

How to Spray and What to Use

The Canadian Horticulturist

MARCH, 1907

Volume 30, No. 3

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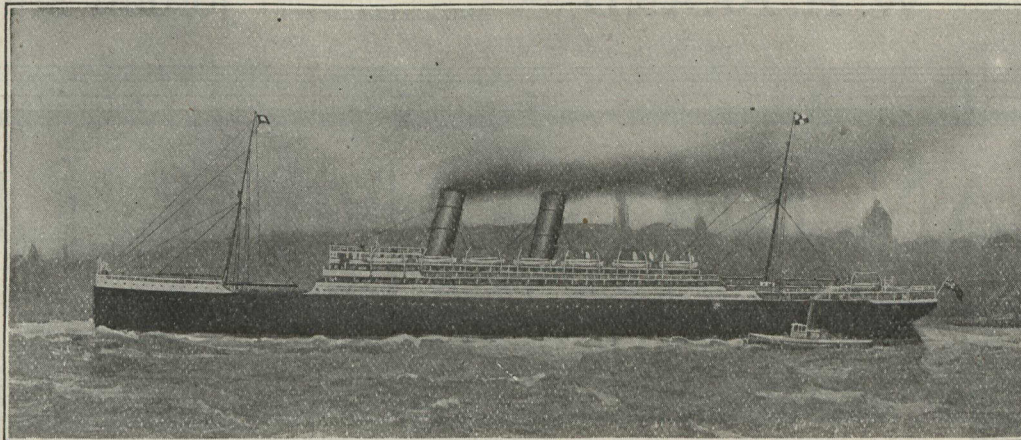
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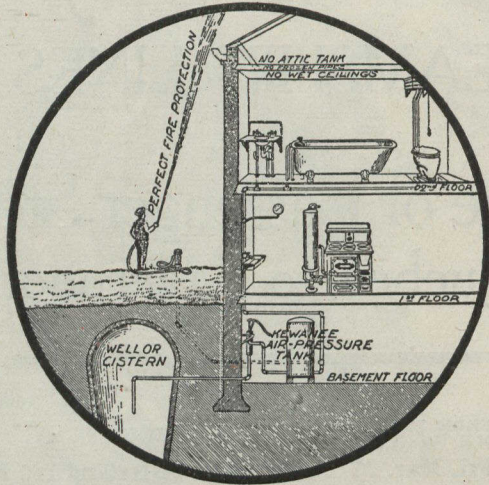
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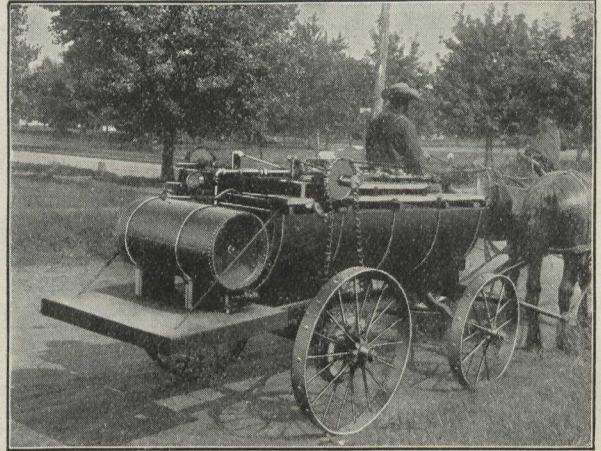
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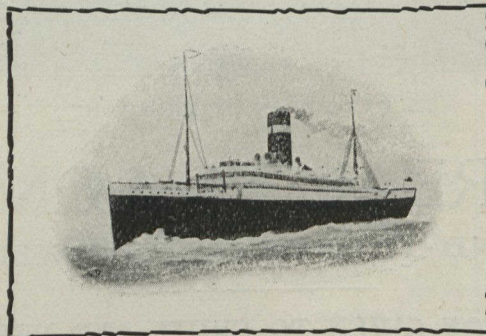
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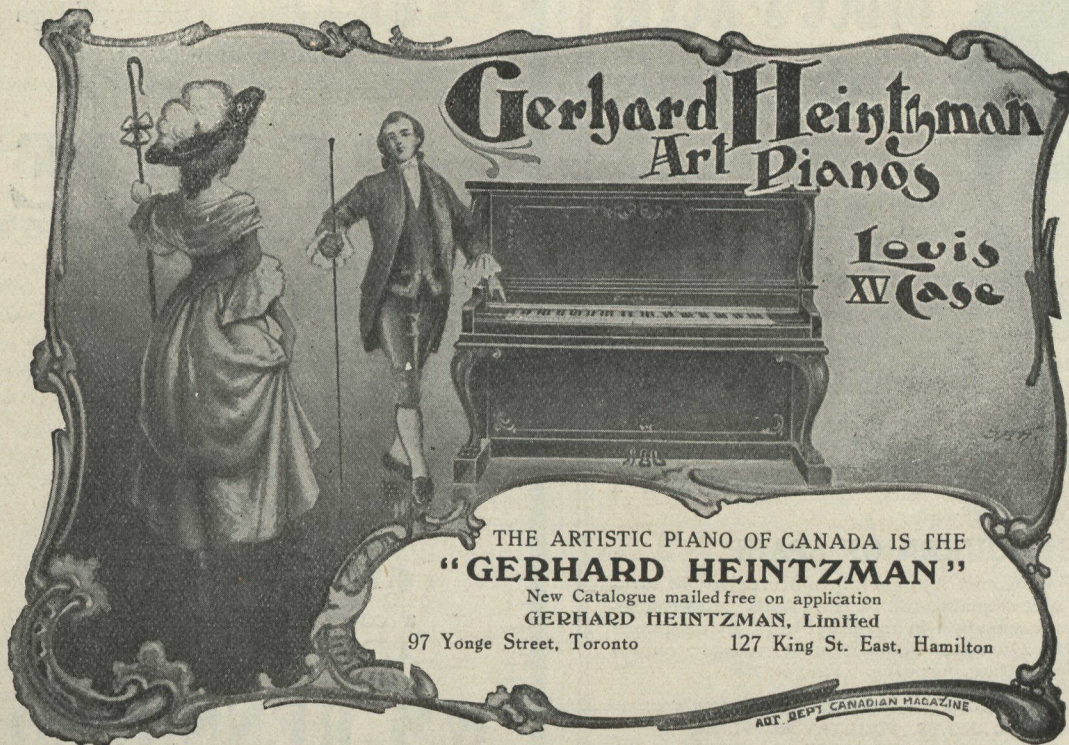
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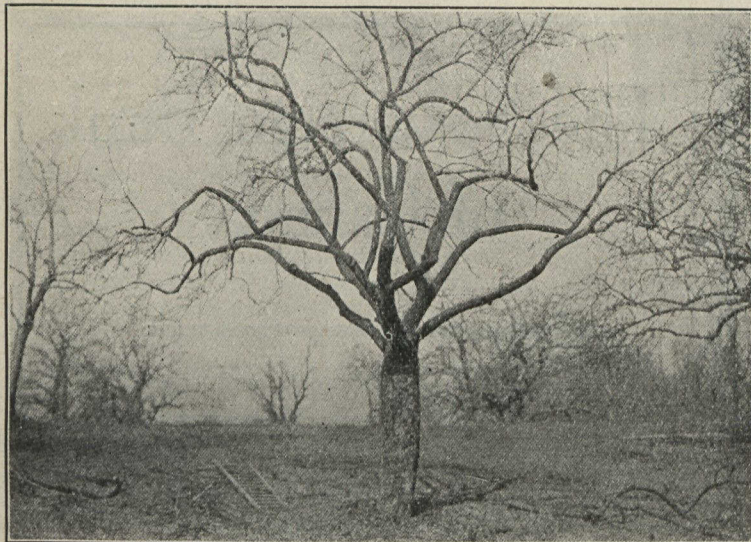
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R. T. Austin, near Boston, Mass., set out 500 Dwarf Pears, occupying about an acre of ground. They commenced bearing in three years and have borne regular crops ever since. An account kept of the sales for a period of six years showed an aggregate amount of \$3,498 00, an average of over \$500.00 an acre each season.

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PROFIT IN DWARF PEARS

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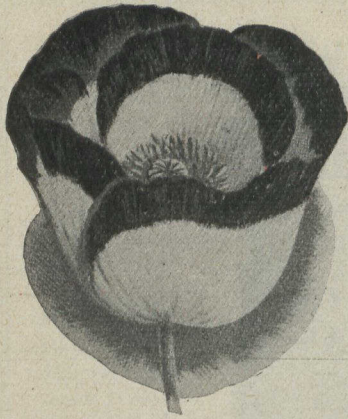
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The Canadian Horticulturist

Vol. XXX

MARCH, 1907

No. 3

Spraying Solutions and How They Are Made

SPRAYING is a means to an end. In fruit growing, the end in view is to produce in quantity a grade of fruit that approaches as near as possible the ideal looked for in the particular variety or varieties grown. Spraying helps the grower to do this. It increases the percentage of high-grade fruit by holding within bounds the ravages of insect and fungous enemies.

The practical value of spraying becomes more and more evident as the seasons go by. Insects and fungi are becoming numerous and are constantly changing their habits from one class of plants to another. To combat them successfully, the work of applying spraying mixtures must be done thoroughly and at the proper time. Every portion of the leaf and branch must be covered with the spray. The nature of the mixture that should be used depends upon the kind of insect or fungus to be combatted, and upon the season of the year. For the benefit of the readers of *THE CANADIAN HORTICULTURIST* some practical fruit growers have contributed letters on the preparation and handling of some of these mixtures.

MAKING LIME-SULPHUR WASH

"We hear so much these days of different methods of making lime-sulphur wash," writes Mr. M. G. Bruner, of Olinda, Ont., "that it may be of interest to observe my method, which is as follows: I cook the mixture with a steam boiler, a small one of six horse-power. The first thing I do is to start a fire in the boiler. While the water is heating I weigh out 15 pounds of sulphur, which I sift so that there will not be any lumps put into the barrel. I also weigh out 25 pounds of lime and get it ready. I mix the sulphur with boiling water to a thin paste; when adding the sulphur to this water, I stir continually so as not to form any lumps, as they will not break up in the cooking.

"In the barrel that is to be used for the cooking, I place 10 or 12 gallons of hot water. There should be at least 60 pounds of steam in the boiler). Then I put the sulphur paste in the barrel and afterwards the lime. The best stone lime must be used. In a minute or less the lime will begin to slake. The mixture must then be stirred continually so as to prevent it from sticking to the

bottom of the barrel. A little cold water should be poured in occasionally to keep the lime from boiling over the top. When slaking has stopped, turn on the steam from the boiler. Apply as much steam as can be used without causing the mixture to boil over. Continue to boil for an hour at least. Do not stop until the sulphur is all melted.

"When the cooking is completed, the barrel will be half full or a little more; *i.e.*, if a 45 gallon barrel is used. Fill it up with hot water. Strain the whole through cheese cloth spread over a fine wire strainer. The mixture is strained

40 gallons of water. Have good, fresh, unslacked lime. Put the sulphur in boiling water and mix to a paste, then put the lime in the boiling tub, and cover it with boiling water three or four inches; then, as quickly as possible, throw in the sulphur paste with the slacking lime, and cover it until it begins to stop boiling, then turn on all the steam and stir occasionally; let it boil 45 minutes. We prefer boiling by steam as it is the cheapest and quickest way. The sooner you can get the wash on the trees the better as it goes through the nozzles much more satisfactorily hot than cold; always spray with the wind, and be sure you spray every twig. We have a large vat of boiling water always on hand a little elevated so that all we have to do is to turn on the tap and let it run into the boiling tubs. We would not recommend boiling this mixture with its own heat."

Interesting information is contained in a letter from Mr. W. A. Hunsberry, Jordan Station, Ont., as follows:

"The lime-sulphur wash is one of the best mixtures we have. I have used it for six or seven years and have found it a benefit not only in preventing the scale from attacking fruit trees and as a means of destroying scale, but also in cleaning the bark and making it smooth and fresh. If we strengthen the bark we will have a healthy tree, and will get a larger percentage of first-class fruit. I have noticed also that the smoother we keep the bark the less we are bothered with insects. The rougher the bark the more hiding places for the insects, and the grower cannot get at them so easily; therefore use the lime-sulphur mixture. It will pay for all trouble and expense.

"The mixture should be boiled thoroughly. It will work better in the spray pump and spread more evenly on the trees. Some growers in this locality have used caustic soda. But I do not think that it gives as good results as when the mixture is boiled. The more soluble you get the two ingredients mixed the better it will spread on the trees and work in the sprayer. It should be boiled for one hour and a half."

Regarding the question of treating the San Jose scale, Mr. Robert Thompson, of St. Catharines, Ont., wrote:

"First, get rid of all useless and unprofitable trees and varieties, then

Each Number the Best

The improvement in *THE HORTICULTURIST* within a year is marked, and each number as issued appears to be better than the preceding ones. This improvement is acknowledged by everyone here qualified to express an opinion on it. The column of questions and answers, the experience column, is a valuable one, and will, I hope, increase in length and interest from month to month.
—J. Cavers, Sec'y Oakville Hort'l Society, Oakville, Ont.

into the spray tank, and is then used on the trees.

"The foregoing description applies when a hand pump is used. My boiler will cook enough at one time to fill my power spray tank, which holds 160 gallons, imperial measure.

"I have tried caustic soda, kerosene emulsion and various patent or miscible oils, but none of these are as effective as the lime-sulphur wash when properly prepared and applied. I have not yet tried all the soluble oils. It would be a great boon to fruit growers if they could get a mixture that would be as effective as the lime-sulphur wash and easier to prepare and apply."

The following letter on the lime-sulphur wash was received from Mr. J. W. Smith, of Winona, Ont., the owner of one of the largest peach orchards in Canada, and a man who has had much experience with spray mixtures: "Use 17½ pounds sulphur, 35 pounds lime to

prune carefully and shorten-in the other trees. If the fight to control the scale forces us to grow low-headed orchards, to shorten-in all of our trees so that we will have a new growth of wood every season, and to keep our trees so that the fruit may be gathered from not higher than a six-foot ladder, it will not be an unmixed evil but possibly a blessing in disguise. Second, thoroughness in application of the remedy or spraying material. No matter what material is used or what variety of pump is handled, cover the tree and branches thoroughly. Do not accept statements of agents who tell you that their material will go farther as it spreads on the branches after being applied. They do this so as to induce you to purchase some of the more costly remedies. If these remedies are diluted too much or

scale. A better plan is to arrange for a number of growers to have an engine or boiler and cook by steam. Where this is not available, an agricultural boiler can be rigged up. Where the steam is used, the cooking can usually be done in about one hour. When the agricultural boiler is used it will take longer. When boiled with steam or agricultural boiler bring 12 to 14 gallons of water to the boil, then throw in 20 pounds of good lime and quickly add 18 pounds of finely pulverized sulphur. Stir occasionally. Dilute by adding enough water to make 45 to 50 gals.

“Commence spraying early in the season. Spray the sides of the trees from the windward side, then watch until the wind blows from the other way, and do the other side; a good, stiff breeze is preferable. This helps to

and the careless grower will be driven from the business.”

ARSENITE OF LIME

A comparison between arsenite of lime and arsenate of lead as regards their value as insecticides for mixing with Bordeaux mixture is made by Mr. Jos. Tweddle, of Fruitland, Ont., in the following letter: “For fruits, arsenite of lime when carefully handled in the early summer gives almost as good results as arsenate of lead, and is much cheaper. White arsenic must be boiled with fresh lime as follows: Take one pound of arsenic, two pounds of fresh lime and one gallon of water, boil briskly for 45 minutes, then use one and one-half pounds of the mixture to one barrel of Bordeaux. Apple foliage is much less resistant to damage by this insecticide after July than before. My experience shows that three times the above-mentioned strength may be used in June without burning the foliage, and that one-half that strength will burn it in July and after. Inexperienced persons, however, should use the arsenate of lead, as it is safe to use full strength and is easy to prepare. Use three and one-half pounds per 50 gallons of Bordeaux mixture.”

ONE GROWER USES ORDINARY LYE

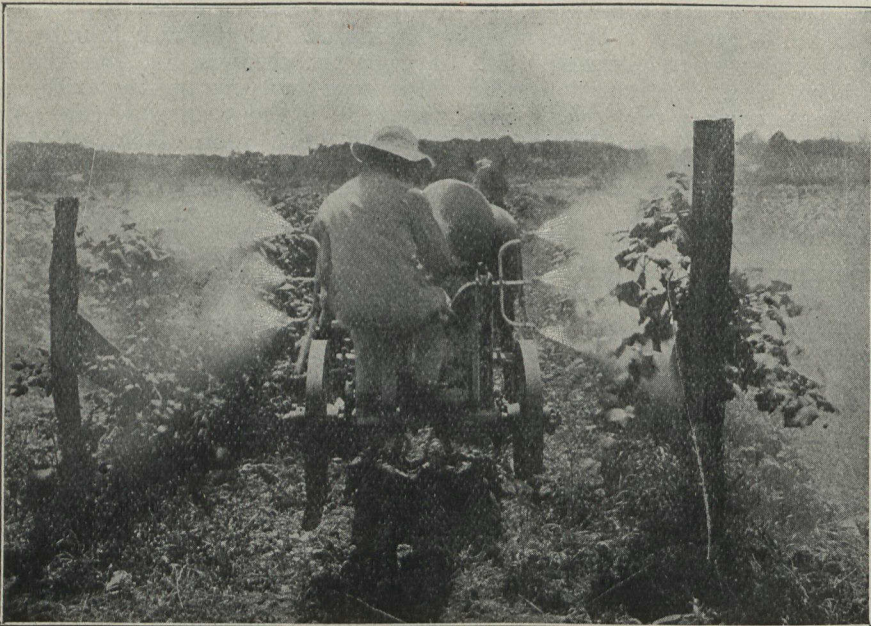
Spraying with old-fashioned lye, to clean the bark of trees and to destroy scale, is practised by Mr. E. Hipple, of Beamsville, Ont., who has faith in its effectiveness. The process of making the lye is, in the words of Mr. Hipple, as follows: “I take a barrel (two or more if required) and bore three holes in the bottom near the rim. The barrel is placed on a raised plank. The holes in the bottom are covered so that the ashes to be used will not clog. The barrel is then filled with ashes, firmly stamped in. On this is poured about 12 quarts of water a day until the lye commences to leach out, then three or four times this quantity of water is added. This is continued until the lye becomes weak. The lye so made is used for spraying diluted with an equal quantity of water.”

Hardy Late Cherries

What are the best hardy cherries as late as or later than Montmorency? Richmond is too early. Robins and cherry birds take them.—C. W. B., Prescott, Ont.

One of the best hardy cherries which comes in just after the Montmorency is the Ostheim. The English Morello is also later than the Montmorency but it is not as hardy as the Ostheim. Another very late kind is Brusseler Braun.—Answered by W. T. Macoun, Horticulturist, C.E.F., Ottawa.

No tree requires regular pruning so much as the peach. Low-headed peach trees are best.



An “Auto-Spray” at Work in a Vineyard

all of the twigs are not covered at the end of the season, you will invariably find the scale very prevalent.

“Many mixtures are being placed on the market. Every season some of these are discarded owing to failure, others stay with us a little longer, or may be used because of fancied ease in application. For the commercial orchard, nothing equals the lime-sulphur remedy properly boiled, because of its cheapness as compared with all the others, and because of the good work that it does, as it remains on the trees throughout the season; it can be seen on the trees now at date of writing 10 months after the application.

“The lime-sulphur wash can be prepared by boiling with the heat of the lime, but this is not safe to depend on as some of the barrels may not get sufficient cooking, owing to some defect in the lime, or something else may result, where this is applied, in not killing all the

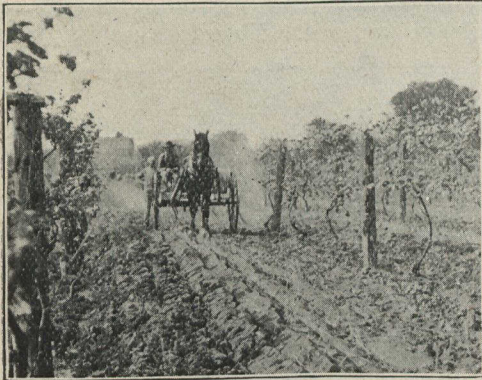
carry the spray to points on the opposite side of the tree and not only ensures better and more thorough work, but also obviates the disagreeable features of the mixture falling back on the clothes and person when spraying is done in calm weather.

“For the encouragement of new beginners, I may say that those who have sprayed three and four years with the lime-sulphur mixture are nearly all planting out larger acreages. They feel convinced from past experience that the scale can be kept in check and the trees healthy. This is a strong point in favor of lime-sulphur. The wash prevents leaf curl in the peach, is a good fungicide and can be used on apples instead of copper sulphate before buds open. Trees sprayed with it show darker and glossier foliage during the summer and the bark is made clean. The grower who takes care of his orchards now will be well repaid for years to come,

Notes on Spraying Mixtures

Prof. W. Lochhead, Macdonald College, St. Anne de Bellevue, Quebec.

THE value of spraying in orchard practice is seldom questioned nowadays in spite of occasional unfavorable results. It must be acknowledged that while we have learned much about the use of insecticides and fungi-



Spraying in Niagara District

injury. Recently also it has been observed that strong, healthy shade trees are injured when sprayed too copiously with kerosene emulsion solution. It is now known that kerosene or crude petroleum falling on the ground during the spraying operations is retained for several years in the soil, gradually finds its way to the tender rootlets, and kills them. It is very probable, therefore, that the continued applications of crude petroleum year after year to apple and pear trees will result in injury, and orchardists should guard against this by giving up the use of this dangerous substance.

More information also is given us every year regarding the lime-sulphur mixture. Recent reliable experiments carried out for several years both in the orchard and in the chemical lab-

oratory tell us that vigorous cooking need not be continued longer than 40 minutes to get all the sulphur into the solution; and that the presence of more than five per cent. of magnesia in the lime causes a considerable loss of sulphur. In view of the fact that much of the lime made in Ontario contains considerable magnesia, more attention should be given to the purchase of good stone lime, free as possible from magnesia.

Some experiments were also made as to the effect of dipping dormant fruit trees before planting. Apple trees were not injured; but peach trees were frequently injured. These results may have some bearing on the present agitation among some nurserymen to have nursery stock dipped instead of fumigated.

