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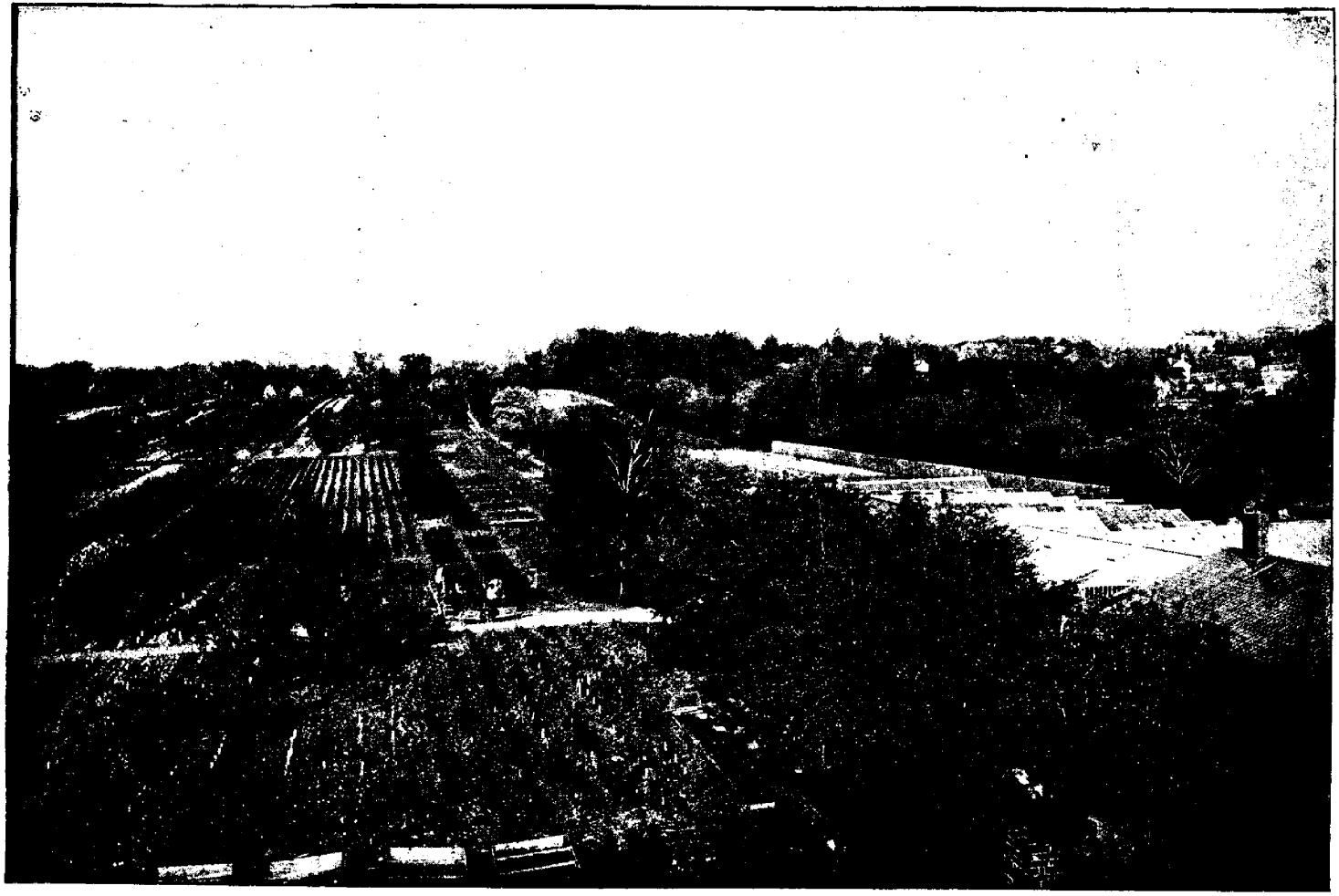

A View of Ellwanger & Barry's Nurseries at Rochester, N.Y.

THE

Canadian Horticulturist

VOL. XIX. 1896. No. 3.

WESTERN NEW YORK FRUIT GROWERS.

THE meetings of the Western New York Horticultural Society bring together the largest and most enthusiastic gathering of fruit growers to be found anywhere in the world. Probably no country in the world contains so many enterprising fruit growers and nurserymen, as Western New York. All this is due in a great measure to the persevering industry of the late P. Barry, the author of that excellent work entitled "Barry's Fruit Garden," and one of the heads of the firm, so familiar to fruit growers all the world over, Messrs. Ellwanger & Barry. For so many years was Mr. Barry the president, and the guiding hand in the conduct of this large Society, that we feel justified in giving him that prominence in our journal, which he deserves as one of the direct benefactors of the present generation of fruit growers. At our special request, therefore, we have secured from his son, Mr. W. C. Barry, the cuts which illustrate this article.

The frontispiece is an admirable photograph of the nursery, in the suburbs of Rochester, which was first established about fifty-six years ago, on about 15 acres of ground, and has since grown to cover over 500 acres.

One important feature of Mr. Barry's work was in experimental fruit growing, a work which we in Ontario, are just beginning to undertake, under the beneficent patronage of the Ontario Department of Agriculture. So long ago as 1846, Mr. Barry wrote: "Our purpose is, and has been since the formation of our establishment, to make here in Western New York, *a collection of fruits* unsurpassed by any in the country, embracing every valuable variety of either native or foreign origin, adapted to our soil and climate; with this end in view,

we have been gathering from time to time from every quarter, such varieties as we have found to be held in high esteem in their respective localities. Two years hence we shall have a superb list of American fruits; our extensive personal acquaintance with the principal fruit growers and nurserymen in England and on the Continent has enabled us to make arrangements to receive *annually any new and valuable fruits* that may be brought to notice. Our practice is to *plant a specimen tree of every variety cultivated in order* to test it under our own observation; our specimen grounds now contain upwards of *two hundred varieties of apples, one hundred and fifty of pears, sixty of cherries and fifty of small fruits*, and so on."

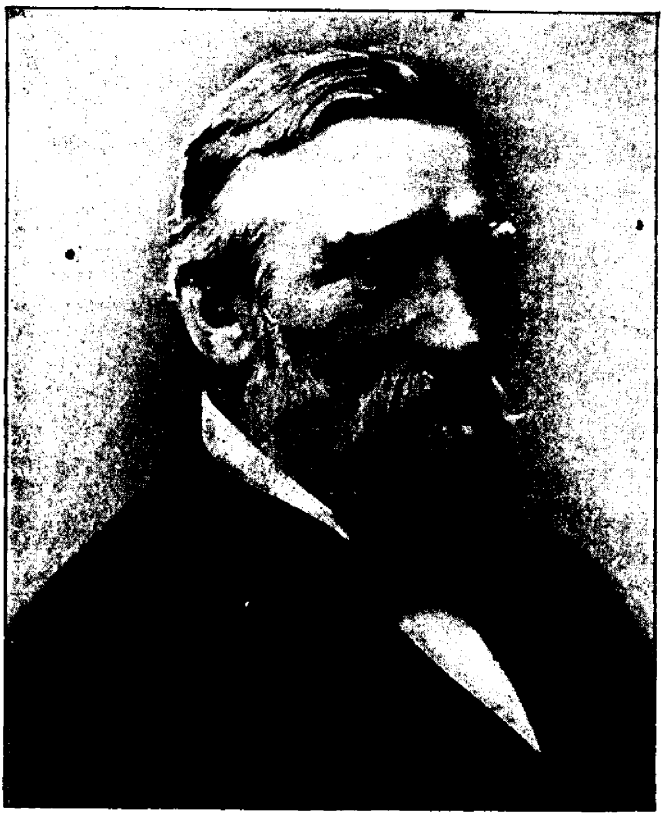

FIG. 915.—THE LATE PATRICK BARRY.

In addition to the trial of fruits, much attention has also been given to specimen ornamental trees and shrubs, which have always been kept correctly labelled and open to the inspection of the public.

The accompanying engraving showing a fine specimen of Picea pungens, or Colorado Blue Spruce, is grown upon the grounds of Messrs. Ellwanger and Barry. The tree on the left is a fine specimen of cut-leaved Weeping Birch,

and on the right are shrubs of various kinds, forsythias, herbaceous pæonias in flower, etc. This Blue Spruce will be interesting to many of our readers because so many trees of this evergreen have been sent out to the members of our Association during the last few years. The tree is a native of the mountains of Colorado, and is now widely distributed throughout the U. S. and Canada as an ornamental evergreen. Mr. Wm. Saunders, of Ottawa, says of it, "Among the Spruces none is so striking and beautiful as the Colorado Blue Spruce, and more especially those specimens with a distinct steely blue color to the foliage. This color varies in intensity from a faint hue to one of a very decided and striking character. The blue color is most pronounced in the new growth in the spring, and as the summer advances it becomes softened and mellowed to a pale bluish green which contrasts strongly with the bright new growth when it pushes out the following season.

