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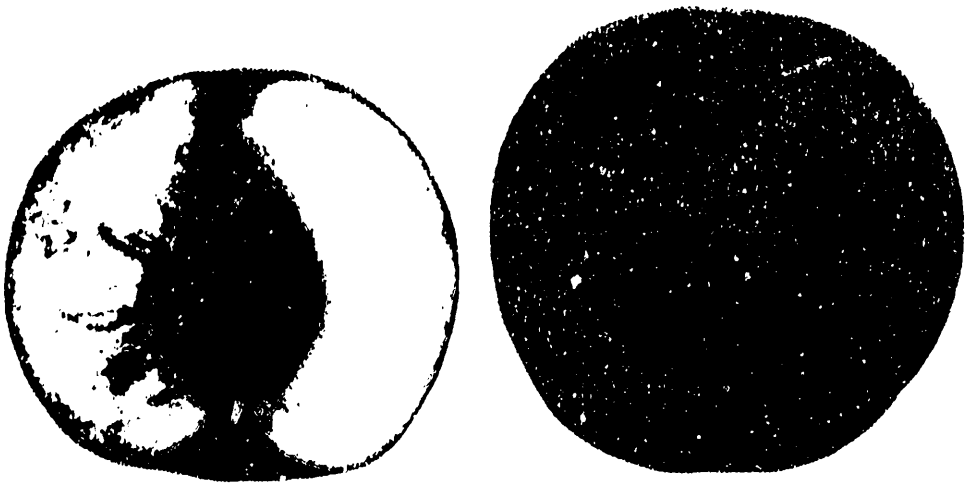

Fig. 2746. The Champion Peach.

The Canadian Horticulturist

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CHAMPION PEACH

A BEAUTIFUL white fleshed peach with a red cheek, and free stone. The flavor is delicious, and it may be classed as the best dessert peach of its season, but a little tender for distant shipments.

ORIGIN: Illinois.

TREE: Vigorous, moderately productive.

FRUIT: Large, frequently measuring 2½ inches in diameter; form, roundish, fairly regular; color of skin, creamy white, with red cheek in the sun; suture, two thirds; apex, small in a slight depression; cavity, deep; stone, free.

FLESH: White, pinkish at the pit; texture fine, tender, juicy; flavor rich, sweet, and agreeable.

SEASON: September 1st to 10th, coming in with last Yellow St. John and the first Early Crawfords.

QUALITY: Dessert, among the best.

VALUE: Very good for home markets, and a good shipper.

THE WHITE FLESH PEACHES

BY THE EDITOR.

THERE seems to be a distinct difference in taste between peach consumers in England and those in America. With the former the white flesh are much preferred to the yellow, while with us there is a decided preference for the yellow. Perhaps this is chiefly due to the great popularity of that magnificent American yellow peach, the Early Crawford, which has for so many years had no rival in the markets, whether for dessert purposes or for canning. It was a fairly good shipper, compared with such contemporary white flesh varieties as Early Purple and Old Mixon, and was therefore planted more widely than any other.

This prejudice in favor of the yellow peaches will be for a long time in the way of the new white varieties taking the place to which their merits entitle them; for orders from consumers call for the yellow flesh.

On the other hand the very fact that everybody is planting the yellow varieties may give rise to a special demand for some of the new and excellent white flesh dessert peaches. Farraud, of the South Haven (Mich.) station, says on this point: "As a

rule, white varieties have not been satisfactory, and many growers have removed them from their orchards, while very few are being planted; and yet the better white varieties grown at the station grounds, well packed in open slat, one-fifth bushel baskets, sold for a higher price than many of the later yellow varieties on the Chicago market."

The Champion, which we describe in this issue, is large, handsome, and of the highest quality for dessert. It is a fair shipper and moderately productive, and for our own table it is a special favorite. To be profitable for market it would need to command a price above the average.

The Stevens Rareripe is a white flesh peach of sprightly vinous flavor, coming in late in September, and is more promising as a profitable market variety than Champion; another season we hope to secure a photograph of this peach for our journal. Of the other white varieties, two very early ones have done well at Maplehurst for three years past, viz., Sneed and Greensboro: the former, the earliest variety we know, of fair quality and of some value for a near market: the latter ripening a little in advance of Rivers, and, though quite as tender in flesh, in our opinion is a more desirable variety for table use, or for a near market.

Editorial Notes

MARCH is a changeable month, and no definite plans for work can be laid down for the guidance of the gardener.

* * *

PRUNING is usually finished during this month, because as soon as the frost is out of the ground the work of plowing and planting will begin on well drained soils. Gathering the brush is a tiresome job in a large orchard, and much labor would be saved if the former could have a horse and brush boat with him and throw on it the prunings as he makes them.

* * *

BRUSH should be gathered and burned as fast as it is drawn to the burning place. Once get a good fire going and even the green brush, if carefully placed, will be consumed.

* * *

OLD TREES, past their usefulness, should be dug out by the roots. Cut off the upper limbs and leave as high a trunk as possible for leverage. Attach a log chain high up, and a span of horses will materially assist the work of taking out the old trunks, roots and all.

* * *

GRAPE PRUNING also should be finished as soon as possible, and the arms tied in place. Then a harrow drawn between the rows will remove the prunings to the ends, where it can easily be forked over on to the brush boat and drawn away to the burning place.

* * *

THE ASHES from the burnt brush is valuable as a fertilizer for the fruit orchard, and should not be wasted. The sooner it is scattered over the ground underneath the trees the better.

* * *

BARN MANURE is the very best fertilizer for the orchard, and, if procurable, leaves all commercial fertilizers out of sight. It should be drawn out and spread about the trees while the frost is still in the ground:

otherwise, when the rush of spring work comes on it is apt to be neglected.

* * *

SETTLE AT ONCE upon the varieties you wish to plant or to top graft, and order in good time, lest you be obliged to accept substitutes or do without for a year. The reports of the Ontario Fruit Stations are of great value to intending planters, because the information given is entirely in the interest of fruit growers, and not of the nursery men.

* * *

DWARF PEARS should be well cut back. The pyramidal form is the ideal for them, but is scarcely practicable unless begun with the first year's growth. In any case the young growth should be cut back about one-third, or, if very vigorous, one-half.

* * *

CHERRY TREES need very little pruning, and no large cuts should be made. Simply thin out the small branches where they overcrowd, and cut back the top if inclined to reach up too high.

* * *

THE BURBANK PLUM tree is one of the ugliest of growing trees, and only by constant attention can it be made presentable. Perhaps its sprawling, drooping habit has something to do with its wonderful productivity. The Wickson, on the other hand, is an upright grower of thin willowy branches, and we fear will never be fruitful enough to be profitable.

* * *

PEACH TREES should be gone over with the pruning shears and the over-vigorous upper and outer branches well shortened in, and the interior of the tree well cleared of its dead and feeble wood.

* * *

ALL PRUNING should be completed before spraying time, so that the poisons will not be wasted upon useless wood.

A Grade for No. 2 Apples

AT a meeting of the American apple shippers in St. Louis last November, it was agreed that a No. 2 apple may be one-fourth of an inch less in diameter than No. 1; not over 20 per cent. affected by defacement, scab, dry rot, worms or other defects; hand picked, not bruised, of bright color and shapely. We in Canada have not yet defined our No. 2 grade, but the results of having a No. 1 or XXX grade has been so excellent during the past season that no doubt our growers are quite prepared and indeed anxious to have the No. 2 or XX grade defined also. Anything that will facilitate sales of our fruit f. o. b. is decidedly in the interest of the growers.

Kieffer Trees as Stock for Bosc

PERHAPS no variety of pear has been so widely planted in Ontario pear orchards as the Kieffer. Its wonderful vigor, its amazing productiveness, and its fair appearance gave it great popularity for a time, until alas! it met universal condemnation for quality. Now there is little sale for the fruit except to canning factories, and many growers are asking whether it makes a good stock for top grafting other varieties upon. At Maplehurst we have been putting Anjou and Bosc upon it, and the growth is encouraging. Powell, of Washington, D. C., has observed a "nice balance between the roots, the body, and the top of the tree, and that each part has a strong influence upon the vigor of the other two:" that "pears are invigorated when worked on stronger growing bodies: and that it is a practice with some nurseries to double work slender growing varieties, like Bosc, on strong growing bodies like Kieffer or Bartlett."

Since the Bosc is one of our best export pears, combining good size, fine appearance, and good quality, and, being withal an excellent shipper, our pear growers need not re-

gret having planted Kieffers, for they will form excellent trunks on which to top work the best varieties.

Hardy Apples

GREEN, of Minnesota, recommends the following varieties as being of the first degree of hardiness: Duchess, Hibernal, Charlamoff and Patten Greening; and of the second degree, Wealthy, Longfield, Tetofsky, Malinda, Okabena and Peerless.

The crabs and hybrids most recommended are Virginia, Martha, Whitney, Ealy Strawberry, Minnesota, Sweet Russet, Gideon No. 6, Briar Sweet, Florence and Transcendent.

In light dry soils in the cold sections it is recommended that the trees be planted 12 inches deeper than they grew in the nursery. This of course is with a view to escape frost, but while it may be helpful in this way, it has been shown that the size of the tree and the extent of the root development decreases in proportion to the depth of planting below the normal.

Don't Butcher Your Apple Trees

IT is discouraging to preach common sense in pruning apple trees, and to see so little of it used by our fruit growers in practice. The saw is being used unmercifully on every side, as if the trees were so many cordwood sticks, instead of living beings; and every year the lower limbs must come off and the fruiting branches grow higher and higher. Dougherty, of Indiana, has twenty acres of apple trees, which are an example of the wisdom of his system of pruning, which contemplates in the first place lower branch growth. All over his orchard this peculiar growth is noticeable, the branches often sweeping to and resting upon the ground. He claims (1) that these lower branches are the strongest and most vigorous, being closest to the root supply; (2) that the foliage in summer protects the ground from the burning rays of the sun, and (3) that it greatly facilitates the gathering of the fruit.

We do not give this instance to induce every one to prune his trees so low as Dougherty has done. On certain soils not needing cultivation, or where mulching takes the place of tillage, it might answer; still it emphasizes the mistake of the opposite extreme.

Profitable Strawberry Growing

A COMMON mistake in planting strawberries consists in setting them too far apart and trusting to the runners to fill up the spaces. Far better plant too near and have your beds well covered, or your rows well matted, with bearing vines the first year. The rows may be set five feet apart if you choose, but 12 or 15 inches apart in the rows is surer of good results than any greater distance. Early potatoes, peas or beans may be grown between the rows the first year, and be harvested by the time the runners begin to occupy the space.

Several growers have recently reported in favor of Wm. Belt as being the best mid-season variety.

The Competitive Power Sprayers

THE time is so near at hand when spraying is to begin for the best success in fruit growing, that it is none too soon to consider whether we can improve upon our hand machines, considering cost. The two power sprayers most prominent at present are the Niagara Gas Sprayer and the Wallace Sprayer, both of which were shown at the recent meeting of the New York State fruit growers. The first is operated by carbonic acid gas, which gives the pressure without the use of any pump. The gas is shipped in reservoirs, just as soda fountain fillers are, and cost from ¼ to ⅛ cent per gallon of liquid applied, with cost of freight added. The second was

shown by Wallace & Co., of Illinois, and in it the pressure is furnished by compressed air made by a gear attached to one of the hind wheels of the wagon. Where the orchard is 40 rods or more from the filling point, it is claimed that enough pressure can be pumped up to spray out a tank full with the additional power gained by going from tree to tree. We thought the gas sprayer the finest instrument, but no doubt the Wallace machine will be much more economical in running. The difference in first cost is not great, the former a little less than $100, the latter a little over that amount.

FIG. 2747. A TOPIARY GARDEN (See page 55.)

How San Jose Scale Spreads

AT an interesting Farmers' Institute meeting at Grimsby in January, Mr. Smith, of Burlington, gave an interesting talk about the dreaded San Jose scale. He had observed that certain trees, such as the Greening apple and the Japan plums, were especially subject, while other kinds, such as the Kieffer pear, are comparatively exempt. Now it is usually supposed that these tiny scales are carried by the wind, or upon the feet of birds, from one orchard to another, but if so, why should one kind of tree escape and another be infested? Mr. Smith had found that the male scale is winged, and his observations have led him to the conclusion that this male carries the infant wingless mites and places them upon such trees as are the most congenial. If his inference is correct it reveals a wonderful degree of intelligence in such a tiny brain.

For winter and early spring spraying he advised the lime sulphur spray, and for summer the kerosene emulsion, 1 gallon of kerosene to 7 of water.

Onion Mildew

MR. A. J. COLLINS, of Listowel, asks what is the trouble with his onions. For two years past, after growing nicely for some time, they seem to get a check, cease growing, and the tops turn brown and rusty. Several others in his neighborhood make a similar complaint. We referred this matter to Prof. Lochhead, O. A. C. Guelph, for his opinion, and have received the following in reply:

I am of the opinion that the cause of the death of the onions to which Mr. Collins refers is the downy mildew of the onion, a fungus which under certain conditions is quite destructive. The disease shows itself first by the yellowing of the leaves in patches. These patches soon become covered with a whitish mildew, changing soon to light lilac. Eventually the whole leaf becomes affected and dries up, leaving nothing but a stalk between the bulb and the base of the leaves. The white mildew, as first noticed on the patches of the leaf, consists of the fruiting body and summer spores of the fungus. The spores are soon liberated and scattered by the wind to other plants in the patch. In the fall, however, another

kind of spore is formed, which rests over winter in the leaf and infects new plants the following season.

As to treatment, the disease may be prevented from spreading if the plants are dusted with sulphur or sprayed with sulphide of potassium, an ounce to two gallons of water. To be effective these must be applied early at the first indications of the disease.

Again, to prevent the infection of the spring crop, the resting spores must be attended to, and these spores can be destroyed to a large extent by collecting and burning all the diseased leaves. It will not do to allow the leaves to rot or even to bury them in the ground, for the resting spores will retain their vitality for two or three years. Do not plant onions on the same plot more than one or two years in succession. I should be pleased to hear from all persons who have difficulty in growing onions on account of the mildew or maggot.

Tomato Growing

THIS branch of fruit growing is much followed in sections where the soil is sandy loam, or otherwise suitable. For market an early variety, such as the Earliana, is needed, and it should be grown in a greenhouse and hardened by transplantings early enough to be in flower when set in the open field. Danger of spring frosts is scarcely over before the end of May, so that even in the most favored sections it is risky, to say the least, to plant out earlier. The writer has contracted for such plants at $10.00 per 1,000.