The Oyster-shell Scale

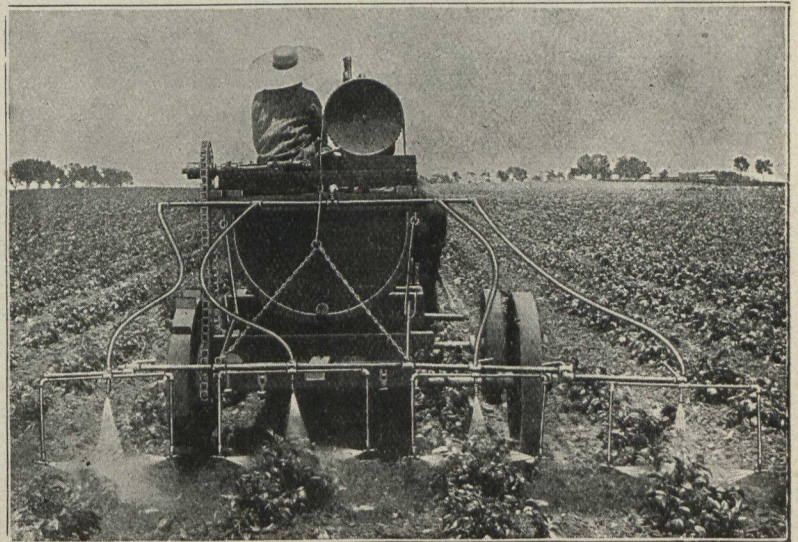
Prof. W. Lochhead, Macdonald College

THE Oyster-shell Scale, often also called the Oyster-shell Bark-louse, is the most abundant and widespread insect of the apple orchards of eastern Canada.

It is everywhere in evidence, from the far-famed Annapolis Valley in Nova Scotia to the Great Lakes. Its diminutive size and its grey, bark-like color seem to suggest that there is "nothin' a-doin'" where it exists; but there is no enemy of the apple tree more insidious and that requires more attention than this little oyster-shaped scale. I have seen many

large apple trees rendered practically worthless and almost lifeless by these insects. Allowed to breed without hindrance for a few years, the scales had practically encrusted the bark of these trees, and had sucked and used the sap that should have contributed to the growth of the new parts, the new wood and the new buds. The trees became "barkbound," and were unable to expand. I saw the same trees a year later, after they had been scraped and sprayed carefully during the late winter with whale oil soap solution,

(two pounds to six gallons of hot water). Great rifts had formed in the bark, rendered soft by the soap solution, and in the rifts new cork was forming. The



A Wallace Sprayer at Work in Field of Potatoes

cides, much remains to be known. The occasional lapses must somehow be examined and explained. Fruit growers sometimes show a little impatience (naturally perhaps) while waiting for accurate information from those whose duties are to secure by careful experiments that accurate information. They sometimes take as *proven* the statements of some "glib" speaker, who, while pretending to be a self-sacrificing hero, is perhaps serving his own ends in advocating some new insect or fungus destroyer. Experiment shows that it is always hazardous to apply on a large scale any remedy which has not been endorsed by the authorities, and its limitations noted. For example, soda Bordeaux, or the "Burgundy mixture," was announced two or three years ago as a better mixture than the Bordeaux mixture. Many fruit growers began using it on a large scale, and they added Paris green. The results were of course disastrous for the reason that the soda unites with the Paris green to form an injurious soluble arsenic compound; on the other hand, the lime of the Bordeaux forms a harmless insoluble arsenic compound. Moreover, recent experiments go to show that common Bordeaux gives on the whole better results than soda Bordeaux, and is therefore to be preferred by the fruit grower.

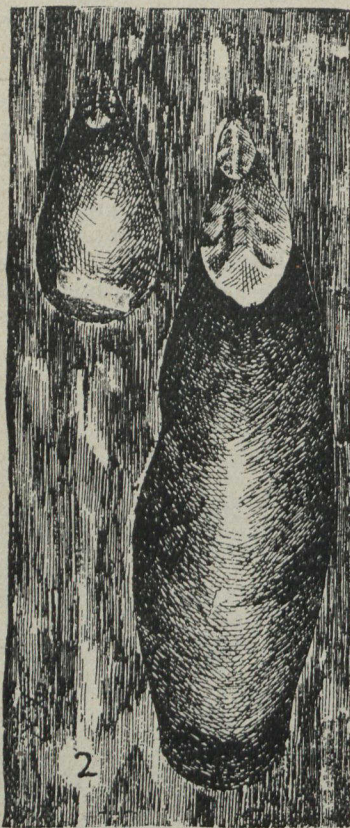
Again, crude petroleum was heralded as a very efficient destroyer of the San Jose scale, for good results were obtained when applied to apple and pear trees. But it was soon discovered that peach and plum trees were often killed by an application of crude petroleum, and even apple and pear trees after a few applications showed symptoms of

diameter of the stem had increased at least an inch; the oyster shell scales were gone; and the trees were enjoying a vigorous renewal of life.

Where trees are not suffering to the extent just described, the best treatment to get rid of the oyster shell scales is to give two applications of whitewash during the winter. The whitewash is made by slacking about 60 pounds of good fresh lime in 40 gallons of water. Such a wash can be sprayed readily if it is strained before it is poured into the spray pump barrel. The two spray-

ings should be made either in December and February or in January and March. Under the action of the weather, the flakes of lime will peel off, bringing the scales with them.

In San Jose scale-infected districts, where the lime-sulphur application is



The Oyster-shell Scale

This cut illustrates a male scale (upper right corner) and a female scale—both greatly enlarged. The various molts in the development of the scale are shown. Cut loaned by the Department of Agriculture, Toronto.

used, there is no need of using the lime-wash. The former treatment is quite effective.

The oyster-shell scale is single brooded. It passes the winter in the egg state beneath the scale. If a scale be turned over carefully with a pen knife, from 40 to 60 minute, cream-colored eggs will be found with the aid of a magnifying glass. The eggs hatch about the first of June, and yellowish, crawling lice make their appearance. These may be seen crawling about the limbs for a few days; but they soon settle on the bark, insert their tiny sucking beaks into the tissues, and begin feeding and making a scale to cover themselves. They grow slowly; but in late September and early October they become fully grown, when the females lay their eggs.

Kerosene emulsion solution, or some good soap solution, (consult O.A.C. Bulletin 144, pages 30 and 36, for preparation of kerosene emulsions or soap solution) is effective if applied when the lice have just hatched from the eggs in early June and are moving about in the limbs;

but most orchardists prefer the winter treatment with lime wash.

It is likely that these insects are carried on the feet of birds from tree to tree, and from orchard to orchard. It should also be borne in mind that the lilac, raspberry, rose, currant, spiraea, cherry, pear, plum, hawthorn, ash, maple, birch, poplar and other plants may harbor this insect, and from these it may spread to the apple.

In any plan of treatment of an infested apple orchard, therefore, it is advisable to take into account the probable infestation of shrubs in the immediate vicinity. On the other hand, there is comfort in the thought that the orchardist in his fight against this scale has three or four able insect assistants; namely, minute parasites, which usually destroy a large percentage, but not all, of the eggs that are lying under the scale. We cannot, however, leave the work of extermination entirely to the parasites; we must do our share of the work if we desire thrifty trees.

Ten Pointers on Pruning

Prof. F. A. Waugh, Amherst, Mass.

Pruning has various objects and is practised on many diverse sorts of plants; therefore, the same rules cannot apply in all cases.

Pruning during the dormant season tends to promote wood growth rather than fruit bearing.

Pruning during the growing season—March, June and July—tends to check wood growth and to promote fruitfulness. The vegetative and the reproductive functions, within certain limits, are reciprocal.

Root pruning (which is seldom practised) tends very strongly to promote fruit bearing and conversely to check wood growth.

Pruning may be done during any month of the year, but March and June



Apple Tree Before Pruning

are the best months. It would probably be a distinct improvement in most orchards in the province of Que-

bec if the principal pruning should be given in June instead of March.

Pruning should be methodical and regular. A certain amount of work should be done each year instead of once in five years. This rule is very important.

The objects of pruning are (a) to repair injuries, (b) to correct faulty growth, (c) to influence the bearing habit of the tree. Pruning is not an object in itself. Therefore unless there



Same Tree After Pruning

is some clear reason for it, do not prune.

Each shoot or branch removed should be cut off smoothly and as close to the parent branch as possible. Large wounds should be painted with white lead.

The best implements for pruning are pruning shears. A sharp saw will sometimes be needed, but not often, except on trees which have been neglected. An axe should never be used.

Pruning will not give satisfactory results by itself. It must be accompanied by good spraying, good feeding and good management in other respects.

Repairing Girdled Trees

Orchard trees are often girdled in winter by mice and rabbits. When the part girdled is small, cover with grafting wax before the exposed wood dries out. This usually will save the tree.

In cases where the girdle is entire and the cambium or green layer beneath the bark completely severed, the latter will have to be connected by bridge-grafting. Cut a number of scions, long enough to bridge the girdled space and bevel the ends. Insert them around the tree spanning the injury, with the cut ends in contact with the cambium above and below. Cover with wax all cut surfaces that are exposed. Badly girdled trees usually die. It is well, therefore, to use judgment before attempting a remedy.

Head back the peach trees each year.

Hardy Fruits for the North

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

FRUIT culture is gradually extending northward in Canada; and, while the culture of some kinds of fruit may not keep pace with the settlement of the country, there is no doubt that in due time hardier kinds will be originated, from those already being grown near their northern limit, which can be grown much further north. Some of the kinds already known would succeed further north if proper care were taken of them. If a tree ripens its wood thoroughly, it will stand very low temperatures; hence, in the north, everything possible should be done to bring this about. Low ground should be avoided, as where there is so much moisture the growth is likely to be later. Rich soil should be avoided as, if the soil is rich, the trees will make strong growth and not ripen so well. High ground, providing there is protection from wind, should be chosen, as there is less danger of spring frost there than in the hollows, and spring frosts do much damage to fruit buds or blossoms in the spring in the north. This high ground will not be so rich nor as moist as the low lying land, hence growth will not continue late. Northern exposures should be chosen for most fruits in the north, to avoid, as far as possible, the bad effects from trees starting to grow early and then being injured by frost. Trees on a northern exposure are not so liable to sunscald, which occurs in late winter and early spring when the sun thaws out the sap on the south side of the trees, and a severe frost coming at night and freezing it again organizes the tissue and causes the bark on the south and south-east side of the trees to die. As the hard maple gets near its northern limit, it is only found on or near tops of hills; as, like fruit trees, it gets there conditions as near as possible like those further south. Good natural drainage of the soil is much more necessary in the north than in the south; if possible, a soil with a gravelly subsoil should be obtained.

APPLES

There are a few varieties of apples, mostly of Russian origin, which can be grown successfully in the north, if given as near as possible the conditions just outlined. These are, in order of ripening, Blushed Calville, Lowland Raspberry, Charlamoff, Duchess, Anis, Okabena, Antonovka, Patten Greening, Hibernial. In addition to these there are the Whitney, Martha, Transcendent, and Hyslop crabs, which will grow where the climate is very cold, providing they get conditions that will cause an early ripening of the wood. The hybrids originated by Dr. Wm. Saund-

ers are very hardy and, where no apples can be grown, will be found quite useful.

PLUMS

Only the earliest plums are useful in the north, as frost comes in the autumn before the later kinds are ripened. These early plums are mostly improved varieties of the native species. They are Odegard, Aitkin, Bixby, Mankato and Cheney. The earliest and best varieties of the wild plums found growing wild should be cultivated.

PEARS AND CHERRIES

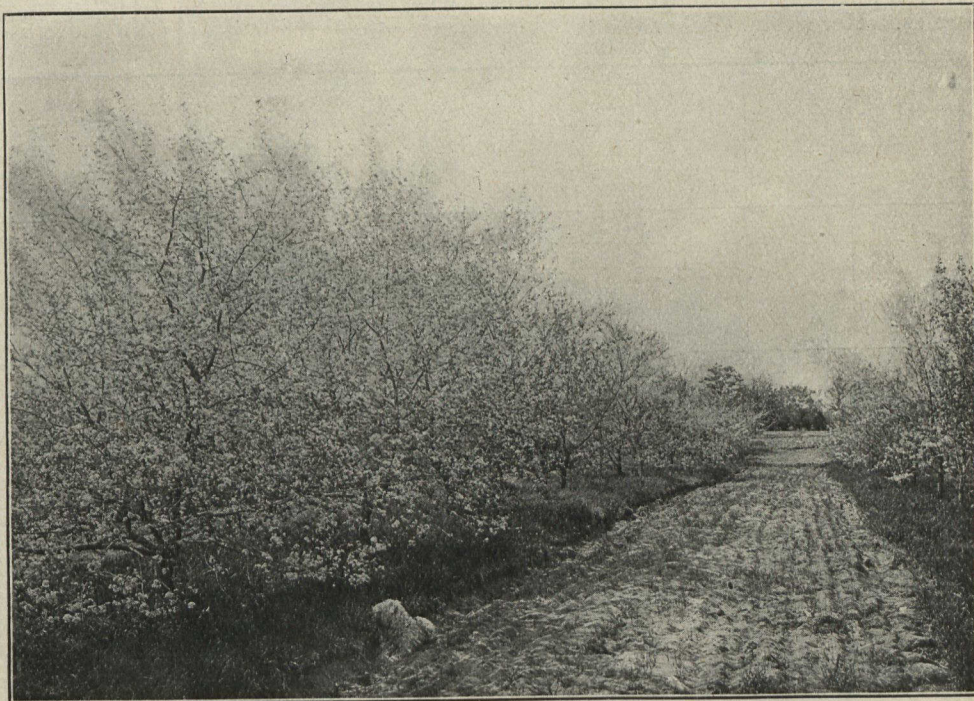
Pears and cherries are not a success in the north, and it is a waste of money

depth of snow. Some of the hardiest varieties are Herbert, Loudon, Clarke and Marlboro, the first being the best of these. A good plan in the north is to bend the canes down in the autumn and cover the tips with soil to hold them there; the canes will then be sooner covered with snow. Black Cap raspberries are not satisfactory.

GOOSEBERRIES

Gooseberries succeed well in the north, the best varieties being Downing and Pearl. The Houghton, though smaller than either of these two, is apparently even hardier. Red Jacket is the best red variety for the north.

Strawberries will do well in many



American Plum Trees at Central Experimental Farm, Ottawa

The photograph was taken by Mr. Frank T. Shutt when the trees were in bloom last year. It shows the type of plum trees that can be grown in the north.

to try them. The Sand Cherry and the Compass Cherry, which are really more plum than cherry, are very useful in the north, the latter especially, where it has been tried.

CURRANTS

The wild species from which the cultivated black and white currants are derived, are natives of the north; hence, currants are among the hardiest fruits and are of great value in the north. Some of the best sorts are: black, Saunders, Collin's Prolific, Black Victoria; red, Victoria, Pomona, Red Cross, Wilder, Cherry, the two last being apparently not quite so hardy in fruit bud as the others; white, the White Grape is one of the best.

Red raspberries succeed well in the north, especially where there is good

places. They need protection in winter, the best being a good covering of snow; but where a good covering of snow is not very certain, a covering of marsh hay will be found very good. Strawberries often suffer from spring frosts in the north, and for this reason a site should be chosen where the snow will lie longest. The varieties which have suffered least are Beder Wood, Warfield, Lovett, Sample, Williams, Buster and Crescent; hence, these should be among the best to plant.

The grape vine is one of the easiest of all fruit-bearing plants to control when pruned systematically and regularly.

Thin out the fine growth twigs on outside of Spy trees.

Future of Apple in Ontario

A. McNeill, Chief, Fruit Division, Ottawa

(Concluded from last issue)

I HAVE referred to the height of land running through the central portion of Ontario, beginning at Queenston and constituting the bluff from Queenston to Hamilton. This height of land, continuing, as it does, north to the Georgian Bay, slopes much more rapidly towards the east than it does towards the west as it approaches the Georgian Bay, and it begins near Collingwood to once more take the high cliff form similar to that between Queenston and Hamilton. It is upon the eastern slope of this height of land, near the Georgian Bay, that we find some of the finest orchards in the world. It is a happy blending of soil, situation and climate that makes it an ideal country in which to grow winter apples. Here new orchards are being

paying one for the farmer. The drawback is that he has to wait 10 years for his dividends, and in this glorious age, when fortunes are being exchanged every few hours, 10 years looks to be such a hopelessly long period that even the patient farmer sometimes dismisses the scheme in disgust.

The counties north of Lake Ontario, styled district No. 3, owe their high reputation as an apple region, partly to the climate, partly to the geological formation, and partly to the shrewdness of the orchardists in learning lessons from the experience of the older orchardists in the west. Geologically, the best apple orchards in this district are in what is known as the Iroquois Basin, extending to the high land at varying

winter fruit in district No. 2 and 3. They are, consequently, 25 cents a barrel, at least, ahead of winter varieties grown anywhere else to the south. The business, therefore, of growing apples might possibly, though it is exceedingly improbable, become unprofitable in New York state, while the growers in districts 2 and 3 could continue with a margin of 25 cents a barrel, at least.

District No. 4 contains probably much less than 1,000,000 apple trees, many of these of unsuitable varieties. The area covered is extremely large, so that, with the exception of a few small sections in this district, it cannot be regarded seriously in the light of a business. Nevertheless, there is no part of Canada where a larger return might be made than in this district. They grow to perfection here the Fameuse, the McIntosh Red and the Wealthy. In addition to these the Alexander and the Wolf River can be grown quite profitably; they are much better apples and better keepers than when grown further south. Nevertheless, they are not of extraordinary quality. The Fameuse and the McIntosh Red stand at the head as dessert apples. If the excellence of these apples as a dessert fruit were recognized, and if the growers would pack in boxes after the style of the Pacific slope fruit, the business would be extremely profitable. There is a splendid opening for any packers who will take up the packing of these apples in this district, and cater to the very high class of customers—those who are willing and able to pay a large price for a most excellent article.

SUMMARY

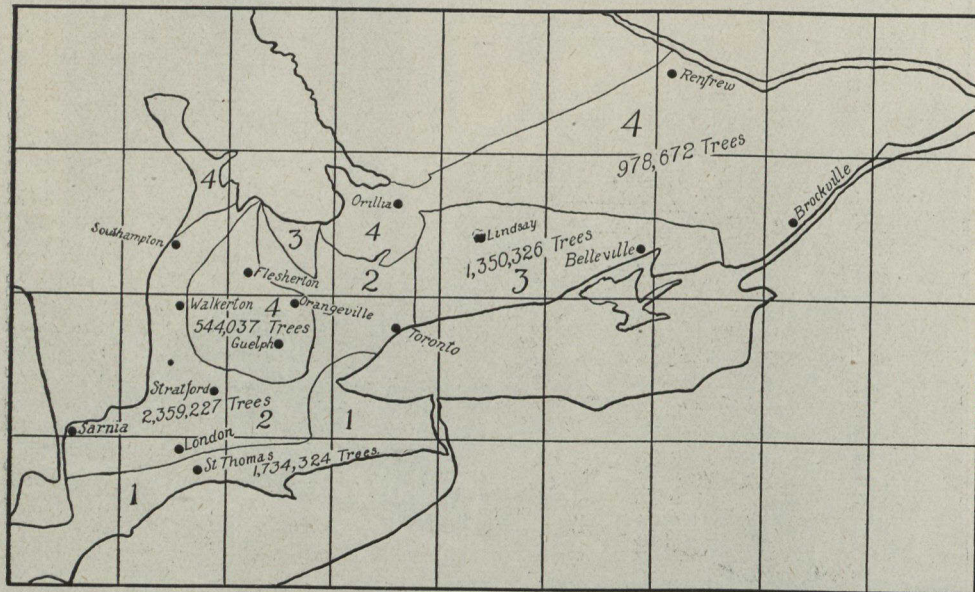
To sum up the situation generally, I should recommend that district 1, or the counties along Lake Erie, should devote themselves very largely to early fruit.

The pressing need in district No. 2, or the counties along Lake Huron, is better organization for harvesting and selling. Cooperative associations are an absolute necessity in this district of small orchards, with many varieties.

What has been said with reference to the Ottawa and St. Lawrence valleys is equally applicable to many parts of the central high counties of South Grey, Wellington, Waterloo and Perth.

The Georgian Bay and Lake Ontario counties, district No. 3, will undoubtedly devote themselves to the winter varieties, and we can look for a large increase in the acreage of orchards on these lines.

I have less hope that many new orchards will be planted in district No. 4. Nevertheless, if cooperative associations were formed, that would induce a somewhat better culture, and introduce box packing, fruit growing would become one of the leading industries.



Province of Ontario Divided into Four Districts for Apple Culture

planted very rapidly, and as a general thing the bearing orchards are composed of comparatively few varieties. The fruit growers of this district had learned the lesson taught by the experience of the older orchardists in southern Ontario and gave their orders so as to have, say, three, four or a half-dozen varieties in their whole plantation. They also had sufficient confidence to plant in large blocks of 10, 20 or 30 acres, and are now reaping the reward of their forethought.

It is not an uncommon thing at all in this district to find large orchards that are paying dividends on a capitalization of \$500 to \$800 an acre. When you consider that the land without trees is valued at from 50 to 75 dollars an acre, and that the cost of putting in an orchard and caring for it until it comes into bearing is probably not more than a hundred dollars per acre, it can readily be seen that the whole operation is a

distances from the present shore of Lake Ontario. This land is extremely fertile and has the climatic advantages of the lower situation protected by the high ground to the north. Many very excellent orchards, however, are grown on the high land just beyond this basin till it merges into district 4, where only the hardiest trees will grow.

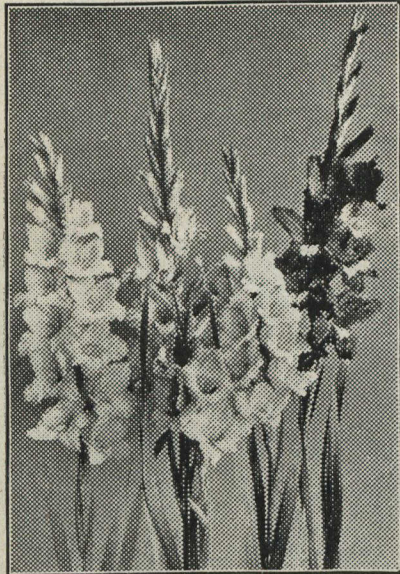
Large orchards are the rule in district 3. The varieties have been well selected to meet the requirements of a winter trade. Orchardng is a specialty with many growers, and the enterprise is considered extremely profitable. This district is well adapted to the usual methods of the apple operators. Owing to the larger orchards, and the fewer varieties, the cost of picking and packing is much smaller than in district No. 2. The recommendation here is, of course, to continue along similar lines, planting the hardy winter varieties.

Cold storage is quite unnecessary for

Results in Growing Gladioli*

H. H. Groff, Simcoe, Ontario

PERSISTENT and continuous activity, with the use of the best material obtainable from all outside sources is the price of the success that I am able to claim in the interest of civilization and horticultural science.



Some Types

For an unknown man in an obscure town, in a country of slandered climate, to bring a semi-tropical plant to Canada, as the foundation for a strain of worldwide recognition, seemed the height of folly and a deliberate courting of failure and loss; and it did not take me long to discover that to secure more than partial success meant a severe and persistent fight.

I found the conditions of soil and climate admirable, and the absence of long-continued periods of atmospheric humidity most congenial to the work of successful crossing. Although the season for maturing late crosses is unfavorable, I overcame this difficulty in securing the admixture of mid-season and late-flowering types by cutting the immature seed spikes on the first threatened frost, and maturing in water a month later—a process requiring much time and trouble—but as pollen from young, early flowering types (which bloom till frost) was used, I soon had the valued characteristics of the later flowering sections available for normal use at a more favorable season, a victory over adverse conditions of incalculable value.