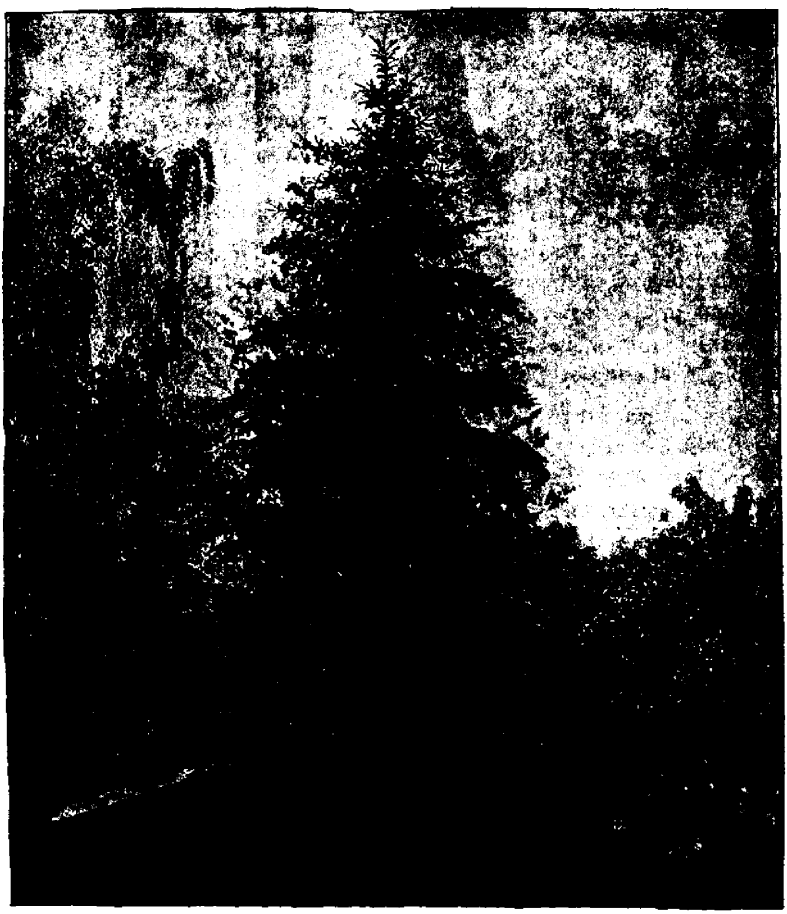

FIG. 916.—COLORADO BLUE SPRUCE.

The subject of *irrigation* for fruit crops was introduced at the meeting by Mr. J. H. Hale, who has recently experimented in a large way, and will soon be able to speak confidently of results. He believes irrigation in fruit growing can be made to pay 25% on investment. Windmill power is too uncertain, except for gardens; fruit growers should co operate, and use steam power, or large hydraulic cranes to lift the water to elevated positions, whence it can be conducted in pipes or hose. Mr. Van Deman said that the Jucunda strawberry, with irrigation, was a grand success in Colorado. One member said he had doubled his cherry crop by irrigation, and saved his pear crop, when otherwise it would have been a total loss. On peaches, however, irrigation seemed to have very little effect.

The Sowing of Crimson Clover was advocated in a paper by G. P. Powell, who advised the covering of every acre of cultivated soil with it in August, or even late in July. Even if it did not survive the winter at the North, the soil would be much enriched by its summer growth. Mr. Hale said he sowed about 40 acres of his orchard to Crimson clover every year; it continues to grow the following spring until he is ready to turn it under. In Delaware, all the peach orchards are sown with Crimson clover, and, as a result of the nitrates thus furnished, the trees grow wonderfully; but many forget that a tree also needs phosphoric acid and potash. Since growing the Crimson clover, he had not found it necessary to purchase any nitrates, and in this way, his fertilizer bill had been very much reduced.

Prof. Roberts cautioned against over-stimulating the wood growth of a young orchard, at expense of reproductive organs; because it might be difficult to teach it bearing habits. He would, therefore, avoid too much nitrate, with too little potash and phosphoric acid.

The Best Absorbents for use in stables are comparatively little known. It is a fact, however, that the low grade potash salts, especially kainit, which is sold by all agricultural dealers, and kieserit (which is not so common), if sprinkled in the stable daily or on the manure pile, will absorb the ammonia or nitrogen, preventing its escape while also adding considerable potash to the manure pile. Kainit contains about 12 lbs. of actual potash to the hundredweight. Acid phosphate is also a good absorbent if not too wet, and where the fine-ground rock phosphate can be had cheaply, it may be freely used in the stable. The decomposition in the manure pile may assist in making the phosphoric acid of this raw product available. Fine-ground land plaster or gypsum (sulphate of lime) is also a splendid absorbent and can be had almost everywhere. Where manures are to be applied to land that seems to require the use of lime, plaster should be freely used as an absorbent in the stable. These absorbents keep the stable free from odor, making them healthful, and also assist in preventing the manure from heating.—Mass. Agl. Exp. Station.

CAUSES OF FAILURE IN APPLE CULTURE.

SIR,—I am thinking of setting an apple orchard, and would like some information as to soil, planting, cultivating, fertilizing, spraying, varieties for English market, etc.

C. C. ARTHUR, *Cobourg*

IN reply we will give, in a series of two or three numbers, an address on this subject, given by Mr. L. Woolverton, the Secretary of the Fruit Growers' Association of Ontario.

Properly cared for, the apple orchard is, comparatively speaking, one of the most valuable portions of the farm, even if it is only large enough for home uses. Situated as some farmers are, at a long distance from a railway station, or a good market, the expenses of teaming the crop might make the odds against growing a commercial orchard; but otherwise, taking one year with another, I believe the apple crop can be made to pay twice as well, acre for acre, as a grain crop.

I am aware that I am courting opposition on this point, and grant that facts, in many instances, are against me. Even in the Niagara district, in the very centre of fruit culture, in the very best of soil and location, apple orchards just in their prime, beautiful thrifty trees of the best varieties, are being mercilessly cut down and sacrificed on each side of me. The owners declare that they are unprofitable. They say that the trees will not bear, that the apples of late are smaller than they used to be, that the worms destroy the most of them, and that the small proportion remaining for the owner to harvest, bring no price in the markets. They have therefore resolved to cut down their orchards, and dig them out by the roots, in order to devote their ground to the growing of grain and root crops which they claim will pay them better.

I grant them honesty in their statements; I myself have observed the unproductiveness of the orchards, which are no doubt duplicated in every part of Ontario, and I venture to say that one or all of the following causes will explain the unfortunate condition of affairs.

1. The Unfavorable Location of the Orchard.

A common notion is that any place will answer for the apple trees, and therefore very often a stoney corner that cannot be worked, or a very heavy clay which one does not want to work up, is set out to an apple orchard. That such an orchard will never be a success goes without proving.

But a more common fault for the location is a wet soil, left without underdraining. Trees in such situations may grow well in summer, but are almost sure to become winter-killed, or at least so injured by the cold in winter, that they become enfeebled and unproductive. The remedy is plain. A thorough system of under-draining is of the first importance.

Another evil of the situation is exposure to high winds. Those who have

had almost their whole crop strewed upon the ground in the autumn by windstorms, know how to appreciate the favoring protection of a dense woods of deciduous, fir and evergreen trees. This cannot be quickly remedied, but a windbreak of a double row of Norway spruce trees will, in twenty years, be of inestimable value in this respect.

2. Lack of Cultivation.

The second cause of failure, and one of the most common, is lack of cultivation. Somehow or other, the idea has got abroad that the apple orchard needs no cultivation. True, there is no growth of wood, the fruit is small, and imperfect of its kind; but it never seems to occur to the owner that the trees would grow any better for being cultivated; or if he does believe in it, he does not sufficiently value his apple crop, to give it the same attention as he would his corn or potatoes. There is need of a general waking up on this question. I must confess to having been once of this opinion myself, but I have been converted. I have found that where the orchard is in an unthrifty condition, so that the leaves are of a light green or yellowish tint and ripen early, and the fruit is scant and poor, cultivation is the surest and speediest cure, and will accomplish what pruning and manure will utterly fail in doing without it. Cultivation of the soil so exposes it to the action of the air as to make available the plant food which is already there in store; and, besides, has a most important influence in counteracting the serious drouths to which our country is of late so subject.

One of my orchards which had been planted some twenty-five years, was in the condition above described. It had been left seeded down for about ten years, and had become unthrifty and unfruitful. In the summer of 1886 I broke up thoroughly one-half of it, applied wood ashes and pruned it carefully; while the other half was pruned and manured, but not cultivated. The same treatment was continued during 1887, and the result was plain enough to the most casual observer. The cultivated portion resisted the drouth of that year completely. Its dark green foliage was a remarkable contrast to the light sickly green of the other part, and more important still, the cultivated trees were laden to the very ground with such a load of fine Baldwins, Greenings and Golden Russets, were not equalled in any other orchard on my fruit farm.

3. Lack of Manure.

Who ever thinks of giving his apple orchard an annual dressing of manure? All the manure is put on the field crops; no farmer would expect to grow fine potatoes, or a paying crop of grain, without a heavy coat of manure; but the apple orchard must shift for itself, without either cultivation or manure; and then if it does not yield a paying crop it is condemned as worthless, and ought to be cut down because it does not pay. Is it the fault of the orchard, or of the orchardist? Why should it be expected to do what no other farm crop could possibly do?

Why, the farm was perhaps cropped for years before the orchard was planted, and the fertility of the soil well-nigh exhausted ; trees have been drawing on the soil for years, and now are blamed for unproductiveness. Is this reasonable, I ask ?

But, says one, "I cannot spare the manure from my other crops." Very well ; you must put it where it will pay best, but I claim that place is the orchard.

I find that farmers generally in Canada quite under-estimate one of the most valuable of orchard fertilizers, and either let it waste, or sell it for a mere song. I refer to our wood ashes, which are so undervalued in Canada, that Canada ashes have become an article of export, to enrich the fruit farms of our Yankee neighbors, who purchase them by the car-load.

The following is an advertisement clipped from an American paper :—

"Canada hardwood unleached ashes, by rail, in car-load lots, furnished on short notice. Ashes guaranteed to be of best quality, and are especially adapted for all grass and fruits. Pamphlets and prices sent on application. M., J. & S., Oswego, N.Y."

This is only one of many. Such quantities have been imported from Canada into the United States, that a special Bulletin has been published by the Connecticut State Experiment Station, showing the analysis of the various brands. The market value is 25 cents a bushel, although their real value is much higher.

The following table shows the value of wood ashes compared with stable manure, and with a commercial fertilizer which we may call a complete manure :

Comparative Value of Wood Ashes.

