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PERLE DES JARDINES.

THE
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PERLE DES JARDINS.



ALTHOUGH the most of our readers are more interested in growing hardy, remontant roses, that large class of hardy outdoor varieties which will endure our Canadian winters and make so grand a display of bloom with so little trouble to the grower, yet some may desire to experiment with those exquisitely scented, though very delicate, Teas, with which florists so often charm our senses. As Mr. H. B. Ellwanger says in his book on "The Rose":

"The Tea rose (*Rosa Indica Ordorata*) may well be taken as a synonym for all that is delicately beautiful. What refinement of color; what subdued, yet powerful fragrance do they possess! They are, indeed, the centre of loveliness; like fair maids at a reception surrounded by admiring groups, these lend beauty to the others, which may well strive to find a near approach to their sweet presence, that perchance they may receive a smile, and borrow beauty, diffused from their chaste loveliness. There has always been a warm place in my heart for the Tea rose, for, *sub rosa*, let me confess it, this was my first love (I fear no conjugal jealousy or censure in making this confession); a bed of Tea roses planted near my father's house first won me as a devotee to the rose, and by foliage and flower I learned to distinguish varieties among them before I even knew the names in other classes; I should now as soon think of doing without roses altogether as not to have a bed of Teas in my garden.

"Most of the varieties in this group are very sensitive to any neglect, and will show very quickly whether they have met with good or ill treatment. The soil can scarcely be made too rich for their reception, but it must be light, warm and *well drained*. If the place chosen consists of heavy clay soil, a foot or more must be dug out, carted away, and filled up with that which is mellow. As most of the varieties are of but modern growth, they require rather close pruning. To protect them during winter, we advise hilling up earth about the plants and then spreading over evergreen branches or loose litter. Care must be exercised that the plants be not embedded and packed down with a heavy mass, otherwise decay and death will ensue. Some air will needs be admitted. The plants must be protected but not smothered."

The *Perle des Jardins* is one of a choice selection of Teas, which Mr. Ellwanger commends highly for healthiness and beauty of both bud and flower. It is largely used by florists for forcing, especially for the New York market, and for this purpose it is truly a superb sort, indeed, it has become a strong competitor with the celebrated *Marshall Neil*. It is also a suitable rose for growing in the open ground in sheltered locations, providing it has proper winter protection.

This rose was raised by Antoine Levet, of Lyons, France, in 1874. It is thus described: flowers canary-yellow, large or very large, full, well formed; stiff stems; very free bloomer; the leaflets are five to seven in number, deeply serrated, very dark and glaucous.

Webster Bros., florists of Hamilton, say with regard to the *Perle des Jardins* rose: "We would say that it ranks first of its color as a forcing rose, and is invaluable for cutting during the winter. Yet we have not found it to be of much value planted outside, the variety *Etoile de Lyon* being superior, as a yellow Tea, for outdoor work. The *Perle* makes a nice pot rose that will sell at sight, but, as a rule, it is hard for the amateur to keep it in good order. Its chief value lies in its being a good forcing rose, that will give excellent results under high cultivation. *Clothilde Soupert* is, in our opinion, the best rose for either outdoor growth, or for a pot rose, that has been introduced, being very free, easy to manage, fragrant; it is, however, not very large."

Mr. Fred Mitchell, of Innerkip, a gentleman of considerable experience with roses, writes: "I would not recommend the *Perle des Jardins* rose as a variety which the ordinary amateur grower need expect anything like perfect success with. I have never seen a truly perfect specimen of a plant of it produced by ordinary pot culture in the house or on the veranda. Under such conditions it becomes unthrifty and stunted in its growth, and blooming only occasionally, and the blooms not of first quality. In my experience, it is more fitted for planting on benches in the greenhouse. Gently forced in this way, with experienced management, it will give a splendid return. The rose in itself has many good points. It is highly perfumed, good form, and, to many tastes, of fine color. There are not many Tea roses which I would recommend to the general readers of the *HORTICULTURIST*."

JUDGING FRUIT AT FAIRS.



HIS subject has been much discussed at the meetings of our Association, and much has been accomplished toward bringing about a greater uniformity in the work of judging fruit in our province, by means of our catalogues of apples, pears and grapes, with values attached, which appear in our report of 1891. These will greatly assist judges in passing judgment upon general collections. In the case of small collections of apples and pears for special uses, as dessert or cooking, some further points will need special observation.

Suppose, for example, there are entries made under the head of the best five cooking apples, each variety will have an absolute value from one to ten, according to our catalogue, as a cooking apple. In addition to this a maximum may be allowed of twenty marks for excellence of sample. In cooking apples the size is very important, while for the dessert apple this will be of little or no account. Indeed, too great a size is an objection rather than a merit in dessert apples. These twenty marks might be distributed as follows :

COOKING PURPOSES.		DESSERT PURPOSES.	
Size.....	8	Size.....	0
Color.....	2	Color.....	6
Form.....	4	Form.....	6
Cleanness.....	6	Cleanness.....	8
	20		20

Add these twenty marks to the maximum value for cooking, which was ten, and we have a total of thirty marks possible for each plate. No marks have been allowed for size under the head of dessert purposes, because a small apple is really more desirable for this purpose than a large one, as for example, the Lady apple which is so popular. If, however, the sample shown under this head is too large to be desirable, a maximum of say two points might be taken from the total on this account.

It must be understood that we do not give these numbers as a basis for judgment, as having passed the approval of our Association, but simply on our own responsibility, in order to bring out the criticism of our readers, and thus eventually arrive at some uniform basis.

Now, regarding plates of single varieties ; what points are needed ? If the purpose is specified as cooking or dessert, then, perhaps, the scale just given might be used, but if no purpose is mentioned, the absolute value, as found in our catalogue, would need to be omitted ; and the twenty points would be the highest possible number for any one plate.

In judging melons the quality is always important, and, therefore, it will be necessary to cut them, in order to arrive at any proper conclusion.

Mr. T. V. Munson, of Texas, writes as follows in the *Rural New Yorker*, on the subject of "Judging Melons":

"If musk-melons (not canteloupes) alone were in a country competition where the farmers' families and local market used the crop, then I would be governed chiefly by size, shape and general appearance, especially coloring and netting; but if the competition were among canteloupes, used at home in the local market, and for shipping to distant markets, I would insist upon cutting, to compare thickness and firmness of flesh, and to taste for quality. I would want for judging such melons a scale of points, something like this: Points when perfect—shape, nearest the nutmeg form, five; size, to be nearest five inches, in the shortest diameter, five; weight the greatest with the same diameter of flesh, thickest and firmest, five; quality, most buttery and aromatic, five; general appearance (most closely netted, upon a golden ground when fully ripe), five; total 25. The prize would go to the one scoring the greatest number of points: 25 being perfect in everything. In size, when going over six inches or under three inches in diameter, I would score zero. The best strains of netted Gem canteloupe come nearest to filling the above score of any varieties tried here, in Grayson County, Texas; hence I consider it the best, and it has certainly proved to be more profitable than any other for market. Musk-melons are here regarded as a different class of melon from the canteloupe, as much so as are pumpkins and squashes separated."

In speaking of judging potatoes, the same writer says:

"In judging between competing potatoes of the same variety, I would prefer to work upon a scale of points, as in all other such matters, so that I could always give a reason for my decision. A good scale for the potato would be: Points—Size, for perfection, five, regularity and uniformity, for perfection, five; freedom from fungus and insect blemishes, five; freedom from hollow-core, five; perfection of condition from digging, handling, etc., five; total 25. Thus perfect kinds would score 25 points."

HANDLING THE GRAPE CROP.

As the grape become affected with rot it will be found a most prudent measure to pick them off and burn them. This should greatly diminish the stock of disease spores for another season. Every rotten berry left on the ground to increase spores increases the liability to a greater amount of disease next year, just as permitting a weed to go to seed makes more to contend with the following season.

Grapes should not be picked until the dew has thoroughly dried, leaving them with the bloom that is so attractive to the eye; they should be allowed to shrink in the picking boxes for several hours and then carefully packed for shipment. Particular attention should be given to the sorting and putting-up of the fruit. Remove carefully all green and imperfect berries from the clusters, and preserve the bloom as much as possible. The best bunches should be selected, and small, bare clusters or single berries should not be put in; some other use may be found for these. For choice grapes, it will pay to line the sides of the package, having a partial cover of pretty fringed paper to turn over the face of the fruit. Packages containing five pounds, or neat baskets of ten pounds, will be found best for marketing fine grapes.—*Orchard and Garden.*

FRUIT TRADE WITH BRITAIN.



THE following extract from the *Commercial Bulletin*, No. 4, issued by the Finance Department, Ottawa, will be of interest to our readers : The High Commissioner, in his annual report, called attention to the opening, in the London Market, for a large trade in canned goods and dry and evaporated fruits, and gives the following useful information :

Dried and canned fruits are increasing greatly in popularity in Great Britain, especially during the time when fresh fruit is not available. An immense trade is done in apples, which are cut into rings and dried. They are sold at about ten cents per lb. This seems to afford an opportunity for an extensive trade.

Apples are done up in another way in the United States, somewhat similar to what are known as the Normandy Pippins ; that is, the core is taken out and the fruit dried. If proper regard was paid to the preparation of goods, so as to ensure their being of the finest quality, I have no doubt that a considerable trade would soon develop. These are put up in boxes, and are sold at ten cents per lb. There is a considerable market in the winter season for tinned apples in syrup. The apples are cut into quarters and the cores taken out ; they are largely used for puddings and sauces, and for similar purposes. The supply is said to be in no way equal to the demand, and, in order to show that the trade is a profitable one, I may say that the wholesale price for tins containing a gallon is 1s. 6d. There are many varieties of apples not good for keeping purposes, and which will not carry well, and these would certainly be available for the initiation of such a trade as that referred to.