Tomatoes for Factories

FOR this purpose of course quantity rather than earliness is the object, because the grower usually contracts to sell his whole crop at a fixed price. Very rich soil is not considered necessary; land that will produce a good crop of corn will do very well for tomatoes. A clay loam, not too heavy, is preferred by many to sandy loam for giving a large crop. Such land, of course, is better fall plowed. The plants for such a plantation can be had at a nominal price, because earliness is not essential; or they may be grown in a cold frame in rich warm soil on the south side of a building or close board fence, until four or five weeks old, when they may be set out in the field in rows about four feet apart each way, for cultivation two ways. Begin cultivation early, being careful not to touch the plants with the cultivator, which is ruinous to them, and continue until the vines begin to fall flat and cover the ground.

The Soda Bordeaux

A SUBSCRIBER in Waterdown asks for the method of preparing the soda Bordeaux mixture, mentioned in the January number of this journal; also the cost of the soda. He is not, he says, at all in love with the Bordeaux mixture. In this, no doubt, we will all agree with him, and heartily wish that some cleaner and less troublesome fungicide were forthcoming. The new nozzles, which do not drip upon the hands, are a great convenience to the operator while spraying, and remove one of the troublesome associations of its use. At Rochester this soda mixture was discussed, and while acknowledged to be effective, it was described as very hard upon the hands and upon the pump. The soda is cheap enough, only about 3 or 4 cents a pound.

Mr. Macoun, horticulturist of the C. E. F., Ottawa, gives the following formula for the soda bordeaux:

4 lbs. sulphate of copper.
5 lbs. washing soda.
40 gallons of water.

He adds: This mixture has been used rather extensively in Great Britain and Europe during the past few years, especially

in spraying potatoes. It is claimed that it adheres better than the ordinary bordeaux. This mixture is thought, however, to be harder on the spray pump than the ordinary bordeaux. It has been used at the Central Experimental Farm, but no definite results have been obtained. The formula given above was prepared at the Central Experimental Farm, and experiments were made to determine the amount of soda necessary to neutralize the copper sulphate.

Water Core in Apples

A CORRESPONDENT at Cornwall asks the cause of water core in his Gideon apples. He has a great many of this variety and nearly all are affected.

We know of no one who has made a study of the cause or remedy for this condition. We have observed it in our Golden Sweets, the off year of bearing, when there were only a few specimens on the tree; and occasionally in wet seasons, in our Kings.

We referred the question to W. T. Macoun, of the Central Experimental Farm, who says in reply:

"The Gideon apple has been sold and planted to quite a large extent in the northern parts of Ontario and the province of Quebec, but although the tree is hardy and the fruit handsome it has proved a great disappointment owing to its becoming water-cored. There has been no study of the water-coring of apples, as far as I am aware, and no statement made as to the exact cause of it, but after sixteen years' experience with a great many varieties at the Central Experimental Farm we have been able to draw some conclusions. Apples of Russian origin are much more subject to water-core than apples of American origin. Apples showing Siberian crab parentage are more subject to water-core than others. Water-coring is evidently a physiological injury caused by certain climatic conditions. Apples, such as Gideon, which water-core, should be picked early and disposed of early, as the injury increases as the fruit matures, and some Russian varieties become quite translucent, they are so badly affected."

Thinning Apples

EXPERIMENTS by Beach, of Geneva, N. Y., go to show that in seasons of very heavy crops, thinning, if done early, say within three or four weeks after the fruit sets, both increases the size and improves the color, but in cases of a small crop no benefit was perceptible.

In the main his method was to remove all wormy, knotty and otherwise undesirable fruits, and each cluster thinned to one fruit. The cost for a well loaded tree of average size he estimates at 50 cents.

Paint For Barns and Sheds

A SENSIBLE job for mild days toward spring is the application of a fresh coat of paint or whitewash to the farm buildings. Perhaps in no respect is the Canadian farmer and fruit grower more negligent than with the exterior appearance of his stables, his barns, his sheds, which are very commonly left unpainted and most untidy in appearance. Not only does this neglect expose the buildings to early decay, but it also exhibits a lack of taste on the part of the owner. For buildings sided up with planed lumber the regular white lead paint is of course the best, but for the many rough sheds and barns throughout the country a cheap paint or whitewash will work a wonderful revolution. This may be made by using just enough water to moisten the slaked lime, and then adding kerosene oil to thin it to a consistency of easy application with a whitewash or other large brush. A little color may be added if so desired. A quick way of covering large barns and sheds is by use of the spray pump. Windows

should be first covered with heavy paper or other protection, and then the work may be done with freedom.

Favored Fruit Sections

Sir: What section of the province do you recommend most highly for general fruit growing, including the tender plants, considering not only climate and soil, but also nearness to markets, economy in freights, etc.

I. S. BELL, Peterboro.

For tender fruits, such as peaches and English cherries, the section adapted is very limited, being mostly confined to the region south of the Great Western division of the Grand Trunk Railway, the Burlington district, and to a less degree the east shore of Lake Huron, including the Beaver Valley. Pears and the finer plums may be grown over a much broader belt throughout a district north of Lake Ontario and east of the Georgian Bay; while apples, of course, may be grown much farther north, especially by making a careful selection of hardy varieties.

For commercial and economical marketing all depends on the markets selected. If for the northern shore of the Georgian Bay, a point near Collingwood or Owen Sound would be convenient to steamer transportation; if for Ottawa, or Montreal, or for export, a section such as we have east of Hamilton, with competition between the C. P. R. and G. T. R., and also between Canadian and Dominion express, is desirable.

Will Co-operative Packing and Selling Work in Ontario

THE low prices received for fruit shipped on consignment, and the excellent address of W. H. Owen at our Leamington meeting, has created much general interest in Ontario in the evolution of some practical method of carrying out co-operative buying and selling.

At a representative meeting of Niagara district fruit growers at St. Catharines on the 30th ult. the question was discussed at some length, but without reaching a definite conclusion. The only scheme presented was by Mr. A. H. Pettit, of Grimsby, which provided for the formation of a stock company for the securing of a site, the erection of buildings, and the current expenses of the company. The large amount of capital required before a beginning could be made seemed to be a damper upon the acceptance of the scheme, which, however, will be still further discussed at a February meeting.

The Leamington fruit growers seem to be advancing a little farther, and have agreed upon a scheme which seems to involve less outlay, and we give a report of it, which appeared in the Leamington Post:

A meeting was held at Ruthven to consider the constitution of the Erie Fruit Association. The aim of the organization is to establish three fruit depots, one at Leamington, one at Ruthven, and one at Kingsville. The fruit from these respective districts is to be graded and packed at the stations, and sold to the best advantage, so as to prevent, as far as possible, the fruit in the section from competition with other fruit grown in the Erie district. The constitution provides for the election of a president, vice-president and two directors from each station. The sales at each station to be under the control of a manager, under the supervision of the directors.

The by-laws provide that the members shall not be allowed to sell or solicit sales of any fruit except culls, or fruit not acceptable to the company, but to deliver their fruit at the company's packing house, where it will be sold to the best advantage, the member receiving credit for his fruit, at the average price paid on that day for first, second or third-class fruit. The capital stock to be $5,000, divided into 1,000 shares of $5 each. Each member of the association is expected to take one or more shares, although it will not be compulsory. The limit to any one member will be 10 shares or $50. A guarantee dividend of ten per cent. will be given to all shareholders, which will be a first charge on the expenses. One-third of the selling price of fruit will be retained until the close of the season, out of which the dividend above mentioned will be paid and all other costs of selling, salaries to secretary and treasurer, traveling expenses, etc., and the balance will be distributed among the members, in proportion to the number of bushels or baskets delivered. Parties desiring to take stock must first become members by payment of one dollar. The only cost to the shipper will be actual cost of selling, and the dividends to be paid on $5,000 stock. If $5,000 worth of fruit is sold, the cost to the grower who is a member of this society will be only 1 per cent. in addition to actual expense of selling.

Reckless Fruit Sales

THE only justification for the present reckless method of shipping our choice fruits on consignment, to be sold at whatever prices the buyers choose to offer, is their perishable nature. While we were negotiating a sale our fruit was rotting, and we were forced to take any offer rather than lose it all. But this method of sale has been taken advantage of by the buyers, until it has become ruinous to the grower. In some cases they agree not to bid against each other, but rather that one one should buy and divide up, in which case there is little hope of getting value for our fancy stock, no matter with what care we pack. How shall this be remedied? The only way is by the making of sales at the point of shipment, or at some storage house where the fruit can be held for the grower until sold.

Cold Storage Stations Will Help Sales

NOW here is the chief advantage of the cold storage stations to the fruit grower. By storing at a proper temperature he can hold his fruit long enough to make sale for it, and thus have something to say about its value. Apples may be stored for almost a year, if need be, and therefore there is little more excuse for shipping them on commission than there is groceries or dry goods. With pears almost the same thing is true, and with peaches and pears to a lesser degree.

Of course it is foolish to store No. 2 stock. The less expense one puts upon it the better, and the sooner it is converted into money the better. But with No. 1, or fancy stock, the case is quite different. It is worth the added expense of storage and of seeking suitable purchasers.

Cold storage houses, built on the most approved plan, have sprung up all through the section from Rochester to Buffalo, says the Rural New Yorker. It is not unusual to find a town with 300 or 400 inhabitants with a cold storage house holding from 40,000 to 50,000 barrels. This is one of the greatest blessings to the grower. It relieves the market from the influx of fruit early in the season, and prolongs the period when the fruit can be put on the market. By the aid of refrigerator cars it can be sent to parts of our country and at seasons never possible to reach before. The men who control these depots are searching out sections where they can place the fruit, and though they do it for their own profit, the benefit is received by the grower as well.

Germany a Good Apple Market

FOR some years past a few Ontario apple growers have been shipping to Hamburg and with considerable encouragement. This season the results have been more than usually satisfactory, Baldwins, Russets, Greenings, Ben Davis and Spys selling at from 20 to 28 shillings, with strong demand.

The first car load of apples from this continent to Germany went forward in 1896. It is stated that almost half as many apples have gone to Germany in the year 1903 as during the whole of the years previous. From 1896 to 1903 a total of 489,000 barrels went to Hamburg.

Laying Out an Apple Orchard

NOW that plans are being made for spring planting of orchards, it is well to consider details and have everything in readiness. Mr. W. C. Abbott, of Hudson Heights, Que., writes:

Sir: If you had to plant in the spring an apple orchard of 1,000 apple trees, how would you proceed in order to have the work done in the best and most expeditious manner possible?

If the ground has been either summer fallowed, or cultivated with corn or potatoes

the previous year, and then fall plowed, the soil will be in beautiful condition for planting in spring, and the task will be an easy one. If the land is at all inclined to be heavy this previous preparation is all the more necessary, both for the ease and speed in planting and for the after growth of the tree. If conditions are favorable, two men should lay out the ground and plant one thousand apple trees in a week or ten days, but if unfavorable it would take much longer.

Should the trees arrive before the ground is quite ready to receive them, dig a trench about a foot deep, more or less, and stand the trees in it close together, and then fill all about the roots with fine earth. Here they will be safe until you are ready to plant. With a lot of 1,000 trees it would be best to heel them in this way, even if the ground is ready, and take out a few at a time as required.

Evans, of Ohio, gives directions for planting, as follows, which is essentially the plan we have always adopted:

If the plot lies facing a road or lane, make that the basis from which to lay out the rows, running them at right angles away from this base. A strong wire about two hundred feet long is an excellent instrument to use in staking out. File shallow notches in it as far apart as you wish the trees to

FIG. 1. SQUARE PLANTING.

stand—say twenty feet for peach, pear, plum or cherry and thirty feet for apple—then stretch it out, sticking a peg at each notch, which can be designated by small rags for the sake of plainness. If the orchard is wider than the length of the wire, prolong the staked line by restretching the wire from the end of the incomplete row. By taking care to have a correct start and make the beginnings of rows at regular intervals on the base line, all the trees will line up, no matter whether the point of view commands a straight or oblique squint, as seen in Fig. 1. Another mode of arrangement which, under certain conditions, may be desirable, is the quincunx planting shown in Fig. 2. But the most economical, beautiful and convenient arrangement is the hexagonal. Every three trees form an equilateral triangle, and each tree, except the outside ones, stands in the centre of a circle described by six others standing at equal distances around it.

The land prepared and staked, you are ready to dig holes. When ready to pull up the tree peg for this purpose, mark its position by using a piece of 1 x 4 pine four feet long, in the center and ends of which notches are cut. Place the center notch at

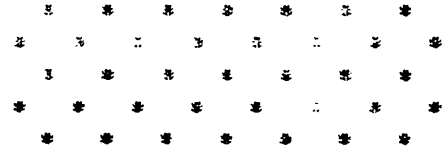

FIG. 2. QUINCUNX PLANTING.

the tree peg and stick other pegs at the end notches. Then pull up the tree peg, dig the hole, and when ready to place the tree, lay the board with the end notches fitting their respective pegs and locate the tree at the center notch. This is a simple and good way.

As you plant, dip the roots of each tree into a bucket of water, then place it in the hole with the budding scar a little below the surface of the ground. Work rich top soil, well-fined, all around the rootlets, pressing it firmly with the hands, and take care to lay each root according to its natural bent. Humor all idiosyncrasies of roots. Cut off broken or bruised roots, making the slope

of the cut on the underside. When enough earth has been pressed into place to enable the tree to stand, use the shovel for the rest, watching to keep the tree in position with regard to line and perpendicular position. If out of plumb at all, lean it toward the direction of prevailing winds. As the earth goes into the hole, stamp it just as though you were setting a fence post, and I would emphasize this point, for it is important enough to mean success, or failure. Thus laid out and the trees carefully selected and

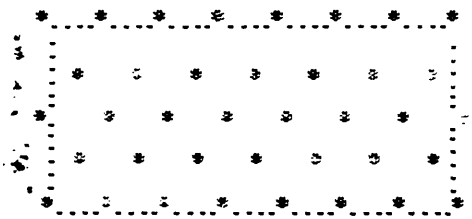

FIG. 3. PLANTING HEXAGONAL.

planted, your orchard will be a thing of beauty and a source of satisfaction. But do not let it grow up in weeds and grass. Cultivate it like your corn field, and keep the trees clean by eternal vigilance.