Again, I found that our clear, dry atmosphere, so favorable to success in crossing, also frequently wilted the flowers—an effect not only making rapid work impossible, but most prejudicial

to the “taking” of crosses so made.

This difficulty I overcame by daily carrying the pollen over until the following dawn, when I found that the work could not only be accomplished in far less time, but that the percentage of successful crosses was most materially increased. The two foregoing original practices are the result of a struggle for control and, as I have never heard of them being advised, I may include them in this record of results.

When I began this work over 15 years ago, although Europe had been engaged on it for 100 years, the ground was only broken—varieties lacked vitality, reproductive powers and adaptability to changed conditions. My first work covered a complete series of violent out-crosses in which every section was made use of to bring the desirable features possessed by each under control for transmission in cross-breeding. From the foundation work of those first years, by the aid of selected types as sires, according to the practice of animal breeders, has this control been handed down with continuous yearly progression until the past season.

In America, the flower was discredited, and the demand so influenced by its lack of quality, value and beauty, that growers thought of allowing large blocks to freeze in the fields with the view of stiffening the market; certainly not a very progressive idea. The advent of my new hybrids changed all this, and the exhibits made at the Pan-American Exposition where they were awarded a

gold medal, and at the St. Louis World's Fair, where they secured the grand prize, not only re-popularized the flower, but exercised a favorable reflex influence on existing low-grade stocks. Thus, no existing acreage has been displaced, but the values have been improved, with over 100 acres of the highest quality in the world added to this country, of such excellence as to enforce commercial recognition throughout the civilized world. Surely this may be included in



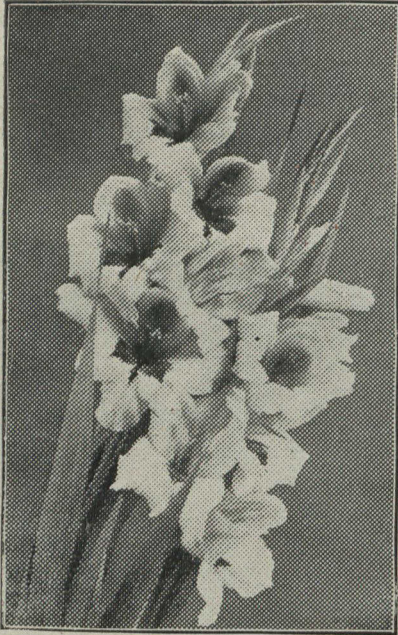
A Field of Bloom

the record of results in growing gladioli.

My practice has proven that not only can the scientific worker do all that he may sanely plan to do, but he will find that from year to year mutations will appear beyond the range of the area of his expectations, of such progressive value, that he will be led onward by an ever lengthening and broadening horizon—beyond the conception of the human mind. The past season afforded an in-

*Extracts from an address presented to the American Breeders' Association at Columbus, Ohio, January 18, 1907.

creased number of proofs as to the correctness of the system of breeding advocated by me. I repeatedly collected in the field new varieties of special merit, supposing them to be the same, until compared in detail, when the transmitted parental characteristics of each collection was distinctly traceable, but with sufficient variation as to make each variety valuable, each bearing distinctive qualities of value under the diverse cultural conditions to which they inevitably must be subjected.



Specimen Spikes

It is not easy for me to illustrate by comparative description the highest points of results claimed by me. If all were gladiolus experts, it would be much easier to secure appreciation. One effective illustration will assist however.

During the earlier years of my experience in securing commercial efficiency, the invariable cry was, "Send no red shades." In 1905, Mr. Cowee was offered \$5 for a single corm, and I was offered \$10 for one of the same variety, a brilliant red, both offers being from amateurs of moderate means, and I may say that no such offer was ever made to me for a variety of any other color. A single spike of six flowers measures one foot wide by two in length, and is so effective as to centre attraction in a field of thousands of other varieties. This variety is being rapidly multiplied for early introduction, but you will be interested in learning that I have types of later origin that will supersede it in due time. You will of course, expect this additional result.

The commercial demand for high-class lights has now been filled by the thousands of new varieties originated by me during the first 10 years of my work. Selections bred from this material have given me thousands of newer and more advanced types which have been

crossed and multiplied during the past five years for future introduction, and will constitute as marked and distinct an advance as did those shown at the expositions referred to. The value of some of these is beyond estimate.

The present commercial yellow is deficient in color, quality and multiplying qualities. This need will shortly be filled by thousands of new varieties developed by me under the same practice that produced the new light section, all varieties of equal and greater quality than the few novelties issuing from European sources under name.

All other desirable colors are receiving the same attention and improvement by the same system of selected breeding.

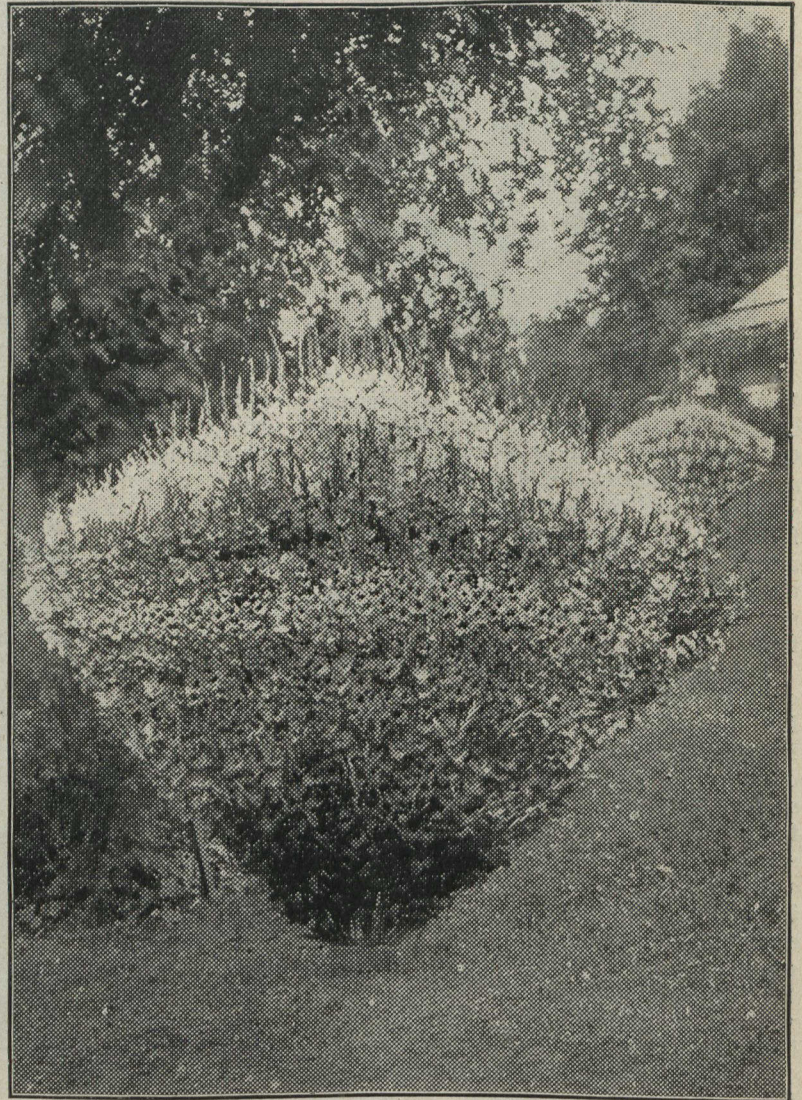
Among all of these are remarkable types of promise beyond my expectations, individual varieties of such special qualities as to be beyond description, for want of adequate comparison.

I have referred to our geographic advantages, but these are by no means sufficient for my personal realization of the best commercial results. Although my season is nearly a month longer than even the northern part of our peninsula, it is fully a month too short for the full maturing of the corms of many valuable and useful varieties developed from late maturing material. The variety named

"America," erroneously classified as Childsi by the purchaser and introducer under that name, has been grown and sold by me in collections for the past 10 years. Its annual cormel production is from 2,000 to 5,000 per cent., but with me a comparatively small percentage mature annually. Of course such experiences are to be expected in work on a semi-tropical plant,

and afford proof of my public contention on this point, many years ago, before this experience proved the correctness of my then expressed theory. While I have knowledge of many similar experiences, the naming of this one of my hybrids, "America," has made that variety useful as an illustration of a scientific fact.

As I have referred to the fact of scientific results I beg to record: That crossing from varieties tending to double has induced the production of twin corms from single seeds; that bud variation, partial the first season and complete the second, has produced a fixed new type, sporting from one apparent equal fixity; that atavism of æsthetic and commer-



Floral Fan of Gladioli

cial value results from the intercrossing of advanced types of diverse parental extraction, the flower form of the iris, a plant of the same natural order, having been brought from the ages long past and replacing the normal form of that of the original species; that racial qualities are as potent and capable of direction in breeding for specific results in plant, as in animal life; that no

simple or limited crossing can produce the value, quality and satisfaction equal to those resulting from unlimited removals from the wild species on the lines of scientific selection, guided by learned human intelligence; that the attainment of the highest success in results is easily secured by cultivation of the perception, some learning, an open mind, use of the best material and unlimited work.

A Currant Hedge

Albert D. Verrault, Village des Aulnais, Que.

The currant hedge illustrated by the accompanying cut was planted several years ago in a single row, the plants being set 18 inches apart. At the time of the first pruning, which was five years ago, the bushes measured from three to four feet high, but were disgraceful in appearance. The branches straggled in all directions and occupied a large space. It was decided to trim the row as a hedge. About one-third of the growth was removed in May when the leaves were out and the operation was repeated early in July.

Since then, they have been pruned at the same height and width each year. They are pruned back to the old wood, as white and red currants bear on wood that is at least two years old. When pruned thus, the fruit is formed and becomes visible on the top and sides of the hedge.

Currant bushes trained in this manner retain their fruits until killed by the frost. The fruits are not picked for consumption, but such may be done should the planter desire. The White Grape and Fay's Prolific planted in two rows, five inches apart, and one foot between the plants in the row, make a fine hedge.

A Durable Whitewash

Will you kindly give directions for making a whitewash that will not rub or wash off?—H. R., Georgetown, P.E.I.]

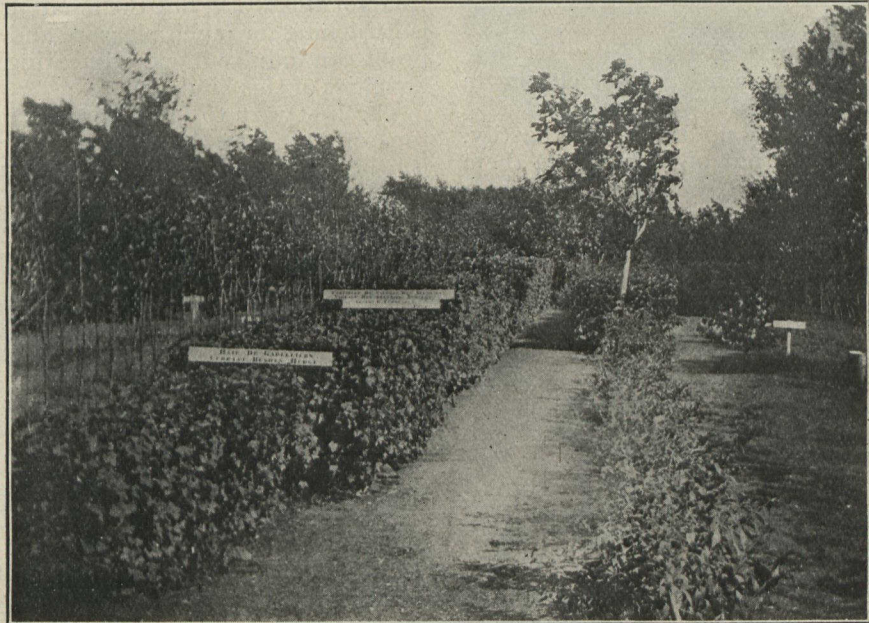
The following formula is said to furnish a whitewash of this character: Dissolve two pounds of ordinary glue in seven pints of water; when dissolved, add six ounces bichromate of potassium dissolved in pint of hot water. Stir mixture well, then add sufficient whiting to make of usual consistency, and apply in ordinary manner as quickly as possible. This dries in a very short time, and by the action of light is converted into a perfectly insoluble waterproof substance, which does not wash off even with hot water, and, at the same time, does not give rise to mold growth, as whitewash made up with size often does. It may be colored to any desired shade by the use of a trace of any aniline dye or powdered coloring matter and, once applied, will last for years, while by the addition of a small proportion of calcic sulphite, its antiseptic power is much increased.

Timely Topics for Amateur Gardeners

IF you have not ordered your seeds, trees, plants, tools, fertilizers and spraying supplies, do so now, so as to avoid the spring rush and get better goods for the same money. There are various important reasons why it is to the advantage of the purchaser to order now, rather than later in the season. You have more time to plan a better garden and to make the selections that you desire. You run no danger of substitution on the part of the seedsman and nurseryman. When planting time comes, you will have a better chance to see that the right things are planted in the right way and at the right time. You will get your trees and plants as soon as it is safe to ship them. The best gardens are those that have been planned beforehand. Amateurs with

are somewhat liable to disease. A clump of lily of the valley should be included in the plan for next spring's garden. Plant them wherever they will not be disturbed and in a position that is shaded.

Some of the best low-growing flowering shrubs should be planted in the mixed border if there is room for them. Among the best of these are *Weigela rosea* and *W. alba*, *Kerria Japonica*, *Deutzia gracilis*, *D. parviflora*, *Spiraea bumalda*, the double flowering *Spiraea prunifolia*, and the herbaceous hibiscus. In a border of large dimensions some of the larger-growing deutzias, forsythias, lilacs and spiræas may be used. Unless the border is large, however, these are better placed in clumps or as individual specimens on the lawn. A rose bush or



The Common Currant Makes an Excellent Hedge

sufficient foresight to order their supplies early, have gardens in which imagination has been used. They have the newest and earliest vegetables and fruits of summer and some that will last all winter.

In the February number of THE CANADIAN HORTICULTURIST, a list was given of standard varieties of herbaceous perennials and a short list of annuals. No mixed border, however, would be complete without a few hardy garden lilies. One of the best of these is the grand old tiger lily, *Lilium tigrinum*, at one time so common, but now seldom seen in our gardens. *Lilium Candidum*, *L. superbum* and *L. Canadense* are also among the best kinds for flower gardens. The Japanese lilies such as *L. rubrum*, *L. speciosum* and others are not so hardy as those before mentioned but are grown with success by many amateurs. They require careful protection in winter and

two of the *Rosa rugosa* type should also be included.

THE WINDOW GARDEN

Plants in the window garden will require to be watered thoroughly at this season so that all the soil in the pot is moistened. Late in March is the best time to re-pot the hardiest kinds of window plants such as geraniums, cyperus, ferns, and plants required for summer decoration.

If plants get frozen keep them from the light and somewhat cool. Syringe them well and gradually bring them to the light and heat. Cut away all the black and frozen stems so as to force them to shoot out new growth.

Cineraria plants are subject to green fly or aphids, especially on the underside of the foliage. These insects are hard to combat on this plant. Tobacco water is a fairly good remedy. Start early in the season, and apply the solu-

tion regularly about once a week. When the plants are out of bloom, throw them on the rubbish pile as they are of no further use. Cinerarias are not generally successful as window plants; they are better suited to the greenhouse.

Pots of flowering bulbs such as narcissi, tulips and hyacinths should have a plentiful supply of water when in flower. When the flowers are faded, the soil should not be allowed to dry out. Stand the pots in a place where they can still have some light and only a little sunshine, and dry the soil gradually. When the foliage shows signs of decay give the plant less and less water until the foliage has become quite yellow. In spring, as soon as the ground is in proper condition, the bulbs may be planted outside in the border. Place a stake to mark the spot where they are planted. Do not disturb them when digging. If left undisturbed for a year or two, they will make a useful and permanent addition to the border. Bulbs forced into flower early in the season in pots, are of little or no use for pot culture in the second year.

Freesias should not be dried off hastily. After they are out of flower, give them water less frequently until the foliage is quite yellow, when water should be withheld altogether. Keep them dry in the pots until next season.

Cannas for planting outside at the end of May or early in June may be potted late in March or early in April.

Hydrangeas, oleanders and similar plants can be brought to the light and started into growth. Put them into larger tubs if necessary.

Old tuberous begonias can be started into growth now. If the tubers have been kept in the pots during the winter, shake out the old soil and re-pot in good, rich, loamy potting soil, mixed with a small quantity of sand. Use plenty of drainage, and water thoroughly after potting. Water then should be given sparingly until the plants have well started into growth.

Some flowering and foliage begonias, including Rex varieties, can be potted. Give good drainage, and water as advised for tuberous begonias. The soil, especially for the Rex variety, should have about one-quarter leaf soil added to that recommended for the tuberous variety. Among the best varieties for the window are *Begonia Thurston*, *B. Haageana* and *B. nivea*, *B. fuchsioïdes*, *B. rubra* and others.

Cuttings of fuchsias, geraniums and verbena will strike readily in sand if vigorous young growth can be secured. Begonia cuttings had better be left until late in April before attempting to strike them.

Seeds of nasturtium for window boxes may be sown. Do not sow thickly, as they do not transplant as easily as many other varieties. Place two or

three seeds in a three-inch pot. To secure early flowers of mignonette, sow 8 or 10 seeds in same sized pots as mentioned for nasturtiums. A few pots of petunias, verbenas, cosmos and lobelia also should be sown, as they require to be early to give good flowering results. Antirrhinum and scabiosa seeds may be sown in pots the end of the month.

AMONG THE FRUIT TREES

This is the best time of year for grafting fruit trees. If you have an apple tree that is not producing fruit that you desire, it can be grafted with scions of good varieties and they will bear in three years. Grafting is interesting work, and can be performed by an amateur who will give the necessary attention to details. Have you ever seen a fruit tree bearing a half-dozen varieties or more? If not, why not try the experiment for the fun of the thing? Professional orchardists cannot afford the time for this work, but the amateur who is gardening for much pleasure and little profit can indulge in experimenting with novelties of this kind.

The best way to graft scions into the tops of fruit trees is by means of what is called the "cleft graft." If the tree is large, it is advisable to top-work each year only a portion of the limbs so as not to be too severe. Cut the branches off squarely at a point where the diameter is about one inch, and make the cut clean, with no ragged edges. Split these in the centre and insert the scions, usually two, one on either side, so that the cambium, or green layer just below the bark, comes in contact with the cambium of the limb being grafted. The limb, or tree, being grafted is called the stock. The scion is a portion or twig of the variety that is being inserted upon this stock. Coat the wounds with grafting wax or waxed bandages so as to exclude the air and the spores of disease and to allow of rapid healing.

Do not forget to prune your fruit trees, bushes and grape vines before too late. Apple trees should be well thinned out so that the sun can gain access to the centre. Do not allow any limbs to rub or cross. Pear and plum trees should be shortened in at least about one-third of last season's growth. Cherry trees require very little pruning when once well established. Peach trees should be well pruned and headed back.

Grape vines require systematic pruning each year. The method to follow will depend upon the system of pruning given the vine during the first two or three years of its growth. One of the main points to observe is to keep the bearing wood as near the trunk as possible. Thin out well, leaving only about six or eight limbs to a vine, well placed, each limb with no more than six or seven buds.

Most varieties of currants and gooseberries produce fruit on wood that is at

least two years old. For this reason, it is advisable to practise a renewal system of pruning. Each year remove two or three of the oldest branches and allow a similar number of new ones to take their places. If these bushes have not been pruned, do so as soon as possible, as they burst into leaf very early in spring.

PRUNING SHRUBS

Most ornamental shrubs require very little pruning. If overgrown, they may be thinned out. If growing unshapely the growth should be corrected. The time to prune shrubs depends largely upon the season of blooming. Early flowering shrubs should be pruned only after they have bloomed, as they produce their flowers on twigs that were formed the previous season. Should they be pruned now these twigs would be removed and, as a result, few flowers would appear. Prune when dormant late flowering shrubs such as cornus, mock orange, some spiræas and honeysuckle, *Clematis Jackmanni* and so forth. *Hydrangea paniculata grandiflora* should be pruned in early spring to about six inches of the old wood.

IN THE VEGETABLE GARDEN

The material for a hotbed should be in course of preparation. If the manure is fresh from the stable throw it in a heap for a week or 10 days. Turn it over once during that time. A hotbed, even if small, is useful in the home garden. On another page is published directions for making and operating. The information given may be applied, with modifications, to the work of making a hotbed at home.

Do you want some early, home-grown rhubarb? If so, place a barrel or box, from which the top and bottom have been removed, over a clump of the earliest kind of rhubarb that you have in the garden. Cover the top of the barrel or box at night, and during cold days. This will give you rhubarb a week or more earlier than unprotected roots will. Force asparagus similarly.

THE OUTDOOR FLOWER GARDEN

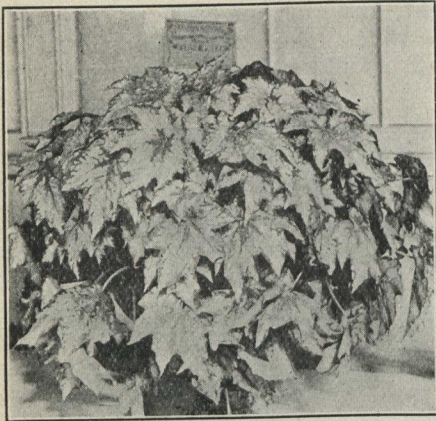
The trying time for plant life out of doors is spring. If you did not give your border plants a mulching last fall, there is still time to afford them some protection against the disastrous effects of alternate thawing and freezing. A few fine boughs or tree trimmings with a sprinkling of straw or long, strawy manure amongst them, will make an ideal spring protection. A heavy, close covering is neither desirable nor necessary. The covering should be over the plants before the snow has thawed away from them.

Bulbs should not be uncovered until danger of severe frosts is over. Remove the cover by degrees, as sudden exposure to light and air, and perhaps light frosts will likely injure the flowering heads.

Insect Pests in the Home Greenhouse

E. F. Collins, Toronto

GREEN and black aphids are the first insects that appear in the amateur's greenhouse. They make great headway unless checked in their infancy. A few tobacco stems laid on the benches or, better still, on the hot-water pipes if you have them, will keep



A Prize-Winning Rex Begonia

Grown in greenhouses of Sir H. M. Pellatt, Toronto.

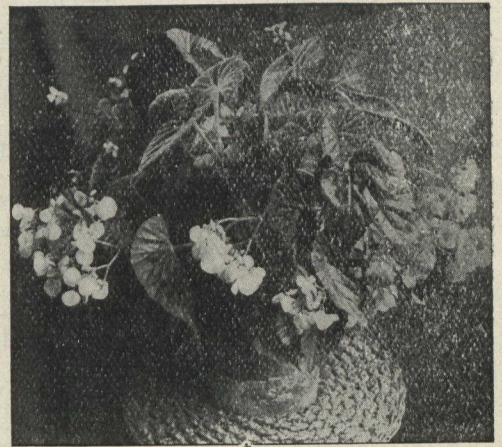
The well-known mealy bug must be watched for, and when seen picked or sponged off by hand. Any spraying mixture strong enough to kill it, will also destroy any plant. Constant watching and killing on their first appearance is the only remedy.