It is hardly necessary to speak of the apple trade which is done in barrels. It has assumed immense proportions during the last few years, and is capable of indefinite extension. There is a large annual consumption of apples in this country, and the seasons here are so uncertain that a good one only comes every few years. Canadian apples have already established a reputation in this country, and bring a higher price than those from the United States. The selection of the apples, and the packing, has greatly improved, but there is still room for the work to be better done.

Canned peaches are also very popular, and immense quantities are sold every year. Considering the numbers that are generally produced in Canada, and that so many are often wasted because of insufficient local demand, it seems to me that this is a matter also which is worthy of attention in the Dominion. The fruit is put up in tins with syrup, and is sold in 3-lb. tins for about 16 to 18 cents wholesale. There is no necessity for quick transport in this case, the goods of the best quality arrive here in February, having come from California by sailing ship. It is said that the maturing of the sugar imparts an excellent flavor to the fruit, and that altogether the article is improved by the few months which it takes to reach this country in the way I have mentioned.

Canned pears are also much in demand, and as this fruit does not carry well in barrels it is worthy of consideration, whether a trade cannot be developed in connection with its canning. Pears come over in very much the same way as peaches, and the prices are, wholesale, about 28 cents per 3-lb. tins. The remarks made about the transport in the case of peaches apply in the case of pears.

The tomato trade is also one which has extended largely during the last few years, and the impression prevails that it will increase. Whether prepared in the form of tomato sauce in bottles or in cans, there is a large market. Tomatoes are sent in large quantities from France and from Portugal, whole, in tins, with some juice for purposes of preservation. There is a large demand, I learn, for goods of this kind, and it may be worthy of attention in the Dominion; 3-lb. or 4lb. tins are sold wholesale for 5d.

In connection with all kind of canned goods, the following points must be borne in mind, if an endeavor is made to open up a trade :

1. That the goods must be of the best quality.
2. That the quality should be kept up and not allowed to deteriorate.
3. That some brand should be adopted which will attract public notice, and that the goods should be put up in attractive tins.

THE NATIVE HORNBEAN.—Our native carpinus, or hornbean, is one of the most ornamental of our small trees. Its clean, birch-like foliage in summer, its furrowed bark in winter, and its trim appearance at all times, bespeak for it more general use. In spring its catkins push suddenly forward before the leaves, covering the tree with a mist of soft green that is a special feature of the landscape on the borders of swamps and streams.—*Garden and Forest.*

SOOT AS A FERTILIZER.—There are few chemical manures that are so valuable in an all-round way as soot, and this is easily procured with a long-handled brush from the chimneys. It is best used in a liquid form, and should be prepared in this way : Place a pound of soot in a square bit of rough sacking or canvas, and tie it up securely with string, yet allowing the soot room to swell and to be moved about inside the canvas. This bag of soot should be dropped into a large pan of rainwater, and allowed to soak for twenty-four hours. The black water surrounding the bag is then fit for use, and will require diluting if at all thick. More water can be added as used, and the bag pressed with a stick as necessary, till the soot is gone. Soot-water is the best fertilizer for pot plants, as it does not make the soil foul, and also destroys all worms and insects; but it must not be used in a thick state, or the surface soil may become too hard and dry. Thin doses once or twice a week for plants in full growth will be found most beneficial to them. Soot in a solid state may be mixed with twice its bulk of fine, dry soil, and used as a top dressing; it is not safe to use it alone, as it may injure the plant, being extremely strong, but when thus mixed it will benefit all garden crops.—*N. Y. World.*

THE LOGGERHEAD SHRIKE.

HIS bird, doubtless, derives its common name (Butcher bird) from the fact that he slays many more creatures than he devours. He seems to have an insatiate love of carnage. I have known him to kill birds when enough food was stored in his larder to last him for weeks. He has the curious habit of impaling on thorns, or sharp twigs, all the carcasses not required for immediate consumption. He generally makes his residence in some locality in which there are thorn trees, and woe unto any small bird which may enter into his chosen territory. He is remarkably swift on the wing, and when he makes a dash he seldom misses the object of his pursuit. I have seen him with seeming amusement catching large moths and grasshoppers, which he also impaled after cutting off their wings and legs. Sometimes he impales mice and frogs alive to perish miserably. The majority of bodies thus impaled are eaten by bugs or left to wither in the sun and be blown away.



FIG. 64.—LANIUS LUDOVICIANUS (Linn).

An instance of desperate rapaciousness is related by Mr. Macnamara, a blacksmith in Kingston. He was startled by the screaming of a sparrow, chased into his shop by a shrike, which certainly would have slain his intended victim only for the timely interference of a sympathizing man. Sometimes a shrike will attack a larger bird. Mr. H. Stratford, Naturalist, Kingston, while out hunting for specimens, observed a robin being attacked by a shrike, which he shot in order to save the robin's life. I have known him bolt through an open window into an inhabited room and attack a caged canary.

The shrike is not provided with the murderous talons of the hawk or the owl, but with his powerful beak he generally crushes the skull of his victim. Of the two species of shrikes which visit us here, the Loggerhead or Grey shrike is the more common. He comes from the south early in spring, and nests in May.

The great northern shrike, a little larger than the other, breeds farther north, comes here in the fall, and, now that he finds abundance of food in the European sparrow, stays with us all winter. The two kinds resemble each other, only the larger bird is of lighter color on breast and head, but in essential particulars they are as one—bold, defiant, reckless, they have little fear in the presence of man.

Their harsh outcries of seeming exultation are as unmusical as are the creaking of an old windmill or the rusty hinges of a barn door.

Audubon says: "This violent little warrior possesses the faculty of imitating the notes of other birds, especially such as are indicative of pain. Thus it will mimic the cries of chased sparrows and other small birds, so as to make you believe you hear them screaming in the claws of a hawk; and I strongly suspect this is done for the purpose of inducing others to come out from their coverts to rescue their suffering brethren." I have seen him in the act of screaming in this manner, when he would suddenly dart from his perch into a thicket from which there would immediately issue the real cries of a bird he had seized.

The shrike is an impetuous and audacious bird which has few admirers; yet few enemies besides man, and, being prolific, has now become common in most parts of the country, and, although he kills many a bird we would wish to live, he is entitled to our favorable consideration for the part he is taking in our behalf against the common bird-pest of this country—the European sparrow.

The shrikes generally build in a bush within arm's reach from the ground, the nest proper resting upon an extensive basement of stout twigs, rather loosely laid together and bristling in all directions. Upon this the inner nest is built of an endless variety of fibrous substances, such as withered grass, strips of bark, tree leaves, mosses, lichens, wool, etc. Sometimes fur and feathers are netted in with the rest of the materials. The number of eggs deposited in this compactly constructed receptacle is generally five or six. They are a little over an inch in length and about three-fourths as much in breadth, of a greenish-grey color, profusely speckled all over with brownish and purplish specks. The eggs are of oval form, quite blunt at the smaller end.

Soon after the young birds leave the nest they may be seen hunting and devouring grasshoppers, butterflies, moths and other large insects. This fact alone has led some to believe that the good which shrikes do in the economy of nature more than counterbalances the evils of their objectionable propensities.

The most remarkable part of the shrike's physical organization is his beak, the upper mandible of which is hooked like that of the hawk; hence he has no difficulty in keeping hold of his struggling victim. There is no reticence about this bird; the whole course of his life runs on in almost incessant warfare—not a very lofty character.

D. NICOL.

PACKING FRUIT FOR MARKET.



PACKING of apples and pears, Ellwanger & Barry say, in *American Garden*, that the fruit is dropping badly, and consequently the crop will be smaller than usual. Their method is to pack choice pears in bushel kegs, and plums in fifteen pound boxes. Another expert advises packing all summer pears while still hard. They will ripen rapidly when once packed, much more so than is generally supposed. Each specimen should be handled most carefully, conveyed to the packing house in a spring wagon, with as little exposure to the sun as possible, and there allowed to cool before it is placed in the shipping packages. This point is very important. When in a condition for packing the fruit should be sorted by hand directly into kegs or barrels. The pears should be placed carefully in layers, observing uniformity in size and quality in all packages, and the outside marked to correspond, so that no person purchasing will be deceived. When the fruit is scarce the bushel keg is the most suitable, when abundant, the half barrel is to be preferred; the full sized barrel is not in any case suitable for a choice quality of pears, especially in hot weather.

In handling plums, this writer advises still greater care than with pears. The trees need picking over several times as the different varieties color and ripen. The fruit is picked with such care as not to disturb the bloom and as quickly as possible taken into the shade of the packing house and there carefully packed in layers in boxes or packages in which they are to be shipped. They ought to be packed so tightly that they will not move about. It will be found wise to use baskets of different sizes, holding five, ten or fifteen pounds each. The fruit that is quite ripe may be handled and marketed best in five pound baskets. For second grade or cheap and common varieties, the fifteen pound box may be used to the best advantage.

The points made by our American friends are all good, and, for the most part, are similar to those observed by the best Canadian fruit-growers. We have constantly taken care, in these pages, to emphasize the extreme importance of the careful handling of all our best fruits in order to get the best prices, whether in the home or the foreign markets.

