older districts less favorably situated, and with much less important financial interests behind them; but the farmer is growing somewhat weary of the prolonged talk on the subject and the lack of action in high places. The prospects of the fruit industry in British Columbia are probably unrivalled. It falls to those in authority to see to it that these prospects are not blighted by lack of suitable labor.

Nova Scotia

G. H. Vroom, Dominion Fruit Inspector

Another Nova Scotia winter is a thing of the past, for which we are truly grateful. The apple crop has nearly all been marketed at only medium prices. The total export from Nova Scotia for the year 1906-7 will amount to something near 325,000 barrels.

I have been looking quite carefully over the orchards in several localities in the Annapolis Valley during the last week or two, and I find the trees well stocked with fruit buds, which ensures a big bloom, without which we cannot get fruit. I find very little winter killing, and the trees look well. The buds have not yet begun to swell as the weather has been cold and backward. The fact that the buds are kept back by the cold weather is a good thing for the fruit, as the bloom will escape the spring frosts. Caterpillars will very likely be troublesome this season, as the nests are plentiful on the apple trees. Present indications argue in favor of a good apple crop in Nova Scotia this present year.

Prince Edward Island

Rev. Father Burke, Alberton

The spring is late in Prince Edward Island. It has seldom been later; but, no doubt, the Giver of all Good will not, on this account withhold, any more than other years, the miracle of the multiplication of seeds, by which the world lives.

In badly broken orchards our experience teaches us that usually it is useless to go to much trouble with repairs. Every broken limb of any size is better off, if not needed for the moment, for purposes of respiration, until new sprouts come, etc. All this bolting and wiring ultimately goes to pieces, in most cases. Set out some good new trees, is our advice. And do not be discouraged; you are learning all the time and this is all the pleasure of life.

What will you put out this spring? This correspondence with Chief McNeill will answer as well as anything else:

"REV. FATHER BURKE: It is difficult, indeed, to say what is the best variety, in fact there is no best variety. A variety is a thing not only

of climate and soil, but of individuals, and consequently we need never hope to get at absolutely the best variety. Nevertheless, there is a working list of six that it is undoubtedly expedient to recommend. You give your own personal list as: 'Duchess, Alexander or Wolf River, Fameuse or McIntosh Red, Gravenstein (top-grafted), Spy (top-grafted), Stark.'

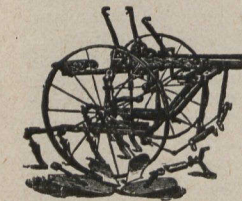
"This is a most excellent list if you happen to be a Duchess man. Like you, I have the conceit to think that I am a Duchess man, and am putting in 500 trees more of them next spring. Your problem with the Duchess is comparatively easy because, as grown in Prince Edward Island, they may with a reasonable hope of success be packed in barrels, and will carry to an extent that we in the southern part of Ontario could not think of counting upon. I expect to have to harvest mine all in boxes and with the assistance of cold storage. Indeed, I should never think for a moment of planting the Duchess if I did not intend to box every Duchess that I sold, and ship it with the help of cold storage from the orchard to the market.

"Of your second choice, Alexander or Wolf River, I think I would prefer the Wolf River, all things considered, but you would make no mistake in the Alexander. It is a paying apple. So, also, in your third choice, I would prefer the McIntosh Red to the Fameuse. It is hardier, I think, of better quality, but certainly either of them is good enough in quality, but it is a somewhat better keeper and shipper.

"I must confess that I have always had great hopes of the Gravenstein in Prince Edward Island. Top-grafted on hardy stock such as the Tolman Sweet, McMahon White, Hibernial or Gideon or Haas, it would be hardy almost anywhere that other apples grow, and could be harvested just with the last of the Nova Scotian fruit and for some weeks after. The better keeping quality of the Prince Edward Island Gravensteins would, I believe, so soon give them a place in the market that they would occupy practically the same position as the Georgian Bay Spys do in Ontario fruit, and would call for a top price. I must confess that I never thought highly of the Spy for Prince Edward Island; and nothing but the success of Senator Ferguson keeps me from severely criticizing the Ben Davis and the Stark.—A. McNEILL, Chief, Fruit Division, Ottawa."

Implements that Save Labor

The scarcity of good farm help is a serious problem that confronts fruit growers and gardeners. The result is that many of them are compelled to allow a large part of their land to lie idle and allow it to run to grass and weeds. The fruit grower or gardener who depends upon Iron Age garden tools, has the best help in the world. These tools do the work easier, quicker, and better than it can be done by any other methods. Some of them combine several tools in one implement.



The illustration shows the No. 60 Iron Age riding cultivator. It is a great time and labor saver. It is quickly adjusted to cultivate any crop in rows from 28 to 48 inches in width. It is successfully operated on both level and hilly land, and on all kinds of soil. It is easy to guide and easy to turn in the smallest space. A little booklet tells about this and many other implements. Write for it to the Bateman Manfg. Co., Box 516, Grenloch, N.J. Mention THE CANADIAN HORTICULTURIST

British Columbia apple growers should make a strenuous effort to command the apple market of Australasia. Reports from the Canadian Commercial Agent at Sydney, N.S.W., indicate that a larger trade in this product should be carried on between Canada, particularly B.C., and that country.

Orchard Management

At the last P.E.I. F.G.A. convention an address on "Orchard Management" was delivered by Mr. W. T. Macoun, C.E.F., Ottawa. He spoke especially on that part of the work relating to varieties, cultivation, cover crops, fertilizers and pruning. In referring to varieties, he mentioned those which appeared to him particularly suitable for the Annapolis and Cornwallis valleys as judged from observations recently made by him on a trip through the Annapolis valley. He said that in the future the Blenheim was going to be to the valley what the Gravenstein had been in the past, as this sort did particularly well, and was sought for in Great Britain. Other suitable varieties were Ribston, King, Baldwin, Wagener, and Stark. Others which did well, though not quite so satisfactory, are Greening, Northern Spy, Golden Russet, Roxbury Russet or Nonpariel. The Ben Davis does well, but is not recommended. He thought orchards were cultivated more thoroughly in N.S. than in most places in Canada, but cautioned the fruit growers against cultivating too late, as he believed that the so-called "collar rot" of the Gravenstein and other varieties was caused by the trees growing too late in the autumn, and that the bark at the ground was burst when severe frost came, the wood not being thoroughly ripened at this point. He recommended stopping cultivation earlier and seeding down with cover crops to check growth.

Referring to fertilizers, he said that young trees do not require much fertilizer, good cultivation early in the season being more important. Expensive fertilizers may be applied to bearing trees. Cover crops were recommended for young and old orchards to furnish humus and nitrogen, and to bring the soil into a better mechanical condition, thus lessening the leaching of plant food and favoring a thorough aeration of the soil, which Mr. Macoun con-

tended was as important a factor in cultivation as the retention of moisture. In pruning bearing or old trees they should be treated back at the top and sides from the outside, rather than pruning off the large lower limbs and cutting out the centre of the tree. This forces the tree to more upward growth, making picking harder, while heading in encouraged the development of bearing wood lower down. Considerable discussion followed this paper, especially on the subject of "collar rot," some favoring Mr. Macoun's views and some not sure that this late growth was the cause.

Toronto Hort'l Society

The Toronto Horticultural Society held its regular meeting on April 2. Arrangements were made for the distribution of seeds to school children and other routine business transacted. Mr. Wm. Hunt, of the O.A.C., Guelph, was the lecturer of the evening, his subject being "The Mixed Flower Border." His address was, as usual, full of good, sound, practical information. The speaker stated that he had selected "The Mixed Flower Border" as his subject for several reasons one being that very few flower lovers in towns or cities had sufficient ground to allow of their having a border of what are usually considered as strictly border perennials alone. For this reason, and the fact that in having a more varied selection of plants such as spring and summer flowering bulbs and plants as well as a few annuals, or even greenhouse and house and window plants mixed in judiciously, a more continuous and lengthened period of flowering results could be obtained.

Numerous questions were asked the speaker during and after the address, the audience evidently being deeply interested in the subject. A hearty vote of thanks was tendered the speaker at the close of his remarks. Extracts from Mr. Hunt's address will be published in another issue.

Notes from Societies

The Thornbury Horticultural Society will miss the well-known and genial face of its late secretary, A. W. Walker, who has gone to join the great majority. He settled in that locality some 40 years ago.

The St. Catharines Horticultural Society is booming. Indications point to a banner year. Three shows will be held, as last year, June, July and September. The September show will surpass in every way the one of last season.