The last few years a little pest in the form of a white fly, a moth-shaped insect, has become a nuisance in many greenhouses where a mixed lot of plants are grown. No amount of spraying or fumigating will kill it. The writer has had some experience with it and finds that the only remedy to keep it in check is hydro-cyanic acid gas. Its use can only be learned by actual experience. Begin with a small quantity and note the effect, increasing each time until you find the flies dead, and the plants not injured. It is not so much the strength used as the length of time you allow the gas to remain in the greenhouse that does the harm. I have found that a fairly strong dose in the house ten minutes is more effective than a weaker one in all night. The following directions will serve for a small house, say, 12 feet long, eight feet wide and about seven feet high at the ridge, either a span or lean-to roof:

Close the house tight all but the door. Place an earthenware jar or basin in the centre of the floor, with a pint of water in it. Pour in the jar a quarter of a pint of sulphuric acid. Next, place one ounce of cyanide of potassium in a piece of tissue paper, and, when all is ready, drop it into the acid. Get out quickly and lock the house. Stuff

The Amateur's Greenhouse

If Easter lilies are pot-bound and in healthy condition, let them have 60 degrees of heat. This may be increased five degrees or so as the time goes by. They will stand considerable forcing



Begonia Velvetina

Grown by Mr. A. Alexander, Hamilton, Ont., and was in bloom three months.

these pests in check. Replace the stems with fresh ones about every three weeks.

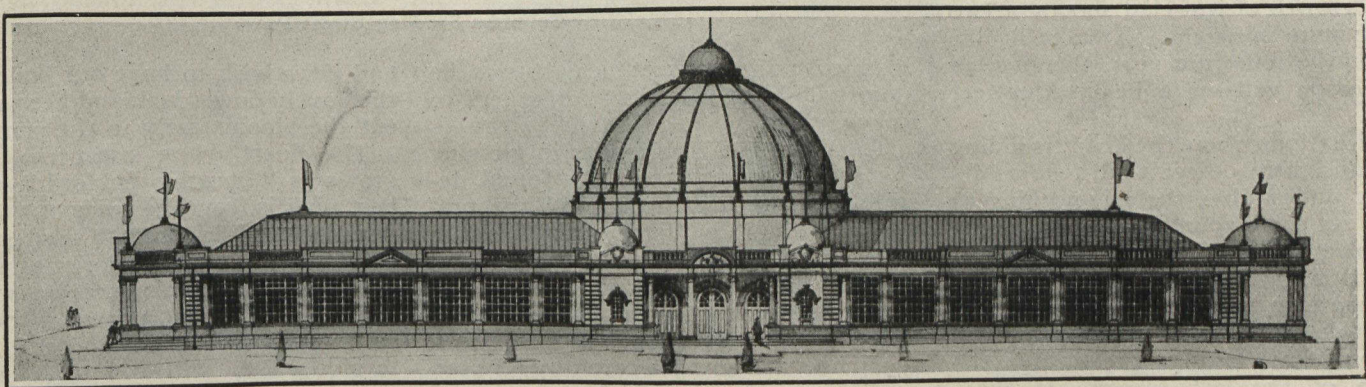
A first-class insecticide is Nicoteen. It may seem expensive at first, but it is the cheapest in the end. It can be used for syringing or spraying almost everything in the greenhouse without the danger of spoiling the plants. If diluted to about the color of tea, a teaspoonful in a gallon of water will be strong enough.

The red spider often becomes a pest during the winter months, if the house should become very dry during the night while hard firing. It can be killed

now. Be careful to fumigate and water carefully.

Geraniums should be pinched at the joint next to the one that produces a flower. Pinching at the same joint seldom results in good growth.

Putting plants into too large pots is a mistake often made by flower lovers when potting or re-potting plants in winter time. Re-pot plants at this season only when absolutely necessary. The spring is the best time. If potted now, use about an inch in depth of broken



Drawing of Proposed New Horticultural Building for Canadian National Exhibition

A cut illustrating the ground-floor plan of this building probably will be published in the next issue of THE CANADIAN HORTICULTURIST.

with the Nicoteen; or, in the case of foliage plants becoming infested, by constant spraying with cold water, especially on the under side of the leaves.

White and black thrips also can be got rid of by spraying with Nicoteen. When these pests appear on plants in flower, the Nicoteen can be sprayed on the hot pipes after the house is closed for the night.

paper around the crevices of the door. Let the gas remain about 15 minutes, then open the door. Allow it to remain open for about half an hour before you go in. By that time all danger will be over. Hydro-cyanic acid gas is poisonous and must be handled with care. These directions can be followed without danger to person and with effect in controlling the insect.

flower pots or cinders in the bottom of the pot for drainage. Good drainage often obviates and prevents damage from over-watering plants in winter.

A few gloxinia tubers should be started for midsummer blooming. Place them in a mixture of leaf mould and sand, and just a little well-rotted manure. Gloxinias like a rather warm temperature when growing, and a temperature of 60

degrees at night. Be careful not to have the leaves wet over night.

Varieties of Rex begonias may be propagated from mature leaves; or the thick, fleshy stems, or rhizomes, can be cut into lengths of about two inches and struck in sand.

Sow a packet of *Primula obconica grandiflora* seed, and grow the plants in the house all summer. They are easy to grow and one of the best of the primula family.

Centaurea gymnocarpa will be found a useful plant for window boxes, lawn vases and in beds when a plant of light foliage is desirable to bring out contrasts. Seeds of these should be started now. Double petunia, verbena, lobelia, and other seeds that are slow in germinating may be sown. A few seeds of *Cobea scandens*, a quick-growing climber, also should be started. Much time is saved and the plants cover a trellis more rapidly if they are of good size when planted.

Pruning Privet Hedges

Privet hedges sometimes become bare at the base. To remedy them, it is well to cut down the plants to within a foot or so of the ground. Many old hedges have been renewed in this manner. There is no use in trying to make them bushy in any other way. Cut the bushes down, and at the end of the next growing season there will be the foundation of a handsome hedge. This spring, when the new growth has made the length of a foot, clip off the tops at their points. This will cause side shoots to form and make a bushy base. About midsummer or a little later, another clipping of shoots should take place. If the old hedge was strong when cut down there should be, by fall, a fine bushy growth of leaf-clad shoots of two feet or more in height. Treated in like manner the following year, the close of that season will see a hedge four feet high.

In situations where the hedge is hiding some unsightly object that renders its cutting undesirable, there is nothing to do but set some young plants where the bare places are. Give them good soil to start on.

To increase your stock of privet, use the cut-down branches of the hedge for the purpose, taking preferably the growth of the last season. If these shoots are cut into foot lengths and set out in early spring, every one should root. It is better, however, to take such shoots now and after making proper lengths, to place them in sand in a cellar until time for planting.

Liberal feeding is the best antidote for weeds. Abundant moisture and plant food furnish conditions for luxuriant growth of grass, which will crowd out almost all kinds of weeds.

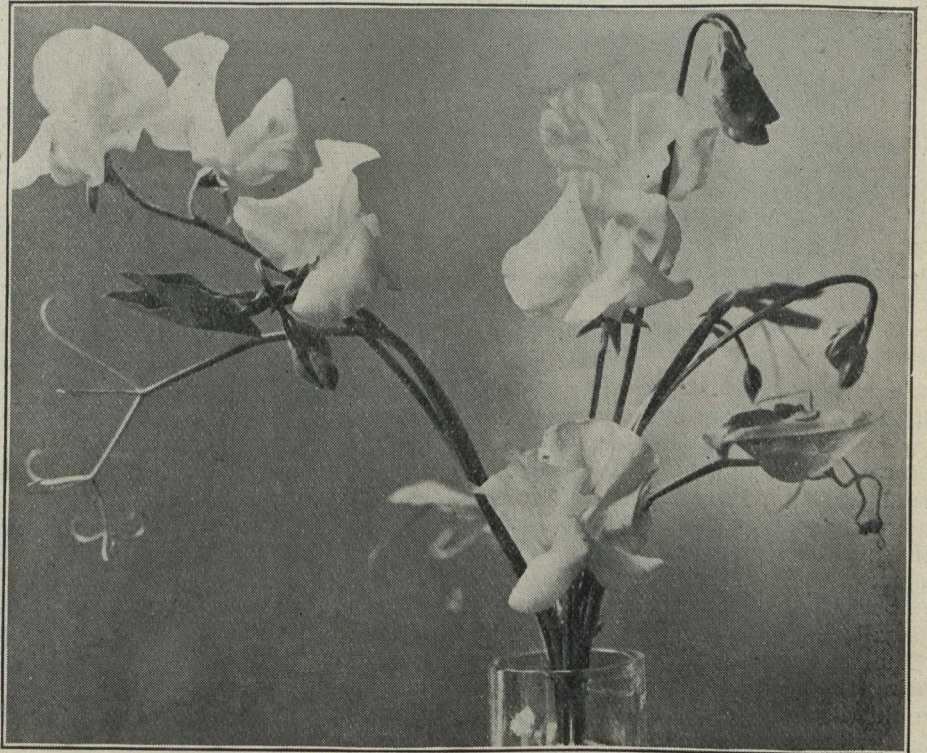
Sweet Pea Culture

James W. Nairn, Truro, Nova Scotia

SWEET peas have attained wonderful popularity during the past 15 years owing to the great improvement in size and form of flower, and wide range of coloring. The greatest factor in advancing the sweet pea to its present great popularity, has been the wonderful work of that famous Englishman, Henry Eckford, who, by selection and cross-breeding, so greatly improved this lovely flower. While others are doing

fine nozzle early in the mornings of bright, hot days.

Sweet peas succeed best in cool, moist, well-drained soil, and we must not lose sight of the fact that they will not do well planted in the same soil two years in succession. The rows should be so situated that they will receive full sunlight, and an abundance of fresh air at all times. No faded blooms or seed pods should be tolerated on the vines.



Countess Seedling Sweet Pea

good work on the sweet pea, it was he alone who blazed the way for others to follow.

To secure the best results in growing this lovely flower, it will be found desirable to prepare the ground the previous autumn by digging the manure deep into the soil before the ground freezes; then, as soon as the ground thaws out in the spring and becomes dry enough to work, open a drill with a sharp hoe, and sow the carefully selected seeds one and a half inches deep, and at least three inches apart in the row if you wish to have strong, good blooming plants. As soon as the young plants are well above the surface, say two inches high, cultivation should begin and should be continued regularly throughout the season. Frequent loosening of the soil, and the application of a little manure water to the roots, will ensure a good season's bloom. It will be found of great advantage to spray the vines thoroughly with water from a

and if we wish to have our bouquets of this lovely flower look and keep well, we cut the blooms early in the morning

The finest white sweet pea I have grown is "Dorothy Eckford," and the best pink is from the seeds of that wonderful orchid-flowered "Countess Spencer." Both of these varieties produce numberless giant blossoms on stems 18 inches long. The names of beautiful sweet peas are legion, and it is useless to give a list.

Wash the sides of flower pots once a month or oftener and they will look like new.

In Victoria and elsewhere in British Columbia English Ivy grows in all its glory, covering walls, stumps, trees, houses and so on. It came into bloom on my grounds about the middle of December last. English and Portuguese laurel and sweet bay all thrive in this climate. Camellias are used as decorative plants on our lawns.—M. J. Henry, Vancouver.

A Garden of Old-Fashioned Perennial Flowers*

J. Raymond Ball, Knowlton, Quebec

A CLASS of plants that is familiarly known as old-fashioned, hardy garden flowers is herbaceous perennials—plants that once established, continue to grow and thrive year after year with but little care and attention. Perennials are the pioneers of the floral kingdom; for who is there that does not remember seeing in the front yard or garden of his mother or grandmother some stately subject, such as an old-fashioned peony or hollyhock, planted and cared for by hands long since laid to rest? Is it not true that there are to-day in the rural districts of our country many cheerless abodes that could be made cheerful and attractive by the judicious planting of these good, old-fashioned perennial flowers? Then let us plant liberally of these old friends of our forbears, which are fast becoming favorites with most flower-loving people; plant them not only for our own pleasure but for the good of the community in which we live, so that others seeing our example may go and do likewise. As the poet says:

Make thy garden as fair as thou canst,
Thou workest never alone;
Perchance he whose garden is next to thine
May see it and mend his own.

The proper place for a perennial border or a place where it shows to the best advantage, is at the edge of a lawn, with a background of shrubbery. A border alongside a fence, a wall, or around a garden, also shows to good advantage, though if planted at the side or sides of a garden, posts should be driven into the ground and a trellis of wire should be erected behind the border, where the different varieties of vines could be grown as a background. A good deal depends upon the soil and the preparation of the same as to the results obtained in this class of plants, from the fact that they are to remain in place indefinitely. The soil should be a good general garden soil; one that will grow a good crop of vegetables will give good results. In its preparation it should be worked to a good depth, say 18 inches or more, and then a liberal quantity of good rotten manure should be mixed into the soil with fork or rake.

The proper time for planting in this climate, and for most all species, is spring, from the fact that the plants then have a year's growth, and consequently are better prepared to withstand the rigors of our Canadian winters than those that are planted in fall. Even then most kinds are benefited by a mulch of leaves or light strawy manure, to be raked off as soon as spring opens. Good cultiva-

tion of the soil, and an annual dressing of manure and bone meal, with a thinning out and a dividing of some sorts, is about all the after treatment they require.

Most perennial flowers can be easily grown from seed. If sown early, say in February or March, many kinds will bloom the first year; but it is in the second or third years that the best results may be looked for. Another method of increasing stock is by division of old plants, which operation can be successfully performed either in the fall or early spring. Many varieties can also be propagated by cuttings.



Perennial Larkspur
Grown in Border at O.A.C., Guelph

The following list of varieties includes some of the best. It is by no means a lengthy list, as there are thousands of species and varieties, and there may be others as desirable or more so. There is the achillea; the Pearl is perhaps the best known and most desirable, as its double white flowers are borne in great profusion all summer, and are valuable for cutting. Then there are aquilegias, or columbines, of which there are several varieties, all good. In anemones, Japonica, of which Queen Charlotte and Prince Henry are perhaps the best. Coreopsis, one of the most popular, with flowers of a rich golden yellow, is good

for cutting; it commences to bloom about the end of June, and continues to blossom, more or less, the entire summer and autumn.

Delphiniums, or larkspurs, are amongst the most showy and stately of all perennials, and range in color through all the shades of blue. There are also white and yellow. They are easily grown from seed. The "gold medal" hybrids are undoubtedly the finest mixture ever offered. I grew them last year, and obtained some beautiful colors. They are all good bloomers. *Dielytra spectabilis*, bleeding heart, is another old-fashioned flower well worthy of a place in the perennial border.

In gaillardias, grandiflora is one of the hardiest, most showy and prolific bloomers. It keeps in flower from June until cut down by frost. Of gypsophilas, or "baby's breath" as it is commonly called, paniculata is the one most commonly grown. It is the most useful. In combination with high-colored flowers, most beautiful effects can be produced. It blooms in August and September.

The helianthus, or hardy sunflowers, are most effective, hardy plants, and look well not only in the border, but they can be placed among shrubbery, or as clumps on the lawn. Among the best varieties are Soliel d'or, Meteor and Multiflorus maximus. *Dianthus barbatus*, Sweet William, is a fine old favorite that needs no description.

Besides the foregoing, there are peonies, some magnificent varieties of which were unknown a few years ago; and various species of iris, all of which are pretty and useful. The rudbeckia, or golden glow, is not only useful but indispensable in bouquet work. Last, but not least, I will mention the hardy phlox; varieties have been wonderfully improved in the past few years, and are among the most showy and important of all hardy perennials. They are in bloom in all imaginable shades and colors from early summer until late in fall.

Plants for Shady Places

Will you please give a list of plants that will do well in a shady bed? I have a place that is too shady for most annuals, but looks rather bare when unplanted?—P. W., Hamilton.

Among the plants suited for shady beds are pansies, lobelia, coleus, ferns, caladiums, nemophilas, forget-me-nots, sweet alyssum, fuchsias, morning-glories, hardy phlox and lily of the valley. If the shade is dense, few of these will do well, except ferns and lily of the valley.

It is important, in establishing a lawn, to choose soil originally deep, fertile and in good physical condition.

*A paper read at the last meeting of the Quebec Pomological Society.

Making and Operating a Hotbed*

F. F. Reeves, Humber Bay, Ontario

IN making hotbeds for forcing early vegetables or raising seedlings, great care should be taken in handling the manure. Good strawy manure with not too large a proportion of droppings is best. Before the bed is made up, the manure should be turned two or three times, at short intervals, as the weather will permit. The reason for the turning is to take the rank heat out, and prevent it fire-fanging. Care should be taken that every portion is well shaken. If leaves can be added it will tend to steady the heat and make it more lasting.

The manure should be left in pile long enough to sweeten. This can readily be ascertained by pulling a handful from the middle of the pile and smelling it; all impure smell should be gone.

The ideal location for hotbeds is facing south or south-east, exposed to the full sun. The boards to be used in making a frame should be 12-inch for the back and 10-inch for the front; this on level land will give sufficient fall to enable the rain to run off. Build on sandy ground with a slight slope. There are two reasons for this, the first is drainage and the second is to enable the sash to have fall enough to run off rain; this can then be secured without having the manure thicker at one end than the other. Enough manure should be used to have the bed about one foot deep when thoroughly tramped. By thorough tramping you prevent the soil from sinking in spots, which would be a source of trouble. The beds should be well sheltered by a fence or wind-break on north and west sides. The more it is sheltered sideways the better, as starving winds operate too suddenly in lowering the temperature.

The soil for the beds should have been well covered with manure. This will mean a great saving in labor and time. For lettuce, radish or beet, about six inches of soil should be used. Care should be taken to let the steam get off before planting, to prevent mildew. When lettuce is to be planted, plants that have been pricked out in flats give the best and quickest results.

My experience in radish leads me to think that the following is the best way to sow them: Make a marker the length of the sash with points three inches apart on it. With this make shallow holes and sow three or four seeds in a hole. When sown this way, practically all the radishes are ready to pull at one time. To do this successfully the seed should be sorted by

*An address delivered before the Hamilton branch of the Ont. Vegetable Growers' Association.

sifting or otherwise, using none but plump, bright seed.

The matter of ventilation needs careful attention. If possible, the air should be changed at least once every 24 hours.

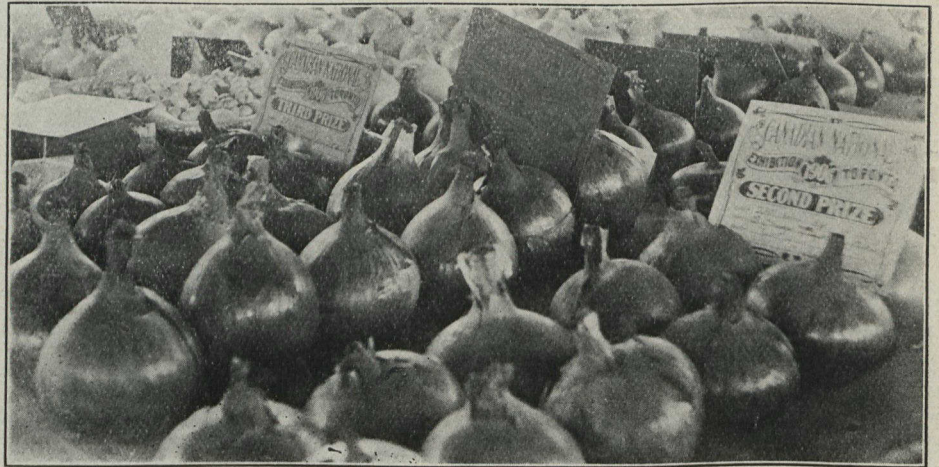
The question of watering will, of course, depend largely on the weather, making sure when watering has to be done to give a good soaking. I have frequently grown the first crop of lettuce without being watered from the time of planting till ready for the market.

Sufficient covering should be kept handy for use in case of frost. Where canvas is used, it is a good plan to go over it on a frosty night with the watering can and give it a light sprinkle; this will prevent frost getting through.

The following has been found a good

way to hasten the germination of tomato, egg plant, peppers, cabbage seed, and so forth: Mix with about three times their bulk of clean sand, soak in tepid water one hour, then place in shallow boxes, keeping the different varieties labelled. Keep in a warm place until they show signs of germination, then sow in bed. Seed thus treated will usually show a green line in 30 to 48 hours after sowing.

Lettuce and radish are generally the first crops grown in hotbeds. These can be taken off and the ground used for the transplanting of tomatoes and so forth. Crops that may be started in hotbeds are beets, cabbages, cauliflowers, celery, cucumbers, egg-plants, peppers, onions, tomatoes, melons and squash.



Prize-Taker Onions that were Prize-Winners

This cut illustrates some of the Prize-taker Onions at the Canadian National Exhibition last fall. In the centre is the lot that won first prize. They were grown by Brown Bros., of Humber Bay, Ont. Regarding their system of producing onions of this kind, Mr. J. G. Brown writes as follows: "The most successful way to grow onions is to sow the seed in the greenhouse or hotbed about the middle of March. Then plant outside as soon as possible, in good rich soil in rows about 18 inches apart. Keep the ground well worked during growth. When the tops drop over the onion is ready to pull, but do not allow them to lie on the ground too long, as it spoils their appearance."

Tomato Culture Inside and Out*

John N. Watts, Portsmouth, Ontario

SUCCESSFUL tomato culture under glass depends as much on the man in charge as on conditions. Eternal vigilance and the exercise of good judgment on the part of the grower are more essential than strict adherence to set rules.

Strong bottom heat, plenty of light and a large volume of pure air are important conditions. They are best secured in a large, well-ventilated house. Tomatoes often are successfully grown without bottom heat, but the period of maturity is much delayed.

* This essay won first prize for best article on "Tomato Growing" in the competition conducted by The Ontario Vegetable Growers' Association.

To make the best use of the house, two crops should be grown during the season. This will bring each crop on at a season when the expense of heating, during a part of the time, will be light. Plants for the first crop should be started as early as August, that is if the bulk of the crop is desired for the holidays. For the second crop seed should be sown about November 1. The plants will then be ready to replace the first lot when the fruit is off in January.

Many growers have been well pleased with the practice of laying down the vines and allowing them to take root after the first crop is picked and thereby forming a succession of fruits on the old plants. The plants are treated in every

way as for outdoor culture till handled the last time.

GROWING TOMATOES OUTSIDE

Among the many varieties of tomatoes that are grown in the field, it is difficult to say which is the best marketable variety. Much time has been spent experimenting for the discovery of some early variety. I find that no variety gives more satisfactory results in this district, for earliness and yield, than the Earliana. The best late varieties for home use and market are Plentiful, which gives general satisfaction but not as early as some others, Success, Perfection, Purple Dwarf, Favorite, and a number of others.

The preparation of land for tomatoes is much the same as preparing for many other crops. Many people claim that tomatoes do not need high cultivation. To my mind tomatoes require one of the highest grades of cultivation of any vegetable that is grown for market purposes. The soil must be well fertilized with rotted manure, which should be put on in the fall. Avoid stiff, hard, clay land, as it has a tendency to spoil the crop in a wet season. Soft loam, or sandy loam, well enriched, or black land, gives the best results.