SULPHIDE OF POTASSIUM.—This remedy for mildew has now been extensively used by our leading gardeners. As it is a remedy, at once cheap and effectual, I am anxious to make its merits as widely known as possible among my fellow amateurs and gardeners generally. As mildew is common this year in (England), I hope every one who is troubled with this pest will test the sulphide and report whether it proves successful or not.—*Gardening World*.

THE GRAPE BUSINESS.



HE grace of the vine is proverbial, and the beauty of its fruitage gives it a high rank among the more attractive products of the soil. It is difficult to imagine a more delicate and delicious fragrance than that which greets one when entering a vineyard loaded with well-ripened fruit.

Grapes prefer a southerly exposure, a well-drained, fertilized and cultivated soil. The uninitiated would scarcely credit the difference careful cultivation makes, not only in the appearance, but in the flavor of the fruit. The vineyards, in the famous grape region from Erie, Pa., to Brocton, N. Y., look, in August, as free from weeds and as carefully kept as the daintiest flower garden in the land, and the vines cling to the trellises perfectly, with no vagrant branches to accuse their owners of carelessness. There is no fruit which requires more delicate handling than the grape, for, if the bloom is rubbed off or the clusters are in any way disfigured, the market value is seriously reduced.

As soon as the fruit has ripened, the labor of picking and packing begins. The picker is supplied with wooden trays, each of which holds about 30 pounds when a little less than even full. These trays are made so that they can be piled up in tiers on the grape wagons. The picker takes each cluster by the stem and cuts it from the vine with sharp-pointed grape scissors, and lays it carefully in the tray. The clusters are handled entirely by the stems, and the careful picker lays them in the tray with the stems up, so that the packers may find no trouble in taking them out. These sit at long, low tables. When boxes with wire nails are used, there is a slit in the table to receive the wire, as the boxes are packed face down, and there are blocks to incline the box or basket toward the packer.

Grapes are usually assorted by the packer into three or more grades. The Niagara Company puts a certificate of excellence on its first-quality fruit, and nothing goes into these boxes that is not absolutely perfect. The clusters must be large and shapely, and the berries large, well ripened, and of good color. The second-quality boxes contain smaller clusters, but all imperfect berries are clipped out, and all webs and other foreign matters are removed. No loose clusters are packed in these boxes. If fruit is scarce and high, a third quality may be packed with profit, but the fruit left from the second selection is usually made into jellies, catsup, and fermented or unfermented wine.

It is said that grapes may be produced at a fair profit for two cents per pound, but unless sold in bulk the margin from such sales must be very narrow. The care necessary to pack the grapes for market renders this part of the work expensive, as cheap labor cannot be utilized. True, a great bulk of fruit may be raised per acre; but the average packer will not put up more than 500 pounds per day, and skilled packers receive a dollar per day.—*Rural New Yorker*

NEWS NOTES.



N currants, the Fay is the largest, and a better cropper than Cherry. Cherry comes next in size; then comes Versailles, which is a better cropper than either of the others. Red Dutch is the best bearer I have, and if given rich soil and good cultivation, is of fair size, but the greatest objection to all of them is that they will not stand up with their load. What we would like is a currant of good size, a good bearer, and one that will stand up. I am told that the Victoria will stand up, but the fruit is no larger than the Red Dutch, and late. The White Grape is a good bearer of good sized fruit, the sweetest currant of all, and the best to eat with sugar and cream.

In gooseberries, I fruited this year Downing, Smith's Improved, American, Industry, and White Smith. Smith's Improved is a better berry than Downing, but Downing will produce double the quantity of fruit; White Smith, I like better than Industry, but the latter is the best bearer. Last year my Industry mildewed badly; this year I sprayed with a decoction of cedar leaves twice, and I have no mildew. Whether I should credit the treatment or the season, I don't know, but the treatment is easy and cheap, and worth trying. I shall try again another year. Gooseberries were a heavy crop with me. I gathered ten bushels off sixty bushes. Currants were also a fine crop. Raspberries are a short crop here. This year Golden Queen are on the market for the first time, and they are all the name implies. When better known they will be more planted. They are the best bearers I have this year, and the best table berry out of four kinds.

The winter was very severe on grapes. All my Rogers were killed to the snow line, so I will have no fruit on them. Other varieties were more or less injured. Brighton, Concord, Worden, Delaware, and Moore's Early are bearing fruit. I thought Champion hardy, but mine was badly injured last winter. It grows by the veranda for shade; alongside of it grows a Moore's Diamond, which was not nearly so much injured as the Champion. So I take it that Diamond is hardy. It had three or four bunches on last year; the fruit was early, sweet, and melting, but the bunches were not compact. There is no fruit this year. I should think it ripens two weeks before Niagara.

The Williams' strawberry did well with me this year. I like it better as a cropper than Jessie or Sharpless, but, like them, the fruit is uneven.

I have planted out a lot of blackberries this spring. I planted Snyder, Ancient Briton, and Agawam, as I consider them all hardy. I would like if some one of your readers, who has had experience in growing blackberries, would tell us how to do it successfully. Should they be pinched back, and when? I also see that some one recommends laying them down, and says that it is not difficult. I wish he would tell us how and when to lay them down, and how and when to get them up again; the latter being of the most importance.

There were no cherries this year. Pears will be a poor crop. Very few plums. Apples will be fair crop; Baldwin's pretty well loaded.

St. Thomas, Ont.

A. W. G.

HINTS ABOUT STRAWBERRIES.



R GEORGE T. POWELL, in an address on Strawberry Culture, before a New York Farmers' Institute, made these remarks: In fertilizing the strawberry remember that it yields from near the surface and as a consequence is easily water-killed. To make success sure it is therefore best to under-drain a piece of land to carry off the surplus moisture in fall and spring. The soil should be moist, but not wet. Under drains are fully as valuable in dry as in wet weather, as they prevent, in a measure, the exportation of moisture from the soil. A soil that will produce a good crop of corn will produce a good crop of strawberries.

Potash is the best fertilizer for the strawberry. The vine and foliage require nitrogen to perfect them; the fruit, potash and phosphoric acid. The former will be cheaply obtained from good barnyard manure, the latter from ashes and ground bone.

I plant in the spring, in rows four feet apart one way, and grow in what is called the matted row system, not permitting the rows to spread more than sixteen to eighteen inches. The second season I obtained the best crop. When the crop is harvested I put in the plough and turn under the whole mass. I have a new bed coming on each year for next season's crop.

If the rows are four feet apart a row of beans may be grown between them the first season, but the ground should be well cultivated, the cultivator running within six inches of the crowns till the runners start to grow, which, when they have reached a distance of eight or nine inches on each side pinch off. As fine specimens and as large crops may thus be grown as by the hill system.

HOW TO COOK THE CRANBERRY.—The American Cranberry Growers' Association has approved and recommends the following recipes for cooking this fruit: No. 1.—1 quart berries, 1 pound granulated sugar, $\frac{1}{2}$ pint of water. Cook ten minutes; shake the vessel; do not stir. No. 2.—1 quart berries, 1 pound granulated sugar, 1 pint water. Bring sugar and water to a boil; add the fruit and boil till clear—fifteen or twenty minutes. No. 3.—1 pound berries, 1 pint (scant) cold water, $\frac{1}{2}$ pound granulated sugar. Boil together berries and water ten minutes; add sugar and boil five minutes longer. Gently stir, or shake, to prevent scorching. In all these recipes use berries of a bright medium color, as they are more delicate in flavor, jelly better and make more sauce than over-ripe dark ones.

The Garden and Lawn.

THE CULTURE OF ROSES.



If you want roses, they must be in the richest part of your rich bed. You cannot give roses too much rich feeding, and you cannot keep them too clean. They must be thoroughly watered, and the plants syringed with whale-oil soap, dissolved in luke-warm water, once a week at first, and later once a month, if there are no bugs. Instantly when you see a single bug, those small, green parasites, thoroughly syringe with whale-oil soap. Water once a week with a watering-potful of luke-warm water in which a tablespoonful of nitrate of soda has been dissolved. This can be bought in crude form at any druggist's at ten cents a pound. This enriches the plant and improves the flowers. Let no rose remain on the plant when it is in full bloom. It exhausts the plant very much.

If your climate is mild you may have a wide choice of roses. If a New England climate, do not waste your time on many roses but the hybrid remontants. They will usually winter with some protection, and they give lavish bloom, and the robust growth of the plant, with its solid leaves, is, to my mind, handsomer than any other rose but a few teas. It is well to have some teas for perpetual blooming and the beauty of the flowers, but they must be taken into the house in winter.

Roses, like poppies and marigolds, need sun. Set your roses out in the autumn only if your winter is mild. If you have a severe winter climate, start them in the spring. Then they will get firmly established by the autumn, and winter more safely. They must be "laid down" as late as possible—that is, gently bent to the ground and fastened so by means of twigs put over them like little arches, the ends of the twigs firmly stuck in the ground; then, according to the severity of the winter, cover them with straw, leaves, litter cloths, lightly or heavily, as the winter may demand. A snowless winter is their greatest enemy.—Mrs. Dewing, in *Harper's Bazar*.

SOIL FOR GRAPES.—Most varieties delight in a sandy or gravelly loam, made rich by potash, lime, and bone. Heavy soils do not suit the grape, and, if wet, they require drainage, and are improved, if very flat and wet, by ridging. The different types and their crosses, generally delight in the same kind of soil as those natural to them where originally found. Thus, those of the *Æstivalis* class thrive more successfully on dry or poor lime and sandy soils. Those of the *Labrusca*, a more moist soil, richer in potash than lime. Those of the *Riparia* are not so nice as to locality, but dislike a wet or heavy clay, and dry limestone soil. With proper care we can make all varieties, not too far unsuitable thrive on almost any soil, and produce abundant crops.—*Orchard and Garden*.