A New Tree Protector

LAST year and the year previous the Expansive Tree Protector was pushed most vigorously by the introducer. We ordered a lot for trial among our fruit stations, and nearly all our experimenters complained that the poison which was applied on the felt underneath the protector had an injurious effect upon the bark. Perhaps if the poison were omitted it would be equally effective. The Arndt Tree Protector takes warning and advises no poison. It is not very costly, about 10 cents a foot, and if applied in October and kept in place until June, it should keep down that troublesome female canker worm, which transforms in the ground, and being unable to fly, can only reach

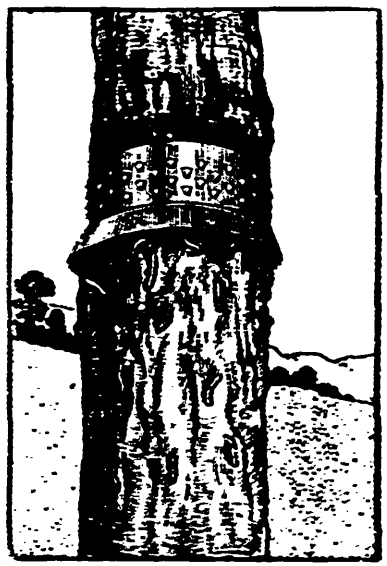

FIG. 2748. TREE PROTECTOR IN PLACE.

the foliage by creeping. Possibly it may be useful for some other insects which have no wings, but like most other novelties, no doubt much more is claimed for it than it really merits.

The band is well shown in place by the accompanying cut, Fig. 2748, and a section of the band in Fig. 2749. It is made of brass, and comes in coils of twenty feet, neatly and securely packed in boxes, with brass fasteners and cotton wadding, and with full directions for use on each box.

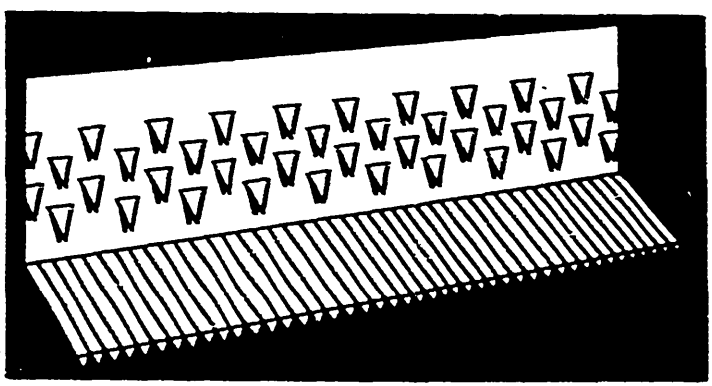

FIG. 2749. SECTION OF TREE PROTECTOR.

A Canadian Power Sprayer

WE are always glad to notice any invention which originates in Ontario and is intended for the benefit of Ontario fruit or flower growers. Let it be, however, fully understood by our readers that what is said of such untested novelties must be more or less based upon the statements either of the introducer or of the originator. Just now we are in receipt of a letter from Mr. W. R. Liddy, principal of the high school at Port Dover, commending a power sprayer of Canadian invention, and we think the inventor is on the right line, for the cheapest power must be that furnished by the turning of the wagon wheel. The following is the letter:

Sir: In your issue of February you state that power sprayers run by a sprocket chain from the wagon wheel have been imperfect, but that an Illinois man has made some improvement. As a constant reader of your valuable journal, I do not think you would pass over, had you known, a Canadian, my fellow-townsman, Mr. F. A. Perkins, who has invented and patented a machine which is a credit to Canada. It has a double acting cylinder pump with air chambers. To each pump is attached three lines of sprayers, each capable of throwing spray twenty-five feet or more. The whole mechanism is simple and complete, and at a price within the reach of all. It will be placed in the market this year, and those interested should correspond with Mr. Perkins.

Give Canada Her Due

That Canada should now assert herself in the great markets of the world no Canadian will dispute, but hitherto our fruit growers have not sufficiently realized the advantage of using the name CANADA as a trade mark upon our export fruit packages. The Fruit Marks Act is giving Canadian fruit a name for reliable branding such as is given to no other country in the world, a name which is every year gaining ground in the confidence of foreign buyers. This means a complete change in our methods of sale, and a sharp advance in values for as our XXX, or No. 1, brand gradually becomes known, foreign buyers will no longer hesitate to purchase in large quantities f. o. b. at points of shipment in Ontario, and the competition will be keen for our XXX goods.

Mr. W. Barlow, of Salford, England, writes as follows under date of February 2:

Sir: In conversation with Mr. John Parkinson, of Portage la Prairie, who has been on a visit to Manchester, it was arranged I should write you upon the following matter, which had come under his notice, viz., the necessity of all Canadian produce being branded and labeled in and outside with the word Canadian apples or whatever kind of produce may be sent to this country. At the present time very large consignments are sent over, and is known in the English market as of American origin, though less than formerly. There is still a great necessity for having such produce made clear as to its origin. If asked where they come from the reply invariably is, They are American. When I visited your country I often mentioned what was in my mind should be done, but it was not thought of much importance at the time. Mr. Parkinson thinks the time has arrived when the false naming of Canadian fruit should be corrected.

This matter is placed with you to take what action appears in your judgment necessary.

The above particulars were sent to the High Commissioner at London, who replied that the matter was all important for Canadian growers, and presume he will move in the matter. If supplemented from your side something should be accomplished.

The Transportation Committee

A MOST important meeting of this committee of our association was held at the Walker House, Toronto, on Tuesday, the 10th day of February. There were present, W. H. Bunting, St. Catharines; Alex. McNeill, Ottawa; E. D. Smith, Winona; H. H. Dawson, Toronto; D. W. Wilson, Seaforth; R. J. Graham, Belleville; C. L. Smith, Toronto, editor of the Sun, and the editor of this journal. The vital importance of the question was shown by the live interest taken by each member, all of whom were personally engaged in shipping on a large scale, and had many well established grievances to present to the Railway Commission, such as the following:

(1) Excessive freight rates.

(2) Discrimination in rates (a) between individuals or firms, (b) between long and short hauls, (c) between places or territories, (d) between commodities.

(3) Want of proper accommodations at the stations.
(4) Delays in transmission of fruit.
(5) Scarcity of cars.
(6) Want of facilities for tracing cars.
(7) Delays in settling claims.
(8) Refusal to give special facilities for fruit shipments, such as (a) "decking" cars for baskets, (b) the use of ventilated cars, (c) the use of refrigerator cars, (d) the use of frost-proof cars, or (e) the use of heated cars.
(9) Refusal to give a receipt for the number of packages delivered by the shipper.
(10) Difficulties with express companies.
(11) Demurrage charges.
(12) Want of competent or sufficient help at stations, etc.

The following are some of the resolutions passed in committee, embodying some of the many points which are to be laid before the Railway Commission:

EQUIPMENT.

Resolved, That the Ontario Fruit Growers' Association, through this committee, petition the Railway Commission to at once take steps to compel the railways of Canada to provide proper equipment for the carriage of perishable freight, such as fruit, during both summer and winter, viz., good clean ventilated cars, or refrigerator cars, well iced, during summer, and heated or frost proof cars during winter, and of such a make as to insure the arrival of the goods in as good condition as receipted for, reasonable allowance being made for ripening; and that railways be compelled to provide sufficient equipment for such service within one week from shippers' request at any point where they have freight stations, and that the employes be compelled to keep a record of the temperature maintained in such cars at least once every twelve hours, and that thermographs be carried, when furnished, as a check on said operators, to see that that temperature is reported correctly, and that tracers be sent after each car, with the privilege to the shipper of being provided with information at least once each day by the local agent of the location of such car in transit.

INSPECTION.

Resolved, That the inspectors under the Fruit Marks Act at Montreal and other Canadian points should be empowered to prevent vessel owners from placing fruit in parts of a ship not provided with mechanical ventilation; also that the Dominion Department of Agriculture be requested to place thermographs in all compartments in which fruit is carried, as well as on the deck of the vessel, as a check; and further, that the chief inspector in Great Britain be required to return to the department a statement of the record shown by the thermographs.

DELAYS IN TRANSIT.

Resolved, That in view of the intolerable delay in the transit of perishable products to and from interior points involving heavy losses, we would urge upon the railway such regulations as will ensure the carrying of these goods with all dispatch practicable, making a time limit for definite distances.

INTOLERABLE DELAYS IN SETTLING CLAIMS.

Resolved, That the Railway Commission be requested to take immediate action to enforce all railways doing business in Canada to examine and report definitely on all claims presented for delays, damages or overcharges to perishable freight, within one month from receipt of such claim when presented with the necessary documents in support of such claims.

GRIEVANCES.

In discussing the above many instances of injustice to shippers were brought out, such, for example, the unfair discrimination between rates on apples and pears, by which a few boxes of pears for export put in a car of apples largely increases the rate on the whole car; or between the rates on flour and apples, the former being carried to Liverpool for 38 cents a barrel and the latter for 50 cents. Even this would not be so much of a grievance if the apples were given su-

perior storage, but when both are stored in the same hold, and the flour is given the preference in the handling, the whole is a manifest injustice to the fruit grower. The miserable cars often furnished fruit growers is another just ground of complaint. Fruit easily takes up bad odors, and when cars in which vile smelling freight has been carried are furnished for carrying fruit, the flavor is badly affected. The intolerable delays are a great grievance to fruit growers. One-half our fruit should go by freight which much now go by express at excessively high rates, just because of the slow service by freight. Local shipments to Toronto from points about 50 miles distant do not arrive until the second day after shipment; they ahe often weeks going from the Niagara district to Palmerston, and about 15 days going to the Sault. These are only a few of the many points brought up, all of which will make a strong case when presented before the commission.

Formation of Horticultural Societies

MR. E. D. ARNAUD, of Annapolis, N. S., writes:

Can you give me some practical directions that will be of assistance towards the establishment of a local horticultural society? I see that there are several flourishing local societies in Ontario, aided, I understand, by government grants, but so far as I know nothing of this kind has yet been attempted by the Nova Scotia government. If it is not too much trouble I would like you to tell me the steps usually taken when a new society is started in your part of the country.

In reply we cannot do better than publish the by-laws adopted for our affiliated societies, which have worked out so well wherever there has been a live set of officials.

These affiliated horticultural societies are formed more closely in accordance with the purpose and intent of the Agriculture and Arts Act than any others, having in view the interests of amateurs and of the members generally rather than of the few professional florists of the locality.

Encouragement is given to the holding of monthly meetings, the frequent delivery of lectures on horticulture, the distribution of horticultural literature, in particular the Canadian Horticulturist, the free distribution of seeds, plants and bulbs, and the holding of horticultural exhibitions.

BY-LAWS

For Affiliated Horticultural Societies.

This society, known as the .. .. Horticultural Society, organized under the provisions of the Agriculture and Arts Act of the Province of Ontario, agrees to conduct its affairs in accordance with the several provisions of the said Act, and with the following by-laws and regulations. A. & A. A., Sec., 13, 1895.

1. The members of this society for any year shall be residents of this municipality to the number of at least fifty, and also others, who shall have paid one dollar into the funds of the society as membership fee for that year. A. & A. A., Sec. 7, S. S. (a), (b), 1895.

2. The objects of this society shall be to encourage improvement in horticulture, and to secure to each member equal encouragement therein. A. & A. A., Sec. 9, S. S. 2, 1895.

3. There shall be at least .... public meetings in each year for discussing local horticultural matters and for hearing lectures on improved horticulture. A. & A. A., Sec. 9, S. S. 2, sub-div. (a), 1895.

4. At any public meeting there may be an exhibition of such plants, fruits, vegetables and flowers as may be in season; and whenever such an exhibition is held there shall be present at least one expert gardener who shall give such information and instruction appertaining thereto as may be required; but no money prizes shall be offered for competition by the society at such meetings. A. & A. A., Sec. 9, S. S. 2, sub-div. (e).

The annual meetings and all other public meetings shall be open to the members free of charge, and members only shall have the right to vote at any meeting.

(a) When exhibitions are held at such public meetings the public shall be invited to exhibit such horticultural exhibits as may be thought suitable for the occasion by a committee appointed by the board to superintend such exhibitions.

(b) This committee shall take such means as they think proper to secure exhibits for the occasion, and also provide proper conveyance for collecting and returning the same free of expense to exhibitors.

(c) These exhibitions shall be open to members and exhibitors free of charge.

6. A sum of money not to exceed...... dollars may be offered in prizes in any one year for essays on any question of scientific enquiry relating to horticulture. A. & A. A., Sec. 9, S. S. 2, sub-div. (d), 1895.

7. Each member shall be given by this society a membership in the Fruit Growers' Association of Ontario. A. & A. A., Sec. 9, S. S. 2, sub-div. (b), 1895.

8. There shall be procured for each member, trees, shrubs, plants, bulbs or seeds of new and valuable kinds, in each year, sufficient in quantity to exhaust the funds of the society after allowing for necessary working expenses. A. & A. A., Sec. 9, S. S. 2, sub-div (c), 1895.

9. The annual meeting shall be held at half-past 7 in the evening of the second Wednesday in January, when there shall be elected a president, a first vice-president, a second vice-president and not more than nine directors, who together shall form the Board of Directors. At this meeting the society shall also elect two auditors for the ensuing year. A. & A. A., Sec. 7, S. S. (c) 1895.

(a) At this meeting only those members who have paid their subscription for the ensuing year shall be entitled to vote. A. & A. A., Sec. 4, 1896.

(b) At this and all subsequent public meetings ten members shall constitute a quorum. A. & A. A., Sec. 3, S. S. (ee) 1896.

10. The Board of Directors at its first meeting shall appoint a secretary and a treasurer, or a secretary-treasurer. A. & A. A., Sec. 7, (f) 1895.

(a) Five directors shall constitute a quorum for the transaction of business. A. & A. A., Sec. 14, 1895.

(b) Subject to these by-laws, the directors shall have full power to act for and on behalf of the society; and all grants and other funds shall be expended under their direction. A. & A. A., Sec. 13, 1895.

(c) At each annual meeting the directors shall present a detailed statement of the receipts and expenditures for the preceding year; and also a statement of the assets and liabilities of the society at the end of the year, certified to by the auditors. A. & A. A., Sec. 11, S. S. (c) 1895.

11. The said statement shall, when approved by the meeting, be placed on permanent record in the books of the society; and such portions thereof, together with what is required by subsection (c) of Sec. 11, A. & A. A. of 1895, shall be sent within one month to the Department of Agriculture. A. & A. A., Sec. 12, 1895.

12. These by-laws or regulations can not be altered or repealed except at an annual meeting or at a special meeting of the members of the society, of which two weeks' previous notice has been given by advertisement. A. & A. A., Sec. 13, 1895.

