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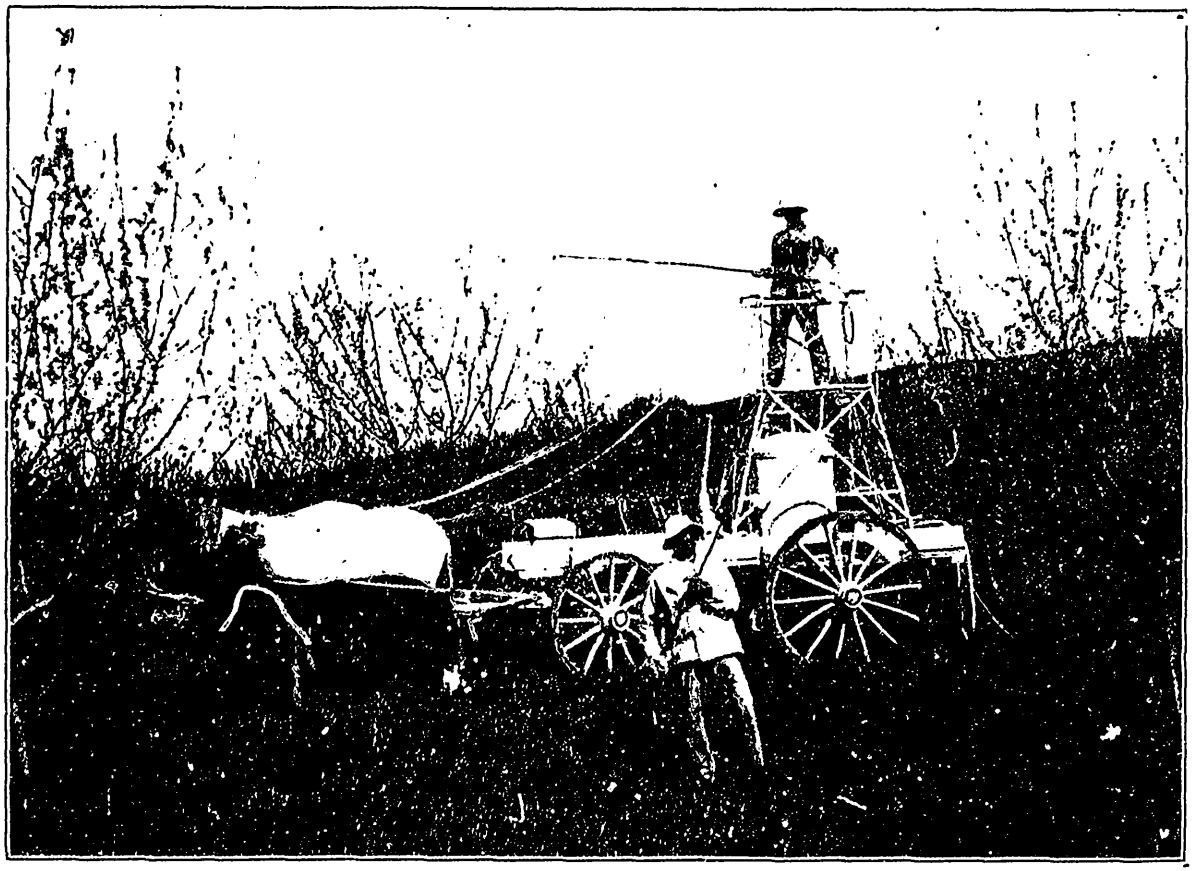


## A Government Sprayer at Work in the Orchard.

One of the Ontario Department of Agriculture's power sprayers (The Niagara Gas Machine) at work at Meaford, in Mr. John Degean's orchard, is here shown. In this section about 20 growers have agreed to have some 2,500 trees sprayed by the Department's machines at an expense not to exceed five cents per tree each spraying. The trees will not be sprayed more than three times. The members of this association are readers of The Horticulturist. Mr. A. Gifford, Dominion Fruit Inspector, is on the left, with his son, Mr. A. E. Gifford, holding the nozzle, and Mr. Wm. Johnson on the tower. (From a photograph taken specially for The Canadian Horticulturist.)

# The Canadian Horticulturist

JUNE, 1905

VOLUME XXVIII NUMBER 6

## SPRAYING DEMONSTRATIONS IN ONTARIO

P. W. HODGETTS, B. S. A., ONTARIO DEPARTMENT OF AGRICULTURE.

FOLLOWING the request last March of the Ontario Fruit Growers' Association that the Minister of Agriculture should place a number of power sprayers throughout the province, this matter was promptly taken up by the Department, and after some investigation two machines were placed in operation at Meaford and Trenton respectively. Both these points are centers of large apple growing sections.

According to the report of the Bureau of Industries for 1903, Grey county, in which Meaford is situated, is credited with 352,894 apple trees over 15 years of age and 200,000 under that age. Northumberland county, in which the other machine is operating, possesses 366,381 old trees and 288,669 young ones. These two counties, with the addition of Huron, headed the list for production during 1903, showing a total crop of over 2,000,000 bushels each. It follows that these sections are of great importance to the apple industry, and anything that the Department of Agriculture can do to improve the quality of the fruit shipped therefrom will materially assist those farmers who are striving to make this branch of agriculture successful.

As power spraying machines are of comparatively recent introduction into Canada it was thought wise to test at least two different types this year. There are, perhaps, four types altogether in use in the Dominion using as motive power the gasoline engine, geared direct to a pump, the expansion of carbonic acid gas, the expansion of compressed air, and the wheel-driven pump respectively. Many of these are in operation throughout Ontario, especially in the Niagara district, where the presence of the terrible San Jose scale compels the grower to spray or uproot his trees.

Readers of The Horticulturist are familiar with the well known Wallace, Spramotor, and Niagara Gas machines, which have been illustrated and advertised so frequently in these columns. Each has its strong admirers, and each, I believe, is doing good work. At Meaford one of the Niagara Gas machines, at present manufactured in Buffalo, was placed, while the Spramotor Company, of London, supplied the gasoline outfit in use at Trenton.

The gas machine, a cut of which appears as frontispiece, is run by the expansion of liquid carbon gas. The main tank, which holds the spraying mixture, is closed absolutely tight when filled, and is supplied with agitator, pressure guage, etc., on top. The gas is purchased in iron cylinders containing 25 or 50 pounds under high pressure, and when released slowly into the large tank containing the spraying mixture forces the latter out from the nozzles in a fine mist. By releasing more or less gas the pressure can be varied to suit the will of the operator, and any number of nozzles may be used.

The Spramotor machine at Trenton is

practically the same as that used by the Dominion Department of Agriculture at Ingersoll last year. The pump is double cylinder, with two speed gear and tank filler, operated by a Coldwater, Michigan, gasoline engine of two and a half rated horse-power. Two lines of hose with 12 nozzles receive ample power from the slow-speed gear. The tank with this machine has a capacity of 200 imperial gallons, which I find rather too much for the hilly orchards around Trenton.

THE DEMONSTRATIONS.

Owing to the lateness of the season when the machines were started the first spraying on the dormant trees was omitted. The first application began at Meaford May 5 and at Trenton May 11. After the initial attempts both machines ran smoothly, and at the date of writing have given no trouble. Many of the orchards in both locations are hilly and will furnish splendid tests of the practical value of these machines under trying conditions. The trees in many cases are only 20 feet apart each way and render the use of a tower almost impossible. The axe could be used to advantage in such cases and every other row should come out.

It is the aim of the Department in this work to interest the fruit growers sufficiently that they may, where already organized as a local fruit growers' association, take up the work thus begun, and having purchased power machines run them from year to year for the benefit of their members. The newly-organized cooperative associations will, it is hoped, make this one of the main features of their cooperation.

With good fruit to sell no association need fear as to the prices. The increase of the apple scab in Ontario seems to have impressed the growers with the absolute necessity of spraying, and this task, for none doubts that it is such, may be done far more thoroughly, profitably and pleasantly by the use of these powerful large-capacity machines than with the still useful hand pump.

## NEW FORMS OF KEROSENE EMULSION

FRANK T. SHUTT, CHEMIST, AND W. T. MACOUN, HORTICULTURIST, C. E. F., OTTAWA.

IN regard to the practical use of the new forms of kerosene emulsion, described in the May issue of The Horticulturist, we beg to state that although a considerable amount of spraying has been done, both with the lime and flour emulsions during the past month, the season is not yet sufficiently advanced to allow us to make deductions as to the strengths best and safest to use. We may, however, make the following remarks:

Lime Emulsions: All these emulsions keep excellently, only traces of free oil showing after five weeks standing. There is, as before noticed, a separation into limey layers, but these on merely shaking or stirring readily become incorporated, making a smooth and uniform emulsion. Of the many lime emulsions under trial we conclude that the most satisfactory is the one made with freshly slaked lime.

Flour Emulsions: These, with the exception of the emulsion made with scalded flour show a separation of oil on standing. Churning for five minutes, as with the Bordeaux mixture is, however, sufficient to again thoroughly incorporate the oil and make a satisfactory emulsion. The scalded flour emulsion (though, as in the case of the lime forms, showing a layer of thin oily paste) gave but slight indication of free oil. This layer very readily becomes re-incorporated and an excellent emulsion obtained.

When properly prepared no difference could be observed in the application of these emulsions, but the whitening effect on the sprayed trees, etc., of the lime forms and the absence of this feature from the use of flour emulsions was particularly noticeable.

# GROWING AND HANDLING APPLES FOR PROFIT*

W. H. DEMPSEY, TRENTON, ONT.

APPLES are grown in nearly every kind of soil and location provided by nature in the Bay of Quinte district, and to a certain extent are giving fair returns for the investment. The successful orchards are those that are in more favored locations, somewhat rolling land, protected from the west and southwest winds, which cause great destruction to fruit before it is ready to pull and cause the young trees to lean to the northeast, leaving the trunks subject to sun scald and of an unsightly appearance.

The ideal soil for an apple orchard is sandy loam, with clay subsoil, well drained naturally or with under drains. This class of land has many advantages compared with heavier land. It is much easier to keep in thorough cultivation, retains moisture better in a dry season, gives quicker returns from fertilizers, although it does not retain them probably as long. Cover crops take much easier, fallen fruit is not so much damaged, and is in a much better condition for the canning factory or evaporation and is very often shipped to market. There are not many varieties which do not do exceedingly well on this class of soil. Cranberry and Blenheim Pippins do better on heavy soil, while Hubbardson Nonsuch does best on limestone gravel.

### SELECTION OF TREES.

A tree of medium size, two or three years old, from a graft or bud is best, as trees that are older are slower in starting and do not make as good growth. I prefer a good one year old to a four or five year old. In four years the one year old tree will be the larger and come into bearing first.

Up to 15 years ago the orchards were all planted 20 to 30 feet apart and of late years 40 feet apart, which might seem to be a lot of vacant space. For 15 years at least I would prefer 25 or 35 feet apart, and when the trees begin to crowd, remove every alternate tree, and if the orchard has been properly cared for they will by that time have paid a profit for the care and land occupied by them. The remaining trees will show a marked benefit both in appearance and in the quantity, size, color and quality of the fruit.

### FORMING THE HEAD AND PRUNING.

When the trees are set they should not be so that the head will be formed 30 or 36 inches from the ground. If trees are dried out and not in a healthy condition, I would leave three or four terminal buds, as they are much easier to start into growth than the other buds.

If all the branches are cut away close to the trunk adventitious buds would have to be depended on for forming the head, and as these might stand out anywhere along the trunk the top would not be as symmetrical as when four stubs were left. During the first season the tree will require little if any pruning, although if a tree is forming a poorly shaped head a little judicious pruning will often be helpful in making a uniform school. In early spring the trees should be looked over and whatever branches are not required in forming a good head should be removed, care being taken not to remove too much. The less pruning done the sooner the trees will come into bearing, and if the trees are quite thick when they come into bearing fruit the weight of the fruit will make them nearly thin enough.

Many growers seem to think they are not pruning unless they remove everything from the centre of the tree so that there will be no fruit except at the outer ends of the branches. Sometimes it is 10 feet from the trunk to the first fruit spurs, causing the tree to split in pieces although there are only a few bushels of fruit on it. I prefer

*Extract from an address delivered at the recent convention of the Pomological and Fruit Growing Society of the Province of Quebec.

to have fruit spurs start at the trunk of the tree, taking whatever is removed from the outside of the tree so that the sunlight can get in to the fruit. Never do more pruning than is necessary. Rather have an orchard not pruned at all than prune it too severely. With little or no pruning the tree will usually load heavily, and with the application of fertilizers the fruit will come to a fair size or a size that will carry to a foreign market in good order. Heavy pruning, on the other hand, forces the tree into too much wood growth and very little fruit of a large size that will not carry to market in as good condition as medium-sized fruit.

PICKING THE FRUIT.

Apples are much easier gathered from trees that are loaded all through. There is less danger of breaking such a tree in pieces. The ladder may be placed against the outside branches, then put through the centre and the whole tree thus cleaned without climbing through it, while the trees with the fruit out far are frequently split with the weight of the picker, which should in all cases be avoided.