ARRANGE TREES ON COUNTRY PLACES.



N plantations depends largely the successful composition and coloring of a country place. The first thing to consider before you begin to plant is the adjustment of your views, vistas or outlooks. Ordinarily, except where you require, for some reason, a special outlook, the entire outside border of the place should be planted with a mass of trees and shrubs, making a hedge of irregular waving lines. Ordinarily, too, there should be something like seven shrubs to every tree, the shrubs standing eight or ten feet apart, and the trees forty to fifty feet. This rule applies, of course, to only large growing shrubs; the smaller ones can be tucked in round about. It is an excellent plan to establish a lofty tree, like the elm, tulip or poplar, at each marked angle of the place and at each side of the carriage entrance. It tends to give character to the entire lawn. If you have room enough, one of the ways of emphasizing certain interesting parts of your country place, and especially the pleasant home character of the house, is to establish a grove near that building. Set out the best shade trees—elms, maples, beeches, tulip trees, liquid ambers and lindens—and let them stand forty or fifty feet apart, so that they may grow into broad and lofty trees, dispensing abundant shade. Such a grove near the house will give perpetual delight throughout the year. Even in winter, during snow and ice storms, you will find unfailing pleasure in contemplating the unexpected and magical effects of snow and ice in your grove, and, moreover, find comfort in seeking its protecting shelter if you have planted a few pines in the midst. Planting groves means to many people simply the setting out of a cluster of trees eight or ten feet apart, and allowing them to slowly crowd each other to death. Properly managed, the grove may be the most delightful and admirable feature of all country places, except the smallest, and even there one great elm or beech may be a grove in itself.

In adjusting the vistas by means of your planting you should see that the longest lines of view are secured. Let them extend diagonally from corner to corner of your place if you can —*Scribner*.

WHITE AND BLUE SPRUCE.—Mr. C. G. Patten, a resident of Charles City, Iowa, confirms the statements of Robert Douglass in regard to the superiority of the White spruce over the Norway spruce for hardiness and beauty. He also mentions some trees of *Picea pungens*, or at least a variety of it, growing about two miles north of Floyd, in the same State. "Many of these trees have quite a silvery appearance. The foliage is very dense, and never injured by our extreme winters, being much more hardy than the Norway." This is the Colorado Blue spruce, which will, undoubtedly, be widely planted when it becomes better known, and is more generally propagated.—*Vick's Magazine*.

A LIST OF NATIVE FERNS PROMISING FOR CULTIVATION.

Most ferns are easily injured by exposure to strong winds, and a large per cent. will not thrive when long exposed to direct sunlight. After observing these two points, and the sections under which the ferns are placed, a little thought will enable any one to give most of our native ferns a suitable location and treatment to ensure success,

a. *Thriving in sun or shade in poor soil.*

Pteris aquilina, L. Eagle Fern. Common Brake.

b. *Thriving in cool, rocky places.*

Asplenium ebeneum, Ait. Spleenwort.

" *Ruta-muraria*, L. Spleenwort.

" *Trichomanes*, L. Spleenwort.

Aspidium Filix-mas, Swz. Male Fern.

" *fragrans*, Swz. Shield Fern.

Cryptogramme acrostichoides, R. Br. Rock Brake.

Pellaea gracilis, Hook. Cliff Brake.

Polypodium vulgare, L. Polypody.

Woodsia Ilvensis, R. Br.

" *Oregana*, D. C. Eaton.

c. *Thriving in bogs or swamps.*

Aspidium cristatum, Swz. Shield Fern.

" *Noveboracense*, Swz. Shield Fern.

" *Thelypteris*, Swz. Shield Fern.

Woodwardia angustifolia, Smith. Chain Fern.

" *Virginica*, Smith. Chain Fern.

d. *Thriving in rich woods.*

Adiantum pedatum, L. Maidenhair.

Asplenium angustifolium, Michx. Spleenwort.

" *Filix-femina*, Bernh. Spleenwort.

" *Thelypteroides*, Michx. Spleenwort.

Aspidium acrostichoides, Swartz. Shield Fern.

" *aculeatum*, Swartz, var. *Braunii*, Koch. Shield Fern.

" *Boottii*, Tuckerman. Shield Fern.

" *Goldianum*, Hook. Shield Fern.

" *Lonchitis*, Swartz. Shield Fern.

" *marginale*, Swartz. Shield Fern.

" *spinulosum*, Swartz. Shield Fern.

" " " var. *intermedium*, D. C. Eaton. Shield Fern.

Cystopteris bulbifera, Bernh. Bladder Fern.

" *fragilis*, Bernh. Bladder Fern.

- Dicksonia pilosiuscula*, Wild.
Onoclea sensibilis, L. Sensitive Fern.
 " *Struthiopteris*, Hoffman. Ostrich Fern.
Osmunda cinnamomea, L. Cinnamon Fern.
 " *Claytoniana*, L. Flowering Fern.
 " *regalis*, L. Flowering Fern.
Phegopteris Dryopteris, Fée. Beech Fern.
 " *hexagonoptera*, Fée. Beech Fern.
 " *polypodioides*, Fée. Beech Fern.

—*Flora of Michigan.*

AN effort is being made to secure for exhibition in the Horticultural Department of the World's Fair a specimen of giant cactus from the desert region of southeast California. The cactus grows at times to the height of seventy feet. A specimen when boxed ready for shipment will weigh eight tons, and it will require an expenditure of something like \$2,500 to deliver it in good condition in Chicago.

ILLINOIS will have an exhibit in its State World's Fair building of specimens of all the indigenous woods of the State. In order to secure uniformity each specimen will be about forty-two inches long and consist of a section of the tree trunk. It will be cut in such manner as to show the grain from the surface to the center. On each specimen will be painted a picture of the leaf and fruit of the tree.



FIG. 65.—THE CARNATION—See p. 237.

❖ The Kitchen Garden. ❖

HARVESTING AND MARKETING OF ONIONS.



WRITER in *Farm and Home* says: "If dry weather can be depended upon, there need be no occasion for sheds, for then the onions can be cured on the ground out of doors. In a dry spell the crop can even be left unharvested for a time after it is ready for pulling, though this is not a safe plan, as onions quickly deteriorate in value if left unharvested too long. It is time to pull the crop when the tops fall over and begin to waste away. If then left in the ground and rain should fall, the onions will make a new start, and nothing will stop them from keeping on growing, and if not quickly used they will spoil. The same result will follow if rain sets in while they are left on the ground to cure. A few hot, dry days will be sufficient for thorough curing out of doors, but in wet weather they must be placed under cover in a dry, airy shed, on shelves, and not over nine inches deep.

"Only bulbs that are perfectly cured are fit for winter or early spring use. Onions should never be kept that are not capped over perfectly, and that are not entirely dormant both at root and top. If perfectly cured they can easily be kept over winter in a dry, cool and airy room, but they should never be stored in large bulk together. Many farmers prefer to ship their onions to market as soon as dried, rather than run the risk of carrying them over, and, as prices ruled last season, this was the better plan. Good, new dried onions brought up to \$6 per barrel in New York about a year ago, but this figure has not been touched since. It is best to ship to market in good flour barrels which are strong, clean and of neat appearance, a combination that always tells favorably in the selling of any product."

Mr. Charles T. Parsons, of Massachusetts, writes the same journal as follows: "Generally, the early onions sell the best. If they are not too scarce and high stemmed, let them stand until the tops turn yellow and fall over. In pulling the earliest, I make selections. If it is a general harvest, I use a rake, made especially for the purpose, and take care not to bruise the onions. When they are dried pile them up in small heaps; this is recommended, as it improves their looks. I have found it convenient to draw them with a dump cart to the tobacco shed, to be spread out; the tops can be cut at leisure, when the market the owner designed them for, requires. Those for bunching need not be cut at all; they will keep much better with the husks and tops on. They absorb moisture, and in this condition can be stored several feet thick. They should be carefully watched, as they are very sensitive to the changes in the weather. The scullions and late gathered should be kept separate and marketed early.

Five hundred bushels are not a large yield per acre. This number was put down as the average yield of 1865, while many record that much on half an acre. The Bermuda islands and Spain send many onions to this country early in the season.

Marketing the crop is expensive, as they must be sold mostly in the large cities. The cost of raising depends upon circumstances, so I will name some of the items. The interest on the land, hauling, spading, plowing, and hoeing in the fall, applying 20 loads of manure to the acre, a thorough cultivation in the spring, carefully raking off the rough soil and raking in 100 bushels of ashes to the acre, and as much else as you can afford to buy; these are the chief items. The seed is often high and should be sown with much care. The weeding and hoeing should be done six or eight times, which means crawling that number of times over an acre, with rows about twelve inches apart.

HOW TO PACK AND MARKET VEGETABLES.



ONE of the most difficult things to get a beginner in packing fruits and vegetables to understand is the necessity for filling packages tightly, so as to prevent jostling in transit. . . . Another matter which has been insisted upon for many years in all the farm papers, is the necessity for honest packing of fruit and vegetables. Growers seem to suppose that city buyers and dealers look only at the big specimens put on top, when, in fact, the only one deceived in the transaction is the shipper, who always loses in cash and reputation. . . .

