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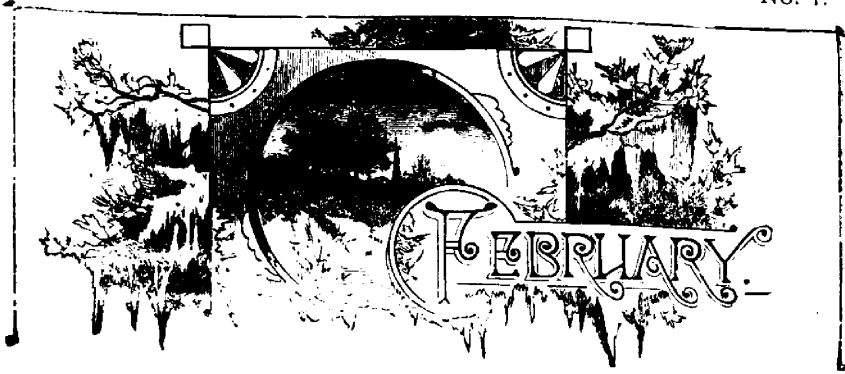
OXALIS ALBA (IMPROVED).

THE
Canadian Horticulturist

VOL. XVIII.

1895.

No. 1.



THE OXALIS.



MOST of our housekeepers who are flower lovers have taken pleasure in the thrift and daintiness of the old-fashioned *Oxalis rosea* and also *Oxalis alba*, which they generally know as pink and white Shamrock ; but they have not discovered half the possibilities of this gem of plants. It embraces a number of species of pretty, neat growing plants, elegant in foliage and bloom, the latter being produced in great profusion, and embracing a wide range of color. It is one of the most satisfactory of bulbs for window culture. For potting, use a good rich soil with a sprinkle of sand in it, placing from one to three bulbs in a four inch pot ; stand in a dark cool place for a few weeks to root thoroughly, then remove to a sunny situation in the window, or conservatory, in a temperature of about 60° Fahr. One of the best varieties for window culture is *Oxalis alba* illustrated by the accompanying cut. It will be seen that this is not the old *Oxalis alba*, but an improved *Oxalis alba*, having much larger blooms and of which the foliage branches out from a parent stem. Its dwarf, spreading habit and profuse bloom make it unsurpassed as a table plant. Flowers and leaves fold at night and open in the morning as with the old variety ; unless the plant is grown in a partially shaded situation, when the flowers remain open all night. *Oxalis Bermuda* buttercup, the newest of yellows, is of more luxuriant growth, and blooms in greater profusion than *Oxalis alba* ; one bulb will be sufficient for a five or six inch pot. The flowers are of purest buttercup-yellow, and of great substance. Well-grown plants have produced as many as seventy-five flower-stems and over one thousand blooms in one season. The bulbs of this *Oxalis* have been grown in the congenial soil and climate of Bermuda, until the bulbs-

have attained great strength, hence the wonderful flower productiveness. I might here mention *Oxalis lutea*, a splendid large, canary-yellow, of strong, upright growth; the leaves of a dull green color, with a deep purple tint on the reverse side. This, in a small pot, will materially brighten up a collection of plants. While growing, the plant should be frequently turned so that all sides may get the power of the sun, that the growth may be symmetrical. Water regularly, making sure the roots, as well as the upper soil, get the water, if you wish a thrifty plant, one which will, through its season remain a thing of beauty. During the resting season, which varies somewhat with different varieties, but which usually takes place about autumn, the plants should be watered sparingly, once or twice a week according to the moisture of the atmosphere. One last word: if you can only grow one kind, grow alba.

Commercial Greenhouses, Orillia.

M. HODGES.

PRUNING RASPBERRY PLANTS.

In sections where large quantities of the Black Cap raspberries are cultivated, there has been a radical change within the past ten years in the management of the plants. Formerly the old canes that produced fruit were not cut out until the following spring. Now, however, just as soon as the fruit is gathered pruning is begun. The canes are cut off as near the ground as possible, with a hook-bladed knife, attached to an old hoe handle. The canes thus removed are carried out and burned in a week or ten days, as they dry very rapidly in September. After the field is cleared from brush, the space between the rows is ploughed. Throwing a light furrow up to and among the new growth of canes allows the rain to settle the earth firmly about the plants, keeping them in an upright position. No other cultivation is given them until the following spring, when, after removing some of the lateral shoots, and perhaps some of the top, the ground is harrowed thoroughly. The surface soil between the rows should be level again by this time. On land moderately free from weeds three cultivations from the opening of spring until harvest time will prove sufficient. By this system of summer pruning, the new growth has a better chance to develop into more bushy and symmetrical plants, and they also can and do absorb the strength that would otherwise go to mature the wood and ripen the leaves upon the canes removed. The raspberry being a very exhaustive crop, this early removing of all wood that has served its usefulness should be promptly attended to. After raspberries have reached the bearing age, the second summer after planting, this system is followed until the plants run out, which is in about six years, much of course depending upon the attention they have received. Red raspberries and blackberries should receive similar treatment as regards pruning and cultivation.—Colman's Rural World.