If the soil at the time of planting the trees contains a liberal amount of, humus and plant food it will not be necessary to apply manure until the trees begin to bear. If the young trees make too rapid growth they will be more subject to blight and fungus growth each season. If they are on land deficient in plant nutriment a light coat of manure should be applied, and when the trees have come into full bearing stable manure may be applied at the rate of 10 to 20 tons to the acre with good results. When the soil is deficient in humus and nitrogen, and the danger to the trees will be lessened, it will be found beneficial if it is supplemented with 50 or 100 bushels of unbleached wood ashes and 300 to 500 pounds of ground bone to the acre. If ashes cannot be obtained 200 to 300 pounds of muriate of potash may be substituted. The stable manure may be spread on any time during the winter and the fertilizers may be used early in the spring.

## PROMOTING WOOD GROWTH

LINUS WOOLVERTON, GRIMSBY, ONT.

SINCE June is the month for wood growth it is the time for constant cultivation of fruit plantations. Unless vigor of growth in tree or plant is kept up in the early summer there will not be sufficient nutriment stored up for fruit and fruit buds in the latter part of the season. In the apple orchard, for example, unless about one foot of new wood growth is made by the middle of July fine apples need not be expected.

My plan is to plow my orchard in the fall and keep it worked in the spring until July 1 with disc and harrows; after that to cease cultivation until after harvest. If growth is too vigorous I seed down for a few years. In rich, sandy loam, with plenty of moisture, I find the apple tree goes too much to wood, and Baldwins go for years without producing a crop. Such trees should be put down to grass for a term of years. The cherry orchards should be cultivated in order to keep up a healthy wood growth, but not deeply. In most soils a good disc and a good set of iron harrows will do the work of thorough cultivation to a depth of about three inches.

The vineyard needs an occasional plowing with a one-horse plow, finishing with the horse grape hoe and the hand hoe, but if plowed away the earth should be plowed back again as soon as the hoeing is completed. Respberries and blackberries need similar treatment. The canes are often much injured by deep plowing away, which should be carefully avoided.

# SPRAYING EXPERIMENTS IN THE NIAGARA REGION

PROF. W. LOCHHEAD, O. A. C., GUELPH.

THE most serious enemies of the fruit grower in the Niagara region are the San Jose scale, the cherry aphis, the codling moth, grape rots, the plum rot and the apple scab.

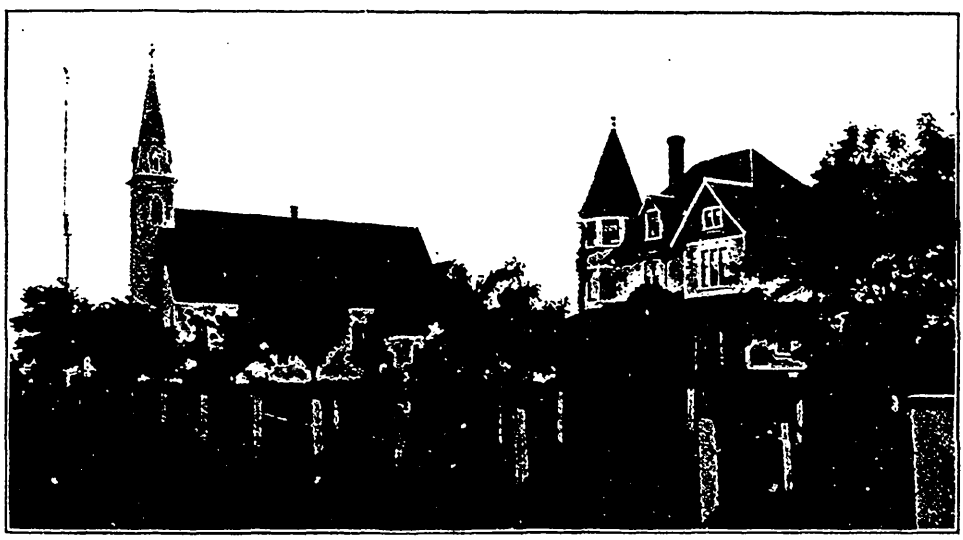
For several years strenuous efforts have been made to control the San Jose scale with such materials as whale oil soap, crude petroleum, and the lime-sulphur wash. Success has followed the application of the lime-sulphur wash in particular, but on account of the trouble involved in boiling the wash it was thought advisable to try a method of preparation which does not require prolonged boiling by steam or fire. Besides, it was deemed advisable to know the effectiveness of certain new scale remedies which have recently appeared, viz.: Carlson's mixture, Pratt's Anti-scale Remedy or Scalicide, and the kerosene-limoid mixture.

The grape rots have also caused much loss during the last three or four years. The black rot is specially destructive in the St. Catharines district, and promises to give much trouble in its control. The downy and powdery mildews are the destructive rots farther west in the Grimsby-Winona district, and the grape growers in that district are decidedly anxious as to the future. The cherry aphis and plum rot are also difficult to control and cause much loss in many orchards.

The Minister of Agriculture, realizing the serious nature of the attacks of these vineyard and orchard enemies in the great fruit-growing regions of Ontario, decided to arrange for a series of experiments and demonstrations this season in spraying at eight places from Winona to the Niagara river. The main object of these experiments and demonstrations is to test the effectiveness of the preparations which have been recommended for the control of the chief insect and fungous pests of the orchard and vineyard.

### THE WASHES USED.

The following substances will be used in the plum and vineyard experiments: Cop-



**Sacred Heart Church and Presbytery, Alberton, Prince Edward Island**

The beautiful home of Rev. Father Burke, President of the Fruit Growers' Association of Prince Edward Island and the foremost among Maritime agricultural leaders.

per sulphate and the lime-sulphur wash on dormant vines, and Bordeaux and soda Bordeaux at intervals during the growing season.

The following substances were used against the San Jose scale: The lime-sulphur wash (unboiled), the kerosene-limoid mixture, the Carlson mixture, and Pratt's Anti-scale Remedy.

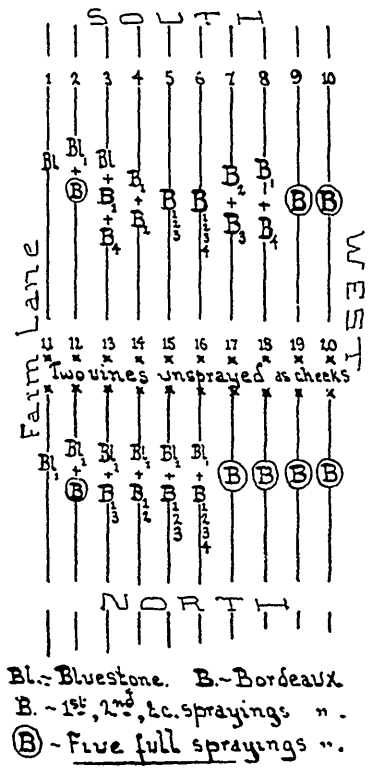
The first round of experiments and demonstrations, as announced in the May issue of The Horticulturist, was held as follows: April 13, at Mr. Murray Pettit's, Winona; April 14, at Mr. Ambrose Pettit's, Grimsby; April 15, at Mr. R. Kelly's and at Mr. Bartlett's, Beamsville; April 17, at Mr. J. Fretz's, Jordan; April 18, at Mr. George Robertson's and Mr. Pay's, St. Catharines; April 19, at Mr. Jas. Hutchison's, Virgil; April 20, at Queenston; April 21, at Niagara Falls.

On account of the large extent of territory to be covered the owners of the vineyards and orchards in which the experiments were conducted were asked to provide facilities for the preparation of the chemicals used, such as hot water or steam, a kettle, two or three barrels, and a small amount of lime, sulphur, and copper sulphate. The owners were also asked to have the grape vines cleaned of old bark.

The spraying operations for the remainder of the summer will be directed mainly against the grape rots. It is hoped that the results will indicate (1) the proper time to apply the Bordeaux, (2) the number of applications which will be necessary for the production of clean grapes, (3) the most effective sprayings of the season's operations, and (4) those sprayings which may be omitted with safely.

The bluestone application (four pounds to 40 gallons of water), according to the Ohio authorities of doubtful value, is made in the spring while the vines are dormant, the first Bordeaux (B1) spraying about the first week in June when the new growths are from 12 to 18 inches long, the second Bordeaux (B2) after blossoming about the first week in July, and subsequent applications at intervals of 10 days or two weeks.

DIAGRAM OF MR. MURRAY PETTIT'S EXPERIMENTAL VINEYARD AT WINONA.




The accompanying chart of the experimental vineyard at Mr. Murray Pettit's will show clearly the varied nature of the applications and the information which we may hope to get from the experiments. Mr. P. W. Hodgetts, B. S. A. of the Department of Agriculture, has consented to act along with me in carrying out these experiments, and he will probably conduct the July and August experiments.

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Barnyard manure, made chiefly from grain and hay, is not well balanced in fertilizing ingredients for strawberries.

# THE CODLING MOTH

BULLETIN No. 10 of the Ohio Agricultural Experiment Station, which has recently reached The Horticulturist, gives some valuable information respecting the codling moth. The following summary contains the substance of what appears in the bulletin:

1. Active, mature larvae of the codling moth may be found in Ohio orchards from June 30 to October 13, which signifies that the fruit is more or less subject to attack during the greater part of the growing season.

2. An average of results from unsprayed plots in three widely separated orchards shows that had no spraying been done during the past season 43 per cent. of the picked apple crop would have shown injury from codling moth at harvest. In addition, a considerable quantity of fruit fell during the summer, a large percentage of which was wormy. The results from sprayed plots averaged only nine per cent. wormy fruit. In other words, 91 per cent. of the fruit from sprayed plots was free from injury, whereas, of that from unsprayed plots, only 57 per cent. could be so classed.

3. The figures from each of three orchards indicate that a large number of sprayings are unnecessary to control this insect. In some cases the very early spraying and in others the very late apparently did not accomplish much. As early spraying with Bordeaux is necessary to control the scab, and as the poison may be applied in it at a very small additional expense, it is best to continue the established practice of spraying as soon as the petals have fallen, using both the Bordeaux and poison. After two or three sprayings of the combined mixture the Bordeaux should be discontinued. After this at least one and possibly two applications of the arsenate of lead should be made at intervals of two weeks.

4. Arsenate of lead is superior in killing power to arsenite of soda, which is probably due to its sticking qualities.

5. Being applied in Bordeaux mixture does not reduce the effectiveness of arsenate of lead.

6. Damage from apple scab can be largely avoided by two or three applications of Bordeaux mixture.

7. Regardless of the care taken in its preparation, Bordeaux mixture sometimes injures foliage, especially when the application is followed by wet weather.

8. The keeping quality of apples attacked by codling moth and apple scab is very seriously impaired.

## Bandaging Trees

PROF. H. L. HUTT, O. A. C., GUELPH, ONT.

At what season should apple trees be bandaged? What material is used and where can it be obtained?—(W. T. N., Zenda, Ont.

I shall take up your questions in the order given. First, June is the time to put burlap bands on the apple trees for the codling moth. This should be done before the middle of the month.

Coarse sacking or ordinary burlap is the material best suited for this purpose. It can be obtained at dry goods stores, where it often comes as the outside covering on goods sent from wholesale houses.

**Set More Trees.**—Farmers should plant more fruit trees, say up to five acres on a 100-acre farm. New markets are being opened up in Europe, which, with our own northwest, will create a demand for first-class fruit, which will increase much faster than the supply.—(Frank J. Barber, Georgetown, Ont.

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The only spraying I have found necessary so far has been for oyster shell bark louse, which I have treated successfully, with a thorough spraying of fresh slacked lime, in March.—(G. H. Hutton, Easton's Corners, Ont.

# RESULTS FROM POWER SPRAYING

"THE power sprayer I purchased last April," said Mr. R. H. Lewis, of Hamilton, to a representative of The Horticulturist, "has given me excellent satisfaction. With it I spray over 6000 trees and 4000 grape vines. Previous to last spring I had done the spraying for four years with a hand sprayer. These hand sprayers should be called 'man killers,' they are so hard on the people who operate them. Three men were required to use the hand sprayer. To spray three acres of solid fruit required seven days, during which we usually had plenty of breakdowns. Using the power sprayer last year only two and a half to three days were required and the work was much better done.

"With the hand sprayer I found it impossible to apply the spray thoroughly, as the force was not sufficient to send the spray to all portions of the trees, especially the large ones. This meant that in the case of plums the center of the trees were frequently not reached by the spray and the fruit was usually badly damaged. With the power sprayer the spray penetrated to every part of the tree and consequently the results were better than those obtained with the old hand pump.

"My sprayer obtains its power from the hind axle. I drive between the rows of trees with a man on each side of the sprayer, each man spraying the trees on his side. Six and sometimes eight nozzles are used. In this way the work is done rapidly and thoroughly. It is possible for one man to drive the team and spray the trees on one side, but it is hard work unless the trees are very small.

A SAVING IS MADE.