Growers are fast coming to the conclusion that it pays best to ship vegetables in crates of moderate size that can be easily handled. Even the crop of early potatoes, still largely shipped in barrels, will pay better sent in crates, and growers who have tested the matter are using crates for this crop. Plenty of city consumers will buy a whole crate who cannot handle a barrel of potatoes, and potatoes in crates go off at better prices. . . .

Our vegetables are sent to the exacting Boston market either in bushel or barrel-boxes. The bushel-boxes are nine inches deep, and square 19 x 19 inches. The barrel-boxes are 38 x 18 inches in length and width, and 10½ inches deep. By considering the number of bunches or individual varieties contained in the standard boxes, the buyer knows whether the size of the bunches is right for his retail trade. Overgrown monstrosities and uneven grading find little favor with dealers. . . .

Asparagus is done up in bunches of one pound each, and exposed for sale in bushel-boxes. The less white found in a bunch, and the larger the individual sprouts, the better is the price obtained for them. Many find it profitable to make two sorts of bunches, putting the smaller and whiter stalks in separate bundles, thereby obtaining enough more for the best to return a better price for the gross lot. . . .

The only variety of cucumber recognized, whether in glass or field culture, is the White Spine. It is sold in bushel boxes, and should be of such size that ninety will evenly fill the box. Cucumbers are sold by count, and if the number is short, the trade knows that there are overgrown, seedy ones in the bottom. If the number is more than ninety, they are too small to please retail customers. Therefore, a box containing ninety cucumbers brings the top price if they are straight and true in shape.—*American Gardening.*

LAND FOR EARLY PEAS.

SIR,—Please say what is the best way to prepare land for early peas.

S. PEDDLER, *Whitechurch.*

Reply by J. J. H. Gregory, Marblehead, Mass.

In reply we would advise your correspondent to select a piece of warm, early land—fall plowed, if possible—and spread on and plow in good composted horse and cow manure, at the rate of six cords per acre. Plant as early in the spring as the ground can be worked.

HOW TO OBTAIN MORE HIGH-GRADE FRUIT.

This subject was treated by Mr. George T. Powell in a practical address from which we make the following extracts: "We cannot plant young orchards in land from which we have taken continued crops of grain and grass for years, and, while the trees are growing, continue to take off potatoes, oats and grass for fifteen or twenty years longer, and then hope to secure full crops of good fruit. The trees must be well planted in the first place, with roots pruned back to half their length and the top cut in quite as severely. The branches of a nursery tree are not where they are needed; often two of them are nearly opposite, which will make the tree liable to split apart. Therefore, it is good practice to take off the top entirely, leaving only buds on the main trunk where the future branches are desired. When trees are thus prepared for planting, pruning for the next ten years can be done with a pocket-knife, and the fruit and foliage will be where they are needed. Since the foliage plays so important a part in preparing plant-food for use, a good growth of leaves should always be ensured. It is of little consequence to use poisons against insects that devour fruit, and fungus diseases which destroy fruit, when the leaves are left to be infested with insects and parasites. Since I have sprayed the foliage of my orchards good Spitzenburgs can be grown once more. Before they were treated in this way these trees set full of fruit, but they never matured into large handsome apples. Healthy wood and healthy foliage are essential to vigorous fruit-buds and perfect fruit. There is a demand abroad, which has never been supplied, for fruit of high quality. In the Old World flavor counts for more than appearance. Every barrel of Ben Davis apples we send abroad depreciates the value of the best American apples.—*Proceedings W. N. Y. Hort. Soc.*

HOW AND WHEN TO HARVEST THE ONION CROP.

MR. T. GREINER gives some good hints in his "Onion Culture" on harvesting onions. When grown by the new method they matured much earlier than when grown in the old way, and as soon as mature they need to be harvested. A long period of rainy weather afterward will injure the bulb for the market if left unpulled. At maturity the tops fall over and begin to waste away, the substance being gradually absorbed by the bulbs, so, when the majority of the tops are dying down, the time has come for pulling. They should be left upon the ground for some time to cure, and for this, it is very desirable to have dry weather. If rain comes, the onions should be raked over carefully with a lawn rake. A week or more of dry weather is necessary for curing. Then, on an afternoon of a dry day, gather the crop and dry them inside, storing them in open sheds, lofts, on the barn floor, or any dry airy place where the onions can be spread out thinly. There they may be left until perfectly cured, that is, until the tops have almost entirely dried away.

Where a business is made of onion growing for market, a shed suitable for storing onions should be built, varying in dimensions according to the needs of the grower. All the bins are made of slats, with spaces between for free circulation of air. In rainy weather the sides may be covered with canvas or adjustable boards.

Mr. Henry Price, of Missouri, furnishes a description and plan of an onion curing crib which seemed worthy of commendation. It is described as resembling a double corn crib. "It is sixteen feet wide, and eighty long, with a ten-foot driveway in the centre the whole length. This leaves the width of crib on each side four feet, its height eight feet. The building is lathed all around, inside and outside, similar to a corn crib. Of course it can be put up to suit the notions of the person building it, and quite cheaply, if desired. Ordinary rough posts cut in the woods, set into the ground three or four feet deep, may serve as a frame work. I think I would divide the storage rooms on each side into shelves, making at least four of them, each two feet deep. The onions can then be stored twelve to eighteen inches deep, leaving space enough for free airing and drying between the layers. The loft may also be used for curing onions, or for storing corn, and for other purposes."

THE currant worm is said to be greatly inconvenienced if the bushes are well mulched with coal ashes. Probably if some wood ashes were mixed with the coal ashes greater results would be obtained. At the New York Experiment Station bushes mulched with the material mentioned suffered much less from the ravages of the larvæ than others, although one plat was given no other treatment than ashes, while the plat unmulched was several times treated with hellebore.

Forestry.

TREES AND SHRUBS BEST SUITED FOR SCREENS OR WIND-BREAKS.

For this purpose, evergreens are mostly employed. Mixed with evergreens or planted by themselves in dense rows or groups, many deciduous-leaved trees and shrubs are useful. Young white oaks and beeches hold many of their leaves during winter and make a very good screen, but they are unsightly at such times. The following are the common names of our best evergreens :

Norway pine, where not too near the dwellings, though the tree is a little coarse.

Red cedar grows rather slowly, and becomes brown in winter.

White cedar makes a dense though somewhat slow growth, and is a general favorite.

White pine, one of the very best. It may be cut back if desired, thus keeping the trees denser and more stocky.

White spruce. Very good.

We enumerate some of the best deciduous-leaved trees :

American elm,	Black maple,	Pepperidge,	Silver maple,
Aspen,	Black oak,	Red maple,	Sugar maple,
Basswood,	Box elder,	Sassafras,	Tulip tree,
Beech,	Mulberry,	Scarlet oak,	White oak,
Black cherry,			

In selecting shrubs to mix with trees, there is no danger of going amiss. Each possesses some peculiar merit.

Alders, for moist land,	Elders,	Mountain ash,	Virginia creeper,
Bladdernut,	Grape vines,	Mountain maple,	Wild crab,
Bittersweet,	Hazels,	Prickly ash,	Wild plum,
Blue beech,	Hawthorns,	Service berry,	Willows,
Choke cherries,	Honeysuckles,	Sumachs,	Witch hazel,
Dogwoods,	Judas tree,	Viburnums.	

—Flora of Michigan.

By overbearing many young trees are irreparably injured. Many planters, however, are so much afflicted with the muckle in their eye that they sacrifice the prospective dollar. In other words, they are so eager for a crop that their trees die of a broken back long before their days of usefulness should have been over. Trees just coming into bearing should be carefully watched, and if the crop promises too large for their strength, the evil should be averted by thinning.



The Canadian Horticulturist

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REMITTANCES by Registered Letter are at our risk. Receipts will be acknowledged upon the address label.

NOTES AND COMMENTS.

POPULAR RASPBERRIES.—Conversing the other day with Mr. Jonathan R. Pettit, one of our Grimsby fruit growers, we were comparing the productiveness of the *Marlboro* and the *Highland Hardy* raspberries. In Mr. Pettit's opinion, the latter yields almost double the quantity of fruit to the row, and is fully eight days earlier in ripening. Indeed, with Mr. Pettit, the *Marlboro* is very little in advance of the *Cuthbert*. We mention this, because we are aware that some growers will scarcely agree with Mr. Pettit in saying that *Highland Hardy* is as productive as the *Marlboro*. Certainly the latter is not quite as early, but the fruit is much larger, and its color is another point in its favor.

The *Cuthbert* is, in our opinion, the most satisfactory of all raspberries, if grown upon suitable soil. Where the ground is too hard and too dry, or inclined to bake in summer, raspberries will be unprofitable, but on rich sandy loam, moist, but well drained, the *Cuthbert* yields enormous crops. This year it has surpassed its record for productiveness at Maplehurst, when compared with any former year, and, on the whole, we are inclined to place it first among our raspberries for profit. That other growers agree with us in this, is proved by the large plantations of this variety which are being set out, some even cutting down apple orchards, intending to devote the land to this berry.

Shaffer's Colossal raspberry is, in our opinion, not likely to be popular. It is a grand berry, so productive and so healthy a grower, and the quality so excellent, when used fresh for the table, or for canning purposes. It ought to command a higher price in the market than the *Cuthbert*, but unfortunately its color is against it, and from consignees in every market, the same word is returned, "Cannot sell those dark berries," and the returns are a proof of what they say, being usually little more than half the price returned for the *Cuthbert*.

THE PROVINCIAL APPLE CROP REPORT.