My reason for advocating the use of well-enriched soil for tomatoes is that the majority of the crop is forced into a marketable size while the moisture is in the land. Should dry weather set in before the crop has had a chance to develop, the fruit and crop will be small. Often a first-class strain of tomatoes is condemned more for want of proper cultivation than the qualifications of variety.

Sow the seed about the end of March or the first week in April. When the plants are three and four inches high, transplant into quart strawberry boxes. These are placed in a hot bed with a nice, steady growing temperature, with about three inches of soil in the bed. When the plants are all in, cover the boxes so as to prevent drying out by the sun. They are left there until the danger of frost is over.

When planting in the field run a deep furrow with the plow, in which set the plants four feet apart each way, allowing room for sun and cultivation. Break the corners of the boxes as they are put in the furrows and thus prevent the disturbing of the roots. Draw the soil around the plants with a trowel to keep them in position until all are planted. Then use the horse and cultivator and complete the work. The crop will be ready for summer cultivation in a few days.

By planting in squares it gives one a chance to work both ways with the cultivator. It thus lessens labor, reduces expenses and increases the profit. For harvesting, the bushel crate is the most satisfactory package.

Vegetables in New Ontario

AN interesting letter was received by THE CANADIAN HORTICULTURIST from Benjamin Hammond, of Fish-kill-on-Hudson, N.Y., a gentleman who has travelled in Canada several times and is interested in horticulture in all its branches. Mr. Hammond is secretary of the American Rose Society. The following is his communication:

"Wabigoon is in the wild country of western New Ontario. It is a station on the C.P.R., 204 miles west of Port Arthur, and is located at the head of Lake Wabigoon. At this station last October, I saw a cabbage and cauliflower patch, that for perfect specimens attracted much attention. Since boyhood, I have always been fond of cauliflower, but for real flavor, it has not been my privilege to eat as good vegetables as the ones that I ate there. In that rigorous, wintry climate, on sandy clay soil, they are doing wonders in garden products.

"In the spring of 1905, before the ice was broken, I left Wabigoon in a primitive sled to go through the bush and over the lakes a distance of 30 miles. About a mile on the journey, I came to a clearing where two log buildings were built; one a barn and the other a settler's cabin. An acre or two of the light timber around the buildings was down. It was being gathered by a boy with a cow and a sled; the settler had no horse. This industrious man, Herbert Wright by name, had taken up the land and settled with his young family to clear up and make a homestead. They were intelligent workers. Last fall at the agricultural exhibition of the Rainy River district, held at Fort William,

Mr. Wright placed his products on exhibition. He was successful in securing first prize for parsnips, early Egyptian beets, early round cabbage, white celery, intermediate stump carrots, early red onions, globe Danvers and winter set onions; second prize for early pointed cabbage, and third prize for potatoes, 'Carman, No. 1.' How is this for new land in the so-called wilderness west of Lake Superior? Two years ago I saw a celery patch that ex-



*A settler's
Cabbage Patch
Wabigoon, Canada.*

A New Ontario Home and Garden

ceeded in strength, crispness, and flavor anything of the kind that I ever saw in New Jersey or Kalamazoo."

Potash for Potatoes

For growing potatoes, which gives the best results, muriate of potash or sulphate?—T. H. P., Appleby, Ont.

I do not know as there is any great difference in the effect of the two different fertilizers upon the growth of the crop, but the muriate of potash does not give as nice a potato as the sulphate. The former substance is inclined to make the potato waxy and the flavor is not so satisfactory as where the sulphate is used.—Answered by Prof. R. Harcourt, O.A.C., Guelph.

The first blossom on the tomato plant usually is double, and always should be picked off.—J. Gibbard, Doncaster.

Hard or Soft Wood Ashes

Which is the best, hard wood ashes or soft wood?—W. B., Ayr, Ont.

The ashes of hard and soft wood are very much alike, except that the former are heavier. Soft wood ashes are bulky. A great deal depends upon the position of the wood in the tree. The limbs and branches contain more ash and consequently more potash than that from the trunk of the tree, and the limbs more than the twigs. As you pass upward and outward you find more potash than you do in the trunk of the tree.

Manure for hotbeds should be uniform in composition and texture.

Vegetable Varieties That Pay

THE following varieties are recommended by Mr. W. G. Horne for the district about Clarkson, Ont.: "Potatoes are grown extensively and for the last four years have been a paying crop. We introduced about four years ago an early variety called Early Envoy, which has proved to be very early and productive. It grows to a good size, is oblong and pink in color. For an early potato it is very smooth, with small eyes, and splendid for cooking. Some of our growers tried the Delaware potato, "which is so much sought after in Toronto," for a late kind, with good results. American Wonder is still a favorite with a great many. In cucumbers for the early market for slicing, I find the Improved Arlington, White Spine and the Evergreen White Spine the best. Have also tried several varieties of tomatoes and find Spark's Earliana Tomato, No. 10, the best. The best early muskmelon known in Canada to-day is the Unsworth. Landreth's Extra Early Citron Muskmelon is fully as early but not quite so showy a melon. These two varieties of melon need to be started in a hotbed to be profitable for market. For late varieties, the Rocky Ford and Paul Rose cannot be excelled."

TORONTO DISTRICT

For the district around Toronto, Mr. J. W. Rush, of Humber Bay, Ont., submits the following: "The time of the year has come again when we must think about what crops will be best for us to grow and where we shall get our seeds. After nearly 40 years' experience, I find it better to buy seed from our local seedsmen, and always to get well-known varieties. Let new varieties and novelties alone. Leave them for the college students to try; we have no time for such work. Always buy the best seed and get it in time to test its germinating power.

"Radish seed to be sown in hotbeds or greenhouses should be large and plump, and sown rather thin, an inch apart each way; in hotbeds, not more than six inches from the glass; in greenhouses, as near the glass as possible. When sowing spinach in early spring, set the drill one inch deep, sow moderately thick and tramp with foot; then every seed will grow. I sow Early Round Summer and Savoy Leaf, as they do best. Beets and carrots may be sown as early as land can be got ready. Be sure and firm soil on the seed. The best varieties of beets are, for early, Crosby, Egyptian and Eclipse Turnip; for late winter, Long Blood Smooth. Two well-known varieties of carrots are Chantenay, Stump Rooted and Half Long Danvers. Cabbage can be sown the first of March in bed or greenhouse; when in rough

leaf, prick out in flats about two inches each way. For early cabbage, sow Jessey Wakefield and Henderson's Early Summer. Plant out April 20 if land is ready. If they get covered with snow a few times it will do them no harm. Give cauliflower the same treatment as cabbage. Snowball and Erfurt are the best varieties; no man can tell one from the other.

"For early corn, sow Early Market; for medium, Parry's Hybrid; for late, Country Gentleman and Stovell's Evergreen. The best onions are Yellow Danvers, and Southport Yellow; red onions are not wanted in Toronto market. Some Toronto growers make big money growing the silver skinned pickling onions, as there is always a ready sale for them at \$2.50 to \$3.00 a bushel; if 200 bushels or more are taken from an acre, they pay well. We sow New Intermediate and Hollow Crown parsnips. Put plenty of seed in the drill if you want a good catch. Sow the Moss Curled parsley; sow some onion seed with it and pull the onions early and bunch for market."

MONTREAL AND VICINITY

For the Montreal district, Mr. Chas. A. Smith, of Lachine, recommends the following: "Beans, butter, Currie's Must Proof, one of the best, Wardwell's Kidney Wax, and Yosemite Mammoth, round, padded; green, Early Red Valentine and Refugee; kale, Dwarf Green Scotch, curled; beets, round, Egyptian Turnip; long, Improved Long Blood; half long, Bonsecours Market; Brussels sprouts, Edinburgh Prizer; cauliflower, selected Dwarf Early Erfurt; cabbage, early, Early Express, Early Etampes; midsummer, Henderson's Early Summer and Cannon Ball; late or winter, Autumn King, Flat Dutch, Marble Head, Improved Brunswick; carrots, early, Early French Horn; general purpose, Chantenay, Half Long Improved, Vanerny Half Long; long, Scarlet Intermediate, Long Red Stump-rooted; celery, White Plume; yellow, Paris Golden Yellow; red, Dobbie's Selected Red.

"The best varieties of early corn are Sugar Cory, New Champion; late, Mammoth, Stowell's Evergreen; midsummer, Kindal's Giant, None-such, Crosby, Country Gentleman; cucumber, White Spine; egg plants, New York Purple, Early Round White, Luke's Musselburgh; onions, Red Wethersfield, White Globe, Red Globe, Prizetaker, Yellow Globe Danvers; parsnip, Hollow Crown, Student; peppers, Cardinal, Giant Large Red; peas, Gradus, Early Star, American Wonder, Heroine, Stratagem, Market Garden; salsify, Mammoth Sandwich Island; vegetable marrow, Long White Bush, Boston Marrow; tomatoes, Earliana, Freedom, Perfection, Dwarf Champion and Trophy."

Producing Early Beets

The best variety of beets for the early market is the flat Egyptian. The seed should be sown in the greenhouse from the last of February to March 20. It is best to plant them in rows, because when they are being transplanted they can be taken in bunches and odd ones left on the bench to get stronger. If sown broadcast, all will have to be transplanted at once. Sowing in rows also results in less trouble from the "damping-off" fungus, which becomes very common if the young plants do not receive plenty of air. Moist air aids the development of the disease.

A liberal watering should be given when the seeds are sown, and then no more for some time. No damage will result if the plants are allowed to wilt down before more water is given. It is difficult to grow beets successfully in hotbeds; but they can be handled if all the steam is allowed to escape from the bed before the seed is planted.

Once the plants are "pricked out" the trouble in handling them is over. They should be set out as early in the spring as the ground can be worked. In preparing the soil, it should be made as rich as possible with manure and then top-dressed with some high-grade fertilizer. This should be followed with thorough harrowing, and then be smoothed off with a plank drag. Best results are obtained from setting the plants three to four inches apart in rows 14 or 15 inches apart. Cultivation then has to be done with a wheel hoe by hand. Too much cultivation cannot be given.

The earlier a hotbed is made the larger should be the quantity of manure used.

Value of Carbonate of Lime

Is carbonate of lime a good fertilizer for market garden soils, particularly for the growing of table roots?—L. M. A., Waverley, N.S.

Carbonate of lime may be looked upon as an indirect fertilizer. Its chief functions in the soil seem to be to improve the physical condition, to neutralize acidity, and to liberate plant food, particularly potash, in the soil. If the soil has been under cultivation for some time and is rich in organic matter, it is quite possible that a dressing of one to one and a half tons an acre of fresh burnt lime would be beneficial to the soil. If the soil is a clay, it is probable that lime will improve the physical conditions and will liberate potash and thus aid in the growth of whatever crops may be grown upon it. Roots of all kinds require large amounts of potash. Lime will liberate this constituent from insoluble forms of combination, and to that extent will aid in the growth of roots.—Answered by Prof. R. Harcourt, O.A.C., Guelph.

OUR QUESTION AND ANSWER DEPARTMENT

Readers of *The Horticulturist* are invited to submit Questions on any phase of Horticultural work

Grafting Wax

I desire to top-graft some apple trees. What are the ingredients and directions for making a good grafting wax?—M. T. S., Falmouth, N.S.

The following formula has been used for many years with satisfaction, as it does not melt and run down the tree by the heat of summer or crack by the cold in winter: Resin, four parts; beeswax, two parts, and tallow, one part. Melt the ingredients in an iron vessel over a slow fire, mixing thoroughly and taking care not to burn. When well incorporated, in half an hour or so, pour convenient portions from time to time in cold water, and when sufficiently cooled in a minute or less, take out and pull like taffy until it becomes light colored, when it may be made into rolls three or four inches long and an inch in diameter, for convenience in use. A little tallow, as little as possible, will be necessary on the hands to prevent sticking. As the sticks are made they should be placed in another vessel containing cold water to harden, after which they should be put away in a cool place until they are wanted for use.

Thomas Slag for Peaches

When commercial fertilizers are used on orchard soils, is it necessary to plow them down? How much Thomas slag per acre should be used for peach trees growing on light, sandy soils?—J. S., Beamsville, Ont.

I do not think that it is good practice ever to plow down commercial fertilizers. They should be sown on the surface and then harrowed or worked into the surface soil. They will find their way down quickly enough. For peach trees growing on light sandy soil, Thomas phosphate may be used at the rate of 300 to 400 pounds an acre, and on such soil it might be well to use some potash fertilizer in addition to the Thomas slag.—Answered by Prof. R. Harcourt, O.A.C., Guelph.

Pruning Small Fruits

When should I prune grapes and small fruits?—J.P., Toronto.

Grapes and small fruits may be pruned in spring before growth starts. March is a good month for the work.

Nitrate of Soda for Lawns

Will nitrate of soda improve a lawn that is bare in spots and moss-grown in others? When should it be applied, and how much per square rod?—B. McN., St. Stephen, N.B.

It is hard to give a definite answer from the conditions given, but I fear that, if the lawn were moss-grown in

spots, the soil is somewhat sour or acid, and, therefore, I would recommend the application of some manure, which would neutralize the acid. This the nitrate of soda will not do. It is quite probable that the use of some Thomas phosphate, which contains a considerable quantity of lime besides phosphoric acid, would correct the sourness. This might be all that the soil needs. If from known conditions it is considered that the ground is fairly rich, it may be that the addition of lime would correct the acidity and would be sufficient. If it would not, I would be inclined to apply Thomas phosphate, some nitrate of soda, and some form of potash fertilizer. The different constituents may be applied in the early spring. If nitrate of soda is used, this should be applied in the growing season, and then in very small quantities or it will burn the leaf.—Answered by Prof. R. Harcourt, O.A.C., Guelph.

Treating Primroses

What shall I do with my primroses after blooming during the winter?—Mrs. A. J., Knowlton, Que.

The uncertainty of next season's blooming, and the care required during the summer make it unprofitable to carry the plants over. Start new plants from seed or purchase new ones from your florist at the proper season.

Plants for Water Garden

Will you name the best plants to make a small water garden, six by nine feet, and the number that would be likely to grow in such a small space?—M.M., Toronto.

Plant two tubers of *Nelumbium speciosum* at one end in a space separated from rest of pond by a 10 or 12 inch board on edge. If hardy lilies are planted probably one of the stronger growing varieties would fill the rest of the pond—*Nymphaea marliacea rosea* (pink), *N. m. chromatella* (yellow), or *N. m. albida* (white) are vigorous growers, free and continuous bloomers. Two less vigorous but otherwise as good varieties might be tried, say *Nymphaea tuberosa rosea* (pink), and *N. t. maxima* (white). If tender lilies are planted, one of either of the following would do, viz., *Nymphaea Devoniensis* (pink, night blooming), *N. dentata* (white, night blooming), or *N. Zanzibarensis* (blue, day blooming). Two or three plants of Umbrella Grass, *Cyperus alternifolius*, or *Papyrus antiquorum* in pots might be stood in the pond, not submerged. The little Water

Poppy, *Limnocharis Humboldti*, is pretty and takes up very little space.—Answered by A. H. Ewing, Woodstock, Ont.

Mildew on Plants

What causes mildew on plants, and what is the remedy?—W. M. C., Newcastle, N.B.

Mildew is a fungus that develops rapidly in damp weather. Flowers of sulphur dusted on the leaves when they are damp will prove an effective remedy.

Diseased Lettuce

Am bothered with rust on lettuce in greenhouses. Free from disease last winter, but had considerable the winter before. The seedlings were fine and healthy this season, so cannot account for rust. Kindly state the cause of, and remedy for this disease.—A. B., Stamford, Ont.

We are not certain what the disease referred to is, as there are several diseases that affect lettuce, none of which is known by the name of "Rust." Names of these diseases are the Grey Mould, Sclerotium disease, the Drop or Rot disease and Downy Mildew. As it is difficult or practically impossible to treat these diseases by spraying, some other means must be found. The plan usually adopted is to sterilize the soil. If it is not found practicable to sterilize all the soil, it is wise to treat as much of it as possible, even an inch on the surface very often will check the spread of the disease to a large extent. The use of fresh manure should be avoided and old soil should not be used unless sterilized. The lettuce house should be kept as well ventilated as possible.—Answered by W. T. Macoun, Dominion Horticulturist, C.E.F., Ottawa.

Grow or Buy—Which?

Should the gardener grow or buy his vegetable seeds?—D. B., Renfrew, Ont.

The latter is much the wiser and safer plan. It is better to purchase seeds from those who make a specialty of growing them. Such men can afford the time, labor and expense required to secure seeds of the best pedigree or strain. The ordinary grower's method of seed selection at home is to save the seed only from plants remaining in the garden after the best specimens have been gathered for market; while the best seed is that which has been gathered from the best plants of the best strain. Occasionally the gardener may raise his own seeds with advantage, as in the case of one who is making a specialty of growing a particular class or variety of vegetable.

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We want the readers of THE CANADIAN HORTICULTURIST to feel that they can deal with our advertisers with our assurance of the advertisers' reliability. We try to admit to our columns only the most reliable advertisers. Should any subscriber, therefore, have good cause to be dissatisfied with the treatment he receives from any of our advertisers, we will look into the matter and investigate the circumstances fully. Should we find reason to believe that any of our advertisers are unreliable, even in the slightest degree, we will discontinue immediately the publication of their advertisements in THE HORTICULTURIST. Should the circumstances warrant we will expose them through the columns of the paper. Thus, we will not only protect our readers, but our reputable advertisers as well. All that is necessary to entitle you to the benefits of this Protective Policy is that you include in all your letters to advertisers the words "I saw your ad. in THE CANADIAN HORTICULTURIST." Complaints should be sent to us as soon as possible after reason for dissatisfaction has been found.

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Few business enterprises pay as well as successful publications. It is seldom that papers or magazines that have recognized fields, fail. It is for this reason that investments in reliable papers are generally sought after and seldom prove disappointing.

As announced some months ago, the shareholders of the Horticultural Publishing Company, Limited, have decided to increase the subscribed stock of the company from \$12,000 to \$22,000, and the paid-up stock from \$6,000 to \$10,000. The \$10,000 in new stock is now being offered for subscription. Already about half of it has been subscribed by the directors and shareholders of the company. It is desired that the balance shall be placed among the readers of the two papers, THE CANADIAN HORTICULTURIST and *The Canadian Florist*, owned by the company. In offering this stock to our readers, we do so with every confidence that, should they decide to invest, they will not regret their action and that in a few years the stock of the company will prove very valuable.

During the past four years the receipts from the advertising carried in THE CANADIAN HORTICULTURIST have doubled each year. During the past five months the paid subscription list of THE HORTICULTURIST has increased by over fifty per cent. By the end of this year it is expected that the number of paid subscribers will be almost, if not quite, double what it was

last year. This is going to make possible, in the near future, a decided advance in our advertising rates which will result in increased receipts from advertisements without its being necessary to further enlarge the paper. As regards *The Canadian Florist*, the receipts from that paper already exceed the expenditures.

The shares of the company are \$50 each, on which it is intended to make four calls this year of ten per cent. each. In other words, on each \$50 share only \$20 will be called. Do you not think it would be nice to be a part owner of THE CANADIAN HORTICULTURIST? Those of our readers who are interested in this announcement are invited to write for a prospectus giving detailed information.

A DOMINION FRUIT ASSOCIATION

Why should there not be a Dominion Fruit Growers' Association? There are six provincial fruit growers' associations, all of which meet yearly, all of which receive regular provincial grants, and all of which are accomplishing much valuable work. It seems as though the time has come when the present organizations should be crowned by the formation of an association that will be representative of the fruit growers of the Dominion.

The Dominion Conference of Fruit Growers, that was held in Ottawa last April, was productive of much good. It demonstrated that there are many matters relating to fruit growing that can be discussed to the best advantage only at a meeting representative of the fruit growers of all the provinces. Although three busy days were spent at the conference, much of the work had to be hurried through without sufficient consideration, while a number of important matters that were down on the program for discussion were not reached. This serves to show the necessity that exists for the holding of regular meetings of the same nature.

This need was expressed at the conference by a resolution that was submitted and which favored the formation of a Dominion Association. This was one of the matters that lack of time prevented being considered. The resolution in question was withdrawn when Hon. Sydney Fisher promised to arrange for the holding of another conference within two or three years. This announcement on the part of Hon. Sydney Fisher was received with such enthusiasm by the assembled delegates, that it leads us to ask Hon. Mr. Fisher why he should not carry the matter further and arrange for similar conferences at stated periods.

One objection, expressed by Hon. Mr. Fisher, to the formation of a Dominion organization, representative of the fruit interests, and which would meet regularly, was that his Department, already, is so busy he would find it impossible to give such meetings his personal attention. With all due respect to Hon. Mr. Fisher, we fail to see the strength of this reason. The provincial fruit growers' associations manage to hold very successful conventions even when they are not attended by the provincial ministers of agriculture. In fact, they sometimes hold even more successful conventions in the absence of the ministers of agriculture from some of the sessions than they otherwise would, inasmuch as the growers present feel more free to talk-out on the matters relating to government work. Later, when decisions have been reached on subjects in regard to which it is felt that the assistance of the government is needed, deputations are appointed to wait on the Minister of Agriculture and discuss them with him. Why could not this be done in the case of a Dominion organization of fruit growers? While Hon. Sydney Fisher might not be able to attend each meeting, he surely could find time to meet with deputations to consider the results of their conferences. This, in the absence of a better arrangement, would be sufficient.

The matter of expense should not be a serious difficulty. A couple of provinces give an annual grant to their local fruit growers' associations of

\$1,800. We understand that the last Dominion conference cost the Dominion Government about only \$2,000. The Dominion Government can afford to be as liberal as the provincial governments in a matter of this kind, and, therefore, should be able to make a regular grant of \$3,000, or \$4,000 if necessary, to assist the holding of such conferences regularly. While it, probably, is not necessary that representative fruit growers from all the provinces should meet together each year, they should meet not less often than once every two years. At present, the calling of these conferences is left to the discretion of the Dominion Minister of Agriculture. While fruit growers generally have every confidence in Hon. Sydney Fisher, they would feel better satisfied were there an arrangement by which they would be able to meet as regularly in a Dominion conference as they now meet at their various provincial conventions.

NOT YET SATISFACTORY

During the discussion in the House of Commons of the new Cold Storage Act, introduced by Hon. Sydney Fisher, it was pointed out that the basis of distribution of the proposed government grant was not satisfactory, owing to the period of payment being extended over too long an interval. The first proposal was that the Government, on the completion of a cold storage warehouse, should make a grant equal to one-tenth of the cost of construction, and that during the succeeding four years, four more payments should be made, each equal to five per cent. of the cost of construction. The Minister of Agriculture has expressed a willingness to increase the amount of the first payment to make it equal fifteen per cent. of the cost of construction and to increase the amount of the second payment to seven per cent.