"In addition to the saving of time that is made when the power sprayer is used there is a big saving in material. Formerly I used to apply 250 pounds of vitriol, while this year I only used 100 pounds, but I used 50 pounds of caustic soda in addition. I am a strong believer in the caustic soda and sulphur wash used before the buds appear and while the wood is dormant. It is, however, a mixture that has to be used very carefully. The caustic soda cleans the trees of every kind of fungus and rids them of all insects, giving the trees a very nice gloss. Cherry trees, after the mixture is applied, look as if they had been polished. This mixture can be applied too strongly, however, in which case the trees will be injured, but the use of reasonable proportions gives good results. I use 15 to 17 pounds of caustic soda to 100 gallons of water. I have had no experience in San Jose scale, but believe that this mixture would be an effectual remedy for the scale.

"I generally spray twice, before and after the buds appear, and plums, pears and grapes four times. For the plums and pears I use the Bordeaux mixture except for the first application, when caustic soda is used. Peaches are first sprayed with the caustic soda and sulphur solution in the proportion of 30 to 35 pounds of sulphur mixed with 15 to 17 gallons of water. The second application is made with the Bordeaux mixture. Last year I applied the caustic soda mixture to part of my trees. The trees on which it was used produced peaches, but those on which I had put the Bordeaux mixture both times did not yield. This year I intend to use the caustic soda application on all my trees.

"I have about 135 cherry trees of the Early Richmond and Large Montmorency varieties. I sprayed three times with Bordeaux mixture, there being five to seven days between each application. It requires about one hour each time to spray these trees. The total cost, including the time, labor and value of the mixture amounted to about $3. As a result of the spraying I secured over 700 baskets of cherries. I sold the crop for 85 cents to $1 per basket, and it netted me nearly $700. One of my

neighbors had about 300 cherry trees of the same varieties and picked 15 baskets of poor fruit, and other fruit growers in the district east of Hamilton, who did not spray, obtained about the same results. I am satisfied that my success in securing a crop was due to the thorough spraying. In view of the returns I have secured I have concluded that it pays handsomely to spray.

"Before I purchased my sprayer I was told that it would be difficult to maintain the pressure when it was derived from the rear wheel, but I experienced no trouble of this kind. It was possible to work the pressure up to 175 pounds in five minutes. The sprayer could remain opposite one tree for several minutes without the pressure decreasing to any great extent."

## Enemies in the Orchard

J. O. DUKE, RUTHVEN, ONT.

I FIND oystershell bark louse one of the most difficult pests to handle. Spraying with whale oil soap may check but does not eradicate it. I have used lime, salt and sulphur for the past two years and hope to have better results from this.

The peach tree borer is easily kept out of an orchard by carefully digging the borers out with a knife. This should be done twice a year until the tree is five years old, after which, if the trees have been kept clean and have no scars at the base, the borers will have difficulty in securing a lodgment.

In the spring, during the months of April and May, I have the earth removed from the base of the tree. In doing this all large borers can be easily found and dug out. In a couple of weeks I send a man over the orchard again. This time most of the small grubs can be found, their presence being indicated by their excreta appearing as fine brown sawdust at the entrance to their hole. This man also paints the tree from the ground to the height of a foot or so with a mixture containing equal parts of whale oil soap, crude petroleum and water. In a week or 10 days the trees are again gone over and banked up six or eight inches above the level of the ground, each tree being carefully inspected, before the earth is put around it, for signs of grubs that may have been overlooked. This final banking up should be done before June 10, as that is about the time the borer moth begins to hatch in Essex county.

In October I like to go over my trees to bank up for the winter, always keeping on the watch for a stray borer. I believe that trees painted with the mixture mentioned are practically insured against mice, as none of my trees that were painted in the summer of 1903 were girdled, while a few rows that were missed were nearly all taken.

## Spraying Trees When in Bloom

PROF. H. L. HUTT, O. A. C., GUELPH, ONT.

A number of farmers in this locality are advocating the spraying of apple trees when in full bloom. One prominent fruit grower cites an instance where a man had started, but stopped part way up a row, being warned that the blossoms would not mature. That fall the fruit on the sprayed trees was far superior and the place he left off could be distinctly seen. Kindly give me your opinion as to spraying when in bloom.—(C. F. Bailey, Colebrook, N. S.

I cannot recommend spraying while the trees are in bloom, for this would mean the destruction not only of the honey bees but the wild bees which help to bring about fertilization of the blossoms. The good results obtained from spraying would no doubt have been just as marked if the trees had been properly sprayed before and after blossoming.

From your statement it appears that trees sprayed while in bloom show marked results over those unsprayed. This is nothing more than might be expected, still it does not show how many bees were destroyed

through spraying at such a time. If the practice of spraying when trees are in bloom became at all general it would in time lead to lighter crops through the destruction of the bees and lack of fertilization of the blossoms.

## Cooperation in British Columbia

THE British Columbia Fruit Growers' Association has a programme at each of its quarterly meetings, including addresses and papers by persons competent to deal with the questions allotted to them. In addition to the regular quarterly meetings supplementary meetings are held in newly settled districts, the object being to point out the proper modes of planting, pruning, spraying and cultivation of orchards, advising varieties of plant, giving instruction in grading and packing fruit, and assisting to have the orchards established on a proper basis.

In the older districts the meetings are to encourage the spirit of cooperation, which does not stop at marketing, but includes cooperation in planting. The growers in a section join in planting the same varieties, thus establishing a name for say Spitzenburgs from Salmon Arm. Cooperation in purchasing supplies, such as boxes, spraying material, fertilizers, etc., is also encouraged, as well as in marketing the fruit. The first efforts were directed to securing uniform quotations and the success encouraged the association to widen its field. The result is four cooperative shipping unions have been formed, with others ready to fall into line.

The association has three vice-presidents, one in each of the natural divisions of the province—Vancouver Island, Lower Fraser Valley, and the interior. The vice-president on the island presides at all meetings on the island; the second vice-president on the lower Fraser; the president in the Okanagan valley, and the third vice-president in the Kootenay valley. The secretary is the only paid member of the executive who attends all meetings, thus saving travelling expenses.

Since the annual meeting in January three meetings have been held, one of the former class at Matsqui, and two of the latter at Chilliwack and one at Mission City. Meetings to encourage cooperation were arranged for Port Hammond, Burnaby and Langley in March, and at Salmon Arm, Enderby, Armstrong, Kelowna, Peachland and Summerland for early in May. These meetings were a combination of the two classes. Meetings will also be held in July in the Kootenay valley.

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**Let the Robins Live.**—Robins have not become so troublesome that I would like to see them destroyed. They take a large number of our cherries, and are increasing rapidly in numbers, so that it may soon become necessary to destroy them. They should not be protected by law when they become so numerous as to destroy our crops. I would not wish to drive them away as long as they leave me a reasonable portion of the fruit.—(W. W. Hillborn, Leamington, Ont.

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The British Columbia Fruit Growers' Association has adopted a resolution in favor of establishing an experimental orchard on Vancouver Island. They also decided to ask the provincial government to enforce section seven of the rules of the Board of Horticulture which gives inspectors power to destroy or ship to the grower any fruit not considered merchantable by reason of scab or other defects.

Our provincial fruit growers' association was only instituted last year, but a good deal of interest has already been shown and the membership is steadily increasing.—(Henry Wilmot, Oromocto, N. B.

## THE SHIPMENT OF APPLES

"WHY should fruit growers have to ship even their peaches by express," asked Mr. E. D. Smith at a fruit growers' meeting held at Beamsville. Fruit sent by freight should reach points within 100 miles the next day. There is needless delay at Toronto for fruit shipped from the Niagara district. The Railway Commission has promised consideration, but he questioned if much will be done, unless by cooperation fruit growers bring pressure to bear on the commission. They spend thousands of dollars for fruit carriage and the railway companies will not even furnish proper cars. The cars on which the apples are shipped get too hot. Prof. Robertson tested the cars and found a temperature of 85 degrees. It was said the apples spoil on shipboard, but more damage is done on the cars.

Apples remain in barrels in the orchard for some time without spoiling, but they soon spoil on board ship because there is not proper ventilation. Apples sent by ventilated ships are probably worth one dollar more per barrel. There should be an act of parliament to compel ventilation, as is done in the case of cattle ships. Thermographs should be provided. Proper ventilation would save $1,000,000 a year to the apple growers of Ontario.

Fruit growers must raise a good article. If half the fruit was dumped out growers would get more money for the other half. The trees must have rich ground and the fruit should be thinned out. Peach trees could be thinned for two cents a tree. Mr. Smith said he had thinned some trees from 12 baskets to five and it paid, as he secured larger and better fruit.

In regard to the size of apple barrels there are two sides to the question of uniformity. Ontario has a reputation for large barrels, and there are no extra charges for freight, handling, etc., in which way more than enough is realized to pay for the extra 16 quarts of apples. Baskets are required by law to be uniform in size, but the act is not carried out. Cooperation is needed among the fruit growers to remedy these defects.

After hearing Mr. E. D. Smith speak of the necessity for cooperation in shipping fruit, Mr. A. N. Brown, of the State of Delaware, expressed surprise that the Niagara shippers have no ventilated cars or fruit trains. The growers in the States, he said, have been through like experiences and had to deal with the Pennsylvania railway monopoly. He advised Ontario growers not to go to the Railway Commission but to appeal direct to the railway companies. They in Delaware had, after a fight over the question of routing which threatened to kill their industry, secured a market train which carried their fruit at the rate of 35 miles an hour. The Niagara shippers should have such a train to Toronto. The rate on such a train was high, but not nearly so high as by express.

**New Seedling Pear.**— A splendid variety of pear is being grown by Mr. E. C. Beman, of Newcastle, samples of which were shown at the last Provincial Fruit, Flower and Honey Show in Toronto. It ripens during the last of October or early in November. These trees have been growing in Mr. Beman's orchard for 12 or 13 years, and he has some that are top grafted. It bids fair to be a very productive variety, and the fruit is of large size. The quality is not quite as good as the Sheldon, but is similar. The fruit is juicy and delicious, and it promises to become popular.

## PICKING STRAWBERRIES

THE strawberry picking season will soon be here. The illustration on this page shows a portion of an 11 acre patch of strawberries on the fruit farm of Mr. J. O. Duke, of Olinda, Ont., with the pickers at work. "I employed 25 to 40 pickers each day," writes Mr. Duke to The Horticulturist. "They were placed under a foreman, who saw that the berries were picked right and that the rows were picked clean, each picker having a row to herself, which was thoroughly done before another was given. The rows were numbered, and as each row was taken the number was placed in a book opposite the name of the picker.

"I find this method a great advantage to keep the pickers on their own rows. There are always some pickers who, if not watched, will run all over the patch. Each picker is provided with a carrier holding six quart boxes, and is instructed to pick into all the six at once and not to fill one box at a time, to be careful not to have any holes in their baskets, and that the berries must be put in carefully and compactly.

"The fruit is packed in crates holding 24 quart boxes for shipping. I pay two cents a box. I grow the earliest ripening varieties and find Mitchell's Early, Bedar Wood and Crescent about the best. They don't grow heavy crops of fruit, but catch the early market. For a late berry Williams is hard to beat, being very firm and very productive, though late. Being one of the first growers in Canada each season to pick berries I always find a market at satisfactory prices to the east and north."

## Pine Twigs For Currant Worms

THE use of pine twigs to keep off the worm from currant and gooseberry bushes is recommended by Mr. T. R. Pattillo, of Bridgewater, N. S.

"Some years ago," he writes, "I read an article bearing on the subject from the pen of a lady amateur gardener who had successfully used them and was anxious others should know of it. I put it into practice, with the result that I have had no trouble with the pests for the past seven years. There is no skill required, but the twigs must be used in time.

"When the bushes begin to bloom I hie to the woods for my supply, getting them from one foot to three feet long, and placing them in and out through the bushes, let-

**Strawberry Pickers at Work for Mr. J. O. Duke, of Olinda.**

ting them rest on the branches so that the wind will not blow them down. I put several on each large bush and let them remain till the season is over. A lady friend tried my method last spring on her currants, overlooking the necessity of putting them on the gooseberries. As a result she found the latter stripped of every leaf while the currants were intact."

## Dandelions in Lawns

PROF. H. L. HUTT, O. A. C., GUELPH.

Can you give me any remedy for dandelions in lawns? Toronto lawns are absolutely yellow with them. Like the poor, they are always with us in season.—(T. McGillicuddy, Toronto, Ont.

The best remedy for dandelions in the lawn is to grow grass in their stead and to grow it so abundantly that the dandelions will find no quarter. It is useless to attempt to spud them out, for this only affords a suitable place for the lodgment of seed which is blown about freely, and really tends to aggravate the trouble rather than remedy it. It is practically impossible to rid the ground of dandelions where there are so many going to seed all around and thousands of seeds being carried hither and thither by the wind.

Our practice has been to apply a top dressing of well rotted manure in the fall to the poor spots in the lawn where the dandelions are most plentiful, and in the spring, if the grass is not thick enough, to rake in some fresh grass seed. We have found this to give wonderful results, the dandelions being almost crowded out by the luxuriant growth of grass, and it has often been possible to trace the boundaries anywhere on the lawn where such applications have been made, not only by the apparent absence of dandelions, but by the luxuriant growth of the lawn grass.