At a meeting of the Hamilton Horticultural Society, held April 11, Prof. H. L. Hutt of the O.A.C., Guelph, gave an address on "How to Beautify Homes." The lecture was illustrated by means of lantern slide views, and was much enjoyed.

A most enjoyable meeting of the members and friends of the Grimsby Horticultural Society was held at the beautiful residence of Mr. Linus Woolverton, on April 12. The speaker of the evening was Mr. Wm. Hunt, of the O.A.C., Guelph, his subject being by request, "Our Grandmother's Garden." Much information of a practical and interesting nature was imparted to those present.

At a recent meeting of the Woodstock Horticultural Society, Mr. Wm. Hunt, of the O.A.C., Guelph, spoke on two subjects, "The Mixed Flower Border," and "Seasonable Topics." The speaker in his introductory remarks congratulated the citizens on the securing of a parks, shade tree and boulevard commissioner. The subjects of the evening were matters on which the speaker seemed quite at home. A number of questions were asked Mr. Hunt, who replied in his usual ready and well-informed manner. In the afternoon, Mr. Hunt addressed about 200 scholars at the Central School, among whom the Woodstock society is distributing about 300 packets of aster seeds.

Reliable Plants for Spring Planting

ROSES

SNOW QUEEN (Frau Karl Druschki or White American Beauty).

The new German Rose which has made such a sensation. Flowers exceptionally large and snow white. Strong grower and free bloomer.

BABY RAMBLER. This new Rose is of dwarf habit and continually blooms from Spring until frost. At the approach of cold weather the plants can be potted and brought in the house, where they will bloom throughout the winter.

Also Baron Prevost, Crimson Rambler, Dorothy Perkins, Madame Plantier, Marshall P. Wilder, Margaret Dickson, Paul Neyron, Ulrich Brunner, White Ramblers, Yellow Ramblers, and a general assortment of extra hardy field-grown Roses which cannot fail to give satisfaction.

WRITE FOR LISTS AND PRICES

EVERGREENS

250,000 NORWAY SPRUCE

(*Picea excelsa*)

in all sizes from 9 inches to 3 feet

All transplanted, healthy and bushy stock, just in the condition for forming thick Evergreen hedges and shelters.

Also Thuja Nervæneana, Thuja Pyramidalis, Thuja Sempervirens (a most beautiful bronze and golden coloured dwarf growing arbor-vitæ), Austrian, Scotch and White Pines, all sizes. Retinosporæ in variety, and the leading varieties of Thuypsis, Abies, Taxus, etc.

WRITE FOR LISTS AND PARTICULARS

Stock packed carefully and shipped by Freight or Express. Shipments made daily by G.T.R., C.P.R., M.C.R., T.H. & B. Ry. and Canadian and Dominion Express

ESTABLISHED ¼ CENTURY

NURSERIES 750 ACRES

HELDERLEIGH NURSERIES

E. D. SMITH

WINONA, ONTARIO

Mention The Canadian Horticulturist when writing.

Items of Interest

At a meeting of the Ottawa branch of the Ontario Vegetable Growers' Association, held recently, the question of using baskets instead of boxes for tomatoes was discussed. No definite action was taken.

Lovers of flowers should read the offer of THE CANADIAN HORTICULTURIST to give 10 gladiolus corms free to all readers who will send in one new subscription for the paper. The offer is good only until May 15. Take advantage of it now.

Several severe freezes have destroyed the peach crop in this vicinity, and have damaged the apples and plums, and the cold, dull weather has been most unfavorable for the fertilization of all the early blooming fruits.—B. S. Pickett, Champaign, Ill.

All the leading varieties of strawberries, raspberries and potatoes are grown and sold by John Downham, Strathroy, Ont. Send for his catalog.

All nursery stock should be fumigated with the roots covered with earth so as to protect the roots against danger from the gas. Some nurserymen are a trifle careless and get in too much of a hurry and the grower suffers. The latter loses not only cash but time and labor.—W. A. Hunsberry, Jordan Station, Ont.

Do you want to try a new strawberry, and one that has proved of superior merit by actual test? If so, send one new subscription to THE CANADIAN HORTICULTURIST, and receive 20 plants free. Read the offer in our advertising columns.

From Far-off China.—The following letter was directed to Mr. M. J. Henry, of Vancouver, B.C., who sent it to us: "I am directed by His Honor the Commissioner to write and ask you if there is a good fruit journal published in Canada. If

there is, I am to ask you to be kind enough to order it sent here for one year, addressed to me. J. Gibbons, Port Edward, Wei Hai Wei, China."

Worth Ten Times Its Cost.—Mr. W. H. Gibson and I have repeatedly compared the cost of our spraying outfit and the results, and we are practically certain that a Wallace Sprayer would pay us supposing it cost \$2,000 instead of \$210. Our orchards as yet have not reached maturity, the majority of trees being about 10 years old. We consider, therefore, that the machine will pay us still better in the future. We are seriously considering buying another, so that each will have a machine. I am planting out 1,000 trees on another farm that I have, and expect to have to get a sprayer for there in a few years. Needless to say it will be a Wallace.—H. C. Bowen, Newcastle, Ont.

Practical Books For All.—Any books on horticulture may be obtained through us at a reasonable price. Every fruit grower, gardener and amateur florist should write for our brief catalog of 16 pages, which will be mailed free of charge to all who are interested. The following are a few of the books we handle and their prices: "Fruit Harvesting, Storing, Marketing," F. A. Waugh, \$1; "Practical Fruit Grower," Maynard, 50 cts.; "Vegetable Gardening," S. B. Green, \$1; "Garden Making," L. H. Bailey, \$1; "Gardening for Young and Old," Jos. Harris, \$1; "Home Floriculture," E. E. Rexford, \$1; "Practical Floriculture," Peter Henderson, \$1.50. Write to THE HORTICULTURAL PUBLISHING Co., 506-7-8 Manning Chambers, Toronto.

One of the three most important elements of plant food in the soil is potash. In fruit trees, it produces fruitfulness rather than excessive wood growth. It has an influence on the flavor, and it causes the fruit to color up

better. Fruit growers and gardeners should use a certain amount of potash each year on their soils. Write for further information regarding it to the Dominion Agricultural Offices of the Potash Syndicate, 1102-1105 Temple Building, Toronto, Ont.

THE CANADIAN HORTICULTURIST for March is a beautiful number, a positive credit to this Dominion. Every orchardist and gardener should subscribe for this 50 cent magazine. It is equal to many dollar publications.—Bowmanville Statesman.

ASPARAGUS WANTED
If you will have any Asparagus to sell this Spring write to me at once with particulars. It will be more profitable to sell to me than to any one else. Let me hear from you.
E. C. KIDDER
ST. CATHARINES, ONTARIO
Mention The Canadian Horticulturist when writing.

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ROYAL MAIL STEAMSHIPS
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Above steamers all carry passengers
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Favorite Steamers for all kinds of perishable cargo having fan ventilation, cold storage, and cool air chamber.
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BRITISH AMERICAN WAR
SPECIAL CORRESPONDENCE
Gasport, N.Y., April 15th, 1907
Both American and British Horticulturists have declared war against the San Jose scale, and in order to make effective the fight, they have placed an order with the leading manufacturers of spraying apparatus for ninety-nine of their gasoline power machines, hundreds of their new ball shut-offs, thousands of their nozzles and a great many more of their hand pumps than ever before.
These orders are a direct result of the good work which the "Friend" outfits have been doing in the past years. The Company report that they have made shipment of eighty of the ninety-nine 1907 machines sold this season and are filling orders promptly on other lines. Every mail brings orders from as far west as Oregon and as far east as Nova Scotia, and they have shipped many of their machines into Australia, Egypt, etc.
Every mail brings to the Company words of praise and commendation from the most prominent Fruit Growers in the world, regarding the machines and especially the spray nozzle which is constructed that it takes the place of the usual cluster of nozzles and the one is all that is necessary. They have carefully protected their own ideas and warn all people to be careful what they buy, as users as well as manufacturers of the infringed articles are liable.
In this issue is pictured one of their complete machines at work in one of Niagara County's orchards in the early spring. The "Friend" nozzles and shut-offs attract considerable attention, especially on a cold day when dripping, clogging nozzles and leaky shut-offs are the pest of the job.
If you want to get in touch with a concern devoted exclusively to the manufacture of spraying apparatus, who originate all of their own ideas, write your wants to the
"Friend" Manufacturing Company
GASPORT, N.Y.
Mention The Canadian Horticulturist when writing.

A Power Sprayer Bonus

In the production of high-grade fruit, spraying has become the most important operation of the year, and while widely practised in certain sections, has not yet been given the attention that it requires in the apple sections. The advent of the power sprayer is of such recent date that the advantages it gives, especially in the spraying of apple orchards, is not yet appreciated.