Prof. James, of the Bureau of Industries, Toronto, has just issued a report of the apple crop, based upon replies from very numerous inquiries, sent out by the Department. This corresponds very nearly with the report already given our readers, through these columns. He says that the crop is almost a failure along the lakes from Sarnia to Toronto. The prospects are better eastward through Ontario, Durham, Northumberland, Hastings, Lennox, and Prince Edward counties; better still in the St. Lawrence and Ottawa districts, and heavy in the Georgian Bay and adjacent counties south, as Huron, Bruce, Grey, Simcoe, Perth, Wellington, Waterloo.

He estimates the total production of Ontario for this season at 3,384,179 lbs., and most correspondents place the whole apple crop of Ontario at less than one-half a full yield. Apples really suitable for export are likely to be few.

Exports of Canadian apples are valued at about one-half those of the United States; our total apple exports for the last three years amounting to \$3,969,055, while those of our American cousins amounted to \$6,597,065.

The variety of apples most grown in Ontario are as follows: *Six autumn*—Oldenburg, Fameuse, Colvert, St. Lawrence, Fall Pippin and Alexander. *Six winter*—Spy, Baldwin, Greening, Golden Russet, Roxbury, King.

THE MARKET FOR WINTER APPLES promises to be good. As will be seen from our various reports, the American crop is short, and our apples will be wanted at high prices by our neighbors to the south of us. Any one who has a crop of clean apples will do well to wait for a good offer before selling.

PINCHING BLACKBERRIES.—A subscriber recently made some inquiry about pruning small fruits. Mr. Thayer, a member of the Minnesota Hort. Society, speaking of pinching blackberries, says, that he performs this operation for the most part, when the canes are about ten inches high. Formerly he had left them until they were ten or fifteen inches high. He was led to make a change from noting the effect of a severe frost cutting off the new shoots, when they were six or eight inches high. He found that the stubs, thus made, threw out new branches, and these formed the best canes he had ever had. The result of his nipping them at ten inches was a finer growth of canes than he ever had before. He is also careful to remove the surplus canes as soon as possible, with the pruning knife, treating all suckers as weeds. He finds that a blackberry plantation will, if cared for, last twenty or thirty years. The varieties which he grows are, the Briton for the main crop, with a few Snyder's to begin with. With good culture he finds the Snyder fairly productive, giving him from one hundred to one hundred and twenty-five bushels to the acre, but the Briton has averaged one hundred and fifty, and in some cases, two hundred bushels.

To keep the curculio from the plum trees, stir one quart of lime thoroughly in two gallons of water, strain through a cloth and add an ounce of sulphur. Spray the trees with this solution about a week after the blossoms are off and when the fruit is formed; repeat the operation in two weeks, and again in three or four weeks more, and you will have plenty of fruit. About four or five times is all that is needed, and the two gallons will answer for three trees. The curculio can be kept off by corn cobs boiled in sweet water and hung on the trees.
—A. T. S., Clearfield, Pa.

THE FRUIT CROP.

LAMBTON, KENT AND ESSEX COUNTIES.—*Sir*,—Further inquiries substantiate the fact that few apples will be harvested in this district; not a quarter of a crop, especially in Essex there will not be enough for home consumption. Pears will be half a crop, but the sample is not up to the standard. There are scarcely any peaches in this part of the country, except in this township near Lake Erie, where there may be a quarter of a crop. Plums are fair, and the grape crop an exception; it promises to be very heavy.—N. J. CLINTON, Windsor, Ont.

PETERBOROUGH.—*Sir*,—The apple crop in this county will be short, so far as I can learn, and will be of the early varieties. Some orchards are full, others lacking. The fruit promises to be of good quality and fine looking. Pears are good and the trees are well laden, but there are not many grown in this county, not more than enough for home consumption. Several members of our Association, to whom I have spoken, say that the crop of apples will be below that of last year.—E. B. EDWARDS, Peterborough.

RENFREW.—*Sir*,—Grapes, apples and plums will be an abundant crop in this section.—A. A. WRIGHT, Renfrew, Ont.

THE EUROPEAN FRUIT PROSPECTS.

Sir,—As we are approaching the season for shipments of apples from your continent, on which supplies this country largely depends, we have pleasure in advising you that the prospects for the sale of apples here is good. Our home crop is light, as also the continental one. This latter will be barely sufficient for home requirements, so that exports from there to us will be small, leaving our markets open for shipments from across the Atlantic. We strongly recommend shipping only the best stock.—L. H. WILLIAMS & Co., Liverpool, England.

Sir,—Although shipments from your side must be influenced in some degree by the success or failure here, in reality, the *extent* of shipments mainly rests on the success, or failure, of your own crop. Our requirements are so large that, however good our crop, we must still look for large additional supplies. The continental crops, especially those of France and Holland, are to be considered, but when you have an abundant crop, the prices will not induce continental growers to ship to us, as they can do better at home. A few years ago shipments from Denmark were only made possible by the failure of the American crop, and attempts to establish a trade between the two countries has proved impracticable as against average American supplies.

The following is an outline of the prospects for apples on this side :

UNITED KINGDOM.—The south-eastern apple districts, which usually supply the London market, have suffered largely from early droughts and subsequent frosts, and the apple trees are in consequence quite bare of fruit. In the southern and north-eastern parts of the country, there is an abundance of both early and late sorts, and the crop in these districts, may, to a certain extent, neutralize the shortness of the supplies in the south-eastern districts.

HOLLAND AND BELGIUM.—A better crop than last year and the fruit of good quality, but that in Holland will be largely unsuitable for our market.

FRANCE.—Half a crop, and in some districts partially a failure.

GERMANY AND DENMARK.—Half a crop, mostly early sorts, and shipments can only be induced to our markets by the prevalence of high prices. The indications are, therefore, that our apple crop will be, on the whole, heavier than last year, and supplies from your side should not reach us until the month of October, when our markets should be open for large samples. For Liverpool and Glasgow, earlier supplies should meet a ready market.—J. B. THOMAS, Covent Gardens, London, England.

↗ Question Drawer. ↖ .

PROTECTING THE GRAPE VINE.

No. 487.

SIR,—I have carefully planted the Moore's grape vine you sent me and up to this date, August 2nd, it has made a growth of eighteen inches. The winters here are cold and long, and I would like to know how to manage with the vine. Shall I lay it down and cover it, or let it stand on the trellis where it is growing now? I have been taking your journal a little over a year and like it very much. I am setting out a small orchard and find considerable information in the journal for me.

IRA N. BURT, *Keswick Ridge, N.B.*

Although Moore's Early is a hardy variety of grape, yet there is no doubt that, in your country, the best plan is to lay down every variety of grape in the fall and cover it with earth. Even in warmer sections, this practice is found to largely increase the productiveness of the vine.

HOW TO MAKE GRAPE JUICE.

No. 488.

SIR,—In your next number would you please give a recipe for making grape juice, such as we had at Maplehurst, and please mention the variety of grape from which it was made.

W. S. TURNER, *Cornwall.*

The grape juice referred to by our correspondent was chiefly made from ripe Concord. We can recommend this beverage as most delicious and wholesome, and one which, in no way, interferes with anybody's temperance principles. Probably no drink is so safe, and conducive to health, in summer time, as grape juice, and we have pleasure in recommending it for general use throughout the country. Of course, it can only be kept sealed up in the same way as our canned fruit. The following is a very good recipe for its preparation, which has already been published in this journal:

"Take grapes thoroughly ripe and fresh from the vine. The Concord and Isabella are especially good, but any fresh, ripe and juicy grape may be used. Allow one quart of water to three quarts of grapes, freed from the stems. Use no sugar. Let it come slowly to a boil, and, when the whole mass is boiling hot, strain the juice through a cheese-cloth, flour sack or other strong cloth. Then return the liquor to the fire, and, as soon as it is at the boiling point again, can it. The less the fruit or juice is cooked, the brighter will be its color, and the better the natural flavor of the grape will be retained. This, like all other articles to be canned, must be at the boiling point when it is sealed. If the juice is to be used at once, it should not be brought to the boiling point a second time. Use wooden spoons in its preparation and only glass jars for keeping it. The action of any acid substance on tin, is to corrode it and poison the fruit."

GRAFTING YOUNG TREES.

No. 489.

SIR,—I have a number of small apple trees that I want to graft next spring. Would it be best for me to take them up this fall and store them in the cellar, or to let them stand until next spring and then graft them and set out in the nursery rows. They are scattered around the fields and I have to take them up before grafting.

IRA N. BURT, *Keswick Ridge, N.B.*

If the seedling apple trees you refer to are small, suitable for whip grafting, the best way would be to take them up this fall and store them in green sawdust in the cellar until the convenient time for grafting them, and when this operation is finished, they may be put back again in the sawdust until the time for planting out in the nursery rows. If, however, the trees are of a larger size, so that they would require cleft grafting, we would advise planting them out first or in the places in the orchard where they are to remain, and to leave the grafting until they have made a vigorous growth. They could then be grafted in the May or June following.

BURDOCK STALK BORER.

No. 490.

SIR,—I send you a borer found at work among my burdocks, boring the stalk. Surely he is a friend that ought to be encouraged?—W.

Reply by Prof. Fletcher, Ottawa.