But why try to get rid of the dandelions? What can be more beautiful than a lawn brilliant with their beautiful bloom? It is simply because we have them in such abundance that we despise them. If they were as scarce as the English daisies we would import them by the thousands. Is it not another case of familiarity breeding contempt?

## Window Box Plants

WM. HUNT, O. A. C., GUELPH.

Many of the plants that have to be taken from indoors during the summer can be made use of in window boxes, hanging baskets, veranda boxes, or vases on the lawn. The Tradescantias (Wandering Jew), Umbrella plant, Cordylines, Ferns, German or Cape Ivy, and many varieties of Begonias or Fuchsias—if in flower—make splendid plants for window boxes on the east or north side of the house, whilst Coleus, Vincas or Perriwinkles, especially the variegated type, will help to fill boxes or baskets for more sunny positions. By paying a little attention to the different positions suited to plants during the hot months of summer, many of them can be grown and will improve their condition very much by the time they are wanted for the window again in winter. Plentiful and copious sprinklings with water on the foliage of Palms, Rubber plants, Cordylines and similar plants is necessary during summer. Azaleas also should be sprinkled every morning or evening when the weather is hot and dry.

We gave up planting trees on Arbor Day about 10 years ago because we had as many as our school grounds would accommodate. We plant 15,000 flowers and vines every year in our school grounds on Arbor Day. —(James L. Hughes, Public School Inspector, Toronto.

I would advise every fruit grower to spray his orchard.—(Fred. Heeney, Ingersoll.

# AUTOMATIC VENTILATION IN PRIVATE CONSERVATORIES

ROBT. W. KING, C. E., TORONTO, ONT.

THE practicability of automatic ventilation in private conservatories was raised a few years ago. It was thought that it would be decidedly advantageous, but it was doubtful whether the average gardener would have sufficient mechanical intelligence to care for the machines. The experiment has been tried with success during the last two or three years.

The pioneer experiment is particularly interesting from the fact that there is, first what may be termed an ordinary greenhouse on a miniature scale in which the heat is controlled by hand valves in the usual way, with the ventilation automatic; secondly, there is a show conservatory, apart from the greenhouses, connected with and opening into the residence in which plants grown in the greenhouse are displayed when in bloom. In this apartment the ventilation is controlled by hand, while the heating pipes are controlled automatically.

In fitting out this establishment cost was a secondary consideration, the main object being to obtain what was best for the purpose even though subject to some experimental expense. Before proceeding to further describe this greenhouse it may be interesting to refer to the way its present arrangements were brought about.

As in all such cases an architect was first employed. When it comes to the designing of a common greenhouse in which bloom can be grown satisfactorily, the ordinary architect usually exhibits himself completely at sea. In the instance referred to the building itself was not so bad, though the wooden wall plates surmounted by heavy, wooden mullions, carrying wooden gutters equally weighty, and a double row of purlin supports, five feet centers, might with advantage have been replaced by some of the more modern light iron or steel construction. When it came to the erecting of the internal arrangements the gardener, who probably had never been consulted unless in some high handed way, objected, and at his request the hand ventilation system that had been contracted for was replaced by automatics.

This greenhouse is 60 feet long by 19 feet wide, running north and south. This enables ventilation on both sides of the roof to be successfully used during winter months. When houses run east and west, and double ventilation is used, it is necessary in winter to disconnect shutters on the north side.

The house is divided into three compartments for the purpose of running different temperatures and degrees of ventilation. The first compartment is used for orchids, carnations, and bedding plants. This compartment is 24 feet long, separately controlled by automatic ventilation on both sides of the ridge. The ventilating shutters are hinged at the headers, the spacing being so arranged that the shutters on opposite sides of the ridge are not opposite one another. This compartment has also side ventilation on both sides and some base ventilation under the benches. The second compartment is used for forcing general conservatory stock, bulbs, etc. Its ventilation is similar to the first.

The third compartment, or rose house, is 15 feet in length, from which is deducted a liberal allowance for pathways and side benches, on which are grown cinerarias and numerous other plants. The rose beds consist of two central, modern, solid tile beds each nine feet in length by five feet in width. The roses grown are American Beauties, Brides and Bridesmaid. This compartment has automatic double ventilation at the roof, no other ventilation being used. It has its own special machine.

The gardener does his work in a very systematic way. He has his books of reference always at hand and is more than a sub-

scriber to florists' literature, because he reads it when he gets it, which is more than many florists do. His little batches of soil are graded to the different tastes of his various patients, his temperatures watched and studied, using self registering thermometers both for high and low. The blooms from individual plants are counted for comparison and guide in further purchasing, his daily cut is recorded, in fact one may see carried out in this miniature greenhouse a routine that might well recommend itself to many more pretentious commercial establishments.

In order to enable readers to judge as to what has been accomplished a list is appended of the cut from the rose house, equal success being accomplished in other branches:

CUT OF ROSES FROM 80 PLANTS, 1903 AND 1904.

| | 24 Brides. | 24 Bridesmaids. | 32 American Beauties. |
|---|---|---|---|
| October.... ... | 111 | 143 | 13 |
| November ..... | 120 | 44 | 24 |
| December..... | 25 | 46 | 6 |
| January ..... | 42 | 33 | 15 |
| February ..... | 20 | 21 | 34 |
| March ..... | 67 | 20 | 56 |
| April.... ..... | 79 | 48 | 137 |
| May..... | 33 | 49 | 105 |
| | 497 | 404 | 390 |

TOTAL CUT FROM 80 PLANTS IN 3 YEARS

| | 1901 and 1902. | 1902 and 1903. | 1903 and 1904 |
|---|---|---|---|
| Brides... .... | 486 | 385 | 367 |
| Bridesmaids.... | 410 | 373 | 404 |
| Beauties..... | 514 | 404 | 390 |
| | 1410 | 1162 | 1161 |

This cut of roses is from the 80 plants for 8 months only of each season.

In regard to mechanical ability to operate automatic ventilation and heat control, if the agents for the latter have had no more trouble than those who supplied the former they must think themselves lucky, the former having had only one call in three years. Now, however, the machines require and are undergoing cleaning and repairs.

Automatic ventilation where it can be successfully operated seems to be particularly well adapted to a private conservatory. It is well known how imperative it is in the culture of flowers, especially the more delicate varieties, to ensure an even and regular temperature. Most important of all is the avoidance of sudden changes which may be ruinous to success. The average gentleman's gardener has a multiplicity of matters to attend to outside the greenhouse, requiring at times his absence from the premises for long periods.

It must also be remembered that the larger the houses or the larger the cubic contents in block the easier it is to maintain an even temperature, so in a miniature greenhouse such as described, with its much larger proportion of outside wall surface as compared with the space heated, changes of temperature follow much more rapidly the changes in outside conditions, rendering more vigilance necessary than in the larger structure, where also at all times there are persons in attendance.

In equipping a private conservatory the cost of attendance necessary to constantly watch the ventilation has to be considered, if anything approaching such results as referred to are expected. If even at a small expense for automatic appliances they can be kept in successful operation it is a wise expenditure to install them in the first instance.

As designer and patentee of the automatic ventilator referred to, and notwithstanding that in some instances disappointment has resulted, the writer, considering the many favorable reports that have been received, together with an increase in the number of his patrons who are able to successfully operate them, is encouraged in his attempt to work further improvements.

Grass mulched orchards should seldom be pastured. The grass should be cut and allowed to lie on the ground.

# PROPAGATION AND CARE OF ROSES

WM. HUNT, ONT. AGRI. COLLEGE, GUELPH.

GARDEN roses can be propagated by four different methods: by budding, grafting, layering, as well as from cuttings. The two last named methods are the best for the amateur to practice, not only because they give better results, but from the fact that budded and grafted roses are more apt to suffer from disease and winter killing than are our own root roses, the junction of the bud or scion and stock on budded or grafted roses being always more or less a dangerous point.

I am strongly in favor of our own root roses versus budded or grafted plants. I have grown hardy roses raised from cuttings for upwards of 20 years with splendid results, whilst during that period I have had to replace budded stock several times. Own root roses are slower in giving results than are budded roses, but when once established they will last for years without renewal, if hardy, suitable varieties are selected for the locanty they are to grow in. Another point in favor of own root roses is that if they sucker out, the suckers instead of being useless—as well as hurtful—to the old plant can be used as young plants, as the suckers from an own root rose will produce a plant the same as the parent plant.

Many varieties of roses will increase themselves very rapidly from root suckers that can be detached from the parent plant early in the spring, and be planted out by themselves. But from budded or grafted plants, these suckers are only a nuisance and should be cut away as soon as they show themselves, being usually growth of the briar or manetti, both of them being useless from a decorative point of view, and are only used as stocks to bud or graft better varieties on.

The best time for an amateur to strike roses from cuttings is during July and August. A shallow open box three inches in depth of the required size, with holes bored in the bottom for drainage, and filled with fine sharp sand, is a good place to strike rose cuttings in. Sink the box level to the top in sand or soil in a partially shaded place out in the garden. Take the cuttings from wood of this year's growth, the wood should not be too soft or sappy, or

**A Crimson Rambler Rose Bush and Its Owner.**

The Crimson Rambler rose here shown was planted about seven years ago by Mr. D. McClew, president of the Deseronto Horticultural Society. It has had no protection from the wintry blasts. It was one year old when set out and showed some bloom the next year. The photograph was taken the fourth year, when it was a perfect mass of crimson during June, July and part of August, and at one time had over 7,000 roses. The following winter it was badly killed and Mr McClew has come to the conclusion that in his section of the country protection is necessary. His experience with the Crimson Rambler is that it wants generous feeding, very little trimming, and that it does better with a northern or eastern exposure.

too old and hard. The base of the wood below where the roses have been growing is perhaps the best, although other growth will answer. The base of the cutting should be made just below a leaf joint, and should be cut quite level or square across the cutting.

It is not absolutely necessary to make the base of the cutting immediately below a leaf joint, but I have had the quickest and best results by taking the cutting in this way. A cutting with two leaf joints will be long enough. Remove the lower leaf before inserting the cutting in the sand. Use a very sharp knife in making rose cuttings, so as not to bruise or damage them. Insert the cutting about 1½ to 2 inches in the sand according to the length, making a hole in the sand with a pencil or stick before inserting the cutting. Water the sand well once, and keep the sand moist but not soddened afterwards. Pot off into small 2½ inch pots as soon as rooted, using a compost of three parts of loamy potting soil mixed with one part of fine sharp sand.

Layering: Climbing roses are more easily propagated from layers than bush roses. By taking a young cane early in spring of the preceeding year's growth and burying a portion two or three inches below the soil at a distance of a foot or two from the parent plant, a good plant can be obtained by the following spring, when it can be severed from the parent plant. About 12 inches in length of the cane should be buried, leaving about a foot or 18 inches of the top of the cane exposed. This terminal end or top of the cane will form the future rose tree.

If a straight cut is made two-thirds through the cane and just below a leaf joint, at a point where the cane is buried deepest in the ground, it will facilitate the layer in rooting. The same method can be used in layering bush roses, but the proper wood from these is not always obtainable. Select the canes for layering from those growing from near the root of the parent plant, as they are easier to layer than canes growing higher up the plant. Climbing roses can also be struck from cuttings as recommended for bush roses.

CULTURE AND PRUNING.

Roses like a deep, well drained clay loam soil well enriched with rotten stable manure. The drainage is an important point in wintering over the more tender varieties of roses. Bone meal forked in in the spring is a good fertilizer for roses. Half a pound of bone meal to each bush will not be too much when the bushes have become established.

Prune hardy bush roses early in the spring just as the leaf buds show the first sign of swelling. Prune all the strong growth back to within four to eight inches of the old growth, removing all dead and weakly shoots.

Climbing roses should have the weak shoots of the new growth removed, especially if the bush is strong and vigorous. Shorten the strong canes back so that they are left about four to six feet in length according to the space they have to grow in.

Green fly and thrip are the worst insect enemies of the rose. Use tobacco dust made from raw tobacco stems or leaves, or a solution of strong tobacco water to keep down these pests. Apply these remedies as soon as the leaves are developed, as they are of more service as preventatives than as cures, and an ounce of prevention is better than a pound of cure.

For the rose slug use dry hellebore powder sprinkled on the foliage when moist, or use it early in the morning when the dew is on. Weak Paris green water will answer as well, but I prefer the dry hellebore. These instructions only barely touch on some of the most important points in the propagation and culture of the rose, much has to be learned by experience, more especially in regard to suitability or different varieties, and treatment of same as required by local conditions and surroundings.

# HYBRIDIZATION *

J. H. FAULL, PH. D., LECTURER IN BOTANY, TORONTO UNIVERSITY.

A PLANT hybrid is the product of a cross between two plants that do not belong to the same variety. It may be a cross between two varieties, between a variety and the parent species, between two species, or between two genera. It may resemble either of the parents, or it may resemble the male parent in some respects and the female in others, or it may be intermediate between the two, or it may resemble neither.

Can the nature of the cross be foretold? On what are the characters of the hybrid dependent? What will be the characters of its progeny and can they be determined beforehand? These are pertinent questions for the plant breeder.