In 1000 lbs. of wood ashes there are, say,—

60	lbs. of	potash, at 7 cts. per lb	$4 20
20	"	phosphoric acid, at 5 cts. per lb	1 00
700	"	carbonate of lime.	
		Amounting to	$5 20

About ½ ct. per lb. The remainder consists of magnesia, insoluble matter and moisture. One bushel weighs about 60 lbs., and is therefore worth about 30 cts.

In 1000 lbs. of a complete fertilizer there are,—

70	lbs. of	nitrogen, at 20 cts. per lb	$14 00
30	"	potash, at 7 cts. per lb.....	2 10
60	"	phosphoric acid, at 5 cts. per lb	3 00
		Amounting to	$19 10

Or nearly 2 cts. per lb.

In 1000 lbs. of stable manure there are, say,—

5	lbs. of	nitrogen, at 20 cts. per lb	$1 00
6	"	potash, at 7 cts. per lb	42
2½	"	phosphoric acid, at 5 cts. per lb	12
		Amounting to	$1 54

Or one-seventh of a cent per lb.

Now potash is a most important fertilizer for the orchard ; (1) it promotes growth, (2) it improves the flavor of the fruit, by causing an increase of sugar and a decrease of acid, and (3) it improves the color of the fruit, and this is very important in apples intended for the market. Apples draw heavily on the soil, and especially upon this element. It has been stated on very good authority that 100 barrels of apples draw more heavily on the soil than a crop of 50 bushels of wheat.

By reference to a table showing the constituents of the apple, the reason will be obvious.

Analysis of the Apple Constituents.

1--1000 parts of apple contains :

Water	831.
Nitrogen	.06
Ash	2.2
Potash	.8
Soda	.6
Lime	.1
Magnesia	.2
Phosphoric acid	.3
Sulphuric acid	.1
Silicic acid	.1

From this it is evident that of the most important elements, potash is one while the two other important elements, nitrogen and phosphoric acid, present in small quantities are also supplied in wood ashes.

With regard to the action of ashes upon the soil, it is important to notice that a heavy application of unleached wood ashes to a heavy soil is damaging to its texture, rendering it heavier still, more tenacious, and inclined to be cloddy on account of the potash. But for this very reason its action on light soils is highly beneficial, rendering it more compact, filling up the pores and keeping it moist.

It also tends to correct "sourness" in the soil by precipitating the soluble iron salts which are sometimes over abundant.

Another benefit is that it promotes nitrification, or the process by which nitrogenous matters in the soil are rendered available for the tree growth.

It is thus evident that ashes have more value than simply for the amount

of potash and phosphoric acid they contain, on account of their mechanical action, especially for light soils.

I have a hundred acres in orchard, and was almost in despair about fertilizing it properly, until I found I could buy ashes from farmers all about me for a mere song, and as much as I wanted. And now every winter I keep my team engaged collecting ashes for miles around, and apply it to my orchard. The results are evident, apples in abundance, and of such a size as astonished those who saw them; Baldwins often as large as Kings.

My soil is chiefly a sandy loam, and consequently of just the character to be most benefited by wood ashes. The quantity applied is about one-half to one ton per acre, or about one-half a bushel to a bushel per tree.

SPRAYING FOR APPLE SCAB.

THE best proof that the apple scab fungus is the immediate cause of the greater part of the apple failures of Western New York is afforded, according to the Cornell Experiment Station Bulletin, by the fact that thorough spraying with Bordeaux mixture is usually followed by a great increase in the productiveness of the orchard; and it may be said that the indifferent results which occasionally follow the spray are equal proofs that there may be other causes than the fungus for the failures. Much of the failure with the Bordeaux mixture, however, is due to careless or hasty application. If the Bordeaux mixture is properly made—using an excess of lime—no injury may be expected to follow its use, and it should be applied with great thoroughness. The operator should endeavor to completely cover all the leaves and shoots.

A mere sprinkling, such as most persons give, is of little good. One thorough application which drenches the tree is better than several of this ordinary kind. Then people are always waiting for fair weather. Now it is the rainy weather when the fungi spread most seriously, and it is then that the spray is most needed. With plenty of lime, the mixture adheres well. Spray between the showers, even when the trees are wet, if you can do no better. To delay is to fail. It is better to spray in the rain than not to spray at all. There is abundant proof that two to four applications of Bordeaux mixture are capable of keeping the fungus almost completely in check. It is not known what value there is in an application before the buds open, but it can do no harm, and it is probable that it is very serviceable in most seasons. At the latest, spraying should begin as soon as the blossoms fall. Make the Bordeaux mixture with six pounds of copper sulphate, four pounds (or more if the lime is air-slacked) of lime, and about forty gallons of water. It is always advisable to add Paris green for various insects—one pound to every 250 gallons of the mixture. Then take up your position near the tree, with a strong pump, and apply the mixture until the tree is soused.

PROFITABLE MARKET APPLES.

THIS was one of the questions in debate at the recent meeting of the Western New York Horticultural Society. The irrepressible *Ben Davis* came forward as usual, and its great productiveness, its freedom from scab, and good appearance amplified by its friends; while others condemned it on account of its poor quality, and claimed that in a few years it would have to give place to some variety of better quality. The old story, fought over just as it so often is at our own meetings in Ontario.

The writer conveyed the greetings of the Ontario Association, and gave his experience in shipping *Cranberry Pippins* to Australia during the past season. He claimed the apple was superior both in appearance and in quality to the Ben Davis, but, of course, by no means good enough in quality to be recommended as the ideal apple for the commercial orchard. Our Mr. Morris, called attention to the excellence of the *Ontario*, as being an ideal apple in many respects, while some New Yorkers commended the *Sutton Beauty*, as the most excellent apple for market purposes.

It was Mr. Van Deman, U. S. ex-Pomologist, who mentioned the *York Imperial* as the most desirable of market apples. The Ben Davis, he said, should not be grown outside of the Mississippi Valley, where it was at home, and attained its highest excellence. He condemned the *Stark* because of its dull color, while *Lawver* and *Gano* were not needed at all. In Chicago York Imperial was now quoted at $4.50 per barrel, and Ben Davis at $2.50. He believed the York Imperial would stand second only to the Newtown Pippin in the British market.

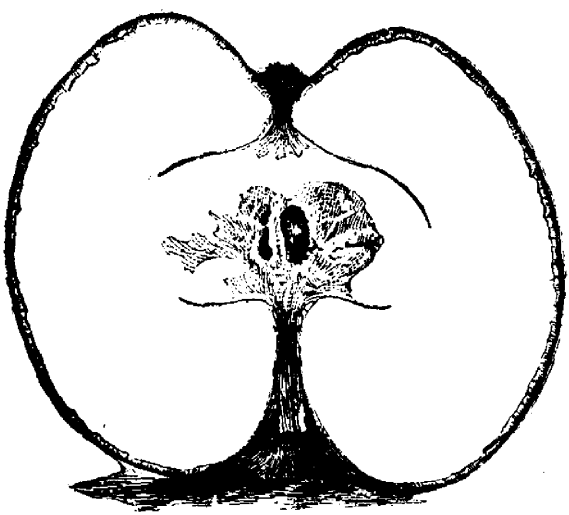

FIG. 917.--CROSS SECTION YORK IMPERIAL.

The American Agriculturist says of this apple:

The York Imperial is an apple which came into favor recently by reason of the demand for it in the English markets, where it sells at a price close to that realized for the Newtown and Albemarle Pippins. The apple is believed to have had its origin in York County, Pa., from which locality it takes its name. Downing describes the apple as being a "sub-acid"—as a matter of fact, however, it is practically devoid of acid and would pass for a sweet at any time. The specimen from which the accompanying photographic picture was made came from the New York Experiment Station at Geneva, and is doubtless genuine.

We describe the apple as follows: Fruit medium, oblate oblique, yellowish, a light crimson over a good part of the apple, which is splashed with crimson of a deeper shade. Stalk very short, inserted in a narrow deep cavity covered with a greenish russet. Calyx closed, in a deep, narrow and irregular basin. Flesh yellowish, fine grained, firm, pleasant, sweet, or nearly so, and very good. The obliqueness of this apple is its most marked characteristic. In almost every specimen, a perpendicular line from the calyx would fall far outside the stem. It is an exquisitely beautiful fruit, and even if of poor quality, would find a ready sale. It is a good keeper, rivalling any of the long-keeping sorts. We should think it a good variety to plant for market purposes.

PICKING AND RIPENING PEARS.

IT is the opinion of most nurserymen that pears should be picked while green and ripened indoors. The sunny side of the tree should be picked first and the rest later on. The greener the pear the higher the temperature should be to ripen it. The atmosphere should be moist to keep the pears from shriveling. The tasteless pear is the result of too early picking, and should have received more sun and less artificial heat. Such a pear is flavorless, and unfit to eat.

As pears absorb odors readily, much care should be taken that the boxes and papers in which they are packed are kept fresh and clean. Pears not being so elastic as apples, require straw, paper or some such material to keep them from being injured by the sides of the box or barrel. Early pears and those nearly ripe should be packed in shallow, well-ventilated boxes. French gardeners generally pack this fruit in layers with the spaces filled up with powered charcoal. The largest and greenest fruit is in the bottom, and all so snugly packed that no movement is possible, and that one pear does not press against another.

Tiverton, Ont. A. H. CAMERON.

DOWNING'S WINTER MAIDEN'S BLUSH.