Education in Floriculture

TO succeed in any business, in these days of close competition, one needs to add business tact and originality to a thorough knowledge of the details of ordinary practice. This latter is from a man in the business, but often jealousy of prospective competition keeps out the young aspirant from the privileges he desires to have. Mr. A. S. Gilmore, Cote St. Paul, Que., who has for some time been carrying on a factory with his brother, has decided to give it up to become a florist. He says: "I think it is healthier work, and I am very fond of flowers. I have had no experience whatever, except in my own garden during the summer, where I have had great success. Is there any school in Canada where they give instruction in the raising of flowers, and in greenhouse work; and are there any spring and summer terms. Do you think the florist business profitable for a young man, etc." Now, suppose we answer the last question first, and we would say yes and no both; for profit in any business depends far more upon the man than upon the business. One man will make money where another man will starve to death. A few men have made fortunes out of growing roses and carnations, and many men have failed; a large percentage of the men who open out stores in great cities sink their investments, while a few make fortunes; a neighbor, who began a village milk trade without capital, has by industry and enterprise secured a large and profitable business of several thousand dollars a year.

The best place to learn to be a florist is with a florist, providing he would give you a chance to learn details of all branches; but for a general knowledge of floriculture, the construction and care of a greenhouse, and much general information essential to an educated business man, a course at the Ontario Agricultural College, Guelph, is almost indispensable.

Mr. Wm. Hunt, superintendent of greenhouses, is a thoroughly trained gardener, and his long experience will give a young man much valuable information which he could not get from the ordinary practical

florist. For details of terms, write Mr. G. C. Creelman, B. S. A., president of the O. A. C., Guelph.

FIG. 2750. MR. G. A. PUTNAM, B.S.A., Superintendent Farmers' Institute.

SINCE our work is so closely connected with the farmers' institutes, our readers will be pleased to have an introduction to Mr. George A. Putnam, B. S. A., who has recently taken up the work of superintendent of Farmers' Institutes for Ontario. Mr. Putnam was born in Elgin County in 1869, and spent his early years on his father's dairy farm near Aylmer. He was educated at the Aylmer High School and at the Forest City Business College, London, and from the latter institution became in 1890 secretary to the Agricultural College. While at the college he took up the regular studies and received his degree in the spring of 1900.

Mr. Putnam is most familiar with details of the organization of institutes, for under Dr. Mills he managed all the details of the work when the Ontario Institute branch was first organized.

Nova Scotia Fruit Growers' Annual Meeting at Bridgewater

NEARLY a hundred fruit growers met at Bridgewater on the 27th and 28th of January and conducted an animated discussion on the fruit interests of the province. A noticeable change was the retirement from the presidency of Mr. J. W. Bigelow, of Wolfville, who for twelve years has so ably filled the position. A resolution was unanimously passed expressing the high esteem in which he was held by the members.

STANDARD VARIETIES OF APPLES.

At this meeting our vice-president, Mr. Alexander McNeill, of Ottawa, gave good advice to inexperienced orchardists. He advises (1) to select varieties combining many good qualities; (2) to avoid novelties, because they are seldom permanent; (3) to watch the tree agent and resist him when he advises little planted varieties; (4) to cater to your market, and if distant to plant good shipping kinds, mainly good winter varieties; (5) to consider which of these will succeed best under the local conditions of one's own farm. Mr. McNeill had written to six apple exporters representing firms which operate in all parts of Canada, asking them separately to name the best paying varieties of apples, taking one year with another, from the exporter's point of view. All named the Baldwin, five the Spy, four the Golden Russet, four the King, four the Ben Davis, four the Canada Red, three the Mann, two the Cooper's Market, one the Hubbardston. Prof. Macoun suggested that records of individual trees as to age, bearing, etc., be kept each year, thus finding out what trees give the best results; a number of gentlemen, representing the various fruit districts, were appointed to keep these records.

APPLE PACKING.

The use of the barrel and the box were discussed, and Inspector Vroom gave full details for packing in barrels, which are the same as commonly practised. "The 10 per cent. of poorer quality," he said, "are allowed for the purpose of covering any accidental putting in of poor quality, and not to allow packers to pass off their poor trash."

For boxes Mr. W. A. McKinnon said that only the very finest quality should be packed in them, and in this we believe he is quite correct, for we have experimented with a carload of XX stock in barrels and in boxes, and the former brought the best returns. We are glad to observe that the Nova Scotians at this meeting agreed to adopt the same sized box as we have adopted in Ontario, viz., 10 x 11 x 20, inside measure.

BOASTING THE PROFITS OF ORCHARDING.

The Nova Scotians always have a way of showing up great results of apple growing. Recently Mr. J. W. Bigelow has circulated an article giving an account of the wonderful apple yield of the Annapolis Valley and the wonderful profits received by the growers; and here at this meeting Mr. R. J. Bridgewater, of Bridgetown, gave an account of a bearing orchard of 3½ acres for four years, showing a net profit of $2,400 for the period.

It is rather a curious feature of the meetings of fruit growers that they always delight in booming their business by telling big stories of immense profits, which are exceptional, and by suppressing the stories of poor prices and frequent losses. In this way they encourage so many to grow fruit that the prices come down on account of competition. From some such reason, for example, plums last season were so abundant that they were not worth gathering. Now men of no other avocation adopt such policy. Fancy the stove makers advertising the profits of stove making, or the dry goods merchant the profits of his business! He would not be so foolish. We do not see why the fruit grower does it unless either he wants to sell out his fruit farm, or because he is interested in some nursery for the sale of fruit trees. No doubt Nova Scotia people want buyers for lands in the "great Annapolis valley."

THE NEW OFFICERS.

For 1904 the president of the N. S. F. G. A. is Mr. P. Innes; vice-president, Mr. R. S. Eaton; secretary, S. C. Parker; assistant secretary, J. H. Cox; treasurer, S. W. Munro.

TRANSPORTATION.

This subject, so vital to the interests of fruit growers, was taken up with great interest. An instance of gross injustice was mentioned in the case of the discrimination between apple and flour, the former costing 27c. a barrel to Halifax and the latter 16c. The poor service on both railway and steamer was also discussed, and a committee, which included the president, vice-president and secretary, was appointed to act in harmony with other organizations in obtaining improved service and fairer rates.

QUARTERLY MEETINGS.

More frequent meetings were advocated by Mr. R. W. Starr and opposed by others. Finally a resolution was passed asking the executive to press for an increase of the annual grant from $300 to $500, with the object in view of holding quarterly meetings in various parts of the province.

This is the opposite of the present policy of our association, which is considering the wisdom of centralizing the meetings of the body and sending experts to subordinate meetings of farmers' clubs in every district.

BLENHEIM PALACE AND PARK

BY THE EDITOR.

THE student of landscape gardening in Ontario can learn many useful lessons from the fine old parks of England. There you see grand old elms, oaks, lindens and other trees in their full development of beauty; the carriage drives approach the mansion in graceful curves, over artistic bridges, with fine vistas opening at inter-

FIG. 2751. BLENHEIM PALACE.

vals; and the open green sward of large extent gives interest and variety. Such a park is that at Blenheim, which was visited by the writer in the summer of 1903. It is situated about eight miles from Oxford and close to the town of Woodstock, and contains one of the finest mansions in Great Britain. According to the Economist the forest of Woodstock many years since contained a house to which Alfred the Great often retired, and which was built by Henry I. Henry II. often resided at this retreat in the forest of 22,000 acres, and here was hidden his favorite, "Fair Rosamond." The estate was at length granted by the crown to John Churchill, first Duke of Marlborough, and Parliament, as a token of gratitude for services in the wars of the Low Countries, granted a sum of £240,000 with which to build a mansion on the estate. Designed by Sir John Vanburgh, the palace—for such it is—is constructed in the most sumptuous style. Among the more conspicuous features are the Corinthian portico, which is beautifully proportioned, the great hall, 67 feet in height, and the library, a magnificent chamber, 184 feet by 31 feet 9 inches. In this last is a beautiful statue of Queen Anne, by Rysbrack, while some of the finest paintings by Rubens, which were presented to the great duke by the States of Holland adorn the walls.

The park is very extensive, and contains a large sheet of water comprising 132 acres,

FIG. 2752. A VIEW IN BLENHEIM PARK.

crossed by a massive bridge of stone of such imposing dimensions that the centre arch has a span of over 100 feet.

Unfortunately our visit was not on the right day of the week for admission to the interior of the palace, but the gardener showed us the dairy with great pride; and, while we waited at the porter's office, we had a good view of the Duchess of Marlboro, formerly Miss Vanderbilt, of New York City.

Orchard and Fruit Garden

FIRE BLIGHT

BY PROF. F. C. HARRISON, O. A. C., GUELPH, ONT.

THAT species of blight which is sometimes called the "fire blight," frequently destroys trees in the fullest apparent vigor and health, in a few hours turning the leaves suddenly brown as if they had passed through a hot flame and causing a morbid matter to exude from the pores of the bark, of a black ferruginous appearance. This happens throughout the whole course of the warm season; more frequently in weather both hot and moist." So wrote William Coxe in a book on the "Cultivation of Fruit Trees," published in 1817, which is said to be the oldest American book on fruit culture.

Nearly forty years before this we have a record of the disease mentioned in a letter written by one, William Denning, who first saw the disease in the highlands of the Hudson in 1770. He described the disease fairly well and thought it was due to a borer in the trunk of the tree.

From 1817 almost to the present time we find in horticultural literature many theories as to the cause of the blight. It would be tedious to give an account of all the different theories put forward by various writers during this period. The most diverse views were entertained as to the cause of the disease, and it was a constant topic for discussion in the horticultural journals and societies. These discussions were so wearisome and so barren of results that the Western New York Society resolved that the subject should not be discussed at their meetings unless some one had something entirely new concerning the disease to communicate.

Amongst the numerous theories put forward to explain the cause of pear blight, we may mention the following:

1. Insects.
2. Rays of the sun passing through vapors.
3. Poor or deleterious soil.
4. Violent changes of the temperature of the air, or the moisture in the soil.
5. Sudden changes from sod to high tillage resulting in surfeit or overplus of sap.
6. The effects of age; old varieties being most subject to it.
7. Autumn freezing of unripe wood, which engendered a poison which destroyed the shoots and branches in the following season.
8. Electricity, or atmospheric influence.
9. Freezing of the sap, or freezing of the bark.
10. The heat of the sun, assisted by raindrops acting as lenses causing the scalding of the sap and bursting of the cells.
11. Fermentation of the sap.
12. The absence of certain mineral matters in the soil.
13. An epidemic transmitted from place to place by the air.
14. Fungi.

Each of the above theories was sustained by various writers, and it may be of interest to note that Henry Ward Beecher was an advocate of the theory that the cause of blight was due to the autumn freezing of the unripe wood.

A. J. Downing, the distinguished author of "Fruits and Fruit Trees of America,"

applied the name "frozen sap blight" to the disease. His theory was that the disease was due to the freezing and thawing of the sap. The sap thus lost its vitality, became dark and discolored and poisonous to the plant.

Thomas Meehan, editor of the "Gardeners' Monthly," supported the idea that fungi was the cause of the disease; but no tests were applied to prove that the inoculation of these fungi into healthy trees would cause the disease.

It was not until the year 1878, when W. T. Burrill, the professor of botany in the University of Illinois, announced to the State Horticultural Society the discovery of bacteria, apparently connected with the disease. Burrill also proved that the disease was infectious and could be communicated to healthy limbs by inoculation, using the gummy exudation from an affected tree as a virus. Not only was he able to produce the disease in pears, but also in apples and quinces. Dr. J. C. Arthur, botanist of the New York Experiment Station, subsequently confirmed Prof. Burrill's results and thoroughly established the fact that a certain species of micro-organism, named by the discoverer *Bacterium amylovorum*, or the starch destroying bacterium, was the sole cause of the disease.

Geographical Distribution.—This disease is peculiar to North America. So far it has never been recognized in Europe. Professor Budd, of Iowa, who is familiar with the disease as it occurs in North America, has inspected the orchards of Europe and states that no trace of fire blight of pear or apple trees can be seen in Europe. It is also unknown in New Zealand and Australia. In North America the blight extends from New York to California, and from the northern counties of Ontario to Texas. Dr. Beadle, in a sketch of the history of the disease in Ontario, states that "in the early days of fruit growing in the Niagara district we had no pear tree blight nor [illegible] blight. With the advent of what [illegible] termed grafted fruit there came, after a few years, 'blight' on the pear tree." By the year 1840 it had spread considerably.

N. J. Clinton, of Essex County; S. Hunter, of Oxford; E. D. Smith, of Wentworth; Stone and Wellington, of Welland; R. Hamilton, of Argenteuil, reported its presence in their respective counties about 35 years ago. The colder parts of the province have suffered as severely from the disease as the more favored districts. The orchard of the Dominion Experimental Farm at Ottawa has been attacked, and the 140 Russian varieties of apples cultivated there have suffered severely. In warmer districts, however, the disease has been much more severe. Whole orchards have been completely destroyed in the State of Texas, and certain pear growing districts in that State have been practically ruined by this parasite.

Losses.—No statistics are available to give us an idea as to the amount of loss to fruit growers from pear blight, but a few references to losses by this destructive disease will help to give us an appreciation of the subject. Coxe in 1817 reported that he had lost upwards of fifty trees in twenty years. In the years 1826, 1832 and 1844 there was an increased prevalence of the disease, and few pear orchards escaped without partial or total loss of many trees, and some orchards were quite destroyed. Downing called it the "monstrous malady of the pear." Lyons stated, as the opinion of many cultivators in the State of Michigan, that "the pear tree cannot be grown with financial success on account of the blight." Hallam, in 1882, reported that "in Southern Illinois pears have failed, utterly failed, so that none are now cultivated for market. The blight has destroyed the trees, branch and root." While A. Noice, of the same State, doubted "if one-tenth of

the pear trees that are planted lived ten years on account of this destructive agent." E. H. S. Dart stated that the severities of winter were not so much to be dreaded as the ravages of blight. He had, in 1874, one to two thousand trees affected. Dr. P. A. Jewell, in 1870, lost 10,000 Tetofsky apple trees by it. Bailey, of Cornell, declared that fire blight was undoubtedly the most serious disease with which the quince grower has to contend. It was the same disease which was so destructive to pear orchards in certain years and to certain varieties of apples, particularly the crabs. Selby, of Ohio, reported that the disease ranked among the most destructive known to the orchardist in his State. Chester, of Delaware, announced that pear blight was of unusual severity during the season of 1901, and caused much alarm because of its rapid spread through the orchards of the State. In 1895 its ravages were most severe on apple trees in the vicinity of Hamilton and Burlington Bay. J. Craig gathered information as to the character of injury of the disease from fruit growers throughout this province, and a number of these state that the injury was very severe.