Unfortunately our knowledge of the laws of hybridization is meagre. Not long since I read a short article in one of the Ontario trade journals in which a prominent florist advised crossing everything that could be got to cross, on the basis that some valuable results were likely to be attained. This was an unwitting testimony to the fact that that florist knew of no guiding principles—to him the production of a valuable race of plants by hybridizing was a matter of merest chance. The day has not yet dawned when we may select two plants of different kinds and predict the characters of their offspring, but we can do this with a few, and it is of these that I wish to speak. Species is a group of like plants that possesses some one or more characters that are not common to its ancestral species. A variety is a group of like plants in which some character of the species from which it was derived remains dormant, or in which there is the reappearance of an ancestral character that was dormant in the parent species. These definitions are due to the Dutch botanist, DeVries.

Practically the first contribution to our knowledge of the laws of hybridization was made by an Austrian priest, Gregor Johann Mendel. He studied the crosses between a species and its variety and succeeded in discovering the law governing hybrids of this kind.

The law, stated in brief, affirms that when a species and its variety are crossed the pairs of differentiating characters become dissociated in the hybrid, and re-arrange themselves in the offspring into as many combinations as is possible in ratios that are determinable by the theory of probability. There are no intermediate forms or new qualities produced.

In order to understand the workings of the law let us select a specific example, say a cross between a blue-flowered species and its white-flowered variety, all other characters in the plants crossed being the same. The results are not affected by the direction in which the cross is made. The only restriction placed on the experiment is that there must be no subsequent crossing, the progeny must be kept isolated from other plants with which they might hybridize.

All of the flowers of the first generation after the crosses are blue. Blue then is a dominant character. Indeed, the species character is almost uniformly dominant. In the second generation there is a splitting up: 25 of the offspring out of every 100 bear white flowers and 75 blue. The white flowers are of the pure variety type, and breed as true as if there had never been a cross; 25 of the 75 are likewise of pure type, of the species kind, and they breed true. The remaining 50 are hybrids, their flowers being all blue because this quality is a dominant. In this generation then one-half of the plants have reverted—an equal number to each parent type, and but one-half are hybrids. The latter break up in exactly the same manner in the succeeding generation, namely in

* Extract from an address before the Natural History Section of the Canadian Institute.

the ratio of one white, two hybrids, one blue. This ratio is a constant for all cases that have so far been put to the test.

Mendel chose two pairs of differentiating characters for a second experiment. One made by DeVries may be cited by way of illustration. DeVries crossed a blue thorny form, Datura Tatula, with the white thornless Datura Stramonium Inermis. The members of the first generation were blue and thorny, so that these were evidently dominant characters. The second generation was broken up into the following classes: (1) 56.25 per cent, blue with thorns; (2) 18.75 per cent, blue without thorns; (3) 18.75 per cent, white with thorns; (4) 6.25 per cent, white without thorns. This is a proportion of 9:3:3:1. Out of the 56.25 per cent. constituting class 1, 6.25 per cent. bred true, and 55 per cent. were unstable hybrids. Of the 18.75 per cent. of class 2, 6.25 per cent. continued to breed blue and thornless plants, and the rest were unstable hybrids. In class 3, 6.25 per cent. bred true, and in class 4 all bred true. It will be seen that two groups reverted to the original types, two new types appeared, and the rest were hybrids, the offspring of which again split in a definite manner.

With a greater number of pairs of differentiating characters the difficulties of the experiment increase and the statistics become much more complicated, though the law applies to these complex cases just as it does to the simpler.

The explanation of this law is embodied in the hypothesis of germinal purity, that is that every germ is pure with regard to any particular character. Thus the hybrid between the blue flowered and the white flowered types of the first example is supposed to produce two kinds of pollen grains and two kinds of eggs, namely, those that are of the blue-flowered type and thise that are of the white. These may be illustrated thus: Pollen (B), Egg (B); Pollen (W), Egg (W).

It will be seen at once that Pollen (B) may fertilize Egg (B) or Egg (W), giving rise to the pure blue-flowered strain in the one instance and the hybrid in the other. Likewise Pollen (W) may fertilize Egg (W) or Egg (B), giving rise to the white-flowered variety or to the hybrid. Thus in a large number of fertilizations the proportions of the blue-flowered offspring to the hybrid and to the white-flowered variety will be 1:2:1.

In the hybrids formed from the blue-flowered thorny Datura and the white-flowered smooth variety (a cross involving two differentiating characters), there is a larger number of possible combinations. The distinctive characters of pollen grains and egg cells borne by them may be represented thus: Pollen (B and T), Egg (B and T); Pollen (B and S), Egg (B and S); Pollen (W and T), Egg (W and T); Pollen (W and S), Egg (W and S).

It will be seen that several classes may arise and that two new types will occur in the offspring, namely, a blue and smooth Datura, and a white and thorny Datura, and that the number in every class can be calculated by an application of the theory of probability, since the fertilization takes place with equal likelihood in all directions. The characters of the progeny can be foretold with equal certainty.

From a practical point of view the discovery of this law has not been directly of as great value to the plant breeder as was at first predicted. Obviously this is not surprising when it is considered that the law is of limited application, that a large proportion of the hybrids revert, that the numbers of any new type produced are comparatively small, that the difficulties of preventing subsequent crosses are very great, that the number of differentiating qualities between desirable crosses is usually large and so entails a most cumbersome experiment, that no new characters can be produced by

crosses of this kind, and that no undesirable qualities can be eliminated.

Nevertheless, it indicates what crosses to avoid. It also shows the danger of growing a species and its variety in close proximity if they hybridize easily. Thus if a blue and a white flowered variety are growing side by side impurities are sure to occur in the seeds of both. Of course the white variety can be purified readily, for on sowing the seeds the hybrids will reveal their presence in the crop by their blue flowers; but it is different with the species, for the blue flowers of the hybrids will pass undetected among the blue flowers of the species.

From a theoretical standpoint the discovery was of tremendous importance. It was a beginning of the unravelling of the difficult problems of hybridization. It showed how new types may arise in undisturbed nature. It opened up a line of experimental work on heredity and evolution, the first valuable experimental contribution to these subjects since the time of Darwin. It indicated methods of research which if prosecuted promised a flood of light on the process of evolution.

Research on hybridizing has become active in recent years. Every earnest experimenter can help towards their solution if he employs careful methods. But it must be pointed out that if the methods are to be of any value they must be statistical and kept with great care.

## HOW TO MAKE CITY GROUNDS ATTRACTIVE*

MAYOR J. A. ELLIS, OTTAWA, ONT.

BESIDES trees and climbers, shrubs are a very important feature of landscape gardening. Unfortunately we in Ottawa are a trifle too far north for many shrubs which thrive and grow most luxuriantly a little farther south. Still, we have quite a sufficient list to choose from. The best shrubs for the Ottawa district are Hydrangea Paniculata Grandiflora, Philadelphus Coronarius (Mock Orange or Syringa), Viburnum Opulus Sterilis (Snowball), several spiraeas, of which Van Houttei is as

**A Mass of Bloom Hiding a Fence in a City Garden**

A portion of the garden of Mr. J. E. Northwood, one of the winners in the Lady Minto garden competition, held in Ottawa for several years, is here shown. The flowers to be seen are a collection of some of the easiest grown and freest flowering plants; such as petunias, gladiolus, coreopsis, some of the better class of perennial phlox, and others, all of easy culture and effective colorings.

*Continued from the May Issue.

good as any, Lonicera Tartarica (Bush Honeysuckle), lilacs, of which there are now many new and improved ones, especially in the doubles, and roses in bush form. There are, of course, many other shrubs which will do well in Ottawa, but the above list is complete enough for a small garden.

The next important feaure for a private garden is perennials. Of these we have a great list which do first-rate in the Ottawa district. During the last few years horticulturists have adopted much time to the improvement of perennials, and the result has been that we have a magnificent range to choose from. Blooms are larger and many new and beautiful colors and shades have been developed in some of the best known perennials. I would not advise everyone to try to grow all the really good and desirable perennials there are. The list is altogether too great. No one can go wrong, however, if he grows the following: Perennial phlox, paeonies, irisis, delphiniums, sweet Williams, aquilegia (of which the long spurred varieties are fine), Iceland poppies, Gypsophila Paniculata, Gaillardia Grandiflora, Helianthus Multiflorus (and some other varieties of perennial sunflowers), many varieties of lilies, of which Speciosum are the hardiest and best for this district, and the now somewhat common Rudbeckia—Golden Glow.

In the above list of shrubs, flowers and perennials I have given those which are the best, in my opinion, to grow in this locality. They are hardy and will live through our winters and flourish. I could have added many which are desirable, but which require a little less severe winter than ours. Having got the trees, shrubs, climbers and perennials, we can, if we have any space in our grounds left and something is still desired to complete our picture, fill in with annuals. I have tried to describe grounds tastefully planted and whose plants, etc., would be permanent and consequently require no replanting, but only a little care and attention each year. Without annuals at all we can make a most beautiful garden, as the shrubs and perennials above mentioned will give a variety of flowers during the whole season.

ANNUALS.

There are a great number of annuals, some good, some indifferent, and some almost worthless. I am only going to mention those which would fit in well in grounds surrounding a city residence, and already planted with trees, shrubs, climbers and perennials. Sweet peas, nasturtiums and gladioli are probably the best for such a purpose. The latter can be planted in clumps of five or six wherever thought desirable amongst the perennials and shrubs. The nasturtiums and sweet peas can be grown as a background against a trellis, or the latter, as Mr. R. B. Whyte, of Ottawa, grows them, around wire netting arranged in the form of a small circle. When the sweet peas are in flower the wire netting can hardly be seen, and they make a pillar of foliage and bloom. Other good annuals are poppies, asters, Phlox Drummondii, zinnias, salpiglossis, dianthus, pansies and scabiosa. Of bulbs, in addition to lillies, we can hardly do without narcissus and tulips, although the latter require to be renewed every third year or so, as they are apt to run out.

In arranging all or any of the above mentioned the trees and shrubs should go on the sides of the picture or along the boundaries of our grounds. The corners of the grounds should be curved off with shrubs or flowering plants. There should be no sharp straight lines in the planting of shrubs and perennials, but they should be so arranged that they will round off the angles and make easy graceful curves. In front of the shrubs should come the perennials and whatever annuals we use. In arranging these shrubs, perennials and annuals due regard must be had to their height and season of blooming. They must be arranged so that they will

grade, as mentioned above, gradually from the back and sides of the garden to the front, so that there will always be something in bloom in every part of the garden.

HAVE SOME COLOR.

Try and avoid too much greenness. Many gardens are spoiled by this, which would be vastly improved by a little dash of color here and there. I would not advocate planting flowers of the same species in different parts of the garden, as a rule, although there are cases (as in that of gladiolii) where this can be done to advantage. The general and best rule is to keep the flowering plants of the same species together so as to make a mass of them.

There are many lovely and beautiful gardens in Ottawa. The Lady Minto garden competition has done much to encourage people to improve their grounds, more than that it has given other people who were not in the competition object lessons from which to lay out their own grounds. It is a fact to be noted that when in a locality even one man starts to improve his grounds and beautify them, it is not long before his neighbors begin to follow his example, with the result that there is a general improvement in the locality. The gardens and grounds of Ottawa are of many and varied styles, each with its own peculiar beauty. This is as it should be, as each garden must be laid out in that way which best suits its surroundings and locality.

## PANSIES IN THE GARDEN*

E. F. COLLINS, TORONTO, ONT.

PANSIES are easily raised from seed. The seed can be sown at any time, but the usual way is to sow it in July and August to have plants to flower the next spring, or in March or April, which will produce nice plants to flower during the summer and fall months.

If sown in the spring the seed should be sown in a pot or pan, in a light soil, or gentle hotbed, and kept moist. As the wellbeing of the plants depends on their being well rooted it is necessary to prick off the seedlings as soon as they are large enough to handle into other boxes filled with a rich light soil, about three or four inches in depth, placing the plants about three inches apart each way. This space will give them room to grow and also allow a nice sized ball of roots to be lifted, with the soil adhering, to plant out in the garden.

The soil should be of a free, rich and gritty nature, and deeply cultivated, as the pansy makes lots of roots of a fibrous nature and likes to penetrate a considerable distance in search of food. Grit is essential to the well being of the pansy. Road sand, gravel siftings with sandy loam, and lots of well decayed manure and leaf soil, are all favorable to the plants. When planting out to flower it should be done firmly and deep, as the plants are continually being renewed by means of the fresh growths which spring up from their base.

It is a good plan to top dress the roots once or twice during the season. This can easily be done by taking some light soil and shaking it close around the stems of the plants to a depth of about two inches, which treatment has a wonderfully sustaining and fertilizing effect on the pansy.

SOWING THE SEED.

If you wish to have plants for flowering in the early spring sow your seed about the early part of August. Do not think that by sowing earlier you will have more flowers the next spring, because, although you will get larger plants before winter sets in, you will find a lot of them liable to die if the

* Extract from an address delivered at the May meeting of the Toronto Horticultural Society.

winter should happen to be a severe one. It is the medium sized, well rooted, stocky plants that come through the winter the best.