For many years the Ontario Department of Agriculture has been advocating more and better spraying. Demonstrations in the use of hand and power outfits, and the preparation and application of the most effective mixtures, have been given throughout the province with satisfactory results. It is now felt that such information has been sufficiently diffused and another step forward is proposed.

The Ontario Fruit Growers' Association has within the past 3 years assisted in organizing a large number of fruit growing associations. One of the aims of these associations has been the cooperative spraying of orchards of their members, and it is now proposed to assist these and kindred organizations in such spraying work. With this aim in view, the Minister of Agriculture has asked the Legislature for a grant of \$6,000 to be devoted to the assistance of fruit growers in the purchase and operation of power spraying outfits. Many associations already own and are operating such machines and these will receive the same aid as those organizing during 1907. The conditions under which the grants are available have been made as simple as possible with the hope that a decided stimulus will be given to the proper spraying of orchards during this and coming seasons. Following are the regulations covering the payment of the grants:

A grant of \$50 will be made to any 5 or more farmers who unite to form a fruit growers' as-

sociation for the purchase and operation of a power spraying outfit during the season of 1907. These associations need not be incorporated to qualify for this grant, though incorporation of cooperative associations should be obtained if the full benefits of cooperation are desired.

Cooperative fruit-growing associations owning and operating two or more power sprayers will be eligible to draw a grant for each machine operated.

The number of such associations receiving assistance during the present year shall not exceed 100.

At least 25 acres of fruit trees must be thoroughly sprayed during the proper season with each outfit.

A reasonable portion of such spraying must be done on the farms or orchards of each of the parties forming the association.

Such associations before receiving any portion of the grant shall satisfy an inspector of the department of agriculture that the above conditions have been complied with, and shall make such reports as shall satisfy the minister of agriculture.

Associations desirous of participating in this grant must apply to the department not later than the first day of May. Forms for making applications will be furnished on request.

High-class Perennials

Mr. E. Byfield, who contributes the article in this issue on "The Hardy Herbaceous Border," has for the past 10 years been an ardent enthusiast in the growing and testing of this class of plants. He has succeeded in getting together a collection probably second only in Ontario to that of the provincial collection in Queen Victoria Park, at Niagara Falls. His aim has been to thoroughly test the adaptability of plants of this description to withstand the rigors of our

Canadian winters, and to select the very choicest varieties of these plants that are procurable.

His efforts have been so successful and applications for plants from his grounds so numerous, that he has been practically compelled to place his spare stock on the market. A limited quantity of such plants as delphiniums, oriental poppies, pyrethrums, Canterbury bells, columbines, coreopsis, foxglove gaillardias, hollyhocks, German and other iris, perennial phlox, helianthus, rudbeckias and many other kinds of hardy plants, thoroughly tested on his grounds are offered, as far as they go, at reasonable rates. All communications sent to his address, Lock Box 96, Balmy Beach P.O., E. Toronto, will receive his prompt attention.

I have been in communication with The Deming Company, and have inspected their power outfit in actual field work with lime-sulphur, at Lockport, N.Y. I can safely say that this company have a splendid power outfit and one that should commend itself to practical growers, as well adapted for the purpose.—W. H. Bunting, St. Catharines, Ont.

The Largest Aster in the World KATE LOCK

This aster has won highest awards at the leading exhibitions in Canada. Colors are in Separate Packages. White or Enchantress Pink Shade.

Large Size Trade Packages, \$1.00

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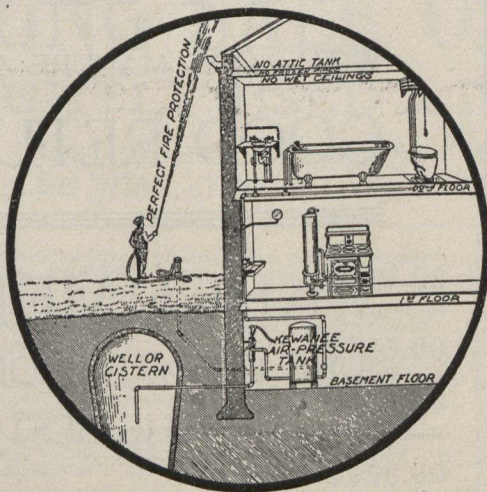
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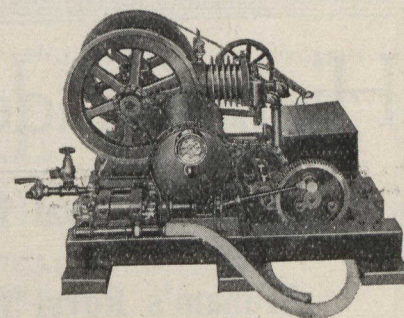
Are now in use in over 7,000 Private Homes, Stock-farms, Greenhouses, Ranches, Hospitals, Charity Homes, Apartment Houses, Factories, Government Buildings, etc. Built in sizes to suit the smallest family or the largest town. Throw streams 100 feet high. Everything out of sight and reach of frost. No failures. They are NOT expensive luxuries but ARE ECONOMICAL NECESSITIES, and give to the country or village resident the FULL SERVICE AND FIRE PROTECTION afforded in the cities. No elevated tank nuisances.



A \$50.00 BONUS IS OFFERED TO PURCHASERS OF

WALLACE POWER SPRAYERS

BY THE ONTARIO GOVERNMENT



Send to the Department of Agriculture, Toronto, for full particulars, and "get busy" about it at once—the grants are limited.

Get the machine which has never proved a failure; which has never been returned on the guarantee thereof; which gives the best of satisfaction; which is GUARANTEED ABSOLUTELY; the kind for which as high as 32 repeat orders have been given by different orchard companies—THE WALLACE. It is now replacing other makes.

"The experience at the Experimental Farm, Ottawa, goes to show that it is possible, with careful spraying, to practically banish the Codling Moth from Canadian orchards. Last year it was impossible to find a specimen of the Codling Moth in the orchards of the Experimental Farm, and what was done there can be duplicated in any good orchard in Canada."—(See April issue *Canadian Horticulturist*, page vii.)

The above spraying was done with a Wallace "Duplex" Sprayer.

Investing in a Wallace Power Sprayer has returned as high as 14 times its cost in ONE SEASON on the Codling Moth alone; it beats the mining stocks to a finish. Try it. Do it NOW.

We have all sizes and styles in both Automatic and Gasoline outfits. The Automatics furnish ABUNDANCE OF POWER WITHOUT ONE CENT OF COST. Will spray anything, and no trees too large for them. Full information free for the asking—write for it.

Regarding any of these increasingly popular goods, enquire of

W. H. BRAND CANADIAN REPRESENTATIVE AND SALESMAN

Jordan Station, Ont.

Mention The Canadian Horticulturist when writing

POULTRY DEPT.

Conducted by
S. Short, Ottawa

Intended improvements in the flocks should be made in May. This is the best season to take out the mongrels and replace them with pure-breds. In the first place, for the sake of economy it is cheaper to get one or more settings of eggs from a reliable source than to buy a pen of pure-bred birds. At this time of year pens of fowls are very hard to purchase, for breeders have disposed of all their surplus stock and do not care to break up their breeding pen unless a good cash offer is made. It should not be hard to get good hatches this month; that is, 10 chicks out of every setting of eggs.

It is better to purchase from a well-known breeder, as you are surer of better results. When a breeder has been years establishing his reputation, he is not going to throw it away by selling poor eggs for hatching, but on the other hand is going to sell eggs from good stock and

IF YOU HAVE APPLES OR POULTRY TO CONSIGN

we can handle them for you to advantage. If apples are in car lots, write us and we can sell them for you f.o.b. your station

THE DAWSON COMMISSION CO.
Cor. West Market and Colborne St. Limited
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from fowls mated together by an expert. He wants to sell eggs that will hatch strong chicks, that will not only be a pleasure and satisfaction to the owner, but will also be a credit, and add to the reputation of the breeds from which the eggs were obtained.

In past years, poultry raisers have borne rather doubtful reputations more or less deserved. Nowadays, the fanciers are men of different character, more intelligent and with better plants and facilities. No one but the experienced poultry raiser knows what possibilities there are in skilful breeding, especially to produce a winner in the popular breeds. Owing to the prevailing high prices of poultry and eggs, brainy men of good repute have been attracted to the field of thoroughbred poultry raising, and no one need refrain from investing in eggs from high-class stock through fear of being duped.