THIS is one of the comparatively new apples which we are sending out to our apple experimenters this spring, in order that we may know its true value for Canadian planters. Very many of these newer varieties are very excellent in their native places, and deserving of all the introducers say; but when removed to other districts are utter failures. We hope in time to give a faithful account of the adaptability of this apple to the Province of Ontario. The following account of this apple from the New York Farmer, will interest our readers:—

In the spring of 1874, Mr. Jason Downing, of Darke County, Ohio, planted seed of the popular Fall Maiden Blush. One of these seedlings turned out to be very similar to its parent in appearance, but being a winter apple the originator was pleased to call it Downing's Winter Maiden's Blush. The length of the name is objectionable. Prof. H. G. Van Deman, who is highly pleased with the apple, suggests that it be changed to "Greenville," and the introducer, Mr. E. M. Beuchly, is ready to adopt such name should the American Promological

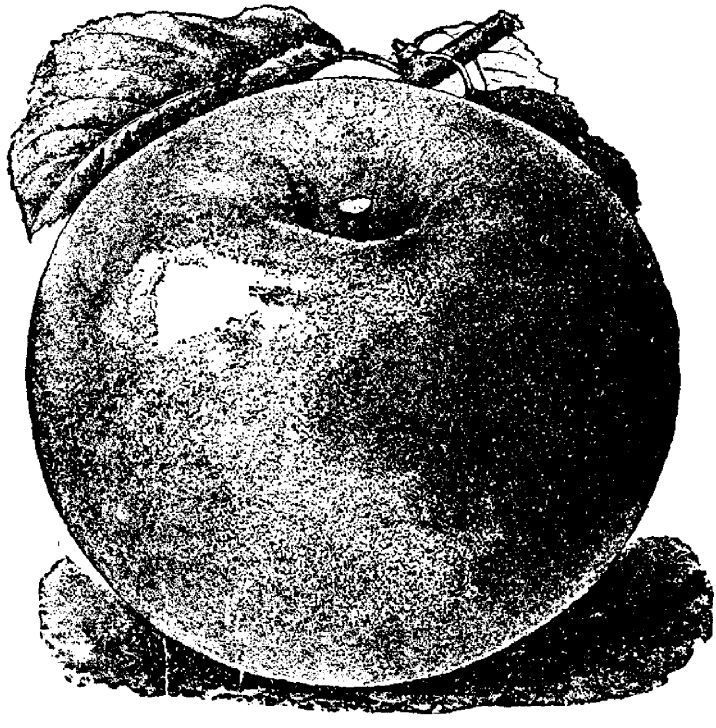

FIG. 918.—DOWNING'S WINTER MAIDEN BLUSH.

Society endorse it at its next meeting. This fine apple is rapidly becoming popular, and there are already large commercial orchards of it planted by the introducer. It has been a success at the experiment station at Geneva, N. Y., where a fine crop of the fruit was grown the past season. The original tree bore some excellent fruit at the age of seven years. The tree is hardy and a fine grower.

Description.—Fruit large, irregular, sometimes flattened and at others slightly elongated, inclining to conic; skin light waxen yellow, with a red cheek in the sun; stem medium length, inserted in a rather deep cavity, often surrounded with russet; calyx small, basin of moderate depth; flesh yellowish white, crisp, very fine-grained, juicy, with a very pleasant sub-acid flavor, and a very fragrant and agreeable aroma; season November to late winter.—N. Y. Farmer.

CAMPBELL'S EARLY GRAPE.

EVER since the introduction of the Concord, which has marked the most important epoch in the development of native American grapes, innumerable seedlings have been raised from it, with the hope of improving upon their parent. Many of these have become standard varieties of the present day, and yet none of them is quite free from one or more objections. Campbell's Early is the most recent competitor in this class.

It originated with George W. Campbell, of Ohio, and is a seedling of Moore's Early, a seedling of Concord. When we first saw the grape, at the meeting of the American Pomological Society at Washington, D.C., we became at once so favorably impressed with its good qualities that we predicted for it a grand future. We are, therefore, pleased to learn that so soon as a sufficient stock of it has been raised it will be offered for sale by George S. Jocelyn, in whose hands the entire stock has been placed by the originator. It is described as earlier than Moore's Early, with no tendency to shell off or fall from the stem, as it can remain on the vine from four to six weeks after ripening. It is free from foxiness and has a delicious and sprightly flavor, far superior to that of the Concord. Its growth and foliage are all that can be desired, the leaf being thicker than that of the Concord. The skin is thin but tenacious; the pulp has no acidity, is a little mealy, and sweet from the skin to the centre, and the seeds part readily from the pulp. From what we have seen of this new grape we consider it a decided improvement over the Concord, to which it will no doubt become a strong competitor after its introduction.—American Agriculturist.

The entire soil where an orchard is growing should be either mulched, or cultivated, or hoed over so frequently during the growing season, that all vegetation will be completely subdued.—S. E. TODD, The Apple Culturist, 1871.

WALTER APPLE.

A new seedling apple of fine appearance and excellent quality, originated by the late P. C. Dempsey, of Trenton, Ont., and named Walter, after his son, our experimenter.

Fruit, large, roundish, one-sided; skin green, suffused and striped with bright red; stem slender, an inch long in a narrow cavity; calyx closed in a narrow basin of moderate depth; core small; flesh creamy white; tender, crisp, juicy; flavor, sub-acid, rich, agreeable, aromatic. Season, September, October. Not yet tested except by the originator. Sample grown by Mr. W. H. Dempsey.

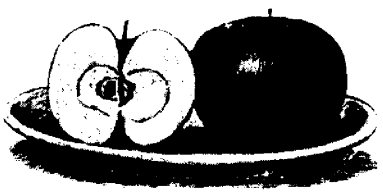

FIG. 919.—WALTER APPLE.

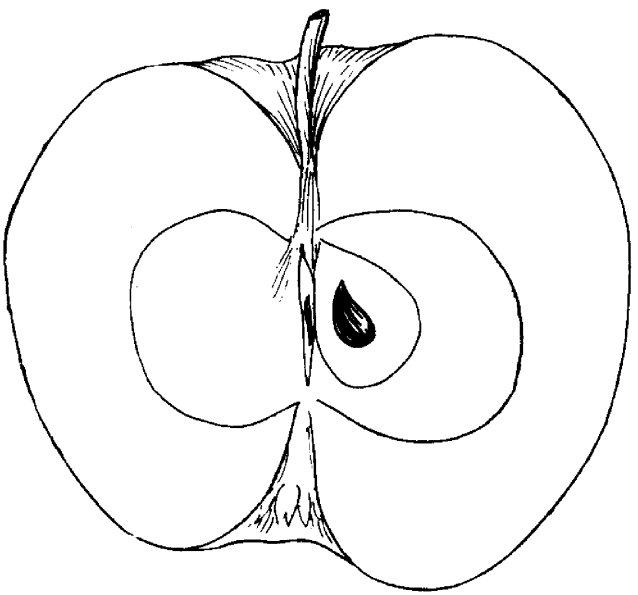

FIG. 920.—SECTION OF WALTER APPLE.

Grain crops should never be planted among trees, as they deprive them of air to a very injurious extent. If no root crops are cultivated, the ground should be kept clean and mellow with the one-horse plow and cultivator. . . . Every third or fourth year, the trees should receive a dressing of a well-decomposed manure or compost.—PATRICK BARRY, The Fruit Garden, 1st Edition, 1860.

PRUNING FRUIT TREES.

ABOUT the first kind of out-door work that the fruit grower finds to do in spring is pruning his trees. As soon as hard freezing weather is past, generally early in March, in Western New York, the fruit grower should examine his fruit trees to see if they need pruning. It is claimed by experts that where a tree is properly attended to every year from the time it is transplanted, it will rarely require the use of saw or hatchet, as no large branches will need to be removed; that where the proper spring and summer pruning is done annually, the thumb and finger, with occasional use of knife, will keep the tree in good shape, with the top properly thinned. This is probably true if the conditions are strictly fulfilled, but in ordinary apple orchards it is necessary to make some use of a fine saw. To grow good, fully developed apples, richly colored, it is necessary to have the tops of the trees so thin that the sunlight shall fall on every leaf and every individual fruit, and the air circulate freely among them. The leaves and the rind of the fruit are the great perfecters and colorists of fruit, through the absorption of light and gases. Some apple trees are naturally so inclined to make thick heads that a considerable proportion of the apples never attain to proper size and color, unless the branches are kept thoroughly thinned. Witness, for example, the difference between the pale green, tasteless, or bitter, Northern Spys, grown on the inside of an unpruned tree and the large, highly colored specimens grown on the outside, fully exposed to air and sunlight. To properly prune a fruit tree is an intellectual exercise, requiring sharp observation and considerable thought. I never cut off a branch without being able to give a good reason for it and why I cut it in preference to an adjoining one. Where the branches rub together there is generally a good reason why one should be removed in preference to the other. Avoid sawing off large limbs wherever possible. It is great tax on the vitality of a tree to cut off large limbs. It is generally less exhausting to remove two or three small ones than one large one.

We seldom practice cutting back the last year's growth of the apple tree, for inasmuch as the apple is of rather slow growth seldom adding more than twelve to eighteen inches of new growth annually, it is hardly necessary to shorten in that growth. Moreover, the new growth of the apple generally matures to the terminal bud. With the pear and the peach it is different. When thrifty the peach seldom matures to the tip, and as it forms fruit buds on the new wood, cutting back one-half or one-third of that wood would cut off but a little more than the weaker, frost-bitten buds, and the remaining buds would develop into larger, better fruit and more in bulk than if all that would grow were suffered to grow.

The same rule applies to the pear, especially the drawf pear. I visited several times one of the finest, best cultivated dwarf pear orchards in Western New York. The varieties were Angouleme and Howell. Every year the new

growth was headed back, the soil kept well fertilized and cultivated and the trees were regular, heavy bearers. One year I visited this orchard and, after passing through many rows well loaded with fruit, came to a few rows that were entirely barren. Asking the proprietor for a solution of the mystery, he said that the preceding year they had cut back the new growth, as usual, up to where the barren rows commenced when something occurred to prevent further pruning and the result was a complete vindication of the efficacy of pruning. At the recent annual meeting of the Western New York Horticultural Society, an object lesson of the effects of pruning the Angouleme was exhibited. Some branches of last year's growth were shown that had made a luxuriant growth of wood without a single fruit bud, but other branches had been stopped in June, when about a foot in length, and they were filled with blossom buds. A good way of pruning pears to promote fruitfulness is to stop the growth of branches by pinching off the leading bud.