Sow your seed rather thin, outside in the garden, in a small plot of well pulverized ground, and protect it from the sun and heavy rains. After the seedlings are large enough to handle make a frame by nailing four pieces of boards together and place it in the plot of ground you have prepared for them. Dig the ground deep and then rake it down to a fine surface and prick out all your seedling pansies into this frame. Each plant should be about four inches apart each way. Begin with the largest plants and work down to the small ones. By doing this you keep your plants the same distance apart and avoid having a strong, robust one overshadowing a tiny one here and there all over the bed.

Keep your plants shaded a few days after being pricked out and well sprinkled with water every day. After that they may be exposed to the sun and air. If the weather is dry they must be watered, but not too much, as this is the time when you want to build up a short, sturdy plant to resist the winter. Too much water makes the plants grow sappy and produces heavy foliage and such plants are sure to die first.

## Chrysanthemums in June

GEORGE HOLLIS, BRACONDALE, ONT.

JUNE, like May, is a busy month for the chrysanthemum grower. The main crop, that is all the late varieties, should be planted this month. If you cannot spare the house for a week or two, and your plants are ready to plant, give them a size larger pot at once, for if they become hard and are stunted in any way your chances of getting first-class flowers are gone.

Keep the ventilators open night and day on your late stock and also on the early varieties you planted in May. Give the plants a light spraying every morning and be careful not to keep them over wet, which would cause a soft growth. Plant each variety separate in blocks across the bench. Single stems can be put five inches apart in a row and seven inches between the rows.

Your pot plants would be better were they plunged outside for two months. Keep the strongest growths pinched back during June and do not over water them nor put them in pots that are too large. A fair sized plant can be grown in a seven inch pot, and a large one in a nine inch pot. They will not need any manure water.

A good soil for the benches and pots is four barrows of earth (two bushels to a barrow) and one barrow of well rotted manure (cow manure preferred), with a four inch pot of bone meal to each barrow load. Four to five inches of earth in a bench is sufficient to grow high class blooms.

**An Ugly Board Fence Made Beautiful**

Readers of The Horticulturist who have bare board fences in their gardens can readily make them beautiful in the same manner Mr. Thomas Davidson, of Hamilton, did last season with his as shown in the illustration. The flowers along the right hand side of the walk are nasturtiums, asters, dahlias and pansies. There are other flowers in other parts of the garden which cannot be seen in the photo. The whole has to be seen before one can fully realize what can be accomplished with a trifling expense. The fence on the right hand is over six feet high and is covered from view by the nasturtiums and was very pretty at the time the photograph was taken last August.

# GROWING TOMATOES NEAR HAMILTON

"I HAVE 48 acres under cultivation at my house and 25 acres in another place," said Mr. E. J. Mahony, president of the Hamilton District Tomato Growers' Association, to a representative of The Canadian Horticulturist who visited his place during May. "About 30 acres of this is in the vegetable garden. All kinds of vegetables are grown.

"Market gardeners about Hamilton have grown tomatoes extensively in past years for the canners. The latter have been paying 25 cents a bushel, but this year the members of the Tomato Growers' Association refused to make contracts at less than 30 cents. This the canners have refused to give, and by present appearances there will be few tomatoes grown. No contracts have been made, so far as I know, by any of the members of the association at last season's rates. The canners are dealing with new people and endeavoring to get them to grow tomatoes. Without contracts they cannot depend on a supply, and I do not believe they have succeeded in getting many to contract. We will be able to sell what tomatoes we raise in baskets and to obtain reasonable prices.

"The growers raise their own tomato plants. For the earliest the seed is sown about March 1, and for the general crop about March 20. They are started in frames. We grow our own seed. I have been offered as high as $8.50 per 1,000 for tomato plants in the canners' interest.

"The Late Ignotum has been the best variety I have grown. The last two years they appear to have run out. The Stone is the next best. It is a week later, but by saving the seed from the earliest fruit it can be made earlier. The Earliana is the best early variety. It is of good quality and smooth. Canners are glad to get it.

"Tomato seed was sown as usual this season by the members of the Tomato Growers' Association, but about a month ago a circular was sent out instructing them not to transplant, as there was no indication of the canners coming to terms. The latter are a strong body, and the combination will try every means to force the growers, but the latter have a fair prospect of gaining their point."

With reference to canned goods Mr. Mahony stated that negotiations are in progress for establishing a factory in Hamilton

**Mr. E. J. Mahony,**

President of the Hamilton Tomato Growers' Association

where vegetables and fruit will be put up in glass instead of tins, like the English goods. There is a demand among people who want the best, for English goods put up in glass, and they are willing to pay a little more for them. There is no reason, he believes, why these goods should not be put up in Canada. Tin cans are objectionable, especially for fruit.

"Though I am turning my attention to

fruit to some extent," said Mr. Mahony, "because the strip of country under the mountain where I live is well adapted for it. I am satisfied there is a bright prospect for vegetable growers and that they are going to make money out of their business."

## SOME EXPERIMENTS WITH TOMATOES

DURING each season comparative trials have been made at the Vermont Agricultural Experiment Station to determine the relative productiveness of different varieties of tomatoes grown under identical conditions. The first season's work included 78 plants of Sutton's Best of All and 74 of New Stone. During 1903-04 48 plants of each of these two varieties were grown. In addition to these, 11 plants of Lorillard and eight of Sutton's Best of All were grown on the side bench for comparison. Taken as a whole the trial, the results of which have just been made known, indicates little difference in productiveness between Sutton's Best of All and New Stone, with the advantage slightly in favor of the latter. In the case of Lorillard and Sutton's Best of All the results of one season's trial are decidedly in favor of the former.

As to earliness the average number and weight of large and small ripe fruit produced by the Sutton and New Stone plants during the first year did not vary materially. A comparison by months shows that in March, during the latter portion of which some ripe fruit was picked, Sutton's Best of All gave the better yields of both large and small fruits. The increase in large fruits was small, about three per cent., while that in the total product was 7 per cent. During April the yield of large fruits from New Stone exceeded that of Sutton's Best of All by 15 per cent., and in total yield by nearly 13 per cent.

In one season's trial Lorillard proved superior in every respect to Sutton's Best of All. Lorillard is apparently the earliest and most prolific for forcing purposes of the three varieties tested.

## A MARKET GARDENER'S EXPERIENCE

"I HAVE seven acres under market garden and orchard," said Mr. G. Nicholson, of Toronto, to a representative of The Canadian Horticulturist. "I raise all kinds of vegetables and dispose of most of my product to peddlers.

"Vegetables are grown in the orchard. Where the trees are close spinach does well. I had 4,000 cauliflower last year, which did well and headed up finely. I make them white by tying up. My tomatoes rotted badly. A considerable quantity of early potatoes are raised, for which I obtain as high as $1.70 a bushel. They are started in hotbeds and transplanted when the sprouts are about two inches high. Last year I lost a portion of the crop by the potato bug. A neighbor lost five acres. Paris green kills the tender plants.

"Club root did considerable damage to my cabbages. When the head has formed, and before it gets hard club root forms and the plant dies. I have not found a remedy. Salt or lime is said to be good, but I have not tried them.

"In the orchard apples, pears and cherries are grown. There are very few early apples, mine being principally winter varieties. Spys are not worth growing. They command a good price, but the trees are small producers. Greenings are the most satisfactory. I do not spray, as I find cultivation gives as satisfactory results. Some people complain of worms in their cherries, but they have never injured mine."

# THE WHITE FLY AND THE REMEDY

THE white fly has proved one of the most serious insect pests encountered in the winter forcing of tomatoes, says Mr. Wm. Stuart, of the Vermont Agricultural Experiment Station, in his annual report, which has just reached The Horticulturist. This fly does not succumb to the ordinary remedies such as are employed against red spider, aphis and thrips. This immunity to the ordinary fumigants such as tobacco stems or dust, aphis punk, nicoticide, and sulphur fumes, or to the liquid insecticides applied as a spray, is largely due to the fact that during its immature stages of existence it is less easily destroyed than are the other pests mentioned. The experimental crop was started rather late in the season of 1902-03, and hence fewer insects appeared on the young plants than occurred the next year and they were more easily managed.

Frequent fumigation with nicoticide did not rid the plants of the fly during 1902-03, but kept it from great increase or from actually doing serious injury. In 1903-04, however, the plants being started earlier and the insects seemingly more prevalent, fumigations with nicoticide seemed to be of slight avail. Trials were made of aphis punk with meagre results. Fir tree oil, lemon oil, X-all and soap solutions were next tried, at strengths in some cases considerably in excess of those recommended, but with little avail, as the insects seemed to increase rather than decrease. It was decided as a last resort to try hydrocyanic acid gas fumigation. The dose employed was at the rate of 0.2 grains of 98 per cent. potassium cyanide to each cubic foot of air space, or at the rate of about two-thirds of an ounce to each 1,000 cubic feet. Fumigation with the dose mentioned destroyed both the nymph and adult forms of the insect and did no injury to the bearing plants. In all cases the room was fumigated in the evening and remained closed until the following morning. This remedy must be handled with creat care.

In fumigating a second crop of plants just beginning to blossom and set fruit, it was thought best because of the tenderness of the plants to use a weaker dose, the amount being cut down to about .014 grams potassium cyanide per cubic foot, or 50 grams to the room. Notwithstanding this very material decrease in amount of cyanide used, considerable injury was done, for the most part confined to the tender growing shoots and blossoms. This outcome seems in part due to the higher temperature of the house during the fumigation, it having stood at 70 degrees F. instead of 60-65 degrees as at the first treatment. This tendency to injury in high temperature fumigations is corroborative of observations made by others. Subsequent trials with the same strength at lower temperatures did no injury to the plants, yet destroyed the insects.

Cucumbers, lettuce and a mixed lot of plants have been fumigated in the same manner as just outlined with equal satisfaction. Fumigation with light doses, half ounce per 1,000 cubic feet of air space, at temperatures not over 60-65 degrees F. and long exposures is effective, and, in the hands of the ordinary person, is perhaps on the whole more satisfactory than strong doses and short exposures as a remedy against the white fly.

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Peas which have been eaten by the weevil may grow, as the insect does not always injure the germ. The plant, however, will be less thrifty, because it should get a good start from the seed, which it cannot get from a half eaten seed. Better feed such peas to the chickens and sow perfect seed.

Damping off of hot-bed melons is caused by closing the hot-bed too soon after watering, especially on warm days. The cells at the surface of the ground become injured and a fungous disease called damping off is induced. Admit fresh air and apply air slacked lime.

# THE CULTURE OF POTATOES*

W. T. MACOUN, HORTICULTURIST, C. E. F., OTTAWA, ONT.

One may keep potatoes growing thriftily through a time of drought by thorough cultivation and yet neglect looking after the tops and preventing them from being destroyed by the potato beetle and by the blight and rot. Prof. Zavitz, in an experiment at Guelph, showed that in an average of two years potatoes which were allowed to be eaten by bugs only yielded 60.69 bushels per acre, while those sprayed with paris green yielded 138.20, an increase of 77.50 bushels per acre, and just in proportion to the amount of top destroyed so much will the crop be lessened. Instead of waiting until the vines begin to show very plainly the work of the young beetles the vines should be sprayed just when they are hatching, as it takes a day or two usually before the Paris green takes full effect and the vines by that time are pretty badly eaten.

Not only should we spray to kill the potato beetle, but also to prevent the blight which causes such great loss every year. If growers would only spray their potatoes with Bordeaux mixture their crops would be very much increased. In an experiment during 1904 with 15 varieties it was found that the average yield per acre of the 15 kinds where sprayed with Bordeaux mixture and Paris green was 369 bushels 21 pounds per acre, and the same varieties unsprayed 306 bushels 39 pounds per acre, or a difference in favor of spraying of 62 bushels 42 pounds per acre. Taking an average of three years, the increase has been 94 bushels 30 pounds per acre, which at 40 cents a bushel means $39.80 per acre, the cost being about $9 per acre at the outset for large areas, or a net gain of $30.80.

A combination of Bordeaux mixture and Bug Death gave an increase over ordinary Bordeaux mixture and Paris green of 29 bushels 42 pounds per acre, but the cost of this was nearly twice as much as the former. There was still, however, a net difference in favor of Bug Death and Bordeaux mixture applied together of $3.08 per acre, estimating the price of potatoes at 40 cents a bushel. Bug Death applied alone in 1904 gave an increase of only one bushel 13 pounds per acre, taking an average of 15 varieties, although with some varieties there was a much greater difference, but on the other hand with others there was about as great a difference in favor of Paris green. It is only by averaging that we can get at fair estimates of what the results would be in field culture.

### AN EXCELLENT MIXTURE.

The best mixture of those which have been tried for several years to prevent blight and rot and to kill the potato beetle is the poisoned Bordeaux mixture, the formula found best by me being: Sulphate of copper, 6 pounds; lime, 4 pounds; Paris green, 8 ounces; water, 40 gallons.

Although the blight does not usually appear until after the middle of July I prefer using the Bordeaux mixture at the time when the first spraying is made to destroy the young beetles and keeping the vines covered with the mixture from then until September. In 1904 it took five sprayings to do this. If the vines are not kept covered it may happen that the blight will come unexpectedly when spraying is needed. Hence the work should be done thoroughly or not at all.