As a rule, eggs hatch an equal number of both sexes. It will be necessary, therefore, to hatch twice the number of chicks as females required for the laying pens next winter.

Fruit growing and poultry keeping should go together. With little additional labor, 2 crops can be raised from the same land, one of fruit, and another of fowls. There is no better place for young chicks than in the orchard or berry patch. The following facts, though, have to be considered: Young and old fowl will pick at strawberries as soon as they begin to color. They will eat green grapes and green gooseberries if they get the opportunity. They will eat ripe raspberries and red currants. They will not eat black currants until the currants are so ripe that they fall from the bushes. They will eat windfalls from the fruit trees, also all moths and bugs that abound in the orchard. The following plan is followed by the writer without the slightest inconvenience. The poultry runs are planted with black currant bushes and apple trees. About the middle of August, when the currants and early apples

are ripe, the fowls are removed to the raspberry and red currant plantations, the crop being over and the patch being enclosed with poultry netting and provided with temporary roosting quarters.

Keeping Hens for Profit

Alfred Andrews, Burlington, Ont.

In the April number of THE CANADIAN HORTICULTURIST I contributed a brief article on "Keeping Hens for Profit." From what was said, one might ask: Why do I remain in the business? My answer is that I want to be sure of having first quality of eggs for our own use, without the torment of looking after a supply outside, and often utterly failing in our efforts. Then, a number of friends who cannot keep fowls get their supply from us. They volunteer the statement that they "get no stock such as we supply them."

Eggs may be fresh and yet not of good quality otherwise. The quality and particularly a rich, agreeable flavor, cannot be assured without carefully providing for it. This depends on clean, pure, rich food, fed at proper times and in proper quantity; on clean water, fresh at least every morning and in good supply; and on clean, wholesome apartments.

Our dropping boards are scraped clean every morning and then sprinkled with dry, clean sand, making it easy to keep the hens from carrying into their nests any filth to soil the eggs. This could be washed off, but the beautiful bloom on a first-class egg should never be washed off. At least once a week all the litter on the floors must be removed.

Next in importance, is to see that the eggs are gathered frequently, especially when the fowls are broody. When gathered, they should not be allowed to stand in a warm, close, or damp room, before they are marketed. The runs should never contain pools of filthy water, or other decaying matter.

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High Grade Seeds

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I like the kind of exercise that must be taken to have best results. Caring for the fowls is a source of health, without being at all severe labor.

In many concerns the bye-products are considered of importance. So with us. The droppings from the fowls, mixed with dry sand and thrown into an enclosed pile, makes the finest fertilizer for the gardens and berry bushes.

These are some of the reasons why I keep fowls. When the business is fairly well understood and judiciously carried on, there are fair probabilities for a moderate return, if one is patient enough to wait. Beyond that, look out, or you'll be sorry.

Novelties in Vegetables

Ed. THE CANADIAN HORTICULTURIST: I read with interest the article from Mr. J. W. Rush, of Humber Bay, Ont., in the March issue of THE CANADIAN HORTICULTURIST. While I agree with the greater part of it, there are one or two sentences to which I desire to take objection, viz., "Let new varieties and novelties alone. Leave them for the college students

to try; we have no time for such work." If we had followed that rule in the past, what varieties of vegetables would we be growing to-day? The Marrowfat pea, Peachblow potato, or would it be Fluke's or Carter's, Demi-dur and Le Normand cauliflower, and so on? Seedsmen will give us new varieties just as soon as there is a demand for them, not before.

With regard to Mr. Rush's proposal to leave the testing to college students, I may say that if Ontario Agricultural College students were meant, the work probably would be both pleasant and profitable to them, and was attempted to some extent last year; but of what value would their experiments be to the commercial vegetable growers of the province? Can the name of one leading variety of vegetables be stated that was introduced to the public in that way?

It certainly would be foolish to plant untested varieties, but a little time spent in consulting the catalogs of leading seedsmen in Canada and elsewhere, and a small expenditure made every year in securing and testing new varieties, would be one of the most profitable investments a vegetable grower can make.—Thos. Delworth, Weston, Ont.

FOR SALE AND WANT ADVERTISEMENTS

Advertisements under this heading inserted at rate of one cent a word for each insertion, each figure, sign or single letter to count as one word, minimum cost, 25 cents, strictly cash in advance.

LANDSCAPE GARDENING—Plans drawn to scale for laying out and planting parks, cemeteries, public or private grounds. Work supervised. C. Ernest Woolverton, landscape architect, Grimsby.

GARDENER seeks situation in private place. Fifteen years' experience under glass and outside. Age thirty. Good references. Box B, CANADIAN HORTICULTURIST.

FOR SALE.—Niagara Power Sprayer, hundred gallons, with tower cart, five-row crop sprayer, tank pump, complete outfit. Used one season. F. Fairbrother, Oakville, Ont.

IF YOU ARE in need of nursery stock for planting this spring, write at once to the Smith & Reed Co., St. Catharines, for their catalog.



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USED FROM OCEAN TO OCEAN

A light, composite, fine powder, easily distributed either by duster, bellows, or in water by spraying. Thoroughly reliable in killing Currant Worms, Potato Bugs, Cabbage Worms, Lice, Slugs, Sow Bugs, etc., and it is also strongly impregnated with fungicides. Put up in Popular Packages at Popular Prices. Sold by Seed Dealers and Merchants in Ontario, Quebec and Manitoba.

For Pamphlets worth having on Bugs and Blights, send to

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JUST EIGHT OF THEM, BUT EACH ONE A DEAD BARGAIN.

BE WISE AND CALL OR WRITE WITHOUT DELAY

- R. S. WILLIAMS**—Upright Cabinet Grand, ebonized case, panelled top door, 7 1-3 octaves, in first class condition, thoroughly overhauled; regular price, \$450.00. Special, at..... **\$215.00**
- R. S. WILLIAMS**—Upright Cabinet Grand, golden oak case, beautiful carved panels in top door, 7 1-3 octaves, practically like new, case revarnished, new hammers, etc.; fully guaranteed. Special, at..... **\$225.00**
- STANBURY & SON**—Upright Cabinet Grand, beautiful walnut case, full length music rack, Boston fall, 7 1-3 octaves, 3 pedals; practically as good as new. Special, at..... **\$245.00**
- WORMWITH & CO.**—Cabinet Grand, walnut case, full length music rack, Boston fall, 7 1-3 octaves, 3 pedals, sustaining bass, full metal plate, in elegant condition, fully guaranteed; used less than three months. Special, at..... **\$250.00**
- ENNIS & CO.**—Full-size Cabinet Grand, 3 pedals, beautifully decorated, full length music rack, Boston fall, 7 1-3 octaves, full metal plate. This piano is in elegant condition, has been used for concert work, and is practically new. Special, at..... **\$255.00**

- LISZT, TORONTO**—Beautiful Colonial design Cabinet Grand Piano, in mahogany, full length music rack, 3 pedals, full metal plate, fully guaranteed, has only been out a couple of times to concerts. At value at..... **\$265.00**
- UXBRIDGE UPRIGHT**—Cabinet Grand, mahogany exhibition case, 4 ft. 10 in. high, 7 1-3 octaves, 3 pedals. This is a particularly fine-looking piano, and has a good tone, fully guaranteed; regular price, \$500.00. Special, at..... **\$275.00**
- HEINTZMAN & CO.**—Upright Cabinet Grand, in beautiful burl walnut case, with three hand-carved panels in top door, swing music rack, 7 1-3 octaves, in elegant condition, case revarnished, new hammers, etc.; five-year guarantee; regular price, \$475.00. Special, at..... **\$279.00**

This is one of our well-known make, and will give satisfaction to any musician.

Several slightly used Piano Players, including Pianolas, Harmonist, etc.; at prices ranging from \$100.00, \$125.00 and \$175.00. All in excellent condition, and a quantity of music given with each machine. SEE THESE.

EASY TERMS OF PAYMENT—\$1.50 per week or \$6.00 per month, quarterly or half-yearly payments if desired. A nice stool accompanies each piano. Piano-players at very reasonable terms. Freight paid to any point in Ontario, and reasonable arrangements to any other Province.

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Trees Indicate a Good Fruit Season

FROM advices received from crop correspondents of THE CANADIAN HORTICULTURIST it is evident that fruit trees and bushes have passed the winter in good shape. Peach buds have been slightly injured, but, as yet, not enough to decrease the prospect for a good crop. Small fruits have suffered to a limited extent, especially strawberry plants that were unprotected. While early to say anything definite about crop prospects, it is with confidence that growers are anticipating a profitable season.