This change is in the right direction, but we feel that it still does not go far enough to offer sufficient inducement to fruit growers to cooperate in the erection of warehouses for the handling of their fruit. When the Cold Storage Act was introduced in the House of Commons, it was explained that one of the chief objects in view was to prevent the enormous waste that takes place each year in the marketing of the apple crop. This object will not be accomplished unless the growers are encouraged to erect their own warehouses. This will not result, to any considerable extent, unless the first payment by the Government is equal to at least twenty per cent. of the cost of construction. We hope that the bill will be amended accordingly. In any event we desire to congratulate Hon. Sydney Fisher on having introduced this measure, which, in the end, should prove of great benefit to the fruit growers of the Dominion.

Announcement was made some time ago that the Provincial Secretary for Ontario proposed to introduce a new Companies' Act. This Act is now before the Legislature. The scope of this Act is so wide as to take in and provide for the incorporation of all kinds of companies, whether joint stock companies or cooperative. Hitherto many cheese-making and butter-making companies have been incorporated under the Act respecting cheese and butter manufacturing associations and companies; and many fruit companies have been incorporated under a similar Act, entitled, "An Act to Provide for the Incorporation of Cooperative Cold Storage Associations." Incorporation under these two Acts was very simple: Five or more persons could sign an agreement which was filed in a local registry office and the company was then allowed to carry on business with certain restricted powers. The new Act will continue the incorporation of all companies organized under these two Acts and will place these companies on a par with joint stock companies, having powers to carry on business just as joint stock companies have at the present time. These companies will hereafter be required to make

annual reports to the Provincial Secretary. The general effect, therefore, will be that their status will be improved. The only objection that might arise would be the fear that high fees would be exacted, but the Provincial Secretary's department has given the assurance that in the case of such companies the annual fee will be merely a nominal one and that there will be no cause for objection along that line. The Act will provide that in future all such companies must be organized under this new Act, so that it will no longer be possible to organize a company by simply signing an agreement and filing the same with a local registrar. The Provincial Secretary's department will provide very simple forms for incorporation and will exact minimum fees, so that encouragement will be given to the organization of companies in connection with agricultural operations. The assurance is given that nothing will be done to discourage the organization of such companies, but that everything will be made plain and simple, and be done at a minimum cost. The advantages of this Act are that all companies doing business will be on record at Government headquarters, with the powers and privileges fully set forth, and that it will be possible to find out at any time on application to the Provincial Secretary's office what companies are doing business along any lines.

A live new branch of the Ontario Vegetable Growers' Association has been formed at Ojibwa, and more are in process of formation. An extensive program of work is being prepared for the provincial association this year, and by the end of the year it is expected that the total membership will be over 700. When this association was formed, just two years ago, it was feared by some that its constitution, which was radically different from those of the other provincial associations, and a good deal in the nature of an experiment, would not work out successfully when put to the test of time and practice. After a two years' trial the association is in a very satisfactory position and looking forward to a bright future. It would seem as though the Ontario Fruit Growers' Association need hesitate no longer about adopting a similar constitution. The step in that direction taken by its members at their last convention was not quite big enough. There is room for still further improvement.

In Denver, Col., an annual cleaning day is appointed every spring for the purpose of cleaning up the streets, parks, boulevards, and other public places. A new feature of the cleaning day last year was the campaign against the dandelion, which feature was introduced by the mayor of the city. Household holders were urged to dig them up by the roots from their back yards, lawns and gardens, and thereby lessen the spread of this ever-present nuisance. The Ontario Horticultural societies, and all cities in Canada interested in civic improvement, would do well were they to institute a similar onslaught on the dandelion, which is a civic nuisance.

Those fruit growers in Ontario who have refused hitherto to admit the presence of the San Jose Scale in their sections and to support the local inspectors in their efforts to stamp out the pest are now regretting their short-sightedness. The time is ripe for an aggressive campaign to wipe out the pest.

We are in receipt of a handsome catalog from Brown Bros. Co., Limited, Brown's Nurseries, Ont. It contains a large number of beautiful lithographs that portray the leading varieties of specialties that are handled by this well-known firm. The illustrations are beautifully done, and the descriptions of varieties are excellent. Fruit growers and gardeners should have a copy of this catalog.

The Cold Storage Act

THE following is a copy of the Act to encourage the establishment of cold storage warehouses for the preservation of perishable food products. Readers of THE CANADIAN HORTICULTURIST are invited to discuss it through these columns:

1. This Act may be cited as *The Cold Storage Act*.

2. The Governor in Council may enter into contracts with any persons for the construction, equipment and maintenance in good and efficient working order, by themselves, their successors and assigns, of cold storage warehouses in Canada, suitable for the preservation of the food products specified in such contracts.

3. The location plans and specification of every such warehouse, its equipment, and the amount to be expended thereon, shall be subject to the approval of the Governor in Council.

4. The Governor in Council may, out of any moneys appropriated by Parliament for the purpose, grant towards the construction and equipment of any such warehouse a subsidy not exceeding in the whole 30% of the amount expended or approved of in such construction and equipment, and payable in instalments as follows: Upon the warehouse being completed and cold storage at suitable temperatures being provided therein, all to the satisfaction of the Minister of

Agriculture, a sum not exceeding 15% of the amount so expended, and at the end of the first year thereafter, 7% of the said amount, at the end of the second year thereafter 4% of the said amount, and at the end of the two succeeding years 2% of the said amount, provided the warehouse is maintained and operated to the satisfaction of the Minister of Agriculture.

5. The Minister of Agriculture may refuse to pay any part of the said subsidy if, in his opinion, the operation of the warehouse has not been of such a character as to provide for the proper preservation of such products as may be stored therein.

6. The Minister of Agriculture may order, and cause to be maintained, an inspection and supervision of the sanitary conditions, maintenance and operation of such warehouses.

7. The rates and tolls to be charged for storage in such warehouses shall be subject to the approval of the Governor in Council.

8. For the effective carrying out of the provisions of this Act, the Minister of Agriculture may appoint inspectors, who shall have access to all parts of such warehouses at all times.

9. Chapter 7 of the statutes of 1897, intitled *An Act respecting Cold Storage on Steamships from Canada to the United Kingdom and in certain cities in Canada*, is repealed.

Spraying in Prince Edward Island

Rev. Father Burke, Alberton

A FEW of our most successful growers are not absolutely satisfied as to the value of spraying; some said openly at the late meeting of our Provincial Fruit Growers' Association that they did not believe in it at all. Personally, I am convinced that spraying with Bordeaux mixture for clean and sound fruit is a necessity, that its use has gone altogether beyond the experimental stage, and that, in ordinary years, it is impossible to grow good fruit of most varieties without it. If science has demonstrated anything, it has this.

In his paper last December before the association, Mr. Registrar White reflected on spraying, and Mr. John Newson, a very successful grower and specially intelligent man, was put on record as saying that the unsprayed portion of his plantation was richer in fruit returns of a superior class than the sprayed portion. He said that he had been enabled to form this opinion from the fact that, for fear of killing his bees, he had desisted, in the main, spraying operations, leaving such apples as the Wealthy, then in bloom, unsprayed. From the chair we told him that in order to prove his case he would need to convince us that the mixture was rightly made of good materials, rightly applied, and that the weather was not such after as to remove the wash from the trees. He thought all those conditions were maintained properly, and was inclined to hold his ground, although the fact that it was a question of only one spraying, predicted a want of system and adherence to instruction in the matter. Mr. Bovyer, of Georgetown, our new inspector-instructor, argued strongly in favor of spraying; so did Messrs. Moore and Dewar, both experienced growers. The consensus of the meeting was strongly on the side of sprays. Mr. White, in closing, said that Bordeaux had been blamed for leaf blight in the States and some parts of Canada.

As a matter of fact, Bordeaux mixture is now being pretty generally used on the potato crop as well as on fruit trees here. It is more generally than ever used on the latter, and fruit cannot long be grown profitably without it. We all recognize, however, the hardship spraying imposes on the ordinary individual. It is a dirty job at best for amateurs. If a public

sprayer could be had to do the work reasonably in price and well as to methods, there would be few people bother with it themselves. Say what they will, half the mixtures made by tyros are imperfect—a loss of time, money and whatever old clothes are valued at. I hate to have to go at it myself, but there is no help for it until spraying is done by travelling professionals licensed by the board, as are many other much less important matters in our everyday life.

Cooperation for Fruit Growers

In the province of Ontario there are some 27 cooperative fruit associations, and the result of the operation in connection therewith during the past season have been most satisfactory to the fruit growers concerned. The prices received by the individual grower have been, in the majority of cases, much beyond that realized before cooperation was introduced. The Department of Farmers' Institutes and the Provincial Fruit Growers' Assn. are cooperating in the holding of special meetings to further the interests of cooperation. Letters have been addressed to a number of points at which it is thought cooperation could be introduced to advantage. Some likely places have, no doubt, been overlooked in this.

Fruit men are asked to make application either to P. W. Hodgetts, secretary of the Ont. Fruit Grs.' Assn., or to G. A. Putnam, Supt. of Farmers' Institutes, if a meeting is desired with a view to placing before the fruit men the possibilities and advantages of this line of work. Cooperative companies can be organized at a nominal fee, and fruit men have nothing to lose and much to gain in forming an organization.

IF YOU WANT A BOOK we will get it for you. Send for our catalog, which is free to all subscribers. You may see some book listed therein which should be in your library.—Address, THE CANADIAN HORTICULTURIST, Toronto.

We Want New Subscribers and are willing to pay generously for them. Canvassers make from \$2 to \$10 a day canvassing subscriptions to THE CANADIAN HORTICULTURIST. Write for particulars now.

Work of Experiment Stations with Insects and Fungi

A BULLETIN, No. 150, entitled: "The Common Fungous and Insect Pests of Growing Vegetable Crops," was prepared by Prof. Wm. Lochhead and Mr. T. D. Jarvis, and issued by the O.A.C., Guelph. Growers may obtain a copy on application to the college or to the Dept. of Agri., Toronto.

In the bulletin an attempt is made to describe concisely the common fungous and insect enemies of vegetable crops, and to state briefly the best methods of controlling these pests. "It is believed that the publication of such information in bulletin form will fill a long-felt want. While criticism may, perhaps, be made of some of the treatments recommended, to the effect that they are too expensive, too burdensome, or but partially effective, it can at least be said that they are the best that up to the present have been devised. It is true that with some vegetable crops the returns are so small that every means must be taken to reduce the cost of growing and marketing the crop. As a consequence, some growers will, perhaps, prefer to replant rather than practise the treatments recommended in the bulletin."

SPRAYING FOR SAN JOSE SCALE

We are just in receipt of a bulletin, No. 107, issued by the W. Va. Exp. Sta. on the results obtained from commercial insecticides for the San Jose scale. Tests were made of various concentrated materials that are on the market. Of the spray materials used in the experiment Target Brand Scale Destroyer and Kil-o-Scale gave the best results, being practically identical. The bulletin says in part:

"Concentrated soluble oil preparations are the most convenient to use of any material yet devised for the destruction of scale insects. They mix readily with cold water and are not injurious to spray pumps, harness, horses, nor the face and hands of the user. None of them, however, seem to possess the fungicidal properties of the lime and sulphur sprays, but as scale killers some, at least, are entirely satisfactory and greatly simplify the matter of combatting scale insects on fruit trees. The ease with which these materials may be prepared for use in small orchards and fruit gardens, as well as larger plantations, offer good reason for the hope that in the future more interest will be taken in the matter of spraying by those who own scale-infested trees."

PETROLEUM EMULSIONS

In bull. No. 75, of the Agr. Exp. Sta. at Newark, Del., an attempt is made to describe methods of making petroleum emulsions without guaranty of their efficiency as insecticides. "These emulsions depend on soap for their existence, and sometimes on other auxiliary agents. Different formulas call for different proportions of emulsifier, and are, accordingly, differently adapted to summer and winter applications. Soluble oils sometimes require a preliminary 'manipulation' with a little water before they will emulsify. It is cheaper to prepare the emulsifier, or 'concentrated oil,' alone and to add the necessary amount of petroleum oils at the place where the material is to be used. High ratio 'soluble oils' are usually turbid, separate in 2 parts and need to be mixed before using. Probably a small fraction of the oil emulsified is visible when magnified. Some emulsions separate within a short time, others last for months.

"Most of the various insecticides, except Paris green, decompose soap, and therefore destroy the emulsions that they are mixed with. Hence, there is urgent need of clean vessels and utensils. Kaolin, or even good clay, may be used as a 'marker' to indicate the completeness of the spraying. Crude oil emulsions are somewhat more difficult to make than those with kerosene, but they are practicable. The cost of materials needed to emulsify a gal. of kerosene

or of petroleum oils ranges from 1½ cts. to 15 cts. 'Soluble oils' may easily be made, with but a few appliances and with but little skill."

INSECTS AND INSECTICIDES

The Agr. Exp. Sta. of Fort Collins, Col., has issued a bulletin, No. 114, containing information in regard to the common insect pests and the remedies that are commonly used for their destruction or prevention. The 1st part deals with the most important insects attacking both large and small fruits, detailing, in particular, those that attack the different parts of the tree, bush or plant. The description, life history, habits and remedies for each are included.

The 2nd part takes up the preparation and use of the more common insecticides, giving in detail those substances that kill by being eaten by external contact, by being inhaled, and those that repel. Insect traps are also dealt with.

The best methods of applying insecticides, wet and dry, are described. Spraying is taken up as follows: "The first requisite for a good job of spraying is a pump that will give plenty of pressure in the hose. Then, if one has a good spraying nozzle and a liquid that is free from solid particles of a size to clog the sprayer, there will be no difficulty in getting a good spray. Barrels and tanks should always be filled through a strainer to avoid loss of time and annoyance through the clogging of nozzles.

"A very fine spray is most economical of material and, for an even and thorough distribution, is best, and is especially useful for the destruction of caterpillars, slugs and other insects that devour the foliage of plants. In case of the first spraying for the codling moth, however, I am still constrained to recommend, as I have done for years, that the spray be a medium coarse one. By this I do not mean that the spray should be composed largely of large drops produced by the breaking up of a solid stream thrown forcibly into the air, and it should not be a fine mist or fog. A rather coarse Vermorel, or a good Bordeaux nozzle with a pressure of 100 or 125 lbs., will furnish such a spray. When spraying is being done to destroy leaf-eating insects, care should be taken not to spray too long in one place, as this will result in the little drops that collect upon the leaves uniting and running off, carrying the poison with them. Here again this rule does not apply to the first treatment for the codling moth. In that application there should be but one end in view, and that to fill every blossom or calyx cup with the spray.

"There are two types of nozzles that are used almost exclusively for the distribution of liquids. Perhaps the most popular among these are the Bordeaux and Seneca nozzles which throw a flat spray or a solid stream, and the Vermorel nozzles which throw a cone-shaped spray, which may be graded from medium coarse to extremely fine, depending upon the pressure and the tip that is used upon the nozzle. It is a big advantage in nozzles of this class to have them joined to the connecting rod so they may be turned at any angle to the rod that is desired. Any of these nozzles may be used singly or in batteries of 2 to 4."

FUNGICIDES AND INSECTICIDES.

A brief treatise on the subject of spraying was issued during the past summer by the Agr. Exp. Sta. at Columbia, Mo. It is bull. No. 23. It contains formulæ for combatting insects and fungi and a spray calendar. Among other interesting points mentioned are the following:

"Plant diseases are caused by some or all of 3 causes—fungi, bacteria, and insects. Many fruit growers attribute the failure of their plants to bad weather; too wet, too dry, too hot, or too cold. These causes are only secondary and their influence is of minor importance. By far the greater amount of damage done to fruit and vegetables is due to fungi, which are minute

plants closely related to the moulds, and live entirely on the bodies of the higher plants. These fungi are very numerous, occurring everywhere on the bodies of both dead and living plants and sometimes on animals. When occurring on dead tissues, they cause the tissues to rot or decay, while on the living plants cause various effects which we know as diseases. These diseases are often attributed to bad weather, but as said above, the weather exerts only a secondary influence. For instance, in the early spring, just after the apple has dropped the petals from its flowers, many of the young fruits are found to have turned yellow and dropped off. Close inspection of these yellow fruits discloses a black mould growing on the body of the apple and also on the stem. Many persons consider this blackening to be directly caused by the cool, wet weather in which it always occurs. It is, however, caused entirely by the apple scab fungus, which develops most rapidly in the cool, wet weather.

"The curling of peach leaves in spring will take place in the same sort of weather, and like the apple scab, is caused directly by a fungus attacking and living on the tissue of the peach leaves. It may be seen as a white mould covering the curled parts of the leaves or twigs. The mould which attacks the fruit of the peach at the time it begins to ripen, causing the fruit to become covered with a grayish mould and quickly rot, is another of the many fungi which attack and destroy the fruit crop.

"No plant is exempt from the ravages of fungi. Nearly all of them develop more rapidly in wet than in dry weather, and the cool, wet weather of spring will usually be followed by a great loss of the fruit through the ravages of fungi. In such cases, it behooves the fruit grower to spray and spray thoroughly.

"For all forms of fungous diseases certain measures may be adopted to control their development. When once a fungus is well established in the plant, however, there is no way by which the disease may be eradicated. Plants differ from animals in being unable to take into their bodies remedial agents, and on this account all material intended for the control of diseases must be put on the outside of the plant. Boring holes in the trees and injecting materials of unknown composition is to be condemned, since it does more damage to the trees than good."

STRAWBERRY CROWN GIRDLER.

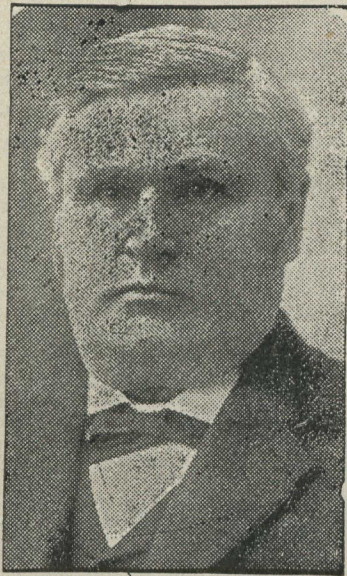
The Maine Agri. Exp. Sta. has sent out Bulletin 123 on insects. The strawberry crown girdler is discussed with reference to its tendency to enter houses, and data concerning its food plants and suggestions as to remedial measures are given. Notes on other insects which have been conspicuous during 1905 are recorded. Among these are the tussock moth, red-humped caterpillar, stalk borer, mourning cloak butterfly, chain dotted geometer, rosechafer, carpet beetle, wire worms, and a grey snout beetle. A list of insects sent to the station in 1905 for identification is appended.

It is pointed out that the strawberry crown girdler in the larvæ or grub stage feeds on the roots of grasses and other plants. Strawberries are especially susceptible to attack and should not be set in or very near soil infested by these grubs. The only known practical remedy is clean cultivation. The adult beetles feed upon the leaves of the strawberry and many other plants. When they are numerous enough to cause much injury, arsenate of lead should be used as a spray.

Send us two new subscriptions to THE CANADIAN HORTICULTURIST, and we will extend your own subscription one year. Send us one, and we will extend it six months. The more subscriptions, the greater influence behind the editorial chair

The Horticultural Societies of Ontario are Active

THE Windsor, Walkerville and Sandwich Hort'l Society held its annual meeting on Jan. 9, elected officers and transacted other important business. The treasurer's report showed that there was \$383.44 cash on hand. It was decided that the premium magazine which is given for a year to each mem-



Mr. Archibald McNee
President Windsor Horticultural Society

ber be changed from *The Garden Magazine* to the home paper, *THE CANADIAN HORTICULTURIST*.

Plans were discussed to make the city of Windsor one of the beauty spots of Essex. Two or three public meetings will be called during the winter when lectures will be given and matters discussed whereby the society can accomplish the most good in this direction.

The following officers were elected: Hon.-pres., S. Lusted; pres., Archibald McNee; 1st v.-pres., C. J. Stodgell, Walkerville; 2nd v.-pres., Geo. Lanspeary; sec., John O. Cheyene; treas., J. T. J. Reynolds; auditors, Messrs. Holton and Templeton; directors, Messrs. Shepherd, Sweeney, Diesburg, Nairn, Bushell, Purcell, Lusted, Powell and Smith.

THE WOODSTOCK SOCIETY

At the annual meeting the reports demonstrated that the society has done good work during the past year. The president for last year, R. W. Woodroffe, read an address, in which he outlined the work of the society for the year. The sec.-treas.'s report showed that the receipts were \$308.81, and the expenditure, \$213.06, leaving a balance of \$95.75 on hand. The paid-up membership was 92.

The election of officers resulted as follows: Hon.-pres., R. W. Woodroffe; pres., J. W. Armstrong; 1st v.-pres., T. L. Clarkson; 2nd v.-pres., Wm. R. Vroman; directors: Mrs. Hoare, Mrs. Armstrong, Messrs. Tindale, Whaley, John Whitehead, D. C. Richmond, Ewing, Close, Bingham; auditors, Messrs. Hoare and T. L. Clarkson.

A by-law submitting the bringing into force of the Parks Act, was passed by a large majority at the last municipal elections in the city, and a park commissioner is now assured. This result has been brought about entirely by the efforts of the Woodstock Hort'l Society, the members of which are to be congratulated on the outcome of their work. The people appear to have been thoroughly disgusted with the manner in which this department had been managed by a committee of the council in the

past, and to realize that well-kept parks and boulevards have something to do with the progress of a city. The chairman of the parks committee two years ago boasted that he had saved \$70 out of a \$200 or \$300 appropriation made by the council for his department for the year. With continuity of purpose, Woodstock can be made as attractive a little city as can be found in the Dominion

THE SOCIETY AT OAKVILLE

At a meeting of the Oakville Hort'l Society, held on Jan. 9, a resolution was passed, dealing with the substitution of varieties by nurserymen. Much loss and injury has resulted to the fruit growing interests of that district, through the careless manner in which nurserymen have in past years filled orders for nursery trees, especially in the matter of substitution without the consent of the buyer. This practice entails much hardship on fruit growers, because of the length of time that must elapse before the grower can become aware of his loss through such substitution. The society decided to ask the Ont. Hort'l Assn. to petition, on behalf of the district societies, the Hon. Sydney Fisher, Min. of Agri., at Ottawa, to cause to be enacted a measure that would compel nurserymen to guarantee that all fruit trees, bushes and plants sold by them shall be true to name.

THE ELORA SOCIETY

Our annual meeting for election of officers was held in the town hall, Elora, on the evening of Jan. 9. The new act or law relating to societies was discussed, as a great many members did not fully understand it. We hope that societies will fall into line with the new act, and also that all societies will roll up a large subscription list to *THE CANADIAN HORTICULTURIST*, as we consider it worthy of support and a place in every home. Our society during the past year has been successful, and we hope for more success in 1907.—Jas. W. Love, Elora.

ANNUAL MEETING IN BELLEVILLE

There was a fair attendance at the recent annual meeting of the Belleville Hort'l Society. Considerable interest was taken in the election of officers for the ensuing year. It resulted as follows: Pres., W. C. Reid; 1st v.-pres., H. J. Clarke; 2nd v.-pres., S. J. Wedden; sec.-treas., W. J. Diamond; directors: Messrs. W. Rodbourne, D. Barrager, S. A. Gardner, J. Harris, E. T. Cherry, Mayor Sulman, W. J. Diamond, F. D. Diamond and W. Kemp.