Your post card is just received and also the accompanying caterpillar which is that of *Gortyna cataphracta*, a species closely related to the potato stalk borer, *Gortyna nitela*. It is always sent in every year from various localities as a borer in different kinds of plants; among others, I have had specimens sent me as injurious to reed canary grass, and a few other large-stemmed grasses, including Indian corn, tomatoes, lillies, potatoes, sunflowers. It is sometimes sufficiently abundant among tomatoes to be noticed by a casual observer, but, as a rule, escapes detection, except to the quick-sighted, on account of its feeding inside the stems. When one stem has been hollowed out, the caterpillar leaves it and bores into another. When full fed, which is about this time of the year, it burrows a short distance into the ground, and changes to a yellowish-brown chrysalis, from which the perfect insect, a pretty, tawny moth marked with dark lines, emerges in about a month.

Amongst fruits, I have found this caterpillar troublesome in the young shoots of raspberries, and this year a very unusual attack was brought under my notice in which the fruit of a gooseberry bush was hollowed out, several berries being destroyed.

The fact of the caterpillar you send having been found attacking burdock, cannot, I fear, entitle it to the designation of friend. Its friendship, I fear, would be too much akin to that shown by the Saxons to the ancient Britons, and if there were no Picts and Scots, in the shape of burdocks, they might pay too

much attention to our vegetables. It must not be forgotten either that their title to friend would even then stand upon the weak foundation of our want of appreciation of the burdock, for in Japan this plant is one of the most highly esteemed vegetables.

THE YELLOW TRANSPARENT IN QUEBEC.

No. 491.

SIR,—I take pleasure in sending you two Yellow Transparent apples, grown in my little garden, as specimens of what, with care, can grow here, under the 45 $\frac{1}{2}$ latitude, but not with the pretention that something superior can be produced in more favorable localities. They are off a two-years-ago top-grafted tree; first bearing the worst apples I ever saw in this and the Old Country. No human being could eat the fruit, and yet it was sold to me by a good(?) agent for a grafted tree! I consider the Yellow Transparent as a precious acquisition for this part of the country. With the best wishes for you and your work.

PASCHE, *Bryson, Quebec.*

These samples are fine. Indeed, no better can be produced in any other part of Ontario. They are quite large, reaching about 3 $\frac{1}{2}$ inches in diameter, and beautifully clear in skin. With many varieties of apples, the farther north they can be grown with success, the finer the sample.

FALL vs. SPRING PLANTING OF STRAWBERRIES.

No. 492.

SIR,—Is it better to set strawberry plants in the spring or in the fall?

W. H., *Rockton, Ont.*

Strawberry plants may be set almost any time during the summer, from April to October, but the most favorable months are April and May in the spring, and September and October in the fall. Most fruit growers have the most leisure in the spring, and, therefore, choose that season. There is little advantage in planting in the fall unless it can be done quite early so that the plants may become well established before the winter. Well-rooted young plants cannot often be found before September, and, if they can, August is generally too dry a month for success in transplanting. But, if set by the beginning of September, a small yield may reasonably be expected the following spring.

FERTILIZERS FOR STRAWBERRIES.

No. 493.

SIR,—What is the best manure, when you have not barnyard manure, to use on strawberry and all other small fruits, including grapes?

W. H., *Rockton, Ont.*

For vigor of plant growth, the strawberry, and all other small fruits, need nitrogen. This is well supplied in dried blood or nitrate of soda. For the perfecting of the fruit itself, potash and phosphoric acid are needed. The latter is easily procured in the form of ground bone, and the former in wood ashes.

The writer makes very free use of this latter material in the vineyard and in the small fruit plantation. Wood ashes contain, not only a large percentage of potash, but a small percentage of phosphoric acid, and on a light soil appear to be of especial merit. In one case, some rows of raspberry and blackberry bushes, which had been bearing very small crops for several years, were thrown into abundant bearing by a liberal application of wood ashes. The quality of the fruit is also benefited by the potash which they contain.

Question Budget

(4) In beginning to keep bees, what kind would be best for me to purchase? How many hives would be sufficient for me on the start? What kind? Should the bees be wintered out of doors?

(5) Would it not be well to allow members a choice of two or more plants by paying an additional sum to cover expenses?

(6) Would it not be a good plan to have a list of Horticultural books that could be obtained at a little over cost, or by paying two or three years' subscription at one time?

* Open Letters. *

THE BEE-KEEPING DEPARTMENT.

SIR,—With regard to having a part of the CANADIAN HORTICULTURIST devoted to bee-keeping, I may say that at present the Bee-Keepers' Association is giving its members the *Canadian Bee Journal*, and is somewhat interested in making that journal a success. I think, however, that there could be a few pages of the HORTICULTURIST devoted to bee-keeping, to advantage. As you remark, quite a number of the bee-keepers are interested in fruit raising.

At our last annual meeting there was quite a discussion on the subject of starting a bee journal, under the management of our Association. It was decided that the Association was not in a position to manage a journal, but had there been some similar proposal then made, it is possible that a definite arrangement could have been arrived at between the bee-keepers and the fruit-growers. Should the matter come up again at our next meeting, I will speak of the possibilities of some agreement being made between the two Associations.

W. COUSE, *Secretary of the Ontario Bee-Keepers' Association.*

SIR,—I thank you for the sample copy of the CANADIAN HORTICULTURIST, and must say that it is a neatly got up paper, and should judge that the subscribers must be well remunerated for their investment. Regarding a department on bee-keeping being started in your journal, it might be well to go slow in the matter. Had such a proposition been made to the Bee-Keepers' Association last January, I believe that we would have jumped at it. A proposition of the same kind might very properly be placed before the meeting of the Bee-Keepers' Association at Walkerton, next January. You are right in saying that our interests are closely connected, but it must be quite a task to induce people to write papers. If you get some contributions from our best men, such as R. McKnight, of

Owen Sound ; S. Corneil, of Lindsay ; Allan Pringle, of Selby ; R. T. Holtman, Brantford ; and F. A. Gemmel, of Stratford, it would be quite safe to start such a department. As for myself, I am not much of a writer, and would not promise to write regularly for any paper, but would contribute at times to the bee department in the HORTICULTURIST, if you make such an addition.

B. B. CHALMERS, *Poole, Ont.*

SIR,—Thank you for the sample copy of the HORTICULTURIST, with which I am much pleased. As to the advisability of adding a department on bee-keeping, I think it would be a step in the right direction, and I think it would pay. I do not anticipate any trouble in getting matter to fill a reasonable space, thus making it, if possible, still more interesting.

A. PICKETT, *Nassagaweya, Ont.*

SIR,—I do not think it would do any harm to add the subject of bee-keeping to your paper. It might do a great deal of good, as many fruit-growers keep bees, and nearly every keeper raises more or less fruit. I do not know whether bee-keepers would write for such a department, as generally our best bee-keepers write the least. Yet, I think you would receive sufficient support.

The HORTICULTURIST was highly spoken of at the meeting of our Association, and I have no doubt that many bee-keepers would take a great interest in your journal, if that department were opened.

MARTIN EMIGH, *Holbrook, Ont.*

SIR,—Your card and sample copy of the HORTICULTURIST to hand. I agree with you that the two industries go hand in hand, horticulture and apiculture ; and therefore think that the opening of the latter department in your journal would be of benefit to all concerned.

F. A. GEMMILL, *Stratford, Ont.*

SIR,—Concerning the propriety of adding a department of bee-keeping to your journal. I think favorably of it. Writing for the press is out of my line, but I think there are plenty of bee-keepers in Ontario who would be willing and competent to contribute to such a department.

F. A. ROSE, *Balmoral, Ont.*

SIR,—I have no doubt that you could keep up an interesting bee-keeping department in your journal. On the other side of the lines I know some of the foremost writers in America contribute to journals not exclusively devoted to their own pursuit. I have no doubt that you could get contributors, but you might have to pay them. Your proposal to start a bee department strikes me as interesting, in view of the discussions on bee journalism in Ontario Bee-Keepers' Association. As a single director, it would be unwise for me to express an opinion as to the future possibilities, but I will bear the matter in mind when our next meeting comes off.

S. CORNEIL, *Lindsay.*

SIR,—I think the proposition to have a bee-keeping-department in the HORTICULTURIST a good one, but you might not have very much to put in it sometimes. I think that while bee-keepers would be glad to contribute to such a department, there would sometimes be a deluge and again none at all. I was wishing for such a department in your journal when this spraying was under consideration.

J. K. DARLING, *Almonte, Ont.*


SIR,—My opinion with reference to the proposed amateur bee-keepers' department in your journal, is that such an undertaking would be hailed with pleasure both by bee-keepers and fruit growers, as their interests are mutual. Thank you for the sample copy of the CANADIAN HORTICULTURIST.

W. J. BROWN, *Apiarist, Chard, Ont.*

SIR,—I think it would be an excellent idea to open a department on apiculture in the CANADIAN HORTICULTURIST. Fruit and bees go well together, and a great majority of the bee-keepers in Michigan are great fruit-growers, and would presume that the Ontario climate is much like that of Michigan. I have no doubt that you can manage that department with credit to your journal, providing you make it a study yourself.

A. I. ROOT, *Publisher, "Gleanings in Bee Culture," Medina, Ohio.*

PIN FOR FRUIT LABELS, AND IOWA FRUIT PROSPECTS.



SIR,—I enclose you a sample pin which I have been using to hold a card with the names of fruit and the entry tag, at our exhibitions. I have the names of the fruit printed in English and German on clear white cards, and it shows a long way from the fruit stands. The card enclosed will show you where the pins may be bought at a cost of thirty cents for a box of one hundred. Our fruit crop is poor this year owing to so much rain and cold weather during April, May and the first part of June. All our fruit blossomed very full, but dropped badly. Plums are an entire failure; cherries rotted on the trees and the grapes have mildewed and are rotting. I am selling my early apples, largely Duchess of Oldenburg for \$4 per barrel.