Grapes should be pruned quite early in March, if not attended to in the autumn, and should they be neglected until after the middle of April, I should prefer to leave them until the new growth had started one or two inches, when I would cut back the previous year's growth, leaving one or two of the new shoots. I have tried this practice as an experiment and found that the vines bled but little—much less than when pruned in March or April—and they bore heavy crops of fruit and made a good growth of vine.

Raspberries and blackberries should be thoroughly pruned, either before or soon after the buds start into growth. If the leading canes were stopped last summer, as they should have been, by pinching off leading buds, then you have but to shorten in the laterals to within a foot or so of the upright canes. This will remove the weaker buds, giving those remaining opportunity to develop into good large berries. Currants and gooseberries should be kept thinned out by cutting out superfluous new sprouts and occasionally removing an old branch when past its greatest vigor and productiveness. No fruit tree or shrub or cane can do as well when allowed to exceed its proper limit of growth as when kept within due bounds. All modern fruit growing is something of an artificial pro cess, as we have departed quite widely from nature's methods in order to reduce it to subserviency to our wants.—P. C. REYNOLDS, in New York Tribune.

Nitrogen in Manure.—The nitrogen voided in manures is contained mainly in the urine, and therefore the liquid manure should be saved even more carefully than the solid, although not one farmer in ten fully realizes this fact. We are also learning that the nitrogen (ammonia) in stable manure is something of an uncertain factor. Wagner, the careful German experimenter, holds that less than half of the nitrogen in manure is immediately available for plant growth. This explains the advisability of absorbents in stables to keep what nitrogen there is in the manure, and also the wisdom of adding ammonia in the form of commercial fertilizers or by plowing under alfalfa, clover, etc.—Mass. Agl. Exp. Station.

HOT BEDS—HOW TO MAKE AND OPERATE THEM SUCCESSFULLY.

ONE of the most convenient and profitable luxuries in the spring is a well managed hot bed from which one can daily gather lettuce, radish, spinach, etc., and forward plants, such as cabbage, tomato, pepper, cauliflower, for outside planting. Also it makes a desirable and very satisfactory place for starting flower seeds and early flowering plants for outside planting. Make the frame "box shaped" to fit sash (any size sash you happen to have on hand), though the standard size is about 3x7 feet. At the bottom, boards should be about 12 inches high; the top or back, 18 inches; the back being higher than the front gives a declivity to the sash, thus casting off the rain and gives proper slant to receive the sun's rays.

Select a well drained location and one never flooded by rain. In preparing a hot bed fresh horse manure should be piled up, which will heat in about six days. It should then be turned and well tramped down; the second fermentation will then take place in four or five days. It is now ready for the bed —should be packed one foot deep and banked up on all sides to the top. Five or six inches of rich and finely sifted soil must be spread over the manure, then cover the frame with sash, after standing six days, or until the rank steam has passed off; seeds may then be sown.

Keep the temperature as even as possible, from 45 to 50 degrees Fahrenheit at night and not over 75 to 80 degrees during the day. In keeping up the above temperature, (cold weather will give some draw backs) it will be necessary in many instances to cover the sash with straw, mats, light manure, etc., on cold and frosty nights. (This covering, however, should be removed as soon as possible.) Remove the covering every morning when weather permits, at 9 o'clock, or as soon as the sun rests upon the glass, as every effort should be made to give the plants all the sunlight possible, as its rays are vivifying to a degree beyond the amount of its heat, it having a chemical and physiological effect beyond explanation.

Even dull light is better than no light, consequently it is a bad plan to cover the sash with mats, except for the direct purpose of keeping out cold. Give a little air about 10 o'clock; cut off the air in the afternoon as soon as it (the air) becomes the least chilly, then if necessary cover with mats, etc., about sunset to retain heat. Care should be taken to keep the cold winds from blowing in upon the plants when sash are removed to admit air. Great care should be taken in watering hot beds. Do not give too much water, for if this be done, the soil is apt to become soggy and sour. Success depends upon bottom heat

from the manure, top heat from the sun, water from the daily application, and air at midday. Without plenty of air the other requisites will be fruitless.

All seedlings should be transplanted into other hot beds, cold frames or intermediate beds when two inches high. For fear that there may be localities where stable manure for hot beds cannot readily be obtained, we give the following simple formulafor "artificial heat" for the production of a moderate and continuous heat, the quantities named being sufficient for a space 8x12 feet.

Take as the crude materials, 500 pounds of straw, three bushels powdered quicklime, six pounds muriatic acid, six pounds saltpetre. Having prepared the

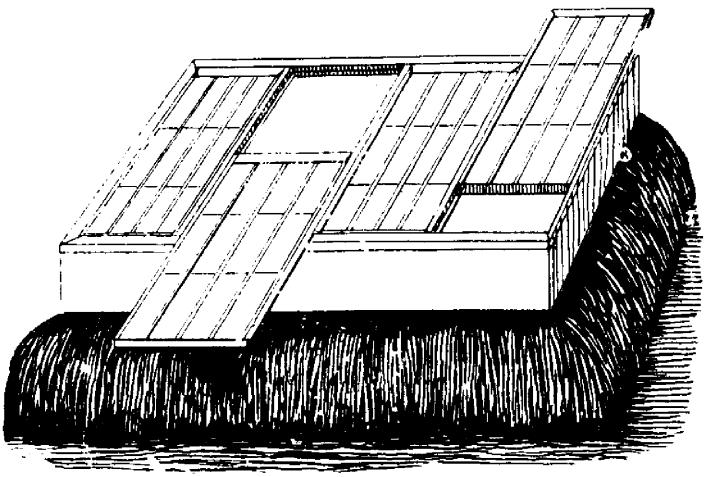

FIG. 921—HOT BED.

excavation of proper dimensions, spread three or four inches of forest leaves or old hay in the bottom: Upon that spread eight inches of the straw, tramp it down and sprinkle with one-third part of the quicklime. Dilute the six pounds of muriatic acid with twenty gallons of water and, by means of an old broom sprinkle the bed with one-third part of the solution. Make another layer of eight inches of the straw, applying quicklime and the solution as before. Repeat for the third layer. Upon this make a fourth layer of straw, and upon it sprinkle the four pounds of saltpetre dissolved in 30 gallons of water. Place the box in position, bank up outside, within the box spread three inches rich, finely pulverized earth, and then put on the sash. A heat will soon be generated which will continue for two or three weeks. The same methods as to location and care will apply to this as in the above.—Indiana Farmer.

CHRYSANTHEMUM CULTURE.

EBRUARY or March is a good time to put in cuttings. Select the short shoots from the base of the plant, bare the leaves well, of the cuttings,—insert them into flats of half-leaf-mould and sand,—place the flats on a bench near the glass with no bottom heat, temperature 45 by night. If the sun is too strong during the middle of the day, slight shading will be beneficial. They should be well rooted in four weeks; then they should be potted into three inch pots,—compost one-third loam, one leaf-mould and one sand. When the pots are filled with roots, shift into six-inch pots of two-thirds rotten sod and one-third rotten cow manure that has been dried and rubbed down. They should be fit, by the middle of June, to be put into their flowering pots. The vigorous growing kinds need larger pots than the more delicate ones. The soil for this potting should consist of two-thirds rotten sod and one-third rotten cow manure. To each bushel of the compost, add a six-inch pot.full of bonemeal. The soil should be firmly pounded down against the sides of the pots, with a stick, as firm potting insures firm growth. Stake your plant while you have it on the potting bench. After this operation has been gone through with plunge the pots into beds of coal ashes,

FIG. 922.

three feet between the lines. To keep the plants from being destroyed by wind, run a wire on posts along each line, to which tie the stakes. Do not allow the plants to suffer for want of water; but be sure they require it before you give it to them, as careful watering is very important. When the pots are fairly filled with roots, give weak liquid manure once a week until the first of August,—then twice a week until they show color, when it should be stopped. Disbud twice a week, whether for standard or bush plants, throughout the growing season. House them by the early part of October,—ventilate freely,—keep the temperature about 40° by night,—keep mildew in check by dusting the affected parts with sulphur. To kill Brown Fly, dust them with tobacco powder.— Meehans' Monthly.

THE GREENHOUSE.

Get all manner of plants that require it repotted and ready for a good summer's growth. Use clean pots, drain them effectively; in repotting have the ball of the plant deep enough that the fresh soil will completely cover it, but not so deep that an inch or so of the stem will be buried. In potting ram the soil very firm. A loose soil when well watered becomes a mud puddle; a very firmly packed soil, no matter how much watered, retains its firmness, and the plants in their short jointed firm wood soon show which is the better practice. The soil used in potting while somewhat moist should not be wet; in fact it should be very free and mellow. Never use a large pot for a small plant; overpotting is very injurious. Newly potted plants should be kept only moderately moist at the root till young roots begin to grow into the fresh soil; they enjoy a moist atmosphere though, and in the case of fine-leaved plants like dracænas, crotons, marantas, aralias, anthuriums, alocasias, and the like, syringing them overhead twice a day, say in the morning and again in the early afternoon, does them much good. The blossoms of plants, however, should never be syringed overhead.

Put in some cuttings of all manner or plants increased in this way, such as carnations, begonias, libonias, eupatoriums, marguerites, stevia, streptosolen, fuchsias, habrothamnus, cytisus, asparagus (*tenuissimus*), myrtles, double petunias, plumbago, passion flowers, and many others. Bouvardias, if they have been kept rather dry at the root since flowering, may now be shaken out of their pots and their fleshy roots cut up into short pieces, say two inches long. If these are inserted as cuttings they throw out adventitious eyes that soon grow into nice little plants. If some clumps of *Anemone Japonica* are lifted and treated in the same way we can get up a nice stock of them flowering next August and September.