The treasurer's report for the past year shows a balance of \$347.94. Plans were laid for this year's work. It is expected that the society will flourish and prosper even more than it has in the past.

LINDSAY HORTICULTURAL SOCIETY

Our annual meeting was held on Wednesday, Jan. 9, with R. Chambers, president, in the chair. The minutes of the last meeting were read and signed; also the annual report, showing receipts of \$183.99, expenditure \$153.30, balance on hand, \$30.69. Our officers for 1907 are: R. Chambers, re-elected president; Alex. Cathro, 1st v.-pres.; R. Morgan, 2nd v.-pres.; F. J. Frampton, sec.-treas.; James Keith and J. B. Knowlson, auditors. Our directors are: T. Connolly, Alex. Skinner, G. Irwin, C. Hughan, B. A. Woods, S. Nevison, F. J. Frampton, Mrs. G. A. Milne and Mrs. H. G. Whiteside.

During the past year we have distributed over 50 numbers of *THE CANADIAN HORTICULTURIST*, beside other literature, have held one lecture on lawn making, and have distributed 600 bulbs, consisting of hyacinths and lilies, and a number of dahlia roots besides.

Our opinion of *THE CANADIAN HORTICULTURIST* is that it is taking a first place as an educator along the lines of fruit, flower and vegetable

growing. It fills the long-felt need in Canada for a good publication of the kind. Keep it up.—F. J. Frampton, sec.-treas.

NEW WORK FOR TORONTO SOCIETY

Suggestions for work for the coming year were mentioned in a printed statement presented by the secretary, as follows:

"That the directors for next year take into consideration the naming of 6 streets (in different parts of the city) and offering prizes for the best kept lawn, flower beds or other floral attractions, which will add beauty and cleanliness, etc., to the surroundings.

"That three prizes be given each street, viz. \$15, \$10 and \$5, and that the streets be named not later than April 1, 1907.

"That it be advertised, and that those who wish to compete notify the secretary not later than June 15.

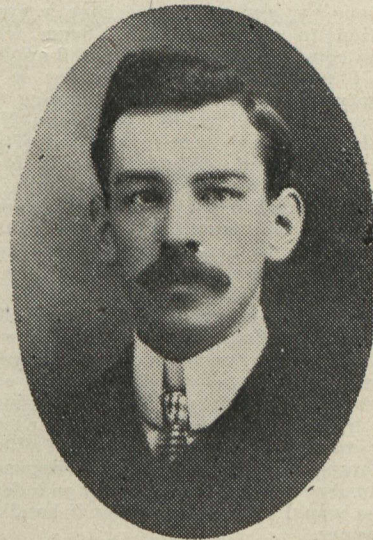
"That not less than 5 residents on each street compete or 3 prizes will not be given

"That 3 competent judges be appointed; and, if in their judgment prizes have not been earned, their ruling will be final. All competitors must be members of the society, and all be amateurs." Also:

"Endeavor to obtain some permanent improvement in the condition of the boulevards and lawns of the city by the planting of trees and shrubs, and hedges at street corners, etc., and seek to establish combined effort on the part of residents of different neighborhoods.

"Appoint some qualified person to make suggestions for the beautification of a street or neighborhood, and interest the residents by advising them of the recommended and possible improvement. Invite them to meet and discuss these improvements, and so obtain the combined effort sought.

"Apply for financial assistance from the city towards the purchase of necessary shrubs, hedges, etc., and have free distribution to those who undertake to carry out suggested improvements.



Mr. J. O. Cheyene

Secretary Windsor Horticultural Society

"Conduct meetings with addresses on civic improvement on above lines, and so stimulate and arouse interest in the matter.

"As an adjunct to the above scheme, offer prizes to members of the society having the best kept lawns, boulevards, etc., dividing competition into whatever classes may be necessary."

Nova Scotia Letter

G. H. Vroom, Dominion Fruit Inspector

Up to the present writing there has been shipped from the port of Halifax a little over 200,000 bbls. of apples. Of this number, nearly all went to England; 10,000 went to Newfoundland, and equal to 4,000 went to South Africa. Part of the South African shipment was made in half barrels, part in whole barrels and the remainder in bushel boxes. There are about 75,000 bbls. to go forward yet. These are mostly Baldwin, Stark, Ben Davis, Spy, Golden Russet and Nonpariel.

The packing has greatly improved this season. The No. 3 grade is still being shipped abroad. This is a great mistake, as it certainly has a depressing effect on the market.

Prices have been disappointing, and dealers in some instances are losing money. In many cases, the apples were bought as they came from the trees, and when they were packed according to the law the shrinkage was more than the price paid would stand and leave any chance to make profit.

About 3,000 bbls. of cranberries have been sold in the Canadian markets as the result of last year's N.S. crop. The net price would be an average of \$6 a bbl.

Montreal Notes

E. H. Wartman, Dominion Fruit Inspector.

During the export season at Montreal, August to November 28, 1906, 8,006 inspections were made on apples from an aggregate 394,399 bbls. and 55,475 bxs. Violations of various clauses of the Fruit Marks Act were many, yet a complete summary reveals to us a better tone than last year. Section 4 (c) shows the most violations, which clause demands a designation of quality. We found 4,648 bbls. without a designation. This demand is a very reasonable and necessary one, and it must be complied with or serious fines will follow.

STATE OF TRADE IN MONTREAL

The wholesale fruit men have about 28,000 bbls. of apples in store, of which the largest portion are No. 2 quality. This supply is not large for our local demand. We have had 60,000 bbls. of apples in store at this date in years gone by, and to-day we have a greater population to consume them. Some wholesale men complain of too many No. 2 apples in stock. I suppose apples were never so bad with sooty fungus as this season, causing them to be put in No. 2 grade. Of course No. 1 grade should be free from fungus and of good color for their kind. When the sooty fungus is seen, it disqualifies them for this grade; and when badly marked, they are not allowed in No. 2, as it will materially waste fruit. It pays a packer to always be on the alert for defective specimens and see that they are placed under a proper designation.

Apples that have been handled carefully in packing are keeping well; but, alas, how few have the careful touch that fruit demands! The fruit rotting to-day, when closely examined from bbls. or bxs., is quite evidently caused by a puncture or bad bruise, which is readily seen that starts decay. In California, where oranges are clipped off with clippers and individually wrapped, they keep for an indefinite time; so would our tender apples if handled in like manner.

Horticulture in the West

A. P. Ketchen, Deputy Commissioner of Agriculture, Regina, Sask.

The horticulture of the west has been grossly neglected. I am satisfied that western Canada could produce the major part of its requirements in the way of fruit if the matter were gone about in a systematic and determined way. Another crying need in the west is more attention to tree planting. What a transformation it would make on these wind-swept, sun-soaked prairies if every

farmstead was surrounded by a windbreak and shelter belt, such as Angus McKay has planted around the experimental farm at Indian Head!

If even the roadsides were planted with trees, it would improve the general appearance of this country 100%; and the pity of it is that it might be done so easily, but is neglected because of the sheer indifference of the people whose chief interest in life, in too many cases, may be summed up in land, wheat and money.

Beautiful and effective windbreaks and shelter belts can be produced in this country in from 8 to 10 or 12 years. Elms, willows and a number of other varieties of trees grow with surprising rapidity here if only planted and given a fighting chance for their lives.

Fruit Growing in Alberta

Geo. Harcourt, Deputy Minister of Agriculture, Edmonton, Alta.

It is well known that apples have been grown at various points in Alberta. In the spring of last year, the provincial department of agriculture sent out circulars to everybody in the province known to have tried large fruits, asking them to give a list of the trees they had tried and an account of the success they had met with. From these reports and other sources, the department has selected a list of what appear to be the hardiest trees for the province, and has decided to carry on a number of experiments in order to be able to give settlers authentic information on this important matter.

The orchards are to be of an acre in extent and will be distributed at seven points, possibly eight. The places selected are those which are considered to be the most representative of the various elevations and climatic conditions prevailing in the province; they are: Medicine Hat, Magrath, Leavings, Okotoks, Didsbury, Wetaskiwin, Edmonton and, possibly in another year, one in the Vegreville or Vermilion country.

About 80 trees will be experimented with at each station, the planting operations to extend over two years. A consignment of the planting material was ordered last fall and the trees buried over winter. These will be duplicated next spring and planted directly, when the two methods will be compared. Six varieties of standard apples, two of crabs and two of plums will be experimented with.

An agreement has been entered into with reliable farmers at these different points, who have already met with some success in tree growing and, as far as possible, locations have been chosen which are sheltered by the plantations set out under the auspices of the forestry branch of the Dominion Department of the Interior. By selecting such places the department at Edmonton hopes, besides making the actual fruit experiments, to draw the attention of the farmers to the benefits to be derived from these shelter belts on the prairies.

Winnipeg Letter

J. Albert Hand, B.S.A.

That many citizens in Winnipeg do not know one variety of apples from another, is very apparent. That the dealers take advantage of the consumers' ignorance regarding this somewhat minor detail is even more apparent. The wholesale fruit houses, and through them the retail dealers, allow large quantities of fruit to reach the consuming public altogether out of season.

What does a lover of fruit want with Golden Russet apples at this season? What demand is there for pears in Dec.? What does a trained taste for Snow apples think when Ben Davis are put up instead? These and kindred games are played on the consumers of this city every day. Golden Russets appear in every fruit collection. A wholesale house has several hundred barrels of Kieffer pears. Any apple that resembles the kind required is given and the purchaser is so disgusted in many cases that he wants no more fruit for some time.

The other night, as I was going home, I saw some nice apples in a window. As they looked like good Snows, I decided to buy some. A lady waited on me and as she began to bag them I noticed they were not Snows. I called her attention to the fact, but she insisted they were "real Snow apples." When I laughed she was haughtily indignant, because I doubted her veracity, or perhaps her knowledge of varieties. The apples were small Ben Davis. I called at the next store to see if they had anything to suit. There were some large dark red apples. On enquiry I learned these were "Alexanders." I do not know what they really were.

The retailer innocently plays these tricks. Names of varieties most generally asked for are attached to any apple that has the color. Golden Russets and Roxbury Russets are all the same. It is known by most of them that a Snow apple is red and that it sells well; so, any red apple must be sold as a Snow until it's season is far past.

The wholesaler is the man to be blamed for a part of this deception. He should be thoroughly acquainted with almost every variety. In the interests of the apple trade, he should see that no variety is put in retail stores out of season. Every time a consumer gets an inferior, tasteless apple the trade is hurt. Every time a consumer gets a superior, tasty apple the trade is given a boost. A Snow or a Spy or a Russet, in season, makes the consumer want more. It is safe guessing that if wholesale houses and retailers knew the varieties and put only the best up for sale and in proper season, that the demand would be doubled.

Kieffer pears are a drug on the market when fall or winter comes. They will keep, but they are fit for preserves only. What housewife wants to start preserving at this season? She has done her preserving in summer and nothing but a profitless low price will induce a purchase for that purpose later.

The wholesale houses report a heavy business for the past 2 weeks. This will continue until Xmas. R. A. Rogers has worked night and day for several days. This firm sends carloads to points west. Their own representatives accompany the car to make delivery and prevent freezing. Everybody wants Spys. Greenings and Russets are also asked for. Any Snows that have been kept in good condition are readily picked up at high prices.

A great improvement has been noted in the stock sent here from Ont. There is not $\frac{1}{3}$ as much inferior fruit as came last year. A great part of the improvement is credited to the eagle eye and careful work of Dom. Fruit Insp. Philp. Good honest packing by the producer and shipper, and attention to varieties by the salesman, will increase the sales wonderfully throughout the west. [NOTE.—This letter was written in December.—ED.]

Superior Quality Tells

"Dealers will pay extra prices for high grade fruit," said Mr. H. L. Roberts, of Grimsby, to THE HORTICULTURIST. "In July, I visited a large number of retail dealers in Ont. and Que., and I was told, in every instance, that they will pay extra money for fruit that can be depended upon in the matter of quality and of packing. Good fruit often brings less than it is worth, owing to carelessness in the manner, of preparing it for market. High grade fruit, properly selected and packed and put up in attractive packages, always commands a good price, in those markets that are overstocked with ordinary fruit—even good fruit in inferior packages."

A branch of the Ont. Veg. Grs. Assn. was organized in Ojibway, on Jan. 12, with 18 paid members. Much enthusiasm was shown. The branch is confident of increasing its membership to 100 within a short period. The branch has been named "The Sandwich West Veg. Grs. Assn. of Ont." The secretary is Wm. Henry O'Sullivan.

Choice Seeds—Free

If you are planting a garden or flower-bed, be sure and read this offer. Every lover of flowers will want to receive some of the seeds and plants listed below. These are offered free except for a few minutes' work among your friends and neighbors. We will send any or all of these seeds or plants to every person who will get us new subscriptions. For every new subscription you get at 50 cts. a year we will allow you the equivalent of 40 cts. worth of seeds. The prices marked are the lowest retail prices. We are able to make this offer only because we have been able to secure these goods at specially low rates. Be sure and order by number:

No. 1—PANSIES.—Giant Trimardeau, mixed, the largest of all pansies, flowers are very large, and of all colors and shades.10c

No. 2—PANSIES.—Giant Black This pansy is another of the large size varieties with beautiful blue-black flowers.10c

No. 3—PANSIES.—Giant Madam Perret. Plants of this variety are full and spreading, with very broad and extremely dark leaves. The color of the blossoms ranges through all shades of red, from pink to a fine deep purple, with an intermediate red edged with white.20c

No. 4—ASTERS.—Crown Prince. This is the most perfect type of Giant Comet or Ostrich Feather Asters in existence. The flowers are much larger than those usually borne by the Giant Comet, and the petals are longer and more beautifully curled and twisted, and produced in much greater abundance. It is the latest achievement in mammoth Asters. Not so tall as the branching Asters. Flowers 5 to 6 ins. across are common. Mixed colors.15c

No. 5—ROSE CROWN COMET.—Striking novelty; flowers of the true Giant Comet type, composed of long, wavy, twisted petals, gracefully formed; densely double flowers, centre

pure white surrounded by rose pink; an unique and beautiful combination.10c

No. 6—DAYBREAK.—Simply unsurpassed. The flowers are perfectly rounded, very large and full, on long stems; the color is a charming sea-shell pink; the plant flowers very early and is a continuous free bloomer; compact, strong grower, and in all respects a desirable acquisition.10c

No. 7—SWEET PEAS, OUR SPECIAL MIXTURE.—This mixture is made up from all the finest new sorts, and will give the most satisfactory results. We particularly recommend this selection.10c

No. 8—Grows in perfect bush form from 24 inches high and 18 inches wide. It requires no trellis, like the tall Sweet Pea, neither does it hug the ground Verbena-like, as does the Cupid race. The flowers, of good size, are of beautiful and varied colors. Mixed colors.5c

No. 9—DOUBLE SWEET PEAS.—Not so beautiful as large expanded single flowers. As good a strain as any, but not more than about 30 per cent. of the flowers, as yet, come double from the most carefully selected seed. Newest sorts, mixed.5c

FOR SALE AND WANT ADVERTISEMENTS

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

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

BE INDEPENDENT—We have a proposition that will appeal to all men interested in horticulture and who wish to be their own employees. Write immediately.—THE CANADIAN HORTICULTURIST, 506-7-8 Manning Chambers, Toronto.

NO MORE BLIND HORSES For Specific Ophthalmia, Moon Blindness and other Sore Eyes, BARRY CO., Iowa City, Iowa, have a cure.

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The Great Commercial Strawberry of the Niagara District

It is quite safe to say that more Williams Strawberries are grown in the Niagara District than all other varieties combined. It is certainly the kind for best results over a wide range of territory and adapts itself to a variety of soils. Be sure and get plants of strong vitality and true to name. I am now booking orders for Spring shipment at \$4.00 per 1,000, 50c. per 100. Can also supply limited quantities of other standard sorts at reasonable rates.

THE CARLETON FRUIT FARM

WM. H. BUNTING

ST. CATHARINES, ONT.

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Shade and
Weeping
Trees**



CUT LEAF WEEPING BIRCH

Beyond question one of the most beautiful and popular of all weeping or pendulous trees. Its tall, slender, yet vigorous growth, and graceful drooping branches and silvery white bark, present a combination of attractive characteristics rarely met with in any other tree. I have an unlimited quantity of all sizes from 4 to 6 feet, 6 to 8 feet and 8 to 10 feet. Special prices on application.

WEIR'S CUT LEAF MAPLE

A silver maple with remarkable dissected foliage. A most rapid grower with long, slender drooping shoots which give it a most graceful appearance. I have several hundred fine specimens in two sizes, 6 to 8 feet and 8 to 10 feet.

LANDSCAPE GARDENING. The character of this work obviously suggests the desirability of employing none but persons capable of exercising correct judgment and good taste in their execution. I have on my permanent staff a thoroughly qualified Landscape Architect and Draughtsman who will cheerfully furnish plans, specifications and estimates where required.

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Is what every fruit grower should grow.
Is what every fruit dealer wants.
Is what we can tell you how to grow.
Is the only strictly Horticultural Paper in the United States.
Is what you should subscribe for, if you want to know how to realize more money for your fruit.

SUBSCRIPTION PRICE, \$1.00 PER YEAR
SEND FOR SAMPLE COPY

Better Fruit Publishing Co.
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Speakers for Horticultural Societies

The secretary of the Ont. Hort. Assn. is endeavoring to secure some well-known speakers from the U.S. to address meetings of horticultural societies in Ontario. A letter has been received from J. Horace McFarland, president of the American Civic Assn., and one of the best known speakers on civic improvement and horticultural matters on the continent, in which he offers to address meetings of horticultural societies at a charge of \$25 and his expenses, the lantern for the stereoscopic lecture to be supplied by the local society. Usually Mr. McFarland charges \$50 a lecture and his expenses, but he is willing to accept the lower rate provided the societies will arrange to hold their meetings successively.

Any horticultural societies in the province that would like to engage Mr. McFarland to address a meeting during March or April should write to the secretary of the association, H. B. Cowan, THE CANADIAN HORTICULTURIST, 507 Manning Chambers, Toronto. Mr. McFarland

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No. 6 Iron Age Combined Double and Single Wheel Hoe, Hill and Drill Seeder

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has a new lecture this year, entitled "A Crusade Against Ugliness," which is said to be both entertaining and attractive.

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Portland to Liverpool

WELSHMAN	Mar. 2nd
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FOUR NEW ENGLISH SWEET PEAS

NORA UNWIN

This charming variety especially takes its place easily in the front rank of pure whites, far out-distancing "Dorothy Eckford," which was hitherto considered the finest white, being larger, purer and finer form. It has the same bold, wavy standard as "Gladys Unwin," and like all the progeny of same, it is true to name and does not sport. Original sealed packet **.35**

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A superb pink of "Gladys Unwin" type, color a pale pink much like the old "Princess Beatrice," which was thought so much of when it was introduced many years ago; but the flowers of "Mrs. Alfred Watkins" are very much larger and have the beautiful bold, wavy standard of "Gladys Unwin." It will be found one of the best market varieties for cut bloom. Original sealed packet **.35**

FRANK DOLBY

A lovely pale blue, the same shade as "Lady Grisel Hamilton," but **very much larger**, and being also bred from "Gladys Unwin," it has the same bold, wavy standard and large size of its parent. It is to-day the largest and finest pale blue Sweet Pea. Original sealed packet **.35**

E. J. CASTLE

A magnificent addition to the "Gladys Unwin" class, with the same large flowers and bold, wavy standard of its parent. The color is a very rich carmine rose with salmon shading in the standard, and this, over and above its other merits, has a rich striking effect, especially in artificial light. Original sealed packet **.35**

1 Packet each above 4 varieties New Sweet Peas, \$1.25

J. A. SIMMERS

SEEDS — BULBS — PLANTS

TORONTO, ONTARIO

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For Gardeners and Fruit Growers

We announced in our last issue that THE CANADIAN HORTICULTURIST would send a copy of Howard Evert Weed's "Spraying for Profits" to any address on receipt of 15 cents. The response was immediate, as many requests for copies have been received from prominent fruit growers and gardeners. This little book is important to every fruit grower and gardener, and is worth many times its price. THE CANADIAN HORTICULTURIST has made arrangements to supply its readers with copies.

As a special inducement to readers and friends of THE CANADIAN HORTICULTURIST, we will send this book to anyone who will send us *one new* subscription. We know every reader of THE CANADIAN HORTICULTURIST is interested in horticulture, and along these lines this book is very desirable.

The seed catalog of Wm. Ewing & Co. of Montreal has been received. In it are the names and descriptions of all the leading varieties of vegetables, flowers, perennial plants, roses and so on. A large number of the most up-to-date appliances and tools for use in the garden and orchard are also handled by this enterprising firm. All interested should send for a copy of this excellent catalog.

The cuts used to illustrate the article in this issue entitled: "Results in Growing Gladioli," were kindly loaned by the Simcoe Reformer.



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Swift's Arsenate of Lead

This is the most efficient and lasting of all insecticides, and at the same time the safest. Swift's Arsenate of Lead sticks to the foliage after application and stays on; rains will not wash it off. This means a saving of time and solution in respraying, and uninterrupted protection of your plants or trees. There is absolutely no danger of burning or scorching the foliage no matter how strong a solution is used; solution is made with water only, or it may be combined with fungicides. Swift's Arsenate of Lead is the perfect insecticide for the Coddling Moth, Potato Bug, Gypsy Moth, Tent Caterpillar and all other leaf-eating insects.

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One cannot tell much about seeds' reliability by their appearance.

"The Harvest Test is the Only Test."

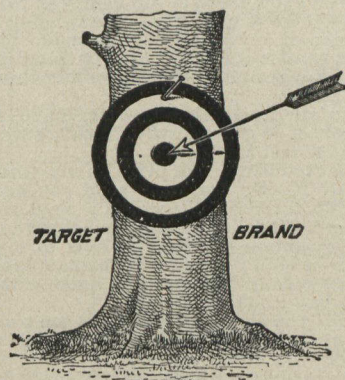
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Are the result of many years of careful selection, and in the ground they can be relied upon to produce bigger and better crops. Thousands of planters all over Canada can vouch for this fact. Our 1907 Catalogue is more complete than ever and we want to mail you one. Send along your address.

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IS NOW THE PEER
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FOR SAN JOSE SCALE, OYSTER-SHELL BARK-LOUSE
APHIS AND SIMILAR PESTS

Destroys both insects and eggs. Is NOT in the least injurious to trees, etc. Does not separate while spraying, and CAN BE instantly PREPARED right IN THE FIELD.

JORDAN HARBOR, ONTARIO

"Having had occasion to use a trial can of your 'Target Brand' Scale Destroyer on a tree that had the scale as bad as a tree could have it, I gave it one application last spring, and have found it a success after a thorough examination. I am convinced that it will do the work, as I cannot find a live scale left."—ENOS J. FISHER

(Mr. Fisher has bought a second supply to use on the trees which surrounded this one.)

We have others still stronger than the above. See previous issues.

W. H. BRAND

Canadian Representative
and Salesman

Jordan Station, Ont.