MONTREAL DISTRICT

Westmount.—The winter has been a good one for fruit. The prospects promise fairly well for apples. Trees heavily loaded last year did not produce much growth of new wood, so crops may be small.—R. Brodie.

STANSTEAD COUNTY, QUE.

Beebe Plain.—Tip buds of sweet cherries are injured. European plums have come through all right; Japans, except Satsuma, killed back to last spring's wood. No damage is noticeable on apple trees.—D. L. House.

GRENVILLE COUNTY

Maitland.—Weather conditions on the upper St. Lawrence during the winter were everything that could be desired. Trees are in healthy condition. Fruit buds on apples are plentiful; appearances point to a large bloom. Small fruits and strawberries are looking bright and healthy, although some sharp frosts injured unprotected strawberries. Last year only 20% of a crop of apples were harvested, so a heavy crop may be expected this year.—Harold Jones.

DURHAM COUNTY

Newcastle.—Buds do not seem to have been injured, but it is too early to estimate prospects for a crop. Oyster-shell bark-louse is very prevalent but growers are fighting it persistently.—H. C. Bowen.

HASTINGS COUNTY

Belleville.—Trees have come through in good condition; buds do not seem to have suffered. Present indications point to a good crop the coming season.—F. S. Wallbridge.

PEEL COUNTY

Clarkson.—Small fruits appear to have pulled through the winter in good shape. The outlook for a good strawberry crop is good. Large fruit trees look well and give promise of good crops.—W. G. Horne.

WENTWORTH COUNTY

Hamilton.—Unprotected strawberry patches have suffered. Protected ones have wintered fairly well. Canning factories are contracting for strawberries at 5 to 5½ cts. a box, but the growers consider this price too low. Peach trees have come through in fairly good condition, although in some sections the buds have been slightly damaged. Raspberry canes have suffered; the snowy tree cricket has done much damage to them.—J. A. Stevens.

Bartonville.—Most trees came through well. Peach buds are quite badly hurt, although plenty are left for a good crop! The San Jose scale has been found in a few places here. The New York scale also is prevalent. Raspberry bushes were quite badly frozen, particularly Marlboro.—H. F. Burkholder.

LINCOLN COUNTY

Grimsby.—Peach, pear and cherry buds appear to be uninjured. The prospects for a crop are good. Raspberries have been slightly winter killed. Strawberries look well.—W. H. Book.

Jordan Harbor.—Fruit trees and bushes came through in first-class shape. Prospects for a good crop are very promising.—John Woods.

Jordan Station.—Strawberries suffered considerably, but probably there will be an average crop. Raspberries and blackberries look well. Pears, cherries, plums and peaches appear to be in good shape for a full crop. The writer's orchard promises to produce its 8th good crop of peaches in 8 successive years.—C. M. Honsberger.

St. Catharines.—Fruit buds look well. The cherry crop is quite promising. Peaches are well laden with buds on young trees. Plums, being scarce last year, should produce well this season. Apples and pears are fair. Raspberries wintered well. Protected strawberries came through all right; unprotected, heaved somewhat.—G. A. Robertson.

Homer.—Peach buds have been damaged, but plenty are left to give promise of a good crop. Pears and cherries look well. Bush fruits appear to have come through all right.—F. G. Stewart.

OXFORD COUNTY

Ingersoll.—Fruit trees and bushes seem to have come through in good shape. Prospects point to a medium crop of apples.—J. C. Harris.

KENT COUNTY

Chatham.—Prospects for a good apple crop are promising; also for pears. Peach trees are badly injured; not only are the fruit buds killed, but even young trees from one to four years planted are dead to the ground. Young pear trees also are killed.—Milton Backus.

Chatham.—Nearly all the peach trees are dead and the San Jose scale is fixing the rest of them. The pear crop will not be as good as last year.—W. G. Lister.

LAMBTON COUNTY

Sarnia.—Uncovered strawberry patches have been damaged by heaving; they will be a failure. Protected plantations have come through fairly well.—W. A. Broughton.

Arkona.—Fruit trees and bushes seem to have come through all right, except peach trees, which have been injured slightly. Prospects for an apple crop this coming season seem good.—W. J. Seymour.

GREY COUNTY

Thornbury.—Generally speaking, fruit buds appear to be in good condition, but the promise of a crop will depend upon weather conditions between now and fruit setting.—J. G. Mitchell.

Low-headed Peach Trees

At the Ont. F.G.A. convention held last Nov., an interesting address on "Low-headed Peach Trees" was delivered by Chas. F. Hale, of Shelby, Mich. In the course of his remarks, he pointed out that peach trees should be headed back when young to not more than 18 inches from the ground. By so forming the head, it costs less to prune, spray, pick, and take care of the tree. By making this work less expensive, profits are increased. The head should be formed with not more than 4 branches, the top one 18 inches from the ground, and each one starting from a different point on the trunk. Never have the centre of the tree higher than the outside limbs. High trees are apt to be broken down by storms. Fruit on low-headed trees is better in quality. Plant peach trees 20 feet apart. Prune and cut back each year. Give clean cultivation in summer until Aug. 1, then sow a cover crop. After planting, the orchard may be inter-cropped for 2 or 3 years, using for the purpose a crop that can be hoed and cultivated. For working under low-headed trees, use both plow and drag. Plow as close to the trees as possible, then use the drag, by going zigzag around the trees.

When trees are in full bearing, prune them by cutting back ½ to ⅔ of the growth each year. Thin the wood out well. The fruit on the limbs should be thinned, leaving them 6 or 8 inches apart. A good average crop for a 6-year-old tree is 2 to 2½ bushels. Among the leading varieties mentioned by Mr. Hale were St. John, Conklin, Engle Mammoth, Elberta, New Prolific, Smock, and for canning, Gold Drop. A good characteristic of low-headed peach trees is the fact that they are not attacked by borers as readily as those that are headed high.

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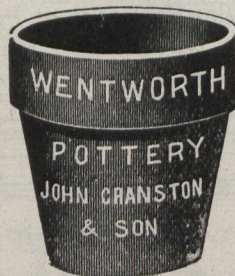
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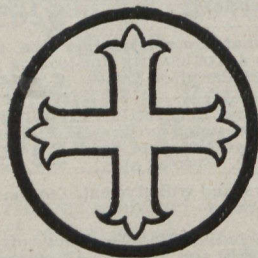
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Opening of the Vegetable Season

THE crop correspondents of the Ontario Vegetable Growers' Association report that market gardeners are planning for a good season this year. Weather conditions so far this spring, however, have not been conducive to active work. For work with hotbeds, the weather has been particularly bad. The season as a whole has been late. Not much plowing has been done. Even greenhouse crops have not done as well as usual, but there is a good demand, especially for radishes, lettuce and rhubarb. It is probable that onions will be planted extensively this spring; the acreage will be increased on account of seed prices. A large acreage of potatoes also will be planted. Other classes of vegetable will be planted as usual, but it is rather early to estimate the extent of the crops.

OTTAWA DISTRICT

Billings Bridge.—For hotbeds the weather this spring is bad. Radishes are scarce; lettuce plentiful. Lots of rhubarb on the market. Turnips, beets, carrots, onions and potatoes are plentiful. Cabbage is a glut on account of imported goods. Local celery is pretty well cleaned up.—T. R. Mockett.

LENNOX AND ADDINGTON

Napanee.—Potatoes will be planted largely; seed is not plentiful and selling at 90 cents a bag. Table potatoes are selling at \$1 a bag. Onions likely will be grown quite extensively. Other vegetables will be planted on a limited scale.—E. M. Sherman.

TORONTO DISTRICT

Humber Bay.—The season is very late. Not much plowing has been done. Some peas and spinach have been sown. The greenhouse and hot bed crops have not done as well as usual owing to the cold and cloudy weather. In Toronto, there is a good demand for all roots and vegetables at good prices.—J. W. Rush.

Bracondale.—Outside rhubarb is not showing yet. Fall spinach will be very scarce. All kinds of greenhouse goods are in great demand, especially radishes and rhubarb.—A. W. Shuter.

PEEL COUNTY

Clarkson.—A large acreage of potatoes will be planted this spring. The tubers have paid well the last three years and constitute one of Clarkson's main vegetable crops.—W. G. Horne.

WELLAND COUNTY

Niagara Falls South.—Spring onions and rhubarb have made very little growth. Asparagus is scarcely showing above the ground. Spinach, parsley and salsify are winter killed. Onions, on account of seed prices, will be planted on an increased acreage. Potatoes are bringing 75 cts. a bu. Cannons are contracting for produce at last season's prices; beets, \$7 a ton, beans, wax and green, \$30; corn, \$8; tomatoes, 25 cts. a bu.—Thos. R. Stokes.