THE QUINCE.



CONSIDERING the ready sale there is for the fruit of the quince, it is a wonder that there is not more effort made to understand the nature of this bush. The numerous complaints of inability to get satisfaction from trees set out, show that their needs are not understood. Only lately a neighbor, a farmer, was speaking to me of the unprofitable apple trees he had. I casually observed that I supposed paid attention to getting borers out of the stems every year, and he to my surprise he answered that he had never done so, but had left the trees to their chances. Of course, it did no good to tell this man that the trees had evidently taken chances against him. It was too late to remedy the evil, for I found on visiting his place later that the high wind had broken off some of his trees where the borers had weakened them. This neighbor does not take any other agricultural periodical, but he has an almanac, and I found he had lots to say about "planting in the signs." It was a complaint he made to me about his ill-luck with quinces that brought to my mind how common it is to hear others say the same thing. And this, too, in the face of the fact that this bush will flourish almost anywhere where the ground is rich. I have seen quinces on high ground, and in low ground, and growing well in both places when well fed. If the choice offered I would take a rather low situation in preference to a high one, because of the chances of deeper soil. What it demands and will not thrive without, is richness of soil and coolness about the roots. Instead of allowing weeds to grow and cultivating to get rid of them, it is far better to spread a thick mulch of straw or manure about them. This keeps weeds down, keeps roots cool and enriches the ground, all to the great advantage of the trees. When so treated I have known quinces to thrive and bear regular crops for years. When in good soil and situation there is no more regular bearing fruit than the quince. When about to plant one of them, see that it is quite free from borers. Then, in June and September every year, see that no borers have made a lodgment. Do not let the bush run to top, but prune it every winter, in such a way that there will always be some new shoots, and some of them spring from near the ground. When the soil is not over rich, liquid manure is a good thing for them, preserving the foliage green and fresh until the latest days in fall. In regard to variety, the Orange is the most satisfactory of all.—Practical Farmer.

Cabbage Salad—Chop a firm white cabbage with a sharp knife. A dull one bruises it. Make a dressing of two tablespoonfuls of oil, six of vinegar, a teaspoonful each of salt and sugar, half as much each of made mustard and pepper. Work all in well, the vinegar going in last, and then beat in a raw egg, whipped light. Pour over the salad, toss up with a fork, and serve in a glass dish.

THE GROWING OF MUSHROOMS.



MUSHROOMS are anything but widely appreciated as food in America. And yet there is no country richer in mushroom food, growing spontaneously, than is ours. Were the people of Germany, Italy, France, or Russia to see our clearings during the autumn rains they would feast on the rich food which in many places here goes to waste. It is the epicures of America, in fact, who appreciate this food, paying fancy prices for it in the markets.

The economic value of mushroom diet is placed as second to meat alone. With bread, and mushrooms properly prepared, a person may neglect the butcher during the season when this growth may be gathered. Mushrooms, as Professor Palmer has stated, make the same use of the air we breathe as is made by animals: when cooked they resemble no other form of vegetable food, and in decay their odor in some cases cannot be distinguished from that of putrid meat. Certain it is that the parasol-like growth used for food, and which springs up in a night, is not a plant in any sense. It is rather analogous to a flower, bearing, as it does, the spores that are analogous to seeds. The true plant

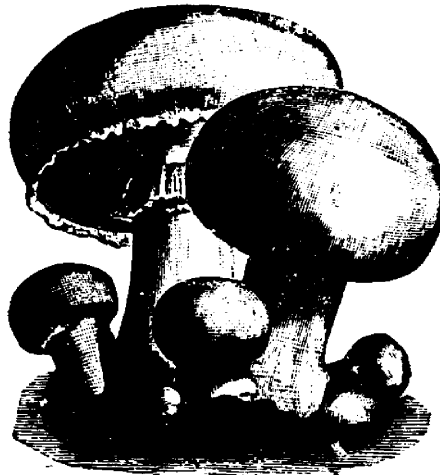


FIG. 721. —THE COMMON MUSHROOMS (*Agaricus campestris*).

which feeds, grows and finally prepares to flower, is the network of whitish threads which form what is commonly known as the "spawn," or, botanically, the mycelium of the mushroom.