These citations are enough to show that the disease is of special economic importance and greatly dreaded by many fruit growers.

FIG. 2753. A BLIGHTED ORCHARD.

SYMPTOMS.—(See Fig. 2753). The first indication of fire blight is seen either in the browning and subsequent blackening of the leaves or of the young twigs or of young tender shoots. When the twigs or shoots are the principal parts affected the disease is spoken of as twig blight. Pears show the presence of the disease more frequently by the blighting and blackening of the leafy tufts of the spurs, and show it especially by the darkening of the blossom clusters on the larger branches; while later, the branches themselves become blackened. The progress of the disease is always downward, an inch or more each day, depending upon the season, until the larger limbs are infected. In the more susceptible varieties it spreads more quickly, involving the whole tree, but in the more resistant varieties the progress of the disease is not so fast. When the disease is active the bark of the diseased branches cracks and a thick, blackish, gummy fluid exudes, and later the affected bark becomes hardened, dry and shrunken. The disease occasionally appears on the larger branches and trunks of fruit trees when these have been bruised or otherwise injured, when its appearance is similar to the injury known as "sun burn" or "sun scald." This disease of the trunks or larger branches is sometimes spoken of as "body blight" or "rough bark." The inner bark and cambium layer of the limbs and trunk are the most important parts of the tree killed by the blight. Instances are known

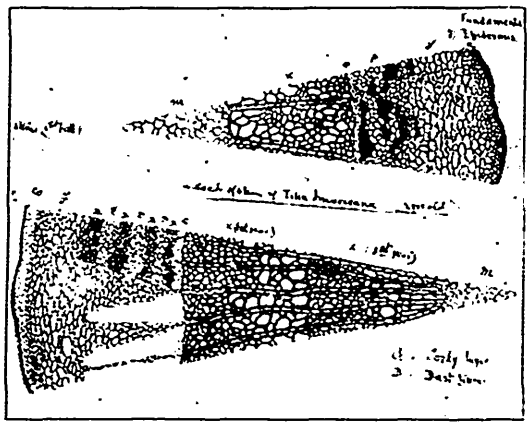

FIG. 2754. DISEASED TISSUE—MAGNIFIED

of its attacking the fruit, producing watery ulcers, accompanied by brown discoloration and decay. The disease may be known by its peculiar odor, said by some writers to resemble putrefaction.

When the disease is in progress the discolored blighted portion blends gradually into the color of the normal bark; but when the disease has stopped there is a sharp line of demarcation between the diseased and healthy portions. (Waite.)

MICROSCOPIC APPEARANCE OF THE DISEASED TISSUES.—(See Fig. 2754). The most conspicuous change in the tissues, affected with the blight, is the disappearance of the stored starch, and on account of this peculiarity the organism has been named the "starch destroying bacterium" (*Bacterium amylovorum*). The germ penetrates from one cell to another and produces a gummy or mucilaginous matter which is found on the exterior of the affected parts. The microbe is found, as a rule, only in the inner bark and in the actively growing tissues (called the cambium, which produces wood on the inner side and bark on the outer side). The organism is unable to grow in tissues that are lignified or woody.

LIFE HISTORY OF THE PEAR BLIGHT GERM.—The organism which produces the disease is a small motile bacillus which increases with great rapidity in the succulent parts of affected trees. The microbe is of microscopic size, so small that 25,000 placed end to end would only measure an inch. They are able to live and multiply in the nectar of the blossoms, from whence they are carried to other flowers by bees and insects which visit the blossoms for honey and pollen. From this locality the germs extend into the tissues and then downward into the branches by way of the inner bark, girdling the limbs and causing a large amount of damage. The blight germ also gains entrance to the plant through the tips of growing shoots, thus producing twig blight. The organism is not killed by the winter frosts, but lives in the bark in a dormant condition until spring. As soon as the plant tissues became gorged with sap in the spring the microbes, which have remained alive all through the winter, start to grow and extend into the new bark. This new blight which develops in the spring can be recognized by its moist and fresh appearance from the blighted dead and dried bark of the previous summer. A large amount of gum is exuded from the affected bark and runs down the tree and attracts to it bees and other insects which carry the microbes to the early blossoms, and from these first flowers it is carried to others, and thus the disease extends.

The germ has never been discovered in the soil, although careful search has been made, hence the importance of recognizing the winter form of the disease, for if these affected portions of the tree are cut out and destroyed the pear blight question is solved, for without the microbes there can be no disease.

CONDITIONS AFFECTING THE SPREAD OF THE DISEASE.—Fire blight differs in severity in different localities, and there are a num-

ber of conditions which affect the character and progress of the disease.

Every tree of the pome family is subject to the blight, but pears and quinces are more susceptible than plums and apples. The mountain ash, service berry and hawthorn are frequently diseased, but not to such an extent as the first named trees. There is a difference in the susceptibility of varieties. Thus among pears, Clapp's Favorite, Flemish Beauty, and Bartlett, are more liable to the disease than Keiffer and Duchess, and amongst apples the crab varieties are the least resistant.

Climatic conditions influence the disease; warm, moist weather with much rain favor it; whilst bright, dry, sunny weather tends to check it.

High cultivation, rich soil, heavy manuring, free use of fertilizers, heavy pruning, or any other treatment which has a tendency to induce new and succulent growth, favors the disease, as the bacteria grow with far greater rapidity and penetrate more quickly from cell to cell when the tissues are gorged with sap. Insects are more partial to young succulent shoots and leaves, and the bites and punctures of such insects, whose mouth parts may be contaminated with pear blight germs, often serve to infect the tree.

It is thus manifest that healthy, thrifty, vigorous, well fed and well cultivated trees are more liable to the disease than others, and hence the severity of an attack of fire blight may be lessened by conditions which are under the control of the grower.

TREATMENT.—The treatment of fire blight is of two kinds, that which is designed to put the tree in a condition to withstand the attack of the blight microbe, and those methods which aim at the extermination of the casual bacterium. Unfortunately all methods which are used for hindering the attack of the microbe consist of restraining the full development of the tree, and hence any such system of procedure should not be followed unless an orchard is very badly attacked.

High cultivation, winter pruning and other conditions already mentioned as predisposing trees to blight should be aboided, but the trees should be allowed to ripen the wood, and in order to do this the fruit grower must use any method which will check the amount of moisture in the soil, for instance, by the growth of a clover crop.

The fire blight organism cannot be exterminated by spraying, as the microbe lives in the tissues beneath the outer bark, and it is impossible to reach it with any spraying solution, for unless the bacteria come into contact with the germicide spraying is ineffectual.

There is therefore but one remedy, to cut out and burn the affected parts of the tree. It is very necessary when cutting out a diseased branch or twig to cut well below the discolored portion, as the bacteria are in teria; so that if only the discolored portion the discoloration not being produced immediately upon the appearance of a few bacteria, so that if only the discolored portion were cut off numbers of bacteria would still be left in the stump, and these would continue to multiply, and the disease would soon be evident again.

Cutting off affected parts may be done at any time in the winter and spring, but it is not advisable to cut in the growing season, as fresh cases may be constantly occurring, and these, owing to lack of sufficient development, would not be seen.

The best time for cutting out affected branches is towards the fall, or when the trees have stopped forming new wood, when most of the blight has developed, and when the contrast between the discolored leaves and branches and healthy tissues is easily seen.

Trees should be carefully inspected for blight during the winter, and in spring before the blossoms come out, in order to destroy any affected parts that may have been missed at previous inspection.

All wild trees of the pome family in the vicinity should be examined as well, as these, if blighted, may serve to reinfect an orchard which has been carefully treated.

In cases where the bark of the trunk is affected it can be cut out and the wound covered with a lead and oil paint. The cut surface of branches over one-half inch in diameter should be painted.

TEN TO ONE IN FAVOR OF SPRAYING

MY attention was called in your December number to an article, Does it Pay to Spray?

I used an apple orchard of 300 trees owned by my father and myself as a comparison, and to the interest to the fruit growers I feel it my duty to make a reply before next spraying season, giving cost, etc.

Cost of Spraying and Quantities Used.

3,000 gallons water.	
1,750 lbs. lime, 25c. per bush.	$6 25
400 lbs. vitriol, 6½c. per lb.	26 00
20 lbs. white arsenic, 10c. per lb.	2 00
20 lbs. Paris green, 16c. per lb.	3 20
40 lbs. sal soda, 2½c. per lb.	1 00
8 days team and man, $2.50 per day	20 00
16 days work, $1.25 per day	20 00
	$77 45

Cost Harvesting.

Picking and packing	$65 25	
500 empty bbls., contracted in Aug.	160 00	
106 empty bbls.	42 40	
		267 65
Total expense		$345 10

Sold.

606 bbls. apples, at $2.50 per bbl.	$1,515 00
114 bush. evaporating apples, at 20c. per bush	22 80
Total receipts	$1,537 80

Canning factory prices, figuring 3 bushels in each barrel, with 114 bushels windfalls and culls, would be 1,932 bushels at 25c. per bushel, $483.00, less 2 cents per bushel for picking up expense, would leave $444.36 net from the canning factory, while the net on the barreled apples, after deducting all expenses, would be $1,192.70. An investment of $77.45 for six months gives us a profit of $748.34 more than we would have got if it had been taken to the canning factory; nearly ten dollars for every dollar invested for spraying. Owing to my being in the apple business we probably got 50 cents per barrel more than most other growers would have got; even at 50c. less this would leave $445.34 profit in favor of spraying to the grower. The expense we were to in pruning, fertilizing and cultivating only went last season in this section towards producing the fungus canning factory apples, and I consider the $748.34 was realized from spraying, as I see unsprayed orchards in this locality that had in previous years better care in pruning, fertilizing and cultivating than our orchard that would not pack (according to Fruit Marks Act) one barrel of No. 1 apples out of fifty barrels of fruit as picked from the trees. Such fruit would be too expensive work to sort, consequently they should go to the canning factory, as experience has taught the apple buyers that no matter how cheap they buy the fungus apples it will, before the end of the season show up a loss. My opinion is, had th

canning factory here at Simcoe realized the apple situation in September as they did in December, canning factory apples would have been cheaper. There were large quantities of apples never gathered, as they had all or more contracted for than they could take care of to advantage, and the apple buyers could not buy for shipping as they were of such poor quality.

My observation of spraying in Ontario is that whether the grower owns a spraying pump or does not, he is apt to be busy at some other work when he should be spraying, and when he ought to spray he does not, and when he does spray it is in such a half-hearted way that his spraying does very little good, and unless you can spray at the right time and not be afraid of expense I consider you are losing your time and material. One grower in New York State last year estimated that he lost $1,000 on his 20-acre apple orchard by not spraying three days earlier.

Climatic conditions may be such that we may not have any fungus disease next year. Wet weather is favorable to fungus and dry weather favorable to insects, so I shall continue to spray to hit both and insure our crop.

Care must be exercised in preparing the mixtures, as I have seen whole orchards of fruit ruined by not preparing the spraying solution properly. You must not guess, but measure and weigh, and keep well agitated every tank or barrel of the spraying mixtures so as to have all go out of the tank of equal strength, and soak the trees well from the ground to its highest branches with the finest spray possible, using Vermorel nozzles. I usually put 200 gallons in my tank each time and run two lines of hose, four nozzles each, and can put on our orchard 800 gallons each day with four men. I have one man take a 20-foot line of hose and walk under the trees and spray the trunk and all the under branches of the tree, while the other line of hose is used from on top of the tank.

My spraying solution for apples: 200 gallons water, 50 lbs. lime, 10 lbs. blue vitriol, 4-5 lb. Paris green, 4-5 lb. white arsenic, 1 3-5 lb. sal soda.

The arsenic must be prepared by boiling one pound arsenic with two pounds of sal soda for 45 minutes.

Time of spraying: 1st, as soon as the buds begin to swell; 2nd, just before the buds break open; 3rd, just as soon as the blossoms fall.

If you have a small orchard of 50 trees a barrel pump will do, but for an orchard of 50 to 300 trees a tank, an outfit like we have, is the best value which cost about $200 complete, and for larger orchards a power sprayer is the best.

Thanking you for this valuable space to benefit the fruit growers, I am, your whole hearted believer in spraying.

JAMES E. JOHNSON.

Simcoe, Ont.

BIRD CHERRY PICKERS

I SEE that one of your correspondents in asking advice about a succession of sour cherries, says: "When my Early Richmond cherries begin to bear I shall be compelled to engage a great deal of help." What for? Not to pick the cherries. If it is there as it is here the robins, jays and catbirds will take everyone before they are ripe. I have a dozen trees and can't get enough to make a pie unless I take them half ripe or be content to pick off the ground what the birds let fall. The robins bring their young, sit them on nearby limbs and drop cherries into their wide open mouths

from sun up till sun down, and they appear to send out runners to all the regions round inviting all birds with their families to come and have a good time.

When the Montmorency cherries come in ten days later the red currants and early raspberries are also ripening, so the birds distribute themselves according to their tastes, so I get about half that grow on fifty trees. These birds ate for me last year at least $75 worth of cherries, saying nothing of strawberries, currants, raspberries and grapes. What benefit are they to the fruit grower and gardener that the government should protect them? In my opinion, none whatever. Who ever knew of a robin eating a potato bug, a cabbage worm, or an aphis? They live on earth worms till strawberries ripen, then choice fruit until they leave for the sunny south. I am in hearty accord with the fruit growers of some of the eastern States, "remove all protection, and if you can't shoo them shoot them."

A. W. GRAHAM.

St. Thomas, Ont.

THE HOTBED IN VEGETABLE GARDENING

FIRST consider the location. A gentle slope to the south is preferable. A windbreak, either natural or artificial, on the north, east and west, but not near enough on the east and west to shade the bed at any time of the day, is desirable. Very good results can be obtained from a hotbed built on level ground until the wet weather comes; then, as there is no chance for the surplus water to get away, the bed gets sour, and the stuff turns yellow and refuses to grow. Have the ground on which the bed is to be built free from ice or snow. If the ground is frozen, cover it with two or three inches of dry, cold horse manure. Cover this with at least a foot of warm horse manure, tread well and cover with another foot of cold horse manure. This for a bed built in the first part of February; if later in the season, smaller amounts can be used, or if the bed is being built on unfrozen ground, less will do. Tread the whole well, so that it is quite level with no soft places. On this foundation place the frame.

HOW TO MAKE THE FRAME.