HAMILTON DISTRICT

Hot house growers have been very successful with lettuce this spring, getting from 50 to 90 cts. a doz. Green onions are not over-plentiful at 20 to 25 cts. a doz. bunches. Rhubarb is not plentiful yet, but the demand is good at 90 cts. to \$1 a doz. bunches. Radishes are bringing 35 to 50 cents a doz. bunches. Dry onions are scarce and are worth \$1.25 a bu. Potatoes are selling at about \$1 a bag; the price is expected to rise soon.—Jas. A. Stevens.

WELLINGTON COUNTY

Guelph.—Early tomatoes, cabbage and cauliflower are now in the seed beds. No great increase in acreage will be planted, as the growers mostly do their own work, and will not be able to handle more than already undertaken. One grower is doing a very good business growing cucumbers, tomatoes, cauliflower and onions for pickling purposes and intends to increase his acreage of cucumbers and onions as he finds

a great demand for good pickles. Very few vegetables will be grown for shipment, as the local demand is quite brisk for a good product. Early potatoes, onions, cabbages, cauliflowers, celery and corn are the crops most commonly grown in this district.—H. S. Peart.

KENT COUNTY

Chatham.—The weather has been unfavorable for hotbeds; many have been completely destroyed. Potato planting has commenced. The acreage in vegetables probably will be about the same as last year. Hotbed lettuce has made its appearance. Winter vegetables are about gone. Potatoes are selling at 90 cts. a bag by the load.—Fred. Collins.

ESSEX COUNTY

Leamington.—Tomato growers are all busy with their plants and hot houses and the prospects for the coming crop are promising. Many new men are going into the growing tomatoes for canning on account of the prospective poor market for tobacco. At 25 cts. a bu. some men are led to believe that they pay well. All the leading growers, however, do not grow them any more.—E. E. Adams.

LAMBTON COUNTY

Sarnia.—Not much work has been done as yet. Plants in greenhouses and hotbeds are doing well. Also cabbage in cold frames.—W. A. Broughton.

Vegetable Notes

E. E. Adams, Leamington, Ont.

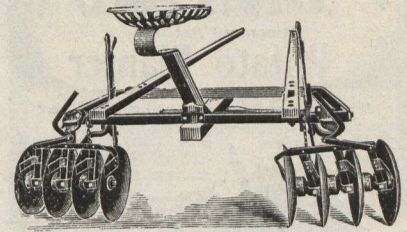
If vegetable products in this district are not handled in some manner different than they have been in the past, very little money will be made by many who are going into the line of early vegetable growing. Far too much stuff is sent into some markets while others are short. The better plan is to sell f.o.b. at point of shipment in place of indiscriminate shipments to commission men. Probably the evil will cure itself in time.

Meetings were held recently by Mr. A. E. Sherrington, of Walkerton, in the interest of the cooperative movement. Just what will come out of it is hardly in view yet. The larger growers are unanimous for it, while some are undecided, and others prefer to handle their own business, and let the other fellow do as he likes. Whatever is done in the line mentioned, will require careful handling, as it will be no child's play to handle the large quantity of truck grown here.

A neat little booklet entitled "Potato Culture" is published by the Aspinwall Mfg. Co., Jackson, Mich. It tells the story of potato culture from the selection and cutting of the seed to the harvesting and storing of the crop in the fall. Many other items of interest also are contained in this book. A copy may be had on addressing the firm.

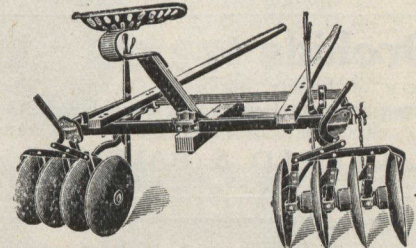
Bulletin 105, Maryland Agricultural Experiment Station, states that there is no danger of injuring young trees by fumigation if reasonable care is exercised in the operation. Careless fumigation, however, early in the fall before the wood has become thoroughly ripened, the exposure to the wash while wet, or the use of the chemical in too great quantities, will result in injury. The exposure of the nursery stock for 30 or 40 minutes in a gas made from one ounce of potassium cyanide, two fluid ounces of sulphuric acid and four fluid ounces of water for every 100 cubic feet of air space, has been found to give good results. It was noted that peach nursery stock was less injured than apple stock with the same conditions, and that some varieties of apples show less resistance than others.

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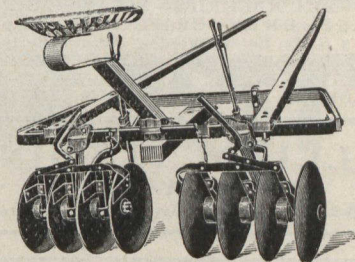
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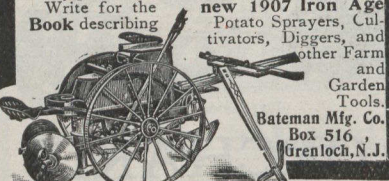
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PERHAPS of all insects, the gardener finds the cabbage and onion maggots the most difficult to control, hence any information along the line of controlling these pests is welcomed. In the experiments carried on by Dr. J. B. Smith and E. L. Dickerson, of the New Jersey Agric. Expt. Sta. (Bull. 200) in 1906, early, frequent and thorough applications of a carbolic acid and lime mixture gave best results. The mixture is made as follows: Slake the lime to a thin cream, use 3 pints to a gallon of water, and to this add one tablespoonful of crude carbolic acid. It should be applied along the rows immediately after the plants are set, or have made their appearance above ground, the 2nd application 5 days later, the 3rd, 4th and 5th at intervals of a week. The applications may be made with a sprinkling can or spray nozzle, and must be thorough in order to get it well around the plants so that the surface of the ground will be coated to the plants.

The experimenters also recommend the use of carbolic acid emulsion if applied soon enough, often enough and thorough enough. This emulsion is made as follows: Dissolve one pound of soap in one gallon of boiling water; to this add one pint of crude carbolic acid, then churn thoroughly with a pump until a good creamy emulsion is obtained. For use, dilute emulsion with 30 times as much water. Apply at the time stated for the carbolic acid and lime mixture, and use plenty.

THE CABBAGE MAGGOT

(Report of Minnesota Entomologist for 1906.) For 2 years efforts were made to find out a practical remedy for the cabbage maggot. Every reputed remedy that the entomologist had knowledge of, and some new ones as well were tried. Good results were obtained in 1906 by immersing the roots at time of setting with hellebore and water (1 part to 2 parts of water), and also by the use of bran and glue, and sawdust and glue. Two pounds of glue, dissolved in one gallon of water, are mixed with one-half pound of sawdust or bran. A handful of the mixture is placed around each plant a day or two after setting. It forms a covering 3 or 4 inches on the ground, and closely around the stem, through which the maggot, when it hatches from the egg, is unable to make its way to the plant tissue below the surface. The experiments will be continued in 1907.

THE GRAPE BERRY WORM

(Circular 63, Ohio Expt. Sta., by H. A. Gosard and J. S. Houser, Nov. 15, 1906.) The reviewer found the Grapeberry Worm quite abundant in many vineyards in the Niagara district in 1905, hence grape growers will be interested in the recommendations of the Ohio experimenters. The borders of vineyards should either be plowed or burned over to destroy the wintering cocoons, and then thorough sprayings with poison Bordeaux should be given, the first before blossoming, the second immediately after blossoming, and the third 10 days or 2 weeks later. The writers recommended double-spraying of the rows of vines, and the addition of some form of soap to the poison Bordeaux as sticker. It will be noted that the sprayings recommended as effective against the Grapeberry Worm will also serve to ward off the mildew and the black rot. Arsenate of lead is to be preferred to Paris green as the poison ingredient in the Bordeaux.

APHIDS AFFECTING THE APPLE

(Circular 81, U.S. Dept. of Agriculture, Mar. 9, 1907, by A. L. Quaintance.) Reference is made to 4 species of plant lice infesting the apple, viz.: The Woolly Apple Aphis, *Schizoneura lanigera*; the European Grain Aphis, *Siphocoryne avenae*; the Apple Aphis, *Aphis mali*; and the Rosy Apple Aphis, *Aphis malifolia*. Descriptions are given of the 3 latter

species, their differences noted, and their life histories, as far as they are known, outlined.