Keep calceolarias cool, faintly shaded, but near the glass, and give them lots of water and plenty of room. Don't wet them much overhead.—Gardening.

THE NARCISSUS AND THE TULIP.

O garden seems to be complete in the early spring without a selection of narcissus, and taking the best, there are no more reliable bulbs for garden use. Many new kinds have been lately introduced, among which those of Spanish origin, after flowering once, dwindle away and rarely succeed in gardens. But among those of hybrid and garden origin, there are few that will not succeed in American gardens, and these hybrids and garden varieties are by far the best kinds. There is a phase of narcissus cultivation that is too rarely seen here, that is their naturalization among grass in wild or shady places. The Poet's narcissus and those allied to it, and the Incomparabilis section, and, in fact, all those of starlike forms are most eligible for this purpose. For cutting for indoor decoration there are few to excel Empress, Horsfieldt, Michael Foster, and William Wilks, all of which are bi colors and bloom in succession. Countess of Annesley, Emperor, Sir Watkin, and Princess, all belong to the larger yellow flowered section, and to these may be added the Incomparabilis and Barrii sections, which are well adapted to our climate. It is preferable not to plant these in a mixed or herbaceous border, but to keep them in a separate border, which in summer is planted with annuals that shade the soil from the burning sun. The narcissi are planted in rows, sixteen inches apart, and the annuals, such as stocks, asters, mignonette, etc., are set between. When the annuals are cleared off in the fall, a top-dressing is given over all in the beds, and this is all the fertilizer they seem to require. They should be lifted and re planted every three years. It is quite in keeping with a herbaceous border to have clumps of narcissus mixed here and there, along the margin, and, where few are grown, this is perhaps the best way, but if the number of varieties is large it is better to have them where labels will not be disturbed, and where each kind is near the other for comparison.

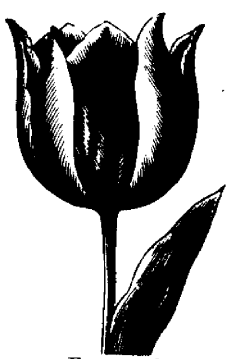

FIG.—923.

There are a number of species of tulips other than those generally used for massing for color effects, which are most beautiful in the mixed border, and they have also greater vigor and taller habit, and grow on for any number of years without deterioration. Tulipa Gesneriana may be taken as the type of these late flowering kinds, and there are few bulbs that give such rich coloring as this, without being gaudy. Other species are the horned tulip (T. cornuta) with petals narrowing to a point: T. Greigi, FIG. 923 with rich colors and prettily spotted leaves; T. vetillina, pure yellow, and many others not often seen cultivated, some of which are real gems in the rock garden. The so-called Darwin tulips are the "breeders of the Flemish and English raisers; the lovely colors of this

section give them a peculiar charm—rich, dark and velvety colors predominate; yellows are absent, and no two in a mixture are alike. Their stems are erect and stiff, and they are admirably adapted for cutting. They like a soil that is not liable to dry out, or the quality of the blooms suffers. They should be planted in groups of six or eight, and each year the quantity of bloom will be about doubled from each clump.—Rept. Mass. Hort. Soc.

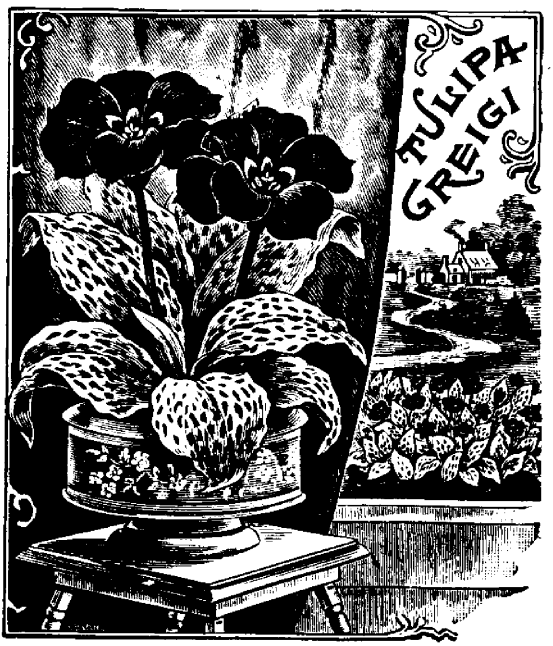

FIG. 924.

Hollyhocks and Pansies.—An excellent covering for the hollyhock is a nail keg, with both ends knocked out. Place one over each plant, and fill in about it with leaves. Then put something over the top, to keep out the rain. When snow comes, bank up well about the keg. Plants come through the winter, when protected in this way, in splendid condition, and give early and fine flowers. Unprotected, half the hollyhock plants die off in spring, at the north. A close, heavy covering is almost sure death to a pansy. The ideal covering for pansies is leaves scattered loosely among the plants, with large branches of evergreens laid over them. These keep the leaves in place.—Am. Agriculturist.

Wild Flower Trade.—The trade in cut wild flowers is beginning to be an important business in the large cities. Wild ferns, especially those with leathery leaves, are an especial feature. The Christmas fern, *Aspidium acrostichoides*, is largely drawn on. It is estimated that five millions of fronds of this fern were sold in Philadelphia last year.—Meehans' Monthly for December.

The Canadian Horticulturist

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.

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

Notes and Comments.

WATERLOO HORTICULTURAL SOCIETY has now sent in to us 121 names for 1896.

THE DRY ROT has seriously affected the quality of the Baldwins and Kings in Southern Ontario during the past season.

THE PORT COLBORNE HORTICULTURAL SOCIETY has elected the following officers for 1896: President, E. O. Boyle, 1st Vice, L. G. Carter, 2nd Vice, W. W. Knisley, Secretary, D. W. McKay, Treasurer, A. E. Augustine, and nine Directors.

THE MCINTOSH RED was shown at the Rochester Fruit Growers' Meeting for Princess Louise. Evidently these two varieties have become mixed by some of our nurserymen.

MORE ABOUT FLOWERS.—Since we have so many Horticultural Societies in affiliation it seems important that we give a little more space in the journal to floriculture. We have, indeed, received requests from some of the societies that we should do so. We shall be glad to comply, but we must always place the cultivation of the fruit garden first, because the larger portion of our readers are more interested in fruit than in flower growing.

COLD STORAGE FOR SHIPBOARD.—Ice storage is apparently too precarious for use on shipboard for any long voyage, besides being very expensive. Dr. Perkins, of California, has invented a process called the "Perkins' Sterilized Air

Process," by which fruit can be preserved from decay at one-eighth the cost of the usual cold storage.

We made enquiry at Rochester regarding the process, and were informed, by Mr. Hale, that the patents protecting Dr. Perkins were not yet received—and until that was completed, the process would not be available.

THE DIRECTORS OF THE GRIMSBY HORTICULTURAL SOCIETY met on the 18th February, at the Mechanics' Institute Rooms. It was unanimously agreed to give each member THE CANADIAN HORTICULTURIST, the Fruit Growers' Report, and the following excellent list of bulbs, seeds and plants, viz.: Two cannas, one named gladiolus, one named begonia, two named chrysanthemums, and an ounce of Burpees' best mixed sweet peas. The ladies on the Board were made a committee to prepare a programme for the next public meeting of the Society, and the gentlemen agreed to give any needed assistance. At this meeting choice house plants and art work will be shown; an interesting programme will be given, and the packages of plants distributed.

CALIFORNIAN PEARS reach England in good condition by cool chambers on ships; why cannot Canadian pears be handled equally well? Speaking of foreign fruits in Covent Garden, a writer in The Garden says:—Cool-chambered ships and cool cars in trains bring such sorts as Bartlett, Beurré Hardy and Doyenné du Comice by thousands of cases in perfect condition from California, and if it can be made to pay by reducing freight, the supply from there seems enormous, and will run the French very close as well as the English. At present the freight of a case weighing 40 lbs. fruit is over 4s., and unless temperature is very carefully regulated, they turn very quickly when exposed, and do not keep so long as the French. Some very fine plums have also come from there in good condition. California has a great advantage over England in regard to pears travelling, and that is, they seldom get rain while the fruit is ripening, and that of course is greatly in favor of any fruit standing a journey as well as the hotter climate ripening them more thoroughly. Easter Beurré coming in winter does not need cool chambers, and therefore comes at a lower freight. A great many peaches came from California this last autumn, but were of very poor quality, being mostly clingstones and were only fit for costermongers. In September this year there were weekly shipments received in our market of about 6000 cases pears and peaches. At the present time the quantity is about 1000 weekly, principally Easter Beurré.

Question Drawer.

Small Fruits—Information Wanted.

793. SIR,—I find it hard to get good help at garden work, such as hoeing, cultivating, etc. How should I set about to obtain good berry pickers? What are the usual prices paid pickers at Grimsby? Are any hired by the season, and at what price? Do you think it advisable to advertise; and what is the best medium? Any information will be thankfully received.

G. FINDLAY, *Walkerville, Ont.*

Our subscriber does not say how large an acreage of small fruits he has to harvest, but in a neighborhood like Walkerville, there should be no need of advertising for pickers. We usually find that the women and children in workingmen's homes are always ready to earn some extra money in the berry field; and it is easy to gather a few dozen pickers in any small village. For strawberries we usually pay 1 cent a quart; for raspberries and blackcaps 1½; blackberries, currants, and gooseberries, 1 cent. Of course there are often exceptional cases where additional pay should be given, but with a first class crop, the above will answer. Pickers are never hired for the season, but it should be agreed that a picker would remain throughout the season with the one employer, when needed unless a week's notice, more or less, be given of a change.

Red Cross Currant.