The frame in most general use in our part of the country is 5 feet and 2 inches wide by 16 feet long, outside measurement; 12 inches deep, with three pieces of 2x4; 5 feet 2 inches long and 4 feet apart, cut into the sides until level with the top of the frame. Before fastening in these crosspieces it is well to square the frame, or the sash will not fit well. They will look like saw teeth, and there is no danger of leaving holes. Under the middle 2 x 4 put a piece of board 5 feet long, 4 to 6 inches wide edgewise, the bottom to be level with the bottom of the frame. This will greatly stiffen the frame and hold it in shape. We make the ends of this frame of 2-inch stuff and the sides of inch stuff.

Cover this frame with four sash 4 feet wide by 5 feet 2 inches long. Do not use glass larger than 8 x 10 inches; in large glass the breakage is much greater. Have glass bedded in putty and lapped about one-quarter of an inch. I have used sash with the glass butted. The breakage in those was much larger. The lap seems to give the glass double strength. The wooden part of the sash should be of 2-inch stuff. I have seen 1½-inch used, but they are too light and will not stand nearly so much wind when open.

FILLING THE HOTBED.

In the hotbed yards these frames may be placed in rows; about three frames, or 12 sash, in as many as can be handled conven-

iently in one row. Supposing this first row to be on the north side of the yard (which is the usual way), put the second 14 or 16 inches south and parallel with the first. Fill this walk or space between the rows with manure, dry, or frozen of you have it; anyway have the top 4 inches of this dry stuff. The wet manure will freeze in a foot, when if covered with dry 4 inches it will not freeze at all. I once tried to save labor by filling the frame with manure when I built the beds, and then take out enough to bank the walks with of the wet, hot manure. It froze to the bottom of the frame, and I had to remove it. Bank the ends of these rows well 2 feet or more.

In from five to seven days these beds should be hot and ready for earth. Then remove the sash and tread the manure until it is quite solid and fill the soft places. If this is well done the earth will come off much nicer in the fall, and if the manure is level and the top of the earth level you will have it the same depth all over. Spank the loose straws down so that they will not stick up into the earth and be caught by the rake. Put in 6 inches of earth, and when it is nicely warmed through, probably in one or two days, your bed is ready for plants or seeds. If it is about the first of March, and you have good plants raised in the greenhouse or earlier beds, you can have fine lettuce for market or the table in 25 or 30 days.

The sash should be covered with shutters on cold nights. They should be opened a little in the morning when the thermometer shows 70 to 75 degrees, when it will probably drop back to 60 or 65 degrees. If in the middle of the day it should go to 80 to 85 degrees, open a little more; by 4 o'clock if it is not above 80 degrees it will be safe to close the sash. If the wind is freezing, open the sash on the side or end away from the wind.

CROPS FOR THE HOTBED.

A crop of radishes can be raised in bed of this kind in 30 days. Sow the seed in drills ½ of an inch deep, the drills about 4 inches apart. It would be well to test radish seed. If it all grows, a seed every ½ inch is plenty; if only 50 per cent. is good, sow it twice as thick. I believe that all seeds used by gardeners for forcing purposes should be tested the year before, so that you may know that they will grow and also that they are true to name. This is especially true as to lettuce and cucumbers, for 15 cents' worth of these seeds will produce $500 worth of vegetables, while if your seeds were not true to name you might expend the same amount of labor, the use of your sash, and grow a poor crop, which would bring half price or less, and always hard to sell. April 1 is about as late as radish seed can be sown in hotbeds and get the crop to market before the outside crop gets in. But if you have good plants you can keep putting in lettuce up to May 1 with a good chance of marketing it in advance of outside lettuce.

About March 15 sow cucumber seed for hotbed crop. Sow the seed either broadcast or in drills, in greenhouse or hotbed; cover with sand. They will come up quicker covered with glass pressed down on the sand; remove this glass when the plants are plainly seen under it. Transplant into 4-inch earthen pots or berry boxes when plants are just starting the third leaf. This will be about April 1 to 5. May 1 you will have nice plants. Remove the plants and dirt from the pots or boxes and plant them in center of sash, place having been made for them by leaving out four or six lettuce plants. I have always had the best success with both lettuce and cucumber plants when they have been kept growing right from the start. Lettuce plants I would keep at 40 degrees if possible at night and on cloudy days, and 70 to 90 degrees when the sun is shining. Cucumbers I like at 80 degrees at night and 100 degrees in the sun.—*American Agriculturist.*

Flower Garden and Lawn

SPRING NOTES FOR FLOWER BED AND BORDER

BY WM. HUNT, ONTARIO AGRICULTURAL COLLEGE, GUELPH.

PLANT life out of doors has been well protected during the exceptionally severe winter we have experienced by the early and continuous falls of snow which have been so general—and in many places too copious—all over the province. In spite of the mercury indicating zero for days together, and sometimes dancing away twenty or thirty degrees below that point, there is very little frost in the ground at this date (February 13th). In many places there is only a few inches of frozen soil, whilst a few specially well protected spots have been found with only a slight crust of frozen earth.

The trying time for plant life this season, however, has yet to come. Owing to the very early snow falls very little artificial protection could be given to plants in early winter.

It will be well, therefore, for those who have plants or bulbs of a tender nature in the garden to prepare to give them some protection during the period of broken weather usually experienced when spring approaches. Tender roses, tender shrubs, as well as plants of a tender nature in the border, will be very much benefited by some slight protection during periods of alternate freezing and thawing, as well as sunshine, the last mentioned being as hurtful to plant life in many cases as severe frost at this season of the year. A few fine boughs or tree trimmings, with a sprinkle of straw or long strawy manure amongst them will make an ideal spring protection for plants. Heavy, close covering is not necessary. The covering should be placed over the plants almost before the snow has thawed away from them. It can be left on day and night if the nights are frosty and bright sunshine prevails in the day time. A few days partial seclusion from sun and light will not hurt plants at this season when severe night frosts prevail.

PRUNING.—Flowering shrubs need very little if any pruning at any time. Thin out here and there the most prominent branches, if the plant is overgrown or unshapely, but do not clip or shorten back all of the young growth, as this mistaken method of pruning deprives the shrub of the growth necessary to produce the coming season's wealth of blossom. In most cases the thinning out process before mentioned can be profitably done later, when the shrubs are in flower, as the prunings can then be used for decorative purposes indoors. If not of too severe a nature this late pruning in summer will not injure the plants.

One exception to this method of thinning flowering shrubs should be mentioned, viz., that of the hardy hydrangea (hydrangea paniculata grandiflora). This plant should be severely pruned back early in the spring before the buds start, or it can be done in late autumn time or early winter. If not already done, the young shoots of this popular shrub should be cut back to within three or four inches of the old growth. This method of pruning produces much better and larger panicles of bloom than if the plants are not so severely pruned. Cedar and spruce hedges may be clipped at any time during April or early in May, not later. By clipping them at this time, just before growth commences, they can be clipped rather severely if necessary. Later clipping than the time mentioned is not advisable, unless left until autumn. Late summer clipping

of evergreen hedges or trees, as sometimes advised, means the disfigurement and loss of most of the delicate green tassel like growth that gives them such a beautiful appearance in the early summer months, more especially that of Norway spruce.

Pruning Roses.—All hardy out door rose bushes should be pruned about the end of March or early in April, just as the buds show the first signs of breaking into growth. Bush roses require severe pruning, especially if the plants are extra strong and robust. Cut out all the dead branches just as well as the weak thin shoots. Prune the growth that remains back to within four or five inches of the old growth. The stronger the shoots the more severe should be the pruning. Strong young canes or shoots growing up from the base of the stem should be pruned back to about eighteen inches in length. Care must be taken, however, to ascertain if these last named canes or shoots are the real growth of the rose, or only suckers from the stock. These suckers occur only on roses budded on the briar or manetti stock and may be discerned from the true rose growth generally by their being of a much lighter shade of green in color, as well oftentimes by the almost entire absence of prickles that the growth of most roses produce. These suckers should be removed from as close down to the root of the tree as possible, or they will eventually kill out entirely the true rose growth.

Climbing roses should have the dead shoots removed and the weak growth thinned out so that the branches are not left too crowded. The strong vigorous canes or shoots should be pruned back so as to leave them from three to five feet in length.

Removing Winter Protection.—In removing winter covering from bulbs, plants or shrubs, do not expose them at once to full light and sunshine or the changeable spring weather. Remove the protection by degrees as the state of the weather permits. Weather conditions and not the calendar must be the guide in this respect.

Seeds.—In making out the seed list avoid putting down too many novelties. Use these as extras; it will often save disappointment.

Planting.—When plants or trees are received from the nursery, either heel them in or plant them in their permanent positions at once. Exposing the roots of any plant or tree to sun and air even for a short time only is injurious, and is often the cause of failure when transplanting. This is especially the case with evergreens, such as spruce and cedar.

In transplanting make sure that the soil is packed well around the roots, sufficient to make the soil firm. Air spaces around the roots of a newly planted tree or shrub often means rot or decay to the roots and perhaps death to the tree. The drier the soil when planting the more necessity there is to pack it firmly.

Plant when the ground is fairly moist if possible. Better to wait a day or two before planting if the ground is of a clayey nature and sodden with water.

Frozen Plants.—The best method of treating plants that have been frozen is to remove them at once—before the frost is out of them—and place them on the floor in a dark corner of the room, where a temperature of about 45 or 50 degrees prevails, not warmer, as a too rapid thawing out is not advisable. Cover the plants up carefully with a blanket or rug so as to exclude all light and as much air from them as possible. Do not touch the foliage with the hands or allow the covering to touch the plants. Keep them covered up close about twenty-four hours. The plants should not be brought into full light or sunshine for several days. I have found this method of treating frozen plants to be much better than the more speedy and radical method of deluging them with cold water as is often done.

THE CHRYSANTHEMUM

BY H. L. HUTT, B.S.A., ONTARIO AGRICULTURAL COLLEGE, GUELPH.

(CONCLUDED)

FIG. 2755. ROHALLION.

Another popular way of growing chrysanthemums is what is known as "single blooms in five-inch pots." The beauty of these is the dwarf size of the plant and the large size of the bloom, although I think the beauty of the plant as a whole is improved by allowing three or four blooms to a plant. To obtain such plants it is necessary to start the cutting in May, pack the soil in which they are grown very firm, keep in small pots, and pinch back lateral buds as required.

CLASSIFICATION AND VARIETIES.—Any classification of chrysanthemums nowadays is a difficult matter and very unsatisfactory. The best classification, and the one usually adopted, is as follows: Pompons, Singles, Anemones, Chinese Incurved, Chinese Reflexed, Japanese Incurved, Japanese Reflexed and Hairy Japanese. But with all the crossing and re-crossing, which has produced so many intermediate varieties, is is often difficult to say to what class any particular variety belongs to. The list of varieties, too, has become so long that only a few of the best of each class need be mentioned.

The Pompons bear small button-like blossoms, an inch or an inch and a half in diameter, of a great variety of colors. The plants are of dwarf habit, hardy and very free flowering. Rose Travena is the most desirable variety of this class I have tried.

The Single Chrysanthemum is built on the same plan as the Ox-eye Daisy. An endless variety of these may be obtained by

FIG. 2756. INFANT DES DEUX MONDES.

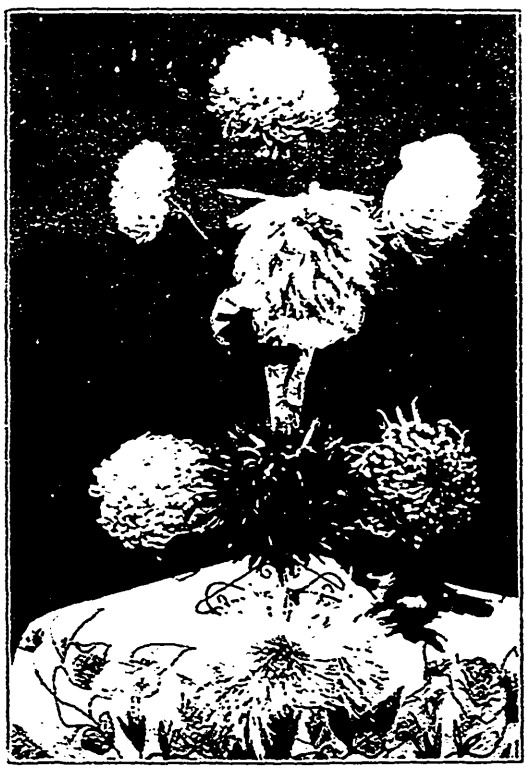

Fig. 275. Mrs. H. Cannell.
Philadelphia. Jessie Hoitt.
Glenny Specimen. Mrs. Geo. Glenny.
Jory. Enfant des Deux Mondes.
Judy Hoitt. Louis Boehmer.

sowing seed, but, as a rule, they are hardly worth while cultivating.

The Anemones have only one or two rows of ray flowers, which may be wide spreading or drooping. The centre florets are usually the same color as the rays, but are quilled and very much shorter. Judge Hoitt is a typical variety of this class.

The Chinese Chrysanthemums are characterized in the typical forms by the regular globular form of the flower, and the evenly imbricated petals of medium width. In the incurved section the petals arch gracefully inwards towards the centre, while in the reflexed section the petals are curved backwards. A few of the best I have tried of this class are: Ivory, an early, pure white, of dwarf habit; Mrs. L. C. Maderia, a symmetrical, compact globe, of bright orange color, and Mrs. George Glenny, a profuse bloomer, bearing medium sized flowers of a pale sulphur yellow color, a beauty when loaded with bloom.

The Japanese Chrysanthemums, and the numerous hybrid forms which have emanated from them, make up the majority of our large flowered varieties. Some have flat petals, in others they are fluted, quilled or twisted. Some are broad and short, others are long and slender, almost thread-like. In some the petals are incurved over the centre, in others they are reflexed.

The petals of the hairy varieties are covered with hair-like granular growths. This type is one of the most recent introductions, and already includes many choice varieties. An extensive list of grand Japanese varieties might be given. In our collection at the

Fig. 276. Hilda Blanchard.
Pitcher and Manda. Harry Balsley. Good Gracious.
Mrs. G. A. Magee. C. H. McCormick. E. L. Ames.
L. B. Bird.

FIG. 2759. BRIDE OF ROSES.

college we have about 130 varieties, but I shall mention only a few of the most desirable ones, including the various shades of the different types.

Maud Dean. This is a variety which can hardly be commended too highly. The flowers are large, a beautiful shade of lilac pink, and of great substance. The plant has stiff, long stems, is short jointed and of healthy compact habit.

W. H. Lincoln. The habit of this variety, like the one just mentioned, is nearly all that could be desired. The flower is large, and probably one of the best of the bright golden yellows.