J. E. CORLETT, *Sec. Clayton Hor. Soc., Farmersburg, Iowa.*

FIG. 66.

GARDENING IN MIDDLESEX.

This will not be a very profitable year to the fruit grower in this part of Middlesex, as the late frosts in the spring injured both strawberries and raspberries, and also currants, and when the apples, plums, cherries and pears came in blossom the weather was so wet that fertilization was not complete, and consequently our crop of fruit is very light, compared with what it was last year. Peaches were badly winter-killed and did not blossom at all, and, owing to the excessive dry weather, some of my blackberries and black raspberries have dried up without ripening their fruit. The Erie blackberry is not hardy here but it gives larger berries than either Agawam or Ancient Briton. The latter I find the hardiest. The Rancoes raspberry did not do well with me this year, and the Cuthbert was winter-killed to the snow line.

Potatoes will be a short crop here. Many planted them the second time, and vegetables generally will be a poor crop, but we have a very good crop of early potatoes, cabbage, onions, and we had ripe tomatoes by the first of August. The flower garden has given a good account of itself this year so far, and now the monthly roses are giving some excellent flowers. Even though the past three or four weeks have been extra dry, the Polyanthus have been continually in bloom. The following roses of the hybrid perpetuals did best with me this year, White Baroness, Merveille de Lyons, Perfection de Blanches, Helen Paul, and White Perpetual Moss, Paul Neyron, John Hopper, Vick's Caprice, Comtesse de Serenay, Dinsmore, Zebrina, Little Gem, Henry Martin; but some others I have are not as good. Gen. Jacqueminot did not bloom nearly as well this year as formerly. I have a seedling pink Scotch rose, that gave some excellent blooms early in the season, but, like most of Scotch roses, only bloomed early in the summer and then took a long rest. I got some French Canna seed this spring and they are commencing to bloom now. I filed small holes in the seed and then soaked them in hot water before planting, and then I tried to keep the ground from getting too dry, as that is sure death to any kind of seed after being soaked in water, and when I transplanted them to the open ground I puddled the soil in around them and then put some dry clay on top and shaded them for a few days, and they never stopped growing when the dry weather came.

Your proposed changes in the HORTICULTURIST meet with my approval, the size of the page as at present just suits my fancy and of course no reader should grumble at an addition to the number of pages and illustrations.

JAS. M. WATERS, *Fernhill P.O., Ont.*

THE WILLIAMS' STRAWBERRY.

SIR,—The Williams' Strawberry has pleased me this season better than ever before. The cool moist weather seems to have favored the development of its characteristic qualities. The crop was something enormous and the berries the largest of any I ever saw; There was no trouble with the white tips. Some of the best berries measured five and a quarter inches in circumference. Its season lasted over a month and held its size longer

than any other berry grown here. It was tested alongside of such good sorts as Bubach, Jessie, Warfield, Haverland, Mrs. Cleveland, Eureka, Itasca, Daisy, Viola, Lady Rusk, and a few others considered the best sorts; but it far outstripped all competitors and commanded one or two more cents a basket in the Brantford markets than any other variety. I consider it the best all-round berry I have ever seen during an experience extending over forty-three years in strawberry growing.

WM. GREIG, *Cainsville, Ont.*

SIR.—The five Williams' strawberries received of you in 1891 wintered well; far better than the Sharpless. They are a very thrifty growing plant. The apple tree Gypsy Girl, received from you this spring was in good condition and is doing finely.

A. S. CROSBY, *Complin, Que.*

CANADIAN APPLES FOR FIRST-CLASS FAMILY TRADE IN ENGLAND.

SIR,—Kindly allow me to call the attention of your leading apple shippers to the importance of putting up a really choice line of Baldwins, or other specially sound keeping fruit. Until recently the green fruit business in the United Kingdom has almost exclusively been done by fruiterers, but last season, my principals, Messrs. Marples, Jones & Co., Liverpool, sold a considerable quantity of apples, particularly Baldwins, at good prices to provincial grocers with whom they do a very large trade. These were consigned through the Imperial Produce Company, of Toronto, and paid the shippers a good profit. In moving around amongst the provincial grocers I find an inclination to go into this business more extensively, especially if our Canadian friends can send forward really choice, selected keeping fruit, packed in cases containing about a bushel of apples, looking quite as large as they are and neatly branded on the end. What is needed is a package that can be sold whole to the consumer, containing such goods only as will be a credit to the Dominion.

WALTER STARK, *Toronto House, Newsham Drive, Newsham Park, Liverpool.*

SEEDLING STRAWBERRIES.

SIR,—I send you to-day a sample of seedling strawberry. Would you kindly pass judgment on it in your next number. Three years ago it was discovered growing where a large number of refuse berries were thrown out. It was transplanted, and last year we had quite a number of plants, which flowered profusely, but were all killed by a late frost. This year I have quite a bed, and they bear very abundantly. They are very hardy, and strong growers, and their roots penetrate deeply. I think they are a seedling of the Wilson, possibly fertilized by the Sharpless.

ROBERT MCINTOSH, *Newcastle.*

[Unfortunately these berries were too loosely packed, and came in bad order. The appearance of them, however, leads us to want to see more of them.—EDITOR.]

THE HONEY STRAWBERRY.

SIR,—This new strawberry belongs to the Alpine species, indigenous to the Sierra Nevada mountains. *Fragaria chilensis* is the botanical name of this variety. It is an ever bearing variety and yields its greatest crops during the months of August and September, after other varieties are gone. The berries are glowing red in color, exceedingly sweet, juicy, aromatic, delicious, melting in the mouth, without a particle of hard core. The berries are not large, but, by proper cultivation, will average three quarters of an inch in length; they are oblong in shape. This season I noticed berries that were the inch and a half in length and a half inch in diameter at the base. I have counted at one time sixty-five berries on a single plant and found numerous young shoots loaded with blossoms besides, and this plant was no exception.

The Honey strawberry is exceedingly prolific and, in favored climates, will bear abundantly all the season long; here it continues in bearing about eight months. It will also stand shipment well. The Honey strawberries raised in this country, are shipped to that great pleasure resort, Lake Tahal, where they bring a good price. It is a perfect flowering variety and would be valuable as a fertilizer among pistillates. In a word I might sum up the good qualities of the Honey strawberry as follows: great productiveness, spiciness, aromatic, flavor, delicious sweetness, sweet fragrance and splendid coloring.

S. L. WATKINS, *Grizzly Flats, Cal.*

* Our Book Table. *

MICHIGAN FLORA.—Prepared for the thirtieth annual report of the Secretary of the State Board of Agriculture, by W. J. Beall, M.S., Ph.D., and C. F. Wheeler, B.S., Agricultural College, Michigan, 1892.

This is a most interesting report. It contains, not only a complete list of the flora of the state of Michigan in natural orders, but a great deal besides, which is both interesting and valuable to students, whether of that State or not. For instance, there are interesting chapters on the trees and shrubs of Michigan, as compared with those of the rest of the world, with reasons why the Michigan flora is so rich, and why there are so few specimens in Great Britain. There are interesting lists of trees, selected for various qualities, as, for example, the native trees and shrubs which should be selected for the color of their leaves in autumn; small trees distinguishable for their flowers; shrubs and trees which are distinguishable for their beautiful fruit, and lists of those which are distinguishable for showy bark. Then follow lists of plants which climb or twine; plants suitable for winter bouquets; native ferns; trees which indicate a fertile soil, and others which indicate a barren soil; trees valuable for timber, for posts and sills, for cabinet work, etc., etc. Clippings from these parts of the volume will be made for use in future numbers of our journal.

ANNALS OF HORTICULTURE in North America, for the year 1891. A witness of passing events and a record of progress. By L. H. Bailey, Cornell University.

This book comes to us beautifully bound in cloth. It is a volume of over four hundred pages, and is quite a new departure in book making. It is an attempt at making an annual record of the horticultural progress of North America, and of Classifying our scattered knowledge of American horticultural literature. Part I of this volume is devoted to General Annals under the following heads: 1st, Fruits, vegetables and general interests; 2nd, Ornamentals; 3rd, Plant diseases and insects; 4th, National and educational interests; and Part II to Special Annals as follows: 1, New introductions of 1891; 2, Census of cultivated indigenous plants; 3, Plant portraits of 1891; 4, Directory of the national, state, provincial, and other most important horticultural societies in North America; 5, Directory of horticulturists, or those in charge of horticultural work, of experiment stations in North America; 6, The botanic gardens of the world; 7, Title index to experiment station horticultural literature in North America of 1891 (including publications of the Department of Agriculture); 8, Subject index of the experiment station horticultural literature in North America for 1891 (including publications of the Department of Agriculture); 9, Books of 1891; 10, Horticultural periodicals of the world; 11, Tools and conveniences of the year; 12, Necrology of 1891. Evidently this is a book which no student of horticulture can afford to do without.

TRANSACTIONS OF THE MAINE STATE POMOLOGICAL SOCIETY FOR 1891. Secretary D. H. Knowlton, Augusta, Me.

These reports are always interesting to us in Canada, because of the similarity of climate between that State and the northern parts of our province. The experience of fruit growers in Maine with hardy fruits is valuable to our apple growers in the colder parts of Ontario. Some of the subjects discussed are, Marketing of apples, Grape growing, Pear culture, Fruit growing compared with other agricultural industries, Fruit lists, secretary's portfolio, etc.