Mention The Canadian Horticulturist when writing.

POULTRY DEPT.

Conducted by
S. Short, Ottawa

In the February issue reference was made to the two methods of hatching chicks—by hen and by machine. We shall discuss in this issue some of the different chick foods that are equally good for the chicks, whether reared in a brooder or by the mother hen. Some breeders use broody hens to rear the chicks hatched by an incubator. This is a good method if the season is advanced, say, May and June, but in March and early in April broody hens are not obtainable in sufficient numbers, and it is then that a brooder becomes a necessity.

As with the incubator, so with the brooder, each manufacturer sends the fullest and most complete directions. The operator cannot do better than follow those instructions to the letter, and only change when experience has taught him that better results will follow any changes made.

No machine will rear all the chicks put into it, or very rarely. It is true also that 90% of the hen mothers trample one or more of her brood to death in the 4 or 5 weeks they are with her. It would be unfair to the machine, too, to blame it for the chicken mortality which

may result from earlier causes. The hens that laid the eggs may have been laying hard all winter and are slightly run down, and while the egg hatches the chick may be constitutionally weak, and no care, whether by hen or brooder, will save it. Buy your eggs from vigorous stock, preferably from fowl that have been kept in cold houses; that is, where no artificial heat is used, and again from fowl that have been fed chiefly grain and very little soft food or mash, for experiments have proved that fertility of egg is higher where hens have been fed dry food. This is important early in the season.

Having removed the chicks from the incubator to the brooder, which has been prepared for their reception according to received directions, the next care is to feed them carefully. Some experts do not recommend feeding for the first 36 hours because the yolk of the egg (on which the chick lives immediately after hatching) takes that time to be absorbed or assimilated. I think that 36 hours is rather long. They will eat readily at 24 hours after hatching. Then let them have very light feed. Fine grit should be in the litter or chaff on the floor of the brooder, and will be picked up by the chicks to their advantage. Early in the season it is much harder to feed successfully than in the warmer weather when the brooder can be placed outside. When obtainable, it saves a good deal of time to feed the prepared foods such as the Cyphers Chick Food, which

is composed of the different grains and meat meal in the proper proportions. This food can be used for the first 4 weeks, and the cheaper grains afterwards.

For soft food, the Puritan Meal is much thought of in Ottawa, and is generally used. Hard-boiled eggs, chopped fine, are always good, and stale bread, soaked in milk and squeezed dry, into which a little fine chopped onion or lettuce has been added, makes a good soft feed. If blood or meat meal is not convenient, boiled liver cut fine and fed every 3 or 4 days is excellent. It is well to understand that every 15 chicks put into the brooder will raise the temperature one degree, so watch the temperature that it is neither too hot nor cold, especially for the first week.

Over 1,500 New Subscribers

Within the past five months, or since we reduced the subscription price, we have secured, with the help of our friends, over 1,500 new subscriptions to THE CANADIAN HORTICULTURIST. It meant much work and expense, but only by securing more subscriptions are we able to give our readers THE CANADIAN HORTICULTURIST in its present form for 50 cts. a year.

Many of these new subscriptions will begin with the February issue. We expect to further increase the number of our readers by 1,000 beginning with the March number. In our efforts to secure subscriptions we want every subscriber and friend to do their part, for only with your help will we attain the 10,000 mark by Jan. 1, 1908.

In return for your support and help we will continue improving THE CANADIAN HORTICULTURIST, giving our readers a better paper for 50 cts. than what they formerly paid \$1.00 for. Every department will be greatly strengthened during 1907; and, when we turn over a new leaf into 1908, we want to know that we have a class of readers who are pushers and who are interested in THE CANADIAN HORTICULTURIST for the good it is doing.



Let Me Sell You a Chatham Incubator —On Time—

Do you know there is big money in raising poultry? Do you know there is more money in running a good incubator than in almost anything else you can do for the amount of time and trouble it takes? Do you know my incubator will pay you a bigger profit than any other thing you can have on your place?

Well, all these things are true, and I can prove it. Thousands of people all over Canada have proved it every year for the last five years.

I want to quote you a price on my Chatham Incubator, —sold ON TIME. I want to send you my Chatham book. This incubator book is free—I'll send it to you for just a postal card. It tells you a lot you ought to know about the Poultry business—it tells you how to make money out of chickens—it tells you how my Chatham Incubator will make you more money than you can make with hens—far more, and with less trouble.

This book tells you how my Incubators are made—why they are the best ever invented—and why I sell them ON TIME and on a 5-Year Guarantee.

My Company has been in business in Canada for over 50 years. We are one of the largest wood-working factories in the country. We also operate a large factory at Detroit, Mich. We have the Incubator and Brooder business down to a science.

Chatham Incubators and Brooders will make you money, for a Chatham Incubator will hatch a live, healthy chicken out of every fertile egg put into it, in 21 days.

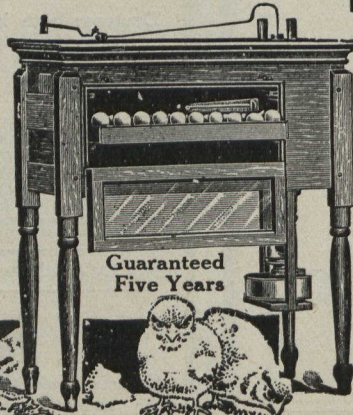
Will you write for my book today? Do it now while you think of it. Just say on a postal "Please send me your Incubator Book"—that's all. Address me personally.

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Five Years

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

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TORONTO ———— ONTARIO

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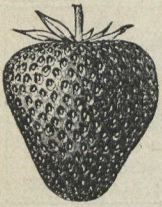
By HOWARD EVARTS WEED, M.S.

A practical hand-book describing the best methods for suppressing the more common injurious insects and fungous diseases. This book should be in the hands of every fruit man and gardener. It is well worth the price of 15c. a copy. Send for it now, and ask for a copy of our free book catalog.

The

Canadian Horticulturist

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CANE BERRY PLANTS

7 Varieties SEED POTATOES
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Clear Cypress for Greenhouse Work
Mention The Canadian Horticulturist when writing

Tried to Evade the Law

Early in February, the daily press of this country published reports of an attempt to evade the Fruit Marks Act by a well-known Canadian apple man, who has been exporting via the port of Portland, Me. According to the *Portland Daily Press*, of February 2, the reports were well-founded. That paper stated that W. W. Moore, Chief, Markets Division, Ottawa, spent some days in Portland investigating the case. The investigation showed that one shipper raised the grade mark on two cars of 300 bbls. of apples. This was done in Maine because there is no law there forbidding such a practice. The shipment was from Colborne, Ont., and originally bore the marks of grades No. 2 and No. 3, which grades the apples fairly represented. The grade marks, however, were not placed in the customary position on the barrel head. Some of the barrels were marked as follows:

CANADIAN APPLES,

Packed by
No. 2.

— — —, Colborne, Ont.

Others had No. 3 instead of No. 2.

The custom is to mark the grade after the name of the packer. The marking of the grade, No. 2, after the words "Packed by," was for the purpose of giving the impression that it was not the grade but a number indicating the packer of that barrel.

The shipper or his agent marked all the apples previously marked No. 2, No. 1 XXX, and the apples previously marked No. 3, No. 2 XX, placing the marks in the customary place. Mr. Moore watched the agent mark the barrels of two cars and then presented his official card which showed him to be an employee of the department of agriculture. Mr. Moore believes that this is the first attempt that has been made to evade the Canadian law in this manner. Fortunately, it was "nipped in the bud."

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Dear Sir:—

After trying an incubator for two years and spoiling eight hatches of eggs, I threw the incubator away in disgust, never meaning to try again, knowing that it was not the fault of the eggs, as I raised over 400 under hens. Last December I read Chas. A. Cyphers' book, "Incubation and Its Natural Laws," after which I ordered a Model, which I had to work under trying conditions. First, I only had eggs from pullets mated with cockerels, mated up only five days before I set incubator. Second, the location in a room that varied from 65 to 28; for two days and nights the temperature was at 30 to 32, and your Model only lost one-half degree—from 103 to 102½. The results are just grand. Out of 71 eggs I got 65 of the strongest chicks I ever saw. All came out on the 20th day, within five hours of each other. Two of the eggs I broke. The other four must have died about the 16th day (weak germ). They are now all safe in a Model Colony Brooder, and all 65 as healthy and well as though it were summer. Temperature inside brooder steady night and day at 90. Outside blowing and snowing as hard as it can.

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Items of Interest

At the annual meeting of the N.B. Fruit Growers' Assn. held at Fredericton on Feb. 15, the following officers were elected for the ensuing year: Pres., J. C. Gilman, Kingsclear; v.-pres., I. W. Stephenson, Sheffield; treas., Henry Wilmot, Lincoln; sec., T. A. Peters, Fredericton; directors, J. W. Clark, J. P. Bel-yea, Geo. McAlpin, Wm. Raymond, J. H. Tilley, Wm. McIntosh, John Ferguson, F. B. Hatheway, B. Flewelling, Norman Hallett and Isaac Stephenson. In the next issue of The Canadian Horticulturist will appear a report of the proceedings of the convention.

The 7th annual banquet of the members of the Toronto branch of the Ont. Veg. Grs. Assn. on Feb. 6, was the largest and best yet held by the Assn. It was attended by over 150 growers. The well-known people present included Messrs. A. Campbell, M.P.; W. Maclean, M.P.; J. W. St. John, M.L.A.; Hermann Simmers, and others.

The new officers of the Strathroy Hort'l Society are as follows: Pres., T. Benstead; 1st v.-pres., T. Luscombe; 2nd v.-pres., John A. Anderson; sec.-treas., R. F. Richardson; directors, Albert McPherson, Geo. Richardson, John Robertson, D. Patterson, F. W. Atkinson, J. W. Prangley, Chas. Beckett, W. Murray, J. J. Condon and W. E. Buttery. It is the intention of the society to distribute seeds and bulbs to members, to hold a midsummer exhibition, and to encourage both horticulture and floriculture in other ways.

The following officers were elected for the ensuing year at a recent meeting of the Flora and Salem Hort'l Society: Pres., Wm. Findlay; 1st v.-pres., Robt. Tapham; 2nd v.-pres., Alonzo Schafer; sec.-treas., Jos. W. Love; auditors, Messrs. Henry Clarke and Fred. J. Ross, and 9 directors.

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Apple, Pear, Plum, Cherry, Peach, Nut and Ornamental Trees. Small Fruits, Roses, Shrubs, cheap. Specialties: Wismer's Dessert Apple and Mammoth Prolific Dewberry.

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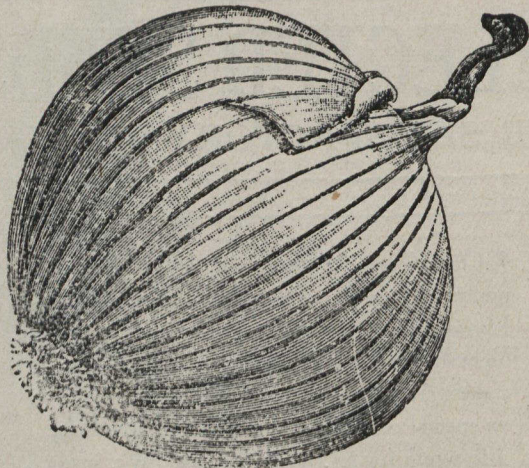
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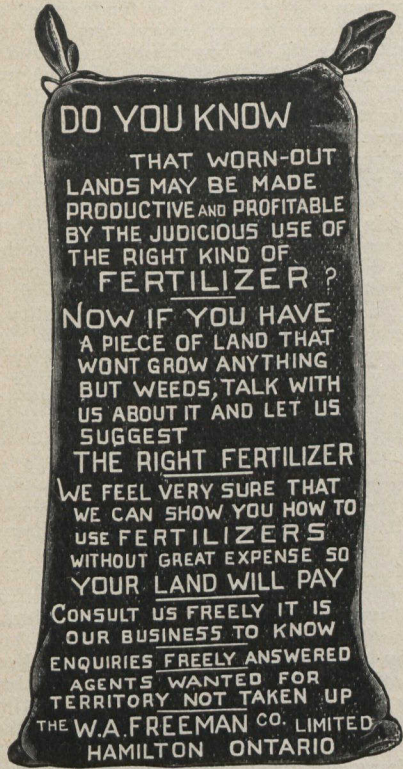
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Vegetable Experiments

The Ont. Agric'l and Exp'l Union intends conducting cooperative experiments with vegetables. The following is a copy of a pamphlet issued by Prof. H. L. Hutt, O.A.C., Guelph, who has charge of the work, and to whom applications for seeds should be addressed.

"For a number of years we have been conducting a system of cooperative experiments with fruits. There are now over 2,000 persons throughout the province who are carrying on these tests. This work is proving of great service to those engaged in it, not only because of its practical nature, but because of its educational value.

"It has been decided to extend the work this year to include vegetables as well as fruits. A beginning will be made with beets, carrots, lettuce, and tomatoes, and in due time other garden crops will be added to the list.

"This work is carried on through the agency of the Experimental Union, an organization managed by the officers, students and ex-students of the O.A.C., but every resident in Ont. interested in horticulture is invited to join in the work and benefit by the results of the experiments.

"The following list gives the varieties which have been selected for each experiment. These have been selected from among those which have given the best results in the extensive experiments conducted at the college, and are most likely to give satisfaction in the garden of the amateur or commercial grower: Exp't No. 1, Beets—Black Red Ball, Eclipse, and Model; Exp't No. 2, Carrots—Chantenay, Danvers Half Long, and Rubicon; Exp't No. 3, Lettuce—Black Seeded Simpson, Denver Market, and Hanson; Exp't No. 4, Tomatoes—Earliana, Stone, and Success.

"Each person in Ont. who wishes to join in the work may choose any one of the experiments for 1907, and send in his application.

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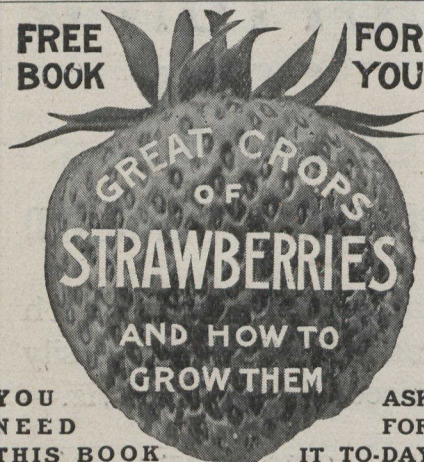
If you have never planted them, try them this year. They never disappoint—they grow—they yield. Always sold under three guarantees, insuring freshness, purity and reliability. For this reason, thousands of farmers, gardeners and planters, both in the United States and Canada, plant Gregory's Seeds exclusively. Our new Catalog contains many suggestions and directions—the fruit of fifty years' experience in the seed business.

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THE BEST BOOK ON STRAWBERRY CULTURE ever written, because it explains every detail of the work from the time plants are set out until the berries are picked, and tells how to prepare the plants for a big second crop. 125 Pictures of strawberries and strawberry fields. This book is worth its weight in gold. If we knew your address, would mail you one **Free**.
R. M. KELLOGG COMPANY, Box, 570 Three Rivers, Mich.

All we require is that the applicant give the number of the desired experiment, and agrees to follow the directions furnished; to properly care for the crop; and to report the result at the end of the season when requested. The seeds will be sent by mail, free of charge, in due time for spring planting. Applications will be filed in the order in which they are received until the supply becomes exhausted. Those who apply promptly will be most likely to get what is wanted.

"A circular giving full instructions for conducting the experiment, and blank forms upon which to report the results of the test, will be provided with each lot of seed. We trust your interest in this work may lead you to become a successful experimenter."

Send for our free book catalog. It will interest you. Send now.

At a meeting of the Ottawa branch of the O.V.G.A., held in February, it was decided to do away with the habit of giving 13 for a dozen when selling vegetables. The move was an important one, and met with the approval of the members.

St. Catharines horticulturists are planning for a great horticultural show next year. Recently a representative delegation from the St. Catharines Hort'l Society waited on the local county council and asked for a grant of \$175, which they were promised. Already plans have been made by the society that will make the show next year even better than the excellent one held last year.

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Size in Exhibition Apples

Ed., CANADIAN HORTICULTURIST,—The point raised by Mr. McNeill in the Jan. issue of THE CANADIAN HORTICULTURIST, in reference to how much value shall be given to the size of specimens in apple exhibits, is a very important one. It is one, as he says, on which judges do not by any means agree. Yet, the tendency of late years has been strongly away from the idea that size was the all-important point, and in favor of giving color, uniformity, freedom from blemishes and quality more nearly their due consideration.

I agree most emphatically with Mr. McNeill that, when it is a choice between normal-sized specimens which are smooth and well colored, against over-large ones which are rough and lacking in color, there should not be the slightest hesitation in giving the former the preference. I find, however, in my personal experience as judge, that it is often extremely difficult to draw the line as to just where desirability in size ends and undesirability begins. Still, if we could once establish the principle, and have it generally accepted that it is quite possible to overdo the matter of size, it would certainly be a point gained; and we should then have judges endeavoring to decide on the line I have just mentioned, instead of, as it is too often the case now, assuming "the bigger, the better."

On the other hand, it should be borne in mind that the commercial value of the different points considered in judging is really the basis on which our scheme of judging rests, and that with some apples in some markets size is, if not the all-important point, at least the winning point, *other things being equal*. I have been told by some of our growers here in Nova Scotia that their "extras" (which have been merely No. 1's of extra size) always bring them the most money. With such apples as Wolf River and the like, which are used for decoration, large size would certainly add to their value.

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OF THE

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The Canadian Horticulturist

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TORONTO

Another point which we should bear in mind carefully, and which might very easily be lost sight of, is that there is a great difference between considering large size an actual defect, as Mr. McNeill suggests, on the one hand, and not giving it undue weight in judging, as it is too often done now, on the other.

All things considered, I should favor Mr. McNeill's suggestion that abnormal size be considered as a defect with strictly dessert varieties of apples. I would add, that even with the ordinary "commercial" sorts, size should not be considered as outweighing color, uniformity and freedom from blemishes; but that two plates, one of which is normal size and the other above, should compete on equal terms so far as size is concerned.

If we could have these two accepted as general principles, the exceptions that I have alluded to above could be, I think, easily managed. For it would only be with a very few varieties that abnormal size would be, or should be, considered an actual asset.

This whole discussion, however, only emphasizes the fact that we ought to have a different score-card—or, if we do not use a score-card, a different ideal—in judging each particular variety; so that, while size would be far more important with Wolf River than with Pomme Grise, and color far more important with Spy than with Rhode Island Greening, quality would be given much more weight with McIntosh Red than with Ben Davis.—F. C. Sears, Agricultural College, Truro, N.S.

Holes in trees caused by decay may be remedied by filling with cement. Scrape away every bit of decayed wood in the hole, wash with Bordeaux mixture and fill with cement until the surface of the new bark is met.

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The June Pink Tomato

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We grow from 15,000 to 20,000 tomato plants for our retail trade. We generally grow about 10 kinds. Each year we try one or two new ones, and test them ourselves before offering to our customers. Last year we tried June Pink and found it satisfactory in every respect. Our land is heavy sand bordering on clay, and grew nice plants of this variety with nice large smooth tomatoes of good texture, and the best flavor of any tomato that we grow. Several gentlemen sampled them, and said that they were excellent. They gave orders for tomatoes of that kind.

The plants were not planted as early as the other varieties. We considered, however, that if planted at same time as other early varieties, they would be just as early. This year we are sowing plentifully, and intend putting them on the market as one of our earliest and best tomatoes. We do not hesitate to recommend the June Pink to growers.

At the annual meeting of the shareholders of the Hamilton, Grimsby and Beamsville Electric Railway, it was decided to extend the line to St. Catharines. Should this be done, it will make communication with the new fruit experiment station in the Niagara district a comparatively easy matter.

At the annual meeting of the Thornbury Hort'l Society, the following officers were elected: Hon. pres., Jas. Lewis; pres., H. Redwell; 1st v.-pres., Mrs. W. L. Lyson; 2nd v.-pres., Dr. Hurlburt; sec.-treas., Geo. Wright; directors, J. G. Mitchell, C. W. Hartman, R. Cook, J. B. Ferguson, Dr. Moore, R. Crews, Mrs. T. Loucks, Mrs. M. Snetsinger, and Mrs. J. M. Steel. It was decided to take THE CANADIAN HORTICULTURIST for 1907. The total receipts for the past year were \$97.22, and the expenditure \$75.21, leaving a balance of \$22.01.

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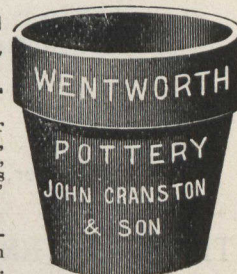
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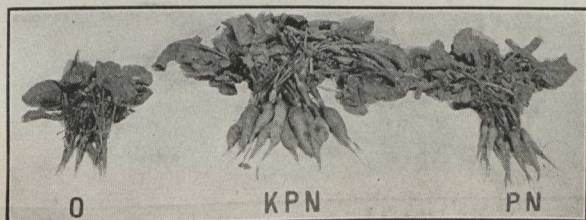
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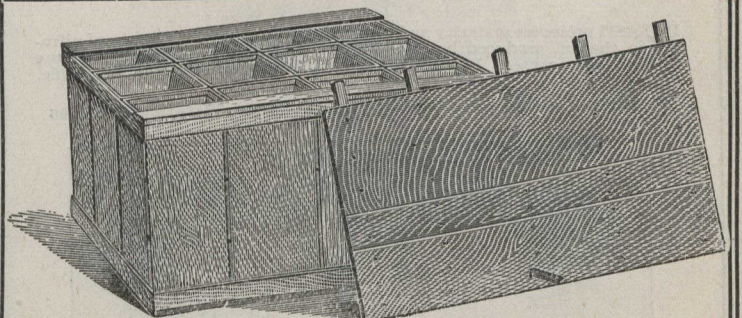
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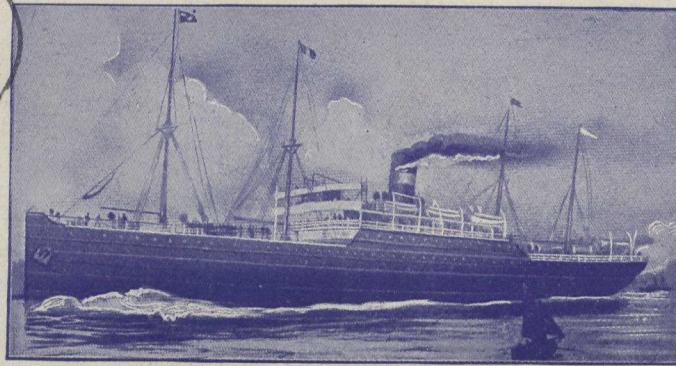
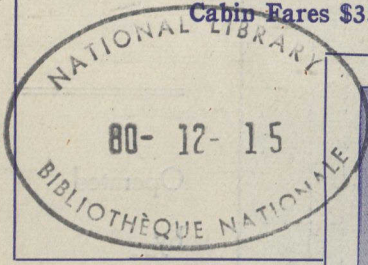
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