794. SIR,—Do I understand from January number that you have the control of the stock of the Red Cross Currant?

W. H. PARKER, *Mimico.*

No, we know nothing of this currant, except what the introducer says on page 27. By mistake the article appeared in the body of the Journal instead of in advertising columns. You will need to write to Chas. Green, Rochester, the introducer, for stock.

Lawver and Delaware Red Winter.

795. SIR,—Are these two apples identical?

W. C. REID, *Belleville.*

They are too near alike to be worth distinguishing. Plenty of better varieties for Ontario.

Gano and Arctic.

796. SIR,—Do you know these apples?

W. C. R., *Belleville.*

The Gano we met at the World's Fair. It is of little account for Ontario. The Arctic we do not know.

Frozen Trees.

797. SIR,—Since last spring frost, some of my apple trees are dead some four or five feet down the branches, to where they are an inch or so in diameter. Do you think they will recover?

JOHN DALGARNO, *Sullivan.*

If not injured farther, cut off the dead wood, and the trees will no doubt grow up from below, and make good trees much sooner than planting new ones.

Raspberries for Home Use.

798. SIR,—I want to plant a patch of raspberries for home use, two or three varieties. Quality not to be the chief consideration?

J. D., *Sullivan.*

Of red raspberries, try Marlboro', Turner, and Cuthbert; of black caps, Gregg, and Hilborn: and for canning, the Shaffer.

Abundance and Burbank Plums.

799. SIR,—Are these hardy enough for Northumberland County?

W. C. R.

Muriate of Potash.

800. SIR,—Where can I buy muriate of potash, and at what price?

J. S., *Henryshurg.*

Manurial Value of Tannery Refuse.

801. SIR,—Would you kindly inform me, if convenient, what the manurial value of the refuse from a tannery is for fruit trees, and how much it would be advisable to apply per acre to light soil not very rich, *i. e.*, worked out considerably; and for peaches and blackberries? Would it pay to give 25c. per load, assuming the hauling cost nothing? What is the highest price it would pay to give for it?

L. G. MORGAN, *Port Dover, Ont.*

Reply by F. T. Shutt, Chemist Central Experimental Farm, Ottawa.

I have your communication of the 13th inst., requesting information respecting tannery refuse. Tannery refuse consists of scrapings and trimmings from the hides, pieces of flesh, hair, etc., and, consequently, is an organic manure. Its chief fertilizing constituent is nitrogen, and the agricultural value of any particular sample will depend not only upon the percentage of this element present, but also upon the condition in which the nitrogen occurs. Thus, the nitrogen of flesh is *much more available* for plant food than that of hair; hence, the proportion of flesh to hair in the refuse must be taken into account when considering the value of this material.

We have not as yet made any analysis of refuse from Canadian tanneries. Most probably the fresh material would contain from 75% to 85% of water, the nitrogen approximating 3%. Without examining the sample referred to by your correspondent, I could not say exactly what it is worth, but in all probability the price mentioned by your correspondent of 25 cents per load is not too high.

I should advise the composting of the refuse before application to the soil. By so doing a more immediate effect would be obtained than by applying the material directly to the soil. Stable manure or good soil might be used to advantage as a composting material. There are also other substances, such as wood ashes and lime, that can be used for this purpose.

For general fruit culture, the compost of tannery refuse should be supplemented by fertilizers containing potash and phosphoric acid, more especially the former. Wood ashes, kainit and muriate of potash are forms in which the potash may be applied; bone meal and superphosphate more especially furnish phosphoric acid.

Sandy soils are especially benefited by an application of organic manure. Some add humus, and by this means improve the soil's absorbent capacity for moisture. From this standpoint, I consider that the compost of tannery refuse would be a highly desirable form in which to supply nitrogen for soils of a light character.

Occasionally I have known the spent tan bark of tanneries to be called tannery refuse. This material is hemlock bark from which the "tan" has been extracted. It is essentially woody fibre. A sample that we examined some years ago contained .167% of nitrogen. As a fertilizer, I am of the opinion that this material is almost valueless, since it contains very little plant food, and is of such a nature that it resists decomposition in the soil for a very long time.

Pruning Gooseberry Bushes and Spruce Hedges.

802. SIR,—Should gooseberry bushes, and a spruce hedge be pruned in March; if not, when? THOS. H. ALTON.

The gooseberries may be pruned in March, but the evergreens would heal better if pruned about the 1st of June, when young growth is pushing forward.

Mulch for Strawberry Plants.

803. SIR,—What is the best kind of mulch to use on strawberries, and when should it be applied? T. H. A.

If for winter protection, evergreen boughs, or a coarse strawy manure, applied as soon as the ground is frozen; if to keep fruit clean, straw or sawdust applied just as the fruit begins to ripen. The following remarks on mulching the strawberry patch, by Mr. Rice, before the Bullville, N. Y., Farmers' Institute, will be interesting in this connection:—

"Where manure from the house stables is used—which is excellent, except where it is full of weed-seed or from timothy—there is little danger of its blowing away, because it is so moist. The same is true of the litter from poultry houses, which is also good because, like the horse-manure, it contains such valuable fertilizing material as well as being a good mulch.

"Where clean straw is used, it may be put over the entire patch to a depth of four inches, and if it is likely to be blown away, a little brush, and an occasional clot of earth or stones can be put on, until the straw has been wet by rain or held down by the snow.

"The mulch may be put on at any time after growth ceases, but usually after the ground freezes, because at this time less injury is done to the plants by the wagon and horses running over them.

"A good mulch has a fourfold benefit: 1st. To protect the crowns from freezing and thawing. 2nd. Holds buds back from late frosts in the spring. 3rd. Makes a fine protector for the fruit, keeping the berries from getting sanded when rains come during the picking season. 4th. It serves to retard the growth of weeds, and also conserves moisture during the drouth.

"It will be necessary in the spring to loosen up the mulch, and let the plants push up through. If this is not done, the plants may be unduly retarded and perhaps smothered out entirely.

Barn Manure.

804. SIR,—Is barn manure good for raspberries? T. H. A.

Yes, the best possible fertilizer.

Gooseberry Mildew.

805. SIR,—What is best to keep mildew off gooseberries? T. H. A.

Persistent spraying with Bordeaux mixture, made with four pounds of lime, four of sulphate of copper, and forty gallons of water. Give four applications, two before blooming and two after. Mr. Morton, of Wingham, has excellent success with even the English varieties, by this treatment.

Summer Pruning of Grape Vines.

806. SIR,—Should grape vines be cut back in June or July, and if so how much? T. H. A.

Summer pruning is little practised in Canada. If the vines are properly pruned in fall or spring, little more is needed than to rub off useless sprouts to direct growth, and to stop the ends of bearing branches just beyond the last bunch of grapes.

Coal Ashes.

807. SIR,—Are coal ashes any use around gooseberry bushes? T. H. A.

As a mulch, yes; as a fertilizer, very little.

Strawberry Crossing.

808. SIR,—How are strawberries crossed? T. H. A.

The stamens, if any, must be cut out of the blossom, and the emasculated flower treated with pollen from the variety you wish to cross it with. For this work a camel's hair pencil is a convenient tool. The flower must be protected by a little bag from any other pollen both before and after the operation. The seed from the fruit thus operated upon will produce a cross between the two varieties.

Planting Evergreens.

809. SIR,—When is the time to plant evergreens? T. H. A.

Evergreens may be transplanted almost anytime, providing the roots are not allowed to become the least dried by exposure to sun or air. To this kind of injury evergreens are more susceptible than other trees, and if roots once become dry, it is impossible to make the tree survive its removal. An excellent time for removing them is about the 1st of June, when they are beginning to push out new growth. August is advocated by some planters, because the drought of summer is over.

Varieties of Raspberries and Blackberries.

810. SIR,—What are the best varieties of red raspberries, black caps, and blackberries? T. H. A.

That depends on the purpose for which they are wanted. If for the general market, we would commend Marlboro and Cuthbert, red raspberries; Hillborn and Gregg, black raspberries, and Agawam and Snyder, blackberries. Where it is hardy enough, and does not rust, the Kittatinny is the finest blackberry.

Pruning Plums.

811. SIR,--Should plum trees be pruned? T. H. A.

Yes, (1) to direct growth and (2) to thin out cross branches and (3) to shorten in sprawling limbs.

What Nozzle?

812. SIR,—I intend purchasing an Ideal spray pump. What nozzle would you advise? We have between three and four hundred apple and pear trees, besides a few plum and cherry. Would a McGowan reach the top of good sized pear trees?

W. H., *Medina, Ont.*

The McGowan will give you excellent satisfaction. For high trees the nozzle should be elevated on a long light pole—a bamboo is excellent for the purpose. The pump should have fifteen feet of hose to allow the elevation of the nozzle.

The Bordeaux Mixture.

813. SIR,—Is the Bordeaux mixture good to spray upon plum trees? Last year I sprayed nine with it, and thought they fell more than usual.

A. S. CROSBY, *Compton, Que.*

If properly made the Bordeaux mixture is perfectly safe upon the foliage of all trees and plants. It should have an excess of lime rather less than prescribed. Milk of lime should always be added to the dissolved copper sulphate until a drop of cyanide of potassium remains unchanged in color when dropped in the mixture. A few cents worth of this latter substance will last the season, and it is a convenience, because no weighing of substances is necessary. The usual formula now for the Bordeaux mixture is four lbs. copper sulphate, four lbs. lime, and forty gallons of water; the simplest method of making is first to dissolve say twelve lbs. copper sulphate in a barrel of water, and in another barrel as much lime as convenient. Then dip out one-third the liquid copper sulphate, which would be four pounds dissolved, into the spraying cask; then add milk of lime until the potassium ferrocyanide will not change color when dropped in the mixture.

Commercial Varieties of Plums for Southern Ontario.