Regarding method of treatment, nothing new is recommended. Special mention, however, is made of the importance of pruning the terminal twigs, for it is on these that the majority of the black shining eggs are to be found. The value of the lime-sulphur mixture, as a destroyer of aphid eggs, is noted, as is also that of the common substances in use as spring or summer sprays, such as kerosene emulsion solution, whale-oil soap solution, strong tobacco decoction, and crude petroleum emulsion. It is important that these spring applications be made immediately after the eggs have hatched, for after the foliage is well out and more or less distorted from the presence of the plant lice, effective spraying is quite difficult, since many of the insects on the lower surface of the curled leaves will not be hit by the spray.

THE APPLE LEAF MINER

(Bull. 45, Storrs, Conn., Agric. Expt. Sta., Dec., 1906, by C. D. Jarvis.) This small Apple Leaf Miner, which has been frequently observed in Ontario orchards, but never to an alarming extent, was very abundant in Connecticut during the past season. The adult of this miner-caterpillar is a minute moth, about the size of an ordinary clothes moth. Two broods occur during the season, the second being the more serious. The first brood begins with egg laying about the 2nd week in June, the 2nd in last week of July. The caterpillars remain over winter in their silk-lined mines. The writer of the bulletin sees only one method of dealing with this miner, viz.: To gather up and destroy the infested leaves, or plow them under, preferably the latter, for the insect feeds within the leaf and cannot be reached with insecticides.

SOME POTATO DISEASES

(Bull. 71, Wyoming Agric. Expt. Sta., Jan., 1907, by A. Nelson.) Four diseases are discussed in this bulletin, viz., Early Blight, Late Blight, Scab, and the Rhizoctonia disease. Careful and accurate descriptions and the best methods of controlling these diseases are given. The Rhizoctonia is known under several common names, such as stem rot, rosette, little potatoes and blackfoot. The fungus attacks the stem at or just below the surface of the ground, destroying the bark in whole or in part. If the attack be a severe one it may result in the death of the plant; if less severe, it may induce a wet rot, and thus result in the death of the plant; or it may simply girdle the stem, the plant continuing to live, and often producing as a result of the girdling, an enlarged and apparently vigorous top.

There are 3 stages of this fungus—the *Rhizoctonia* stage, where only threads are seen; the *corticium* stage, where minute summer spores are observed, and the *sclerotia* stage, where compact bodies occur on the tubers and the stem. These sclerotia, as they are called, carry the life of the fungus over to the next growing season. The treatment recommended is to plant tubers free from sclerotia, rotate the crops, and treat the tubers for planting with formaline solution, as is done for the prevention of scab.

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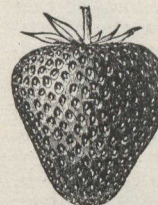
With all of these good friends working for our interests we are confident of adding many new names to our list each month. We ask our old and new friends to help increase the number of our readers. The more readers we have the more power will be given our editor to help advance the cause of horticulture in all its branches.

Needs of Fruit Industry

While Mr. J. A. Ruddick was giving his evidence, before select committee on agri. and colonization, a discussion took place as to manner of regulating the temperature of cars upon which fruit was transported. Some cars, he said, were iced in summer and heated by stoves in winter. Frequently the cool cars were too cool and the warmed cars too hot, and so the goods were spoiled by the very means designed to preserve them. Mr. Ruddick explained the difficulty of regulating the temperature of cars in transit, where they were attended to by men who had no interest in them and where it was so difficult to trace or punish carelessness. Mr. E. D. Smith pointed out that in the tender fruit section there was a great need for 1 or 2 inspectors. Mr. Ruddick admitted the neces-

sity and said that he would make a note of it and see what could be done. In reply to a question as to whether the Govt. had an inspector at Portland he said that there was none.

I have been experimenting with Japan plums, Satsuma, so far, is the only variety I have succeeded in wintering. We ought to have a law in this province compelling every land owner to cut down and burn all trees that are infected with black knot. New York State has such a law, and it works well. We may get one some day.—D L. House, Stanstead Co., Que.



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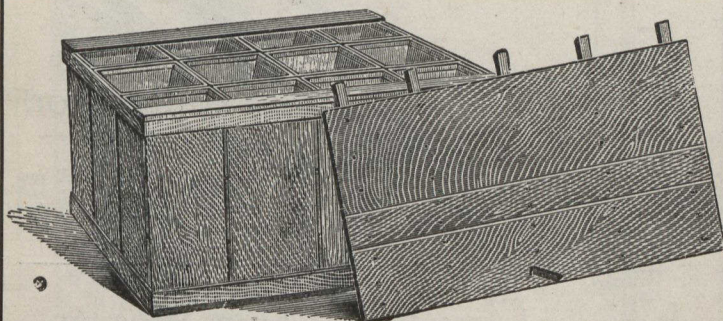
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Varieties for Ottawa Valley

Ed. THE CANADIAN HORTICULTURIST: I read with much interest the article in THE CANADIAN HORTICULTURIST for April on varieties for the north by Mr. G. C. Caston. He states that the Spy is a desirable variety and that growers cannot have too many of them. He also states that Spy, Baldwin, R. I. Greening and King, must be top-grafted on hardy stock. Further, he states that Burbank is the best of the Japan plums. Now, we consider ourselves in the northern part of the fruit belt, and perhaps more properly the far north. Mr. Caston's letter may not apply to us; but, for fear that some of the readers of THE CANADIAN HORTICULTURIST in the Ottawa Valley may be advised to plant some of the varieties listed in Mr. Caston's article, I wish to say that his list is of no value here. Spy will bear if top-grafted on hardy stock, but it does not attain perfection as it does along the great lakes. The other varieties named are of no value whatever.

We would advise the planting of Wolf River, Wealthy, Fameuse and McIntosh Red, as we can grow them to perfection, particularly the latter, which is a fairly good annual bearer, and the fruit brings from 50% to 75% more money than Spys at their best. Of course, it is necessary to spray them if perfect specimens are desired, but we should spray orchards of any variety if we wish to maintain good health in the trees. There is no difficulty in getting \$5 a barrel for No. 1 McIntosh Red. If a few long keepers are wanted for home use (not for market), we may plant Scott's Winter, Canada, Baldwin, North-West Greening, Patten's Greening or Milwaukee. As to raspberries, I may say that Herbert is perfectly hardy in localities where Cuthbert will winter kill 3 years out of 5. The fruit is larger than Cuthbert, of better quality, just as attractive in appearance and as good a shipper, and for the last 3 years it has averaged at the Central

Experiment Farm 5 times as large fruit as the best other kinds on the market. Other experimenters have had equally as good results.

In strawberries, I have tested about 150 varieties, and after several years' experience I consider Bederwood, Senator Dunlap, Haverland, Sample, Parson's Beauty, Pocahontas, Lovett, Marie and Buster the best general purpose varieties.—W. J. Kerr, Ottawa, Ont.

Should Cooperate

A novel method of selling Canadian apples to the market in Great Britain was suggested to THE CANADIAN HORTICULTURIST not long ago by Mr. Derbyshire, a member of the firm of the North of England Fruit Brokers Co., Limited, while he was on a visit to Canada. "Canadian growers," said Mr. Derbyshire, "do not like consigning their fruit to G. Britain under present conditions, because, in the majority of cases, they do not know the people to whom they are consigning it, and they have no method of ascertaining after it reaches G. Britain if it sells for the prices claimed. I would like to see more cooperation between the Canadian growers and the British buyers, and would suggest that the growers should unite and send a traveller to England. A number of British buyers could unite in the same way and keep a representative in Canada.

"The growers in Canada would have to have enough capital to manage cooperative plants, and they would have to look after the picking, grading and shipping of the apples. The representative of the British firms could visit these packing houses at frequent intervals and thus give the British buyers assurance as to the quality of the fruit being packed and its condition when it was shipped. Their representative in Great Britain would be able to examine much of the fruit on its arrival in Great Britain, and to keep track of the prices at which most of it was

sold. He could also report on lots that were bad on arrival. Such an arrangement would give both the buyers and sellers more confidence in each other, and should help to place the system of selling and buying apples on a better basis.

Free Surveying for Drains

During the past two seasons the Department of Physics, at the O.A.C., Guelph, has been endeavoring to emphasize the importance of under drainage, and arrangements have been made whereby its services are available to anyone wishing advice in matters relating to drainage. They have full equipment for drainage survey work, and when requested, visit a man's place, survey his land, give him a map, showing elevations of all parts surveyed, together with location of drains, their grade depth, etc.

There is no charge made for this work except the travelling expenses of one man, consisting of railway fare, meals and cartage of instruments. These expenses are very light, as arrangements have been made with the railway companies whereby the surveyor can travel at one cent a mile each way, i.e., a man living 50 miles from Guelph would have an outlay of \$1 for railway fare and 25 or 50 cents for cartage; one living 100 miles away, an outlay of \$2 for railway fare and 25 or 50 cents for cartage, and so on. Ontario farmers should take advantage of this opportunity to secure such valuable service at so little cost. Address requests for assistance or information to W. H. Day, Dept. of Physics, O.A.C., Guelph.