It is to the garden or indoor culture of the Common Mushroom, *Agaricus campestris*, shown in our engraving, that we desire here to call attention. There is an ease and novelty about this business which should make it attractive, not

only to all amateurs for home use, but to commercial gardeners near all large towns. Some of the largest profits the writer has ever made in gardening were by growing mushrooms under greenhouse benches in winter, and selling them in the Buffalo market, at from 50 cents to \$1 a pound at wholesale.

The conditions necessary to success consist in growing them in very rich soil, the indispensable ingredient of which is horse manure, and in a steady temperature. Any place, such as a cellar, shed, greenhouse pit, space under the benches, etc., where, either naturally or by the use of artificial means, a temperature of from 50° to 60° may be had, will answer. Good drainage must also be provided, hence, a shelf as in the lower figure, or a series of shelves, may readily be employed to hold beds.

The manure should be dry and freed as much as possible of straw or other litter by shaking out. Manure alone can be used in which to grow them, by repeatedly treading it down and throwing over to get rid of its greatest heat, but usually it is preferred to mix from one-fourth its bulk to equal its bulk with good garden soil. It is best to allow something of an accumulation before putting down into beds.



FIG. 722 —MUSHROOM BED ON SHELF NEAR THE FLOOR.

The manure ready, and it may at once be made into beds. The beds may be of most any shape or size desired, but experience proves that to have them from two to four feet wide, and about 20 inches deep answers about the best. Where there is a good deal of room it is well to make the beds more or less sloping at the sides. Beds may also be made in old tubs, in casks sawed in two, or in boxes. In this way they could, after the making and for cropping, be carried into cellars or other parts of dwelling houses where one would not like to bring in the manure in its rough form. We see no reason indeed why the preparing and selling of mushroom boxes, to be grown in houses, should not in some places become a profitable branch of the gardener's business.

In putting down the manure and soil, it should be firmly packed, layer by layer, with a brick or other weight. A thermometer should at some central point be imbedded into the soil, with its bulb some three inches below the surface. The probability is that the temperature in the bed will rise for a few days and then begin to lower. When it reaches about 80° the bed is ready to spawn.

- Spawn may be purchased in bricks of all seedsmen for the start in mushroom culture; once begun and any of the white spawn-flecked earth of an old bed will answer for planting new beds.

For inserting, the bricks or pieces of spawn are first broken to half the size of a hand lengthwise, or some less. These are placed into the top and other exposed surfaces of the bed, at about ten inches apart, and half as deep, covering up firmly. After some ten days spread over the bed about three inches of fresh loam, and then wait for your crop. This should begin to show a few weeks later, varying somewhat according to temperature.

It is often possible to dispense with watering the beds, this being only necessary when the surface gets quite dry. Then water carefully, using water heated to about 100 degrees.

By making up beds at intervals of ten or twelve weeks throughout the year a continuous supply of mushrooms may be secured. The product is usually salable at all seasons in limited quantities. It is to be hoped that the consumption of this valuable food article will greatly increase in the near future. Let our readers in general inaugurate the growing and using of mushrooms commonly.—Popular Gardening.

Raising Cuttings in Water.—Almost any plants with comparatively hard wood, can be made to root by being placed in bottles of water. The oleander is a familiar illustration—the ivy also can be easily raised this way. After the roots have become strong in the water, the plants can be taken out and placed in earth. For this, perhaps it is better to let the water continue stagnant in the bottles—a change of water is not beneficial. In these cases, the gases necessary to aid in the life of the plant are furnished by the decaying materials which cause the water to become stagnant. Even soft-wood cuttings will root readily in sand with water. A saucer of sand, for instance, filled with water, is all that is needed to root many soft-wood cuttings. These saucers with the cuttings should be kept shaded for a day or two, and then placed in the full light. If placed at once in the full light they are liable to wilt.—Meehans' Monthly for January.

Top-Dressing Lawns.—To make a bright green sward next season, a good top-dressing on the lawn, during the winter, should not be neglected, and the earlier the work is accomplished, the greater will be the result. The continuous mowing during the summer, without giving any stimulant to the soil, soon weakens the grass until it finally dies out. Well-rotted manure for the winter is probably the best remedy, though many prefer to use wood-ashes, guano, ground bone or other commercial fertilizers, as being less likely to introduce seeds of noxious weeds.—Meehans' Monthly for January.