814. SIR,—I am wishing to set out 400 to 600 plum trees this spring, on Pelee Island, and will feel very much obliged to you to give me the names of six or eight varieties that will give me the earliest and also the latest, and the others to fill in the time, to give me a continuous supply to ship. The soil is rich clay loam, on a limestone base. I want large and showy ones—plums good to ship.

JAMES SPRIGLEY, *Pelee Island, Ont.*

Reply by Mr. S. D. Willard, Geneva, N. Y.

My list of plums for the section you refer to would be as follows:—Field, which is ten days earlier than Bradshaw, of same size and general appearance, being a seedling of the Bradshaw. Then Burbank, Black Diamond, Fellenburg, Grand Duke, Monarch, and Archduke. If I wanted yet another, I do not know but what I would take the Prince of Wales. Please note one fact, that the Grand Duke and Fellenburg are much the best when they are top-

worked on some other varieties, like the Lombard. They want something to impart more vigor and growth than they get when they are bottom-budded. This gives additional surface to the tree, rather earlier bearing and very much greater productiveness. As I grow older, I am impressed with the idea that many varieties of apples, plums, pears, etc., are very greatly improved by working upon some other sort.

The Ideal Spray Pump.

815. SIR,—What do you think of the Ideal Spray Pump manufactured at Brantford? A SUBSCRIBER.

Our foreman, Mr. P. Blanchard, who used this pump last season almost constantly for some weeks, says he is much pleased with it, indeed, that it gave excellent satisfaction, especially with the McGowan nozzle.

Best Blackberries.

816. SIR,—What blackberry do you consider the best? for I want to plant a few. I see Lovetts' advertise some new ones; have you tried any of them? Are the June Berries any good? Have you tried the Pawpaw, "Northern Banana" and Persimmon?

EDWARD WILSON, *Bright, Ont.*

Judging at Exhibitions.

SIR,—I think we should follow up the very excellent work we have done in listing fruit for exhibition purposes, and extend our work to descriptions of garden fruits and vegetables. I have been unable to obtain the list which the Michigan Society issued, but, in my opinion, the idea is an admirable one. Any one who visits our fall fairs, and more particularly the township fairs, must be convinced that the biggest sample is, in the estimation of the judges, the best. Within certain limitations, this is correct, but who would prefer an overgrown potato one sees at exhibitions to a medium sized one for his own particular use? What earthly use is a beet as big as your head for table purposes? I have seen long beets that could only be cooked in a washtub without being cut —which spoils the beet—awarded first prize as table beets. There is great confusion, too, as to what is a squash and what is a pumpkin. At Goderich the judge of vegetables awarded first prize for winter squash to what six of us, practical men at that, considered a variety of pumpkin; botanically they are the same species. Some of you who have the reports of other societies to assist you in its preparation, might take up this matter. I cannot without a great deal of labor, as I am not in possession of material such as I have indicated.

J. A. MORTON, *Wingham.*

✱ Open Letters. ✱

Cost of Living in Paris, France.

I do wish something could be done to bring Canadian fruit and other products more before the British public than is the case now. Here in Paris we find things very high. The following will give you some idea of what the cost of living is: Meat 26c.; butter 35c.; milk 8c. a quart; coal oil 56c. a gallon; coffee, best, 70c. a lb.; tea $1.20 a lb.; sugar 12c. a lb.; bread 3½c. a lb.; pork 24c. to 26c. a lb.; this is given you in our currency. I notice you are having cold weather in Canada; here we have not had it very cold, but we feel the cold, damp air more than your severe dry cold.

JOHN PENMAN, *Paris, France.*

Last Season's Experience with Fruit.

Our land here lies immediately on the northern margin of lake Ontario, the influence of which appears to make vegetation at least ten days more backward than on land even only half a mile further back. This told largely in our favor when the sharp frosts between May 13th and 22nd (on four nights of which the thermometer, 5 feet from the ground dropped to 25°, 29°, 27° and 29°) come upon us; as our apple, pear and plum trees and grape vines suffered less than those even a short distance inland, where the crops were almost entirely destroyed owing to their more advanced state. On our pear and plum trees the blossom afterwards opened apparently all right, but close inspection of the more exposed showed many of the fertilizing organs blackened, thus thinning the crop considerably. Though a sheltered block of Lombard plum trees, afterwards fruited so heavily that notwithstanding attempts at supporting the branches many of them gave way under the weight of fruit; and many pear trees, especially Flemish Beauty, offered a good crop in the neighbourhood. A few of the shoots on the lower branches of the grape vines were damaged, but still we harvested at least three quarters of a crop of unusually fine grapes. Strawberries, usually a leading crop here, suffered largely. From a plot which the previous year gave us close on 7,000 quarts, we picked this year an additional 2,000 quarts. Raspberries and blackcaps produced a fair crop of fine fruit. The few bearing peach trees, which the last year had given us a fair crop, had not a fruit. As for apples the orchards in this neighborhood for a mile or so from the lake shore, have seldom yielded so good a crop of perfect fruit, while in orchards a few miles further north there was practically none. The result of spraying plum trees and grape vines was very satisfactory. I cannot agree with Mr. E. B. Stevenson, in your January issue, as to Parker Earle strawberry Here, of Parker Earle, Bubach, Jessie, Warefild, Haverland, Michel's Early, Williams, Woolverton, Burt, Enhance, Gandy and Lovett, the first two named gave the best result. Sturdy old Crescent made a good showing with Michel's Early substitute for Wilson as a fertilizing companion in several neighboring patches, and appears to be an old reliable variety under adverse circumstances.

ARTHUR G. HEAVEN, *Oakville.*

Himalayan Apricot.

In the CANADIAN HORTICULTURIST for 1892, page 106, is an account of the Uruick Apricot This must be the same little apricot I found so common at the villages among the Himalayan Mountains in Cashmere, and up the Upper Ganges Valley, between Mussoorie and Gangootrie. It is about an inch or so in diameter and of pleasant flavor and ripens early. I had ripe fruit in June. I remember when coming out of Cashmere, I found both mulberries and apricots ripe. This was about the 3rd week in June. As the winters are severe in these mountainous regions (it was at a 10,000 ft. elevation I saw them at one place), I think they would be suitable for Canada. I think the natives only propagate them by sowing the seed, and if you could get the stones of the fruit it would be worth while trying them here. Through the Canadian Government and the Indian Government, this might be done, and they would be readily sent through such application. The dealers from Afghanistan bring down lots of dried apricots, whether the same or some other species,

I don't know. But they are good. I suppose the stones of these dried ones would grow. They bring also green oval grapes, almonds, and such like things, also dried plums. I seldom saw a village in the hills without its apricot orchard, I suppose a sort of common property for the whole village.

The Indian Government has its summer quarters at Simla, about 8,000 ft. elevation. Here the apricots grow to some extent, but there are much more further in the interior. The summer there is not at all warm: I was nearly two months there, (July and August), and never saw a greater temperature than 65. But this was during the rainy season, and in May and early June it may have been warmer. They cannot grow apples there, I suppose on account of the great dampness and little sunshine, when apples most require it.

Perhaps you have some of these Bokharian apricots on trial If there are any to spare I should be glad of one. The "Siberian Apricot" I have. has been winter killed more or less, and it is a sort of low thick bush now but it does not blossom. I suppose it is one of the common kind which is from a far warmer country than Canada.

W. E. BROOKS, *Forest, Ont.*

Wintering the Hydrangea.

Answer to Question 771.

SIR,—Noticing this question asked by "Iroquois," relative to the wintering of the hydrangea, I may state that I have probably the largest and finest flowering Hydrangea in the Ottawa valley. Each year it is covered with a mass of large full blooms. It requires no winter protection even here where that season is always severe, the mercury often falling to 40° and 42° below zero. It is not protected from the wind which sweeps against it from the north with terrible force. The snow that falls round it through winter is all the protection it gets, but it comes out better each year.

Our Book Table.

VEGETABLES FOR THE HOME GARDEN, a Valuable Manual for the Million, published by W. Atlee Burpee. This book is a very handy book of reference for the amateur vegetable grower. It treats of the location and management of the garden, and gives Cultural directions for Culinary vegetables. Will be given to subscribers in place of a plant if desired.

CATALOGUES.

Catalogue of Fruit and Ornamental Trees, Small Fruits, Roses, etc., 1896. Fred. E. Young, Nurseryman, Rochester, N.Y., U.S. Illustrated....Lovetts' Guide to Horticulture, Spring 1896, well illustrated. The Lovett Co., Little Silver, N.J., U.S....Catalogue of Green's Nursery Co., Spring 1896. Chas. Green, Proprietor, Rochester, N.Y., U.S....Price List and Descriptive Catalogue for 1896, of choice seed Potatoes, Grains, Bulbs, etc. Closson Bros., Highland Creek, Ont....Trees, Plants and Vines, 1896. A. G. Hull & Son, Central Nurseries, St. Catharines, Ont.. .Descriptive List of Chrysanthemums, Pansies, etc. E. W. Bowslaugh, Kingsville, Ont.... Catalogue of Fruit Trees, Vines, etc., for 1896. Lewis Roesch, Fredonia, N.Y....Illustrated Catalogue of Flower and Vegetable Seeds, 1896. Ed. Mautner, Budapest, Hungary.

THE SPRAYING OF PLANTS, a succinct account of the history, principles and practice of the application of liquids and powders to plants for the purpose of destroying insects and fungi, by Prof. E. S. Lodeman, of Cornell University. Published by McMillan & Co., New York. Price $1.00.

This is the fourth volume of the Garden Craft Series, published by this firm, under the general editorship of Prof L. H. Bailey; a series which promises to be of especial value to every enterprising horticulturist. This work contains the history of spraying in foreign countries, in America and in Canada; the materials and formulas used in spraying; spraying devices and machinery; action of insecticides and fungicides; specific directions for spraying. It may be ordered through this office.

FIG. 925.—ONTARIO FRUIT EXHIBIT AT WORLD'S FAIR.