Joey Hill. Flowers very large, florets broad and reflexed, cardinal red above and old gold beneath. The plant is healthy and free flowering, but rather tall.

Roballion. An excellent pale yellow. The flowers are medium size, the florets semi-quilled and curled. Plant healthy, vigorous and a profuse bloomer.

President W. R. Smith. A rather tall growing variety for window culture, but one of the best to grow as a standard. Flowers large, late, incurved, and of a very pleasing shade of light pink.

Lilian B. Bird. This is also a rather tall grower, but the bloom is very striking, being made up of long straight quilled florets, of a soft shade of light pink. One of the latest to bloom.

Iora. An exceedingly artistic flower of light pink color. It is also a quilled variety, but unlike the one last named, the florets are curled and twisted. The plant is moderately short jointed, vigorous and very free flowering.

FIG. 2760. VIVIAND-MOREL.

L'Enfant des deux Mondes, or The Child of Two Worlds, is one of the finest of the hairy varieties. Flowers large, pure creamy white and densely covered with granular hairs. Plant of good compact habit and a profuse bloomer.

Louise Boehmer is a beautiful magenta pink, of the hairy class, and similar to the last mentioned variety in almost everything but color.

To those who would like to get more information on the subject than could be given in a short paper, I would like to recommend some literature which would, no doubt, be of interest to them. One of the best books on the chrysanthemum is "Chrysanthemum Culture for America," by James Morton. As an excellent work on floriculture generally for the amateur, I could not recommend anything better than "Vick's Home Floriculture," by E. E. Rexford, the popular writer on that subject in the Ladies' Home Journal.

FIG. 2761. LOUIS BOEHMER.

FIG. 2762. PORCH COVERED WITH VIRGIN'S BOWER.

Fig. 2763. Clematis Virginiana (Virgin's Bower).

SOME GOOD CLIMBERS FOR THE PORCH—I.

FEW of our readers, even among those who belong to our affiliated horticultural societies, are aware that we have in Ontario a native variety of Clematis which is sufficiently hardy to be grown even in our northern sections. Some years ago we received some plants of it from Mr. J. P. Cockburn, of Gravenhurst, and these have thrived wonderfully well, covering a portion of the front porch as seen in our engraving.

The flowers are white and small, compared with many foreign varieties, but are so numerous as almost to cover the vine, and grows in panicles as shown in Fig. 2763. These come on the new wood in June and July, and in August the flowers are succeeded by numerous carpels, with long tails, as shown in Fig. 2764 and which are also ornamental. The leaves of the Virgin's Bower are alternate, and each leaflet is acute heart-shaped, and coarsely toothed, and often cut in deep lobes. The vine grows stronger each year, and will reach up fifteen or twenty feet.

Fig. 2764. Bunch of Carpels.

WINTER WINDOW GARDENING

AN ADDRESS BY WM. HUNT, ONTARIO AGRICULTURAL COLLEGE, GUELPH.

(CONCLUDED)

FIG. 2765. ANTHERICUM PICTURATUM.

Dutch hyacinths and several varieties of Narcissi, such as Von Scion, Poeticus, and the Trumpet, are among the best and easiest varieties of bulbs to grow in a window, although the Jonquils and other types of Narcissi than those mentioned succeed splendidly as window plants. These last mentioned species of bulbs are later flowering than the Roman hyacinths, and do not usually come into flower until February or later. When potting these later flowering bulbs it would be advisable to bury the pots in the cellar, or plunge them in some position where they can be protected from very severe frosts. A certain amount of freezing will not hurt them, but it is difficult to remove the pots without injury when they are frozen too hard. All potted bulbs require plenty of water after they are brought out to the light, that is, the soil should never become really dry at any time.

In potting bulbs, the top or apex of bulb should be barely showing above the surface of the soil. Three Roman hyacinths or three or four bulbs of narcissi can usually be planted in four or five inch pots. In the case of Dutch hyacinths one bulb to a four inch pot is usually sufficient.

The Freesia is another useful and easily grown winter flowering bulb. Plant five or six bulbs in a four or five inch pot in the manner described for hyacinths, etc., but do not bury the pots under ashes or soil. Stand the pots in a fairly sunny position in a temperature of about 50 or 60 degrees, and water sparingly after the first watering until growth has well commenced. The first Freesia bulbs can be potted in August, and as often as required afterwards until November. The delicious odor from only a single spray of these flowers will perfume a large house. Late planted Freesias should be started in the window. The Arum or Calla Lily should be kept nearly or quite dry during the summer months. The best place for these lilies during the summer is to lay the pots on their sides about the first of June or as soon as the plants are out of flower. A shaded position under trees or in the shade of a building or fence is a good place for them while dormant. Re-pot them in August if necessary, but do not overpot them, as too large a pot often means a lot of leaves and no lilies. Give the plants lots

of water whilst they are in a growing condition, never allow the soil to become quite dry. Some drainage placed at the bottom of the pot when repotting is advisable. Use light rich soil for callas.

Many varieties of begonia make splendid window plants for winter. Among the most satisfactory is the beautiful golden blotched leaf variety, Begonia manicata aurea. This is, in my opinion, the best window begonia we have for winter use. Begonia argentea guttata is also another useful variety, also the Paul Bruant variety. The Begonia incarnata rosea, with its pretty pale pink blossome, that it produces so freely at Christmas

FIG. 2766. HYBRID REX BEGONIA, BERTHA McGREGOR.

time, is another that should not be overlooked, but it is rather more delicate than those first mentioned.

The Rex, or ornamental leaved Begonia, make pretty window plants. Many people fail with these begonias from placing them in a sunny position in the window and by over-potting them. All Begonias like a light soil to grow in, one third of fine sharp sand and two thirds of fairly rich loamy potting soil makes a good admixture of soil for Begonias. A little well rotted leaf soil mixed in will be beneficial. Use nearly an inch of drainage in the pots when potting Begonias. Begonias like a temperature of 65 to 70 degrees, but do not like much real hot sun, preferring partial shade, at noon especially.

Many more varieties of Begonias could be mentioned, but those I have named are among the best for windows in winter.

A very easily grown and effective window plant is the Anthericum picturatum. Its pretty striped foliage makes it a bright, conspicuous feature at any season of the year, more particularly in winter, its silvery, ribbon-like leaves contrasting very prettily with the almost universal green of the foliage of winter window plants. These plants like a temperature of about 65 degrees, and require a rather shaded position in the window. Plenty of water should be given them, as a very dry condition of the soil often results in serious injury, and perhaps the total loss of the plant, if the drought is of long duration.

There are many other species of plants suitable and comparatively easy of culture, but time will only allow of a few being mentioned. Among them is the Cyperus alternifolia or Umbrella plant, that delights in a warm, partially shaded window, where the sun does not strike at noonday. Given this position, with plenty of water at the roots, and its foliage also given a dip once or twice a week in water, its whorls of delicate green leaves will retain their freshness much longer than if they are kept in a dry, overheated atmosphere.

Many of the varieties of Cactus help to relieve the sameness that a collection of window plants often present in winter. Cactus like plenty of drainage in the pot, plenty of sand (nearly half) in the potting soil, and not too frequent watering. The Lobster Cactus (Epiphyllum truncatum) as well as a few of the quicker growing Cactus of the Phyllocactus type, may like a little richer and heavier soil, but there is danger even to

these, unless plenty of drainage is given, as well as care in watering, as they are very liable to rot at the base of the growth, especially if over-potted.

The Farfugium grande (Leopard plant) is also a good window plant, its thick leathery gold spotted leaves being particularly noticeable in a window. It delights in a rather cool shaded window, requiring plenty of moisture at the roots. This is one among the few plants that succeed better in a window than in most greenhouses. It is seldom a good specimen is seen in a greenhouse, whilst handsome specimens, a foot or two in diameter, are often seen in dwelling house windows, as well as on verandahs in summer.

The Ficus elastica (rubber plant) is also a good enduring window plant. Its leaves require sponging frequently to increase and preserve the glossy green of its foliage; the latter, together with its power of resisting gas and the bad effect of a dry temperature, being its chief points of recommendation as a window plant, as it is not of a very graceful appearance, even under the very best conditions.

Amongst climbing or trailing plants the several varieties of Tradescantia or Wandering Jew, as well as the variegated Japanese Vincas or Periwinkles cannot be omitted. The Saxifraga sarmentosa (Spider wort or Mother of Thousands) is also a splendid plant for a hanging pot or basket in a window.

The rampant climbing plant known as the German or Cape Ivy is a grand climber for the window, a single plant often covering the entire window.

During the address practical illustrations were given by the lecturer of the methods of propagating most of the plants mentioned. The method of propagating the Ficus or Rubber plant by mossing partially severed cuttings, whilst the branch or cutting is still left on the plant, was most interesting. Cutting up the leaves of the Rex Begonia into discs and sectional cuttings from the leaves of these plants was also fully illustrated and described, as well as the best methods and seasons of the year for propagating them. Propagation from terminal cuttings from plants, such as the fuchsias, geraniums, begonias, etc., was fully illustrated and explained, as well as sectional stem cuttings, and raising plants from root cuttings, natural specimens being used in the different demonstrations made during the progress of the address.

It was also explained that clean, sharp, fine sand placed in well drained pots or shallow boxes was the best material for rooting cuttings of most window plants, the summer time being the season when success was most likely to crown the efforts of the amateur in increasing his stock of window plants from cuttings of any kind.

The best kind of soil to furnish the basis of a good potting compost for window plants is obtained by cutting sod from a pasture field where the soil is of a loamy nature, and the grass kept fed down. Cut the sod about four inches thick and the size over of a spade. Make a pile of sufficient size of this sod by first laying two thicknesses of sod with the grass side downward, then put about the depth of one sod, three or four inches, of cow manure. Continue this succession of sod and manure until the pile is large enough. Make the pile outside in a corner of the garden away from chickens and animals. In six months it will be ready for use. This compost can be tempered with sand or leaf soil as required for plants that require a very light soil, such as begonias, fuchsias, ferns, etc.; but for geraniums, roses, bulbs, and the majority of window plants, the sod compost will suit splendidly, especially if the sod is taken from a sandy loam soil.

The Canadian Horticulturist

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SUBSCRIPTION PRICE, $1.00 per year, entitling the subscriber to membership of the Fruit Growers' Association of Ontario and all its privileges, including a copy of its valuable Annual Report, and a share in its annual distribution of plants and trees.

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ILLUSTRATIONS—The Editor will thankfully receive and select photographs or drawings, suitable for reproduction in these pages, of gardens, or of remarkable plants, flowers, trees etc.; but he cannot be responsible for loss or injury.

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THE CANADIAN ASSOCIATION OF FALL FAIRS.

H. B. Cowan, the New Superintendent.

The two days' convention of the Canadian Association of Fall Fairs and Exhibitions, held in Toronto, was one of the most successful, systematic and beneficial sessions in the history of the organization. The attendance was large, and great interest was manifested throughout in the proceedings.

The association's officers for the coming year are: President, W. R. Sanders, Stayner; 1st vice-president, J. W. Sheppard, Cayuga; 2nd vice-president, James Mitchell, Goderich; recording secretary, Alex. McFarlane, Otterville; corresponding secretary, H. B. Cowan, Toronto; directors, J. T. Murphy, Simcoe; Ed. Jeff, Bond Head; Rev. C. B. Clark, Russell; Chas. Walker, Erin; W. E. Smallfield, Renfrew; R. R. Hall, Parry Sound; Allan Gray, Uxbridge.

The first paper of the day was that of Prof. C. A. Zavitz, of the O. A. C., Guelph, who spoke on "Experimental Plots in Fair Grounds." Mr. Zavitz spoke of the striking increase in value of Ontario's crops, which he attributed largely to the seed plots at the Guelph College. The Whitby Fair had first introduced plots, and since then five other Ontario fairs had done so, while applications for seed had come from Quebec and the Maritime Provinces. Mr. Zavitz predicted that in the ensuing five years the fall fairs would exert a greater influence in improving crops than they had done in half a century.

Mr. C. C. James, Deputy Minister of Agriculture, stated his opinion that the fall fair should be purely educative. He believed the farmer should have amusement, but he should have it all the year round, and not expect to get it only for two days at his fall fair. He urged that the rate of advance the past five years be maintained.

Enterprising Poultry.

The last item on the morning's program was a talk on "Poultry Culture" by W. R. Graham, of the Ontario Agricultural College. He made the surprising statement that the hens at the college had been laying all through the cold weather, even one day when it was 13 degrees below zero in the coop. This he laughingly cited as a result of educating the hens. The hens were not kept warm, but were given exercise and fresh air.

At the afternoon session W. A. MacKinnon, chief of the fruit division at Ottawa, gave a

valuable address on "Fruit at Fall Fairs." He advised that exhibitions of fruit be separated into two classes—commercial and amateur. The commercial class should again be classified as export or domestic. The former should be shown packed in barrels ready for shipment, and in boxes, wrapped and unwrapped. Those intended for domestic sale should be shown packed in baskets, barrels and boxes. He said that the Dominion Department of Agriculture was willing to give all possible assistance and to supply expert judges for fruit exhibitions.

This Year's Outlook.

Mr. Creelman, in an address on "The Outlook for Fall Fairs in 1904," suggested that smaller associations be formed, embracing districts whose products were in common. In a central association, covering so much territory, it was possible to deal with subjects only in a general way.

Mr. H. R. Cowan, who succeeds Mr. Creelman as superintendent of agricultural societies, outlined his proposed work for 1904. He advocated liberal advertising of fairs, a convention of secretaries for mutual benefit, careful attention to the interests of the farmer, the main support of the fall fairs, and unity of effort by groups of adjacent fairs, including the hiring of a manager to devote his whole time to a group of fairs. Mr. Cowan also proposed a method of insuring fairs against financial loss by reason of rain on exhibition dates.

The usual votes of thanks to the city authorities, the speakers and press were passed, and the convention was closed.—The Mail-Empire.

THE EXPORT APPLE TRADE.

Late advices from Liverpool report a good market for all arrivals of sound stock which have sold at steadily advancing prices. Account sales have just been received from Liverpool of a lot of 120 barrels of Golden Russets netting the shipper $2.40 in the west, a lot of 100 barrels Baldwins netting $3.10 in the west, and 100 barrels of Greenings netting $2.00. A choice lot of Golden Russets netted the shipper a fraction over $4.00 per barrel. The same western shipper, however, admits that by the same mail he received returns of two lots that only netted him 75c and $1.10 per barrel respectively, on account of a portion of the fruit being frosted. But on the whole he is well satisfied with the result of his shipments this season up to the present: but what he is afraid of is that as the market on the other side has held up so well, that shippers will be induced to send forward second qualities, a considerable quantity of which it is said is still held in the west, and which it is difficult to dispose of to the local trade. Up to the present it is generally admitted that Canadian shippers have realized good average profits this season, and a Montreal firm is reported to have made splendid gains on its Nova Scotian shipments to London market. The total exports of apples from Canada and the United States for the present season up to week ending February 13, 1904, were 2,922,906 barrels as compared with 2,097,581 barrels for the corresponding period last year, showing an increase of 825,325 barrels.—Fruit Trade Journal.