The first spraying we give is not considered necessary for the prevention of the late blight, but it does, we believe, protect the foliage from other enemies. Five sprayings should not cost more than $9 per acre for time and materials if one has a good spray pump. The Bordeaux-Bug Death mixture which was tried this year for the first time gave better results than Bordeaux mixture and Paris green, but several seasons' tests are necessary in order to show whether it will average better than the Bordeaux mixture and Paris green.

*Continued from the May issue.

# The Canadian Horticulturist

**Published by The Horticultural Publishing Company, Limited.**

The Only Horticultural Magazine in the Dominion.

**Official Organ of British Columbia, Ontario, Quebec and Prince Edward Island Fruit Growers' Associations and of the Ontario Vegetable Growers' Association.**

H. Bronson Cowan, Editor and Business Manager.

J. A. Hand, Associate Editor.

W. G. Rook, Advertising Manager.

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## NOTICE TO ONTARIO SUBSCRIBERS.

Owing to the transfer of The Canadian Horticulturist, formerly published by the Ontario Fruit Growers' Association, to an independent company known as The Horticultural Publishing Company, Limited, the fee of one dollar if sent to The Canadian Horticulturist or to Mr. H. B. Cowan will not include membership in the Fruit Growers' Association as in past years. As many of those subscribing in this way consider the membership in the association, together with the annual report, as of considerable value, it would be an injustice to cut them off summarily. However, as the transfer dates back to December, 1904, those who desire the copy of the annual report and other privileges of membership this year in the association will require to drop a card at once to the secretary, P. W. Hodgetts, Parliament Buildings, Toronto. Next year be sure to join your Provincial Fruit Growers' Association and get The Canadian Horticulturist as one of the premiums.

P. W. HODGETTS,
Sec'y Ont. Fruit Growers' Ass'n.

## WHAT HAS HAPPENED TO MORGAN?

It would be difficult to determine which has fallen the flattest, the seedless apple boom or the horticultural reputation of Mr. Sampson Morgan, of Broadstairs, England. Following the publication of Prof. Craig's letter in The Horticulturist for April, ridiculing the extravagant claims made in the March issue by Mr. Morgan for the seedless apple, Mr. Morgan was written to and his attention drawn to Prof. Craig's letter and he was invited to reply thereto.

Since then The Horticulturist has waited patiently for the reply which has not come. Lately, something worse than the publication of Prof. Craig's letter has happened. It has been discovered that the two so-called coreless apples which Mr. Morgan sent to Covent Garden Market, and which created so much excitement among the buyers who frequent that historic spot, and which were finally auctioned off for about seven dollars apiece, really possessed healthy seeds and cores larger and harder than those of most apples of their size. When, after the excitement connected with the introduction of these apples had subsided, and they were cut open, the discovery of the cores and seeds created an explosion of ridicule and fun in regard to Mr. Morgan and seedless apples generally, the echoes of which are still to be heard among the papers of Great Britain. The question now being asked is, how many seeds did the apple sent the King contain? No person, however, has been found who has dared to put this question direct.

When Mr. Morgan was beseiged by the British press for an explanation he wired that the fruit cut were not the Spencer seedless apples, to which Mr. Shearn, their buyer, retorted that if they were not the Spencer seedless apples they were apples he paid 30 shillings apiece for. The Horticulturist has come to the conclusion that the reason it has not heard from Mr. Morgan must be that he has either innocently swallowed the seeds of one of his famous apples or that he is on the war path for the Spencer Coreless Apple Company which led him from the paths of veracity into troubles he had dreamed not of.

## BRITISH COLUMBIA FALLS IN LINE.

The Canadian Horticulturist has recently been appointed the official organ of the British Columbia Fruit Growers' Association. This means that The Horticulturist is this year the official organ of four provincial fruit growers' associations extending from Prince Edward Island on the east to British Columbia on the west.

This is as it should be. There are many questions connected with the fruit industry in Canada which are of as great interest to the fruit growers in one province as to those in another. There is only one paper in the Dominion which represents the fruit interests. That paper is The Canadian Horticulturist. This means that if the fruit growers in all the provinces desire to keep in touch with one another and to discuss matters and to advocate reforms which are to their mutual benefit they can best

# We Want 8000 Subscribers

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and

# We Need Your Help

United States fruit and floral publications are pushing their paper into Canada, and are constantly asking their readers to help them get new subscribers. **Will not our readers help us in the same way?**

Without saying anything against our United States competitors (they are hard ones to fight) we will state that **The Canadian Horticulturist** is the only paper published, which will keep you fully posted in regard to what Canadian Fruit, Flower and Vegetable Growers are doing. Our aim is to give our readers in each issue the information they are looking for, and therefore our articles are timely. Tell these facts to your friends.

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If you will induce one friend to take The Horticulturist for one year, and send us a dollar for his subscription, we will extend your subscription for six months.

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Those of our readers who are taking The Horticulturist through horticultural societies or fruit growers associations will be allowed to retain a liberal commission on all new subscriptions or we will arrange with your secretary to extend your next year's membership.

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**The Canadian Horticulturist**

do so through their common organ, The Horticulturist. The appointment of The Horticulturist as the official organ of the British Columbia Fruit Growers' Association means that the paper now practically represents the fruit interests of the Dominion and that when it speaks for these interests it does so with the voice of one having authority. This union of forces on the part of Canadian fruit growers will result to their advantage.

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Why do some fruit growers succeed in obtaining four and five times as much for their fruit as others? Thousands of Canadian apple growers were unable to obtain over 60 cents a barrel for their 1904 crop of apples. Recently The Horticulturist received a letter from Mr. Eben James reporting a sale of apples made in April by his principals, Messrs. Woodall & Co., of Liverpool, Eng. This sale included 131 barrels of apples sold for Mr. W. H. Dempsey, of Trenton, Ont., which netted a gross average of $5.94 a barrel, or a net value to Mr. Dempsey of $4.50. The article by Mr. Dempsey on "Apple Growing for Profit," which appears in this issue, shows some of the methods Mr. Dempsey has adopted and which have enabled him to make such sales as the one here mentioned.

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While the resignations of Prof. Lochhead and Prof. Harrison from the staff of the Guelph Agricultural College will be a loss to that institution it is fortunate that instead of leaving Canada, as so many of our best men have done, they have accepted positions with the Macdonald Teachers' College and College of Agriculture at St. Annes, Que., where Canadians will still reap the benefit of their services. Prof. Lochhead will sever his connection with the Guelph college on July 1 and will probably make special studies, along certain lines of plant diseases and insect life, for three or four months in the laboratories of the Department of Agriculture at Washington, and otherwise prepare himself for his new duties before the new college opens in about a year and a half from now.

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The British Columbia Fruit Growers' Association is to be congratulated on the excellent work it is doing as shown by the article in this issue by Mr. Brandrith, the secretary. The holding of a number of meetings at different points in the province each year is an excellent one. The efforts being put forth to ensure for fruit growers the benefits of cooperative effort are in the right direction and will result in benefit to the industry.

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Fruit growers join in expressing their sympathy with Mr. Harold Jones, of Maitland, Ont., the well-known fruit experimenter and farmers' institute speaker, who is also a director of the Ontario Fruit Growers' Association, in the recent death of his father, at the old homestead at Maitland. Those who knew Mr. Jones, sen., realize what a blow his death means to his son and family.

# THE PROVINCIAL HORTICULTURAL EXHIBITION

The second Provincial Fruit, Flower and Honey Show, with the addition this year of an exhibit of vegetables, will be held from November 14 to 18 in Massey Hall, Toronto. Even at this early date indications are that it will prove a great success. The fact that Massey Hall has been secured will add greatly to the interest taken in the exhibition.

A meeting of those interested in the show was held in the secretary's office in the Parliament Buildings early in May. Those present included Messrs. W. H. Bunting, St. Catharines; P. W. Hodgetts and Alex. McNeill, representing the Ontario Fruit Growers' Association; W. A. Emory and Joseph Rush, representing the Ontario Vegetable Growers' Association; W. Couse, representing the Ontario Bee Keepers' Association; Geo. Douglas, W. Jay and T. Manton, representing the Toronto Gardeners' and Florists' Association; H. R. Frankland, W. G. Rook and H. Simmers, representing the Toronto Horticultural Society; R. J. Score, B. Sanders and J. H. Dunlop, representing the Toronto Electoral District Agricultural Society, and H. B. Cowan, representing the Ontario Department of Agriculture.

It was explained by Mr. Cowan that since the show held last fall in Toronto a deputation had waited on the Minister of Agriculture and urged that the show should be held in Hamilton. A second deputation had waited on the Minister and urged that the show should be continued in Toronto. Mr. Cowan stated that he had received a letter from the Deputy Minister of Agriculture notifying him that the Minister of Agriculture had decided to continue the show in Toronto and to give a grant of $1,000 for that purpose and that he desired Mr. Cowan to call together those interested in the holding of the show and to make the necessary arrangements for it.

Mr. Cowan explained that the intention of the Department, when it inaugurated the holding of this show a year ago, was to encourage a Fruit and Honey show. At the suggestion of the florists it had been decided to hold a joint show last year, the Government assisting only the honey and fruit interests financially. Mr. Cowan stated that he had consulted the Minister of Agriculture, who had intimated his desire that the grant this year should be distributed in the same manner except that a portion of the money would have to be given to the recently formed Ontario Vegetable Growers' Association, which he desired should have a part in the show.

Several of those present expressed the view that the government grant should be distributed to the show as a whole, claiming that the floral sections are as much deserving of assistance as the fruit, honey or vegetables.

Mr. Cowan stated that if the representatives of the fruit honey and vegetable interests were willing to pool their share of the grant the Department would offer no objection. After some discussion it was agreed to do this.

In a discussion of the prize lists Mr. Hodgetts stated that the prize list for the fruit section this year should be $800. Mr. Dunlop stated that the prize list for the floral section last year was about $1,200, and that this amount would not need to be increased much, if any, this year. Mr. Couse said the bee keepers offered $200 in prizes last year. Mr. Emory and Mr. Rush believed the prize list for the vegetable growers would be about $200. It was decided to estimate the prize lists at $2,700, rent of Massey Hall, $650; carpentering, $250; advertising and printing, $500; labor, $200; incidentals, $200, making a total estimated expenditure of $4,750. The estimated receipts were placed at: Government grant, available, $800; City Council, $200; Electoral District Agricultural Society, $150; Florists' and Gardeners' Association, $125; public subscriptions, $1,000; Vegetable Growers' Association, $100; Bee Keepers' Association, $50; Fruit Growers' Association, $200, total, $2,625, leaving about $2,125 to be raised by gate receipts.

## OFFICERS ELECTED.

The election of officers resulted as follows

President, R. J. Score, Toronto.

1st Vice-President, W. H. Bunting, St. Catharines.

2nd Vice-President, John Chambers, Toronto

Secretary, H. B. Cowan, Toronto.

Treasurer, J. H. Dunlop, Toronto.

It was decided on motion of Mr. Rook that the chairmen of all committees connected with the show must be members of the executive committee.

The following chairmen and secretaries of committees were appointed:

Honey—Chairman, Mr. Sibbald; Secretary, Mr. Couse.

Vegetable—Chairman, Mr. Rush.

Floral—Chairman, Mr. Manton; Secretary, Mr. Collins.

Fruit—Chairman, Mr. McNeill; Secretary, Mr. Hodgetts.

Finance—Chairman, Mr. Frankland; Secretary, Mr. Dunlop.

Printing—Chairman, Mr. Rook; Secretary, Mr. Simmers.

On motion of Mr. Manton, seconded by Mr. Dunlop, it was decided that at meetings of the executive committee the representatives present from any organizations interested in the show should have the right to vote for their absentees.

The executive committee will be composed of four representatives from the Ontario Fruit Growers' Association, four from the Ontario Vegetable Growers' Association, and four from the Ontario Bee Keepers' Association, making twelve representatives from these three sections, and four representatives from the Toronto Horticultural Society, four from the Toronto Gardeners' and Florists' Association, and four from the Toronto Agricultural Society, making twelve representatives from the floral section, with Mr. Cowan representing the Department of Agriculture.

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A deputation representing the Niagara Fruit Growers' Association waited on the Ontario Department of Agriculture recently and asked for an annual government grant.

## Items of Interest

Mr. W. T. Macoun, horticulturist, Central Experimental Farm, Ottawa, sails June 14 for the old country and will be absent two months. While away Mr. Macoun hopes to visit many places in Great Britain and Ireland where experimental and commercial work in horticulture is being carried on. The trip is primarily a holiday, but Mr. Macoun hopes to get much information which will be useful in his work.

Mr. A. E. Sherrington, of Walkerton, attended special fruit meetings arranged for through the Department of Agriculture at Simcoe May 10 and at Burford May 11. The attendance at the Simcoe meeting was fairly large and representative. A strong committee was appointed to take up the work of organization in order that the fruit of the district may be handled on the co-operative plan during the coming season. The meeting at Burford was not largely attended, but those present were most enthusiastic, and an association will be formed at once to handle the apples of the district.