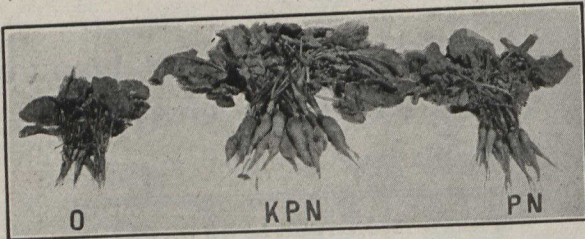
Mr. T. B. Revett, Ontario Department of Agriculture, says that most peach trees in the Essex peninsula have been killed during the past winter. Not only have the buds been destroyed, but, in many orchards, whole trees have been killed to the ground. Mr. Revett also said that nursery stock in the vicinity of Strathroy and at some other points has been badly injured.

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**An Appraiser of Vegetables
May Be Appointed**

During April a deputation of leading vegetable growers waited upon Hon. Wm. Paterson, Minister of Customs at Ottawa, and on behalf of the Ontario Vegetable Growers' Association requested that the Dominion Government should appoint an official whose duty it would be to set a fair value on the vegetables imported into Canada, so that they could not pass the customs at a ridiculously low valuation. While there is a duty on vegetables imported into Canada, it has been little protection to the vegetable growers, because of the fact that the people in the United States, who ship vegetables into Canada, value them at such a low figure that the duty on such valuation is so low it does not serve as any protection to the Canadian vegetable growers. The Government listened attentively to the representations of the committee, and gave reason to believe that the requests made would be granted.

The deputation was composed of Messrs. R. J. Bushell, of Kingston, the president of the Ontario Vegetable Growers' Association; Thos. Delworth, of the Toronto Branch, and some nine members of the Ottawa branch, for whom Mr. Williams and Mr. Farquarson acted as spokesmen. The deputation was introduced by Mr. Archie Campbell, M.P., of Centre York, who was assisted by Mr. Avery, M.P. for Frontenac, and Mr. M. Devlin, M.P. for Wright County. In introducing the deputation, Mr. Campbell pointed out that the Dominion Government was being defrauded in the matter of customs receipts by the vegetables being brought into Canada at a price below their true value. He pointed out that the vegetable growers are men who invest a large amount of money in their business, and that having to meet the competition of vegetables from the United States is a serious hardship to them.

Mr. Bushell referred to the importance of the vegetable industry, showing that in Ontario alone it represented an investment of \$10,000,000. In the remarks of Mr. Delworth, attention was drawn to the fact that many of the vegetables imported into Canada have a damaged appearance, and are passed at a very low value, but after the boxes are opened and carefully inspected, it is found that the percentage of damaged vegetables is much smaller than first appearances indicated. The Dominion Government excludes Chinese labor because it believes that Canadians should not have to compete with the Chinese. By allowing United States vegetables to be imported into Canada at prices below their true value, the Government is not protecting Canadian vegetable growers against the products of the Chinese growers in California who send a large quantity of celery into Canada. Mr. Delworth further pointed out that much of the vegetables imported into Canada are the tail end of the crops of United States growers. The United States growers sell 80% of their crops in their own markets, and rather than flood their own markets with the remnants of their crops, they ship such vegetables to Canadian markets, and make Canadian markets a dumping ground for such products.

Mr. Williams assured the Government that Canadian growers do not desire to be protected except during a few months in the year when their own vegetables are ready to be marketed. At present the Canadian growers when they offer their fresh vegetables have to meet the competition and the low prices caused by the importation of large quantities of cheap United States vegetables.

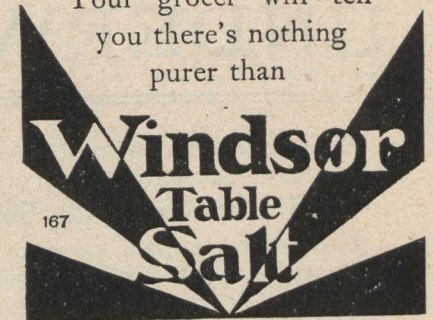
Hon. Mr. Paterson stated that he believed that the dumping clause can be utilized to prevent vegetables being brought into Canada as they have been in the past. He promised to take steps to see that vegetables when crossing the border have a fair valuation placed on them.

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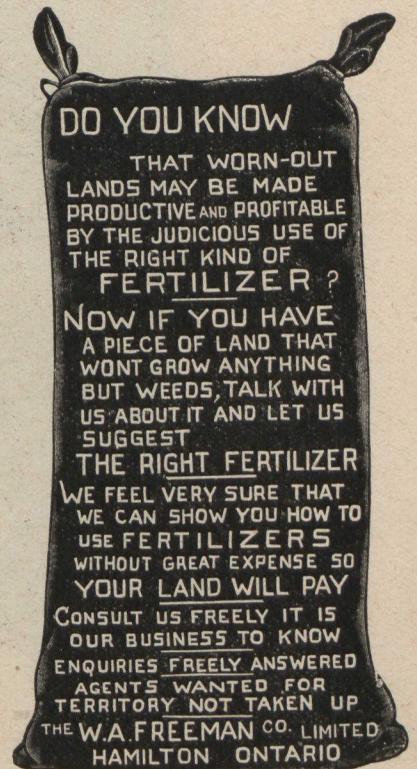
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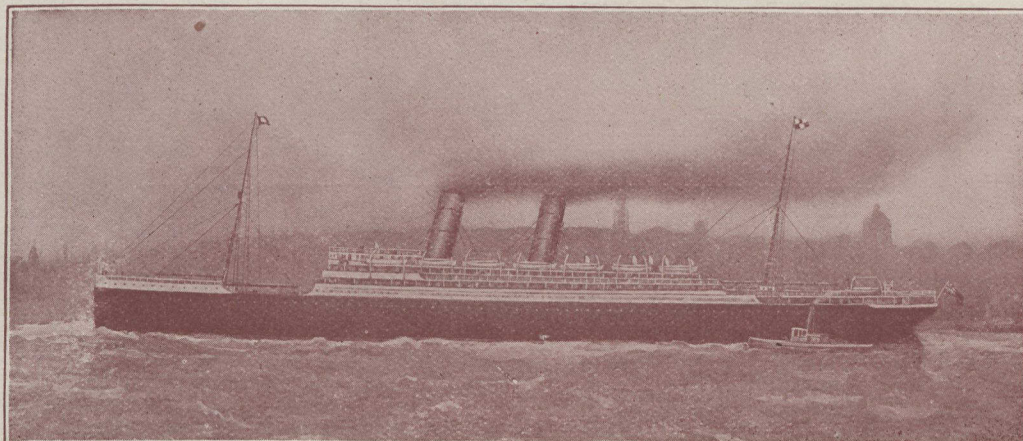
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Fri. " 17	Empress of Ireland	Fri. May 3
Sat. " 25	Lake Champlain	Wed. " 8
Fri. " 31	Empress of Britain	Fri. " 17
Sat. June 8	Lake Erie	Wed. " 22

FROM MONTREAL AND QUEBEC [According to Steamer]	STEAMER	FROM LIVERPOOL
Fri. June 14	Empress of Ireland	Fri. May 31
Sat. " 22	Lake Manitoba	Wed. June 5
Fri. " 28	Empress of Britain	Fri. " 14
Sat. July 6	Lake Champlain	Wed. " 19
Fri. " 12	Empress of Ireland	Fri. " 28
Sat. " 20	Lake Erie	Wed. July 3
Fri. " 26	Empress of Britain	Fri. " 12



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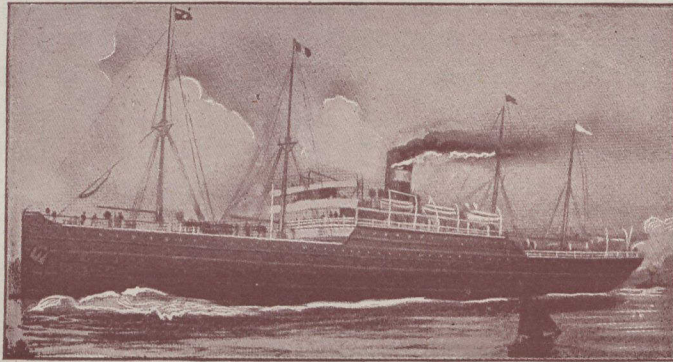
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