FRUIT GROWERS' ASSOCIATION SHOULD LEAD IN THIS.

At the Ontario Fruit Growers' convention Principal Mills, of the Ontario Agricultural College, made a suggestion that has elicited considerable discussion, and may lead to a most important change in the railway freight charges. The suggestion was that the Dominion Government should be asked to establish an express branch in connection with the postal service. The railway freight rates are much too high, but the charges in a service carrying small parcels in connection with the postoffices is already in existence and works in a most satisfactory manner. With our express business nationalized it would be possible to take a package of butter, eggs or fruit to any postoffice on rail line and have the same delivered to the customer more promptly and at very much less cost than now. It would be a great gain to the farmers and to the consuming portion of the community. In Canada a large proportion of the cost of railway construction has been borne by the taxpayers, and it is now proposed by the Laurier Government to increase the grants out of the people's treasury to the Grand Trunk by many millions of dollars. It is then quite time that the people should study their own interests more, and the suggestion of Principal Mills regarding nationalizing the express service is a case which every intelligent citizen should adopt and press to a conclusion favorable to the people. The Fruit Growers' Association might very properly lead the way in the agitation, and it is to be hoped the association will do so.—Bobcaygeon Independent.

FRUIT FOR ST. LOUIS.

Mr. T. H. Race, editor of the Mitchell Recorder, has been appointed as the Dominion Fruit Commissioner at the St. Louis Exposition, and expects to spend the greater portion of the summer at the place. He will have entire charge of the fruit exhibit of the Dominion.

"I think Canada will make a splendid showing in the line of fruit," he said in a recent interview. "All arrangements have been completed, and the growers are responding well. The exhibit should be a good advertisement for this country, especially as it is to be housed in a very fine building which Canada is erecting. There will be a fine showing of all agricultural products, save live stock, and I can scarcely say that I blame the stockmen for the stand they have taken in the matter, as the conditions were certainly most vexatious."

Mr. Race has been addressing institute meetings, which on account of the weather have not been as well attended as in former years. This does not mean any diminution of interest in the

work, but the terrible state of the roads is entirely the cause. Farmers are quite unable to get out to attend the meetings, and with the best desire in the world to hear what the speakers have to say, they are impotent to help themselves. Last year was about the best in the institute work.

SPREAD THE FRUIT AROUND.

How Canadian Shippers May Obtain Good Prices.

Mr. Peter Ball, Canadian Commercial Agent at Birmingham, advises Canadian apple shippers not to pour the whole of their fruit crop into London, Liverpool, Manchester and Glasgow, within a few weeks, for sale in auction rooms, but to spread them over the different towns, placing them in the hands of firms who could take regular supplies. The latter course would pay better.

"I could place," he states, "among different towns in this district up to 10,000 barrels a week, divided among respectable men, if any of our apple shippers would care to get into communication for regular supplies." It was most unfortunate that Canadians shipped so many apples just before Christmas. At the present time it is almost impossible to purchase Canadian apples in the market. Spys, Russets and Baldwins, which went for 12s 6d and 14s a barrel, now command from 21s to 25s.

CANNED AND EVAPORATED GOODS TRADE.

Mr. A. W. Grindley, agent of the Department of Agriculture in Great Britain, gives the following information in regard to the trade in canned and evaporated goods during 1903, in addition to the extracts from his annual report, published last week.

Fruit Pulps.

There is a good demand for the following fruit pulps, which can be put up in Canada: Strawberry, raspberry, gooseberry, black currant, peaches, pears, apricots.

The above fruits are largely used in jam factories in Great Britain.

Canadian packers of fruit pulps should observe the following points:

1. Use a heavy grade of charcoal tin plates for making the cans.

2. Do not use resin for soldering the inside seams, as the least portion imparts a bad flavor to the contents.

3. One gallon tins are preferable to cans holding five gallons, chiefly because there is less loss in case of a puncture or other cause of damage.

4. For colored pulps an internally lacquered tin is very much preferred.

5. No coloring matter or preservatives of any kind should be added.

6. Have cases holding cans made strongly and with tight covers, not slats.

NATIONAL CONFERENCE OF FRUIT GROWERS.

At the annual meeting of the Nova Scotia Fruit Growers' Association at Bridgewater it was mentioned that the Dominion Minister of Agriculture had received a communication from leading fruit growers of Prince Edward Island, New Brunswick and Nova Scotia, asking him to call together at Ottawa a conference of representative fruit growers from all the provinces of Canada to discuss matters of national interest, such matters as might call for legislation by the federal parliament, or matters that might require unanimous action on the part of the fruit growers of this country. In this connection Mr. W. A. McKinnon, chief of the Fruit Division, Ottawa, referred to the advisability of concerted action regarding such subjects as transportation, legislation, uniformity of packages, etc., and said that the Hon. Sydney Fisher and Prof. Robertson would welcome a full discussion of the proposal and an expression of opinion from the Nova Scotia and other provincial fruit growers' associations. The matter will accordingly be taken up by a committee of the Nova Scotia Fruit Growers' Association, some members of which suggested the formation of a Canadian Pomological Society of national character and scope.

APPPLE BARREL STAVES.

A leading Guelph apple shipper writes the Fruit Division, Ottawa, that he can use from 12,000 to 15,000 barrels every year, and that it is his intention to buy the staves and make his own barrels hereafter. He says: "The trade will have to make great preparations, because all staves in the country will now be very green wood, and I should specially warn your department to urge all stave dealers to get drying kilns working so that stock will be O. K. when needed."

FRAUDULENT APPLE PACKING.

Under the above heading the Winnipeg Commercial of February 6th has an editorial of more than ordinary interest to the fruit shippers of Ontario. The article says: "Another Ontario fruit man was fined at Winnipeg last week for attempting to sell apples in this market which had been falsely marked and packed. The offender had not even the excuse that he was ignorant of the law to offer, and his guilt was even increased by the fact that he had been warned for the same offence before. If we are to judge the Ontario fruit shippers by the proportion of them fined here for dishonesty of this kind the opinion would be formed that more than an ordinary percentage of them are worth watching in business; and if we are to judge Ontario business men generally by the standard which this would set up for the fruit men, there is danger that the good opinion of them heretofore held will have to be considerably modified. The number and extent of the frauds exposed

by the operations of the inspectors working under the Fruit Marks Act has been such that the public may well believe that before the act went into effect honest packing was the exception rather than the rule. It is to be hoped that the recent police court experiences of Ontario shippers to this market, of which the above mentioned case is a sample, will have the effect of stopping the dishonest practices which, if continued, can only have the one effect of driving Ontario out of this market altogether."

THE FRUIT PROSPECTS.

It is a little early to say much about the fruit crop of 1904, but it is a question of such importance to fruit growers that we welcome even the probabilities. The winter has been one of such universal severity that the peach and sweet cherry buds in even the most favored parts of the province have been very severely thinned, and in the less favored places almost entirely destroyed. In our own orchards we find from one-third to one-half the peach buds black at heart when cut open transversely; but, unless the injury is more extended than this would indicate, a sufficient number are still alive to secure a good peach crop. If the reports are true that New York and Michigan peach buds are destroyed, then we have a fair prospect for good prices in 1904.

Pears and plums are injured in sections farther north, and even apples will be most severely tested in their most northerly limits.

Mr. J. S. Mitchell, Clarksburg, near Collingwood, writes:

"Peach buds seem to be badly hurt. All other fruits are all right and prospects good. We have had no thaw this winter. Most ice in Georgian Bay in forty years, and deepest snow I ever saw. Great damage done by mice, especially in uncultivated or grass orchards."

Mr. Harold Jones, of Maitland, near Brockville, writes:

"It is too early in the season to state definitely the condition of the fruit trees in this section. The long continued cold weather and deeply frozen ground has caused some shrivelling of twigs and buds on the apple trees, but I cannot see any serious injury as yet.

"Pears and plums will likely suffer serious injury, as much of the wood is darkened, and cherries are in an uncertain condition.

"The thermometer in January registered as low as 38 and 40 degrees below zero, and we have had steady cold with very few days above zero since January last."

Mr. W. H. Bunting, of St. Catharines, writes:

"It is generally conceded that peach buds are pretty well destroyed, although not entirely so. A great many of the older trees are also badly frozen, and in some cases will not in all probability recover. It is quite too early to discover whether root killing has obtained to any degree, but from the fact that we have had a great deal of severe weather, with little snow covering the ground during portions of the winter, this trouble may be in evidence later on. Under favorable circumstances we could hardly expect a repetition of last season's heavy crop of fruit this year. I would therefore not be surprised if the coming season should be marked by a very great decrease in the production of our tender fruits."

CANADIAN APPLES IN FRANCE.

That only the finest qualities of firm fruit will bring profitable returns when exported to Europe is again made manifest. Writing to Mr. W. A. MacKinnon, chief of the Fruit Division, Ottawa, M. W. Richeux, of the firm of Champagne Freres, Limited, Paris, says: "In August and September last we had occasion to write you and take advantage of your kindness to obtain information about the apple business in your country, and also about the line of steamers from Canada to France. As was foreseen, and for the first time, this year Canadian and American apples have come to France in important quantities, on account of the French crop being almost a complete failure, and we are glad to say that the best goods have obtained satisfactory prices, although the market is not so very good at present. We are, however, of opinion that it will soon recover, and that prices will rise again, but what we want in France are the best qualities and hard and strong apples that will arrive in good condition. Any arriving in somewhat doubtful condition will sell very much lower. We have started this business ourselves, and hope to receive some Canadian apples and obtain satisfactory results."

THE NORTH OF IRELAND MARKET.

Once again the attention of the Fruit Division, Ottawa, has been called to the excellent market that exists in the north of Ireland for first-class Canadian fruit and other food products. This time it is Mr. R. Andrews, 56 Clifton Park avenue, Belfast, who mentions the fact that this market is not properly cultivated by Canadian shippers, and who desires to be put in communication with some of these gentlemen. He is in a position to do general commission trade, and would undertake agency for Canadian manufacturers as well as produce in the north of Ireland, where he has good connections.

A similar request has also been received from Albert Cabaret, 77 Bd. Gouvion, St. Cyr, Paris, France. Mr. Cabaret is prepared to handle all lines of Canadian goods, including fruit, of which considerable quantities have been exported to France this season.

The pussy-willow and the hazel know,
The bluebird and the robin, what rings true:
I trust to such, and let the whiners go.
Bravo! Bluff March: I swing my hat to you.
—*Country Life in America.*

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(1) The Dorothy Perkins, a new pedigreed climbing rose. We give the originator's account and description:

Parentage: This rose was originated from seed of the Japan variety, Rosa Wichuraiana, hybridized with pollen from that grand old rose, Mme. Gabriel Luizet. The seed plant was chosen for its hardiness and vigorous habit of growth, the pollen parent for its beautiful color and remarkable freedom of bloom. The qualities of both are combined to a remarkable degree in the hybrid, which was one of a lot of two hundred seedlings hybridized in the same manner. While many of the others were of great merit, the Dorothy Perkins was the best of them all.

Hardiness. In this important point nothing more could be desired. Two unusually severe winters failed to injure the plants in the least, although during one of them the temperature went as low as 20 degrees below zero and there was not the usual snowfall to protect them.

The Flowers are of large size for this class of rose, usually about one and one-half inches across; are borne in clusters of from ten to thirty and are very double; the petals are very prettily rolled back and crinkled; the buds are remarkably pretty, being pointed in shape and of just the right size for the button hole.

The Color is a most beautiful clear shell-pink and holds a long time without fading. Even when the flowers commence to fade the color is still pleasing, being then a lovely deep rose.

In Vigor the Dorothy Perkins is a true descendant of Rosa Wichuriana, making in a single season strong, lusty shoots, often of ten to twelve feet in height.

In Habit of Growth it is, unlike its seed parent, decidedly upright, having, as stated by Mr. Wm. Scott, Assistant Superintendent of Horticulture at the Pan-American, exactly the habit of the now well-known Crimson Rambler. It is therefore especially adapted for planting as a companion rose to Crimson Rambler.

Fragrance. The flowers are very sweetly scented, a characteristic not possessed by most other roses of this class.

The Foliage is of a deep green, of thick leathery texture and remains on the plant in perfect condition till well on into the winter, making it almost an evergreen variety.

At the Pan-American Exposition there was a bed of Dorothy Perkins roses which attracted an immense amount of attention, although the plants were young stock which had been propagated only some eighteen months before. Mr. Wm. Scott, Assistant Superintendent of Horticulture expressed in the Florists' Review the following unsolicited opinion regarding the variety:

DOROTHY PERKINS ROSE.

"Messrs. —— —— sent us last year some plants of their new Rambler Rose, Dorothy Perkins. This has exactly the habit of the well-known Crimson Rambler. They have flowered splendidly and have been very brilliant. This seems to me to be a great acquisition, and I believe it to be a good forcing rose. The individual flowers is larger than the Crimson Rambler with not such bright tones, but it is a beautiful shell-pink in color." Later on Mr. Scott wrote: "The Dorothy Perkins proved to be just as good a forcing rose as the well-known Crimson Rambler. Had the plants been grown on my grounds and potted with no delay they would have been still better. As it was they flowered well and flowered profusely."

From Gardening Illustrated (London): "A beautiful New Rambler Rose. We now and then get a very good novelty in the way of roses from the United States. Dorothy Perkins is the latest comer. The charming little shade shell-pink flowers as they appear remind one of the miniature Provence de Meaux, only that they are brighter and rather larger. They are produced in splendid trusses of twenty to fifty flowers. One can imagine, therefore, the effect obtained from a well developed plant. Growths are made in a season of ten to twelve feet long. Although this new rose was raised from Rosa Wichuraiana, crossed with the old H. P. Rose, Mme. Gabriel Luizet, it has the prostrate form of the seed parent, or instead, partakes of the upright character of the Crimson Rambler, so that it is a first-rate companion of the latter."

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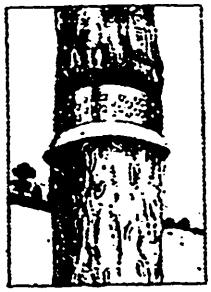

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