Meetings to discuss matters relating to the fruit industry were held during the latter part of May at Salmon Arm, Enderby, Vernon, Kelowna, Peachland, Summerland, Penticton and Keremeous, B. C. These meetings were addressed by the president of the British Columbia Fruit Growers' Association, Mr. T. W. Stirling, on "Varieties to Plant;" Mr. W. J. Brandrith, the secretary, spoke on "The Planting, Care and Cultivation of the Orchard;" Mr. R. M. Palmer, on "Marketing and Transportation," and Mr. Maxwell Smith, Dominion inspector under the Fruit Marks Act, on "Co-operation in the Fruit Industry" and "The Fruit Marks Act."

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**The Picton Horticultural Society** has distributed neat circulars stating the plants and seeds, etc., being given to members this spring, as follows: Half pound hybrid sweet pea seed, one exhibition double begonia, one single fringe begonia, three pearl tuberoses and three named gloxinias. On the sheet is a detailed description of the premiums given, with cultural hints and directions for their favorable growth.—(W. T. Ross, secretary.

**The Late R. W. Lloyd.**

The cause of horticulture in Ontario, and particularly in Deseronto and vicinity, has suffered a severe loss in the recent death of Mr. R. W. Lloyd, the energetic and enthusiastic secretary-treasurer of the Deseronto Horticultural Society, whose portrait is here presented. Mr. Lloyd was a native of England, but had lived in this country for 21 years. For eight years he held an appointment under the British Government in India, having to do with the cultivation of cotton. He lived in Deseronto for eighteen years and was always held in the highest respect for his sterling qualities. He always took a lively interest in the welfare and progress of the town and was among the first to join the Horticultural Society after its organization. For some years past he had filled the office of secretary-treasurer with advantage to the society; and his knowledge of plant life and cultivation, which was of a high order, was at the disposal of all enquirers. The society and the town are distinct losers by his death.

## The Toronto Society

The last meeting of the Toronto Horticultural Society was one of the best attended meetings held for a long time, many ladies taking an active interest in the meeting. Mr. E. F. Collins prepared a paper on the culture of pansies, but being unable to attend, Mr. J. McP. Ross read the paper and commented on its worth. This paper is published in this issue.

Mr. Jay, Mr. Mills, Mr. Tyrrell and Mr. Uttley spoke of the worth of flowers and gardens. Dr. Fletcher, of Ottawa, will give an address June 6 on Insect Pests, which will be illustrated by steropticon views.—(H. R. Frankland, Pres.

## Ottawa Society's First Meeting

The first exhibition this season of the Ottawa Horticultural Society was held in May. A large

number were present, and the display of flowers and plants was a fine one. Mr. W. G. Black, president of the society, delivered an address on the benefits of growing plants, flowers, etc. Superintendent of the government park, Mr. T. E. Davis, gave a particularly interesting and novel address on the arrangement of color in budding plants. The next show will be held June 20, when Dr. Fletcher, of Ottawa, will give an address on What Flowers Do.

## An Interesting Meeting

The subject of an interesting address delivered before the Port Dover Horticultural Society recently by Mr. Wm. Hunt, of Guelph, was "Beautifying the Home Grounds, and the Propagation of Plants." Some 20 questions of a practical nature were asked by different members in the audience and promptly replied to by Mr. Hunt.

This society is distributing aster seed this spring to the pupils of the public schools, who are much interested in the fall show, when they will have a chance to show the results of their labors. The society is also giving to members trees, plants and garden seeds.—(S. F. Butler, secretary.



## Classified Advertisements

**Advertisements under this heading will be inserted at the rate of ten cents per line, each insertion; minimum charge, fifty cents in advance.**

WANTED — SUBSCRIPTION CANVASSERS for The Canadian Horticulturist both in cities and in the fruit districts of Canada. Liberal commissions offered. Good men soon put on salary. Write The Canadian Horticulturist, Rooms 507-508, Manning Chambers, Toronto, Ont.

FOR SALE—FRUIT FARM OF 200 ACRES, Township of Niagara, will be sold en bloc or divided to suit purchaser. Hundreds of farms, stores, factories, etc., on my list. W. J. Doan, Manning Chambers, Toronto.

GREENHOUSE AND STOCK FOR SALE TEN thousand feet of glass; one of the best equipped greenhouses in Toronto, located in the best residential sections of Parkdale, large plant trade; residence, stable and everything in good condition. Apply to F. C., care of The Canadian Horticulturist.

**Gave 300 Plants.**—In May the Hespeler Horticultural Society distributed 300 plants, consisting of coleus and geraniums, to the school children. A very pleasant and interesting meeting was held, at which Mr. Wm. Hunt, of Guelph, spoke, giving many valuable hints regarding seasonable garden topics and plant propagation. This meeting was one of the best of a series of many meetings at which Mr. Hunt spoke this spring.

## Proposed County Competition in Apples

It is proposed to have this year at the annual Fruit, Flower and Honey Show, to be held at Toronto in November, a county competition in apples. The County Councils are to be asked at their sessions in June to make a grant of $25 each, which it is proposed to divide into four prizes of ten, eight, five and two dollars, to be limited to growers in the county offering the prize. The exhibits shall consist of not more than five varieties for domestic and five for commercial purposes, each exhibit to consist of five named apples on a plate. The apples shall be judged by points, as follows: Form, 5; size, 15; color, 20; quality, 15; uniformity, 20; freedom from blemishes, 25; total, 100. Ten points will be added for correct naming.

The Ontario Fruit Growers' Association will pay express charges from the point of shipment to Toronto and will keep the fruit in cold storage till the show is held. Growers will simply have to pack their fruit and deliver it at the nearest express office, when their responsibility ceases. There will be no entry fee.

The Ontario Fruit Growers' Association has also arranged for delegations to wait on every County Council at their June session to ask for the grant. Fruit growers are invited to act on these county deputations.

The proposal has met with much favor, and it is needless to enter into any argument to show what an advantage it would be in giving an impetus to the fruit industry in all parts of the province. The money given by the County Councils will all come back to their counties in the form of prizes.

## Fruit Crop Conditions in Ontario

Special crop reports received by The Horticulturist from correspondents in the Niagara and Leamington districts under dates as late as May 23 and May 24 indicate that crop prospects in those important fruit sections are bright. Late frosts have done some damage, but at the date of writing the correspondents did not consider the damage serious. The reports are as follows:

QUEENSTON.

H. St. C. Fisher: The prospects for cherries are very bright. The trees have blossomed well, and if all goes well there will be a large crop. Strawberries are rather light, as not many were planted this spring. I have seen very few good patches. The late frosts will greatly lessen the crop. All other crops are looking well.

JORDAN STATION.

C. M. Honsberger: Strawberries have wintered in fine shape and are full of bloom and promise a full crop. A light frost in the morning of May 21 injured some blossoms, but to no serious extent. Peaches are in full bloom and promise well where trees were not allowed to overbear the past two or three seasons. Cherries are literally covered with bloom, more especially the Early Richmond, which bore a heavy crop last season. The weather for fertilization was fine, so much so that the assistance of the busy bee was not required.

FRUITLAND.

Jos. Tweddle: Cherry buds came through the winter in excellent shape, with full bloom and weather mostly fair during bloom. We should have a splendid crop. Strawberry prospects are first-class. We had a heavy white frost May 21, but I have heard of no particular damage to strawberry bloom. Other fruits, including apples, are looking well, and should yield a heavy crop. Grapes are only fair; quite a proportion of buds seem to be dead.

BURLINGTON.

A. W. Peart: The general fruit outlook is bright. Trees have wintered well and bloom appears sufficiently plentiful, especially with plums. The prospect for cherries is excellent, notably the sour varieties. Apples, pears and peaches also promise well: Strawberries generally passed the winter in good condition and their appearance indicates a fair return. Blackberries, raspberries and currants promise an average crop.

W. F. W. Fisher: Strawberries, vines last season ran moderately well, wintered fairly, promise a two-third crop. Cherries, trees thrifty, bloom heavy. Pears, trees fairly healthy, bloom medium. Plums, trees fairly healthy, bloom heavy. Apples, trees look well, very full of bloom. Raspberries, injured some by winter, two-third crop. Blackberries, promise well.

LEAMINGTON.

E. E. Adams: The Early Richmond cherry shows little or no fruit, but the Montmorency is all right. Strawberries will be a good crop, providing we have enough rain to develop the fruit fully at ripening season.

## THE SPRAMOTOR MACHINES.

There was a time not long ago when it was necessary to go into foreign countries for any special machinery. In many lines this is changed. In 1896, when the Spramotor Company won the Government spraying contest at Grimsby, there were 11 makers of spraying machinery in Canada. All of these have tried to sell out to the Spramotor Company, but none were bought. It was thought that a specialty like the Spramotor could not live in Canada owing to the restricted market, but by adhering to

original lines and cultivating the foreign market a good business has resulted, sufficiently large to keep a staff of expert mechanics at work the year round. Four years ago the United States trade was large enough to warrant the company starting in that market, and each year since the trade has doubled, so that it is now eight times what it was the first year. When it is remembered that this is the hardest market in the world to capture it will be seen that the Spramotor has merit.

Over 5,000 Spramotors have been supplied to one manufacturer of paints in the United States to apply their product. Mr. W. H. Heard, inventor of the Spramotor, is the possessor of many patents in this and foreign countries, but the business is built entirely upon a commercial basis. Not one cent has been added to any article made by the company because of its being patented; the selling price being based entirely on the cost of production.

Every Government in Canada has used the Spramotor and pronounced it good, and use no other. The general Government at Washington, together with all the State Governments in the United States, use the Spramotor.

There are more Spramotors in use in Canada than all others combined. Mr. W. S. Blair, of Nova Scotia, and A. McNeill, Chief Fruit Division, Ottawa, say that the Spramotor has contributed as much to the success of the fruit growers in Canada as any other cause, by making it possible for them to save a larger percentage of their crops than would otherwise be possible. The absence of complaint against spraying machinery in Canada is largely attributable to the effort of this company, whose products are recognized as the standard of excellence. A catalogue of 80 pages may be had on request.

## ARE DOING A LARGE BUSINESS.

A recent visit to Gammage & Sons, of London, found this firm in the midst of their spring plant trade. Thousands of plants were being shipped to all parts of the Dominion—we noticed cases of plants addressed to points in Nova Scotia and New Brunswick in the east and Winnipeg, Nelson and Vancouver, B. C., in the west. Nor is their trade confined to Canada alone, a number of shipments having been made to the United States.

Pelargoniums, of which the firm have made a special feature this season, have proved a great success. Additional time and space will be given to them in the future. Preparations are well under way for planting chrysanthemums and carnations. Said Mr. Gammage, "We were handicapped last year with building operations, having added 40,000 feet of glass, but this year we are taking time by the forelock as, having no building to do, we can give our stock proper attention."

## FAVORABLE REPORTS.

Some reports just received on Arnott's Concentrated Horticultural Manure:

From Messrs. Geo. Dobbs & Son, Auburn, N. Y., U. S. A.: "The 25 pounds we ordered last fall have given us excellent results. Please send us 100 pounds more."

From the Fenwick Nursery, Halifax, N. S.: "Everything in which the "food" was applied is doing well. The Calla and Easter lilies were beautiful. Chrysanthemums are looking well, also hydrangeas, fuchsias, geraniums and bench roses."

From the general superintendent department of parks and boulevards, Detroit, Mich., U. S. A.: "The sample of Arnott's Concentrated Horticultural Manure gave satisfaction."

## A LADDER IN THE ORCHARD.

So long as fruit trees grow taller than unassisted man can reach so long will it be necessary for him to have at hand some assistance in reaching the higher parts of the tree. Before the leaves are put forth in the spring the careful orchardist prunes his trees and examines every part carefully for signs of disease and for the rings of eggs of the tent caterpillar. Later he may require to get to the high branches to relieve them of an overload of fruit which threatens to break the tree or to leave the quality of fruit inferior. And later still he must climb to where the ripe fruit is and bring it down for use. It will not do to wait till it falls down to him or to knock it down with sticks and stones as we did when we were boys.

For all these purposes he must have a ladder and a ladder which is light, handy and strong and which can be put up in the middle of the tree as well as against the outside. The old-fashioned single ladders have served their day, but with the spraying machines, binders and the cream separators have come in the extension ladder. The fruit grower who has only one tree should have an extension ladder. It will pay him handsomely, and proportionately it will pay the man who has many trees.

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**Favorable Season for Packing.**—We have had a splendid season for packing, writes Mr. E. D. Smith, of the Helderleigh Nurseries, at Winona, and have got out our stock in excellent time and in splendid shape. We had 150,000 trees dug in the fall and heeled in my above ground cellars. This enabled me to get the goods out to the planters over the country earlier than could possibly be done if everything had to be done in the spring, and the stock was in better shape as it was not damaged by the winter, as it sometimes is, although there was very little damage last winter.

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I like a number of the best fruit journals published in the United States, but I consider The Canadian Horticulturist the most complete and valuable of any.—(J. L. Hilborn, Leamington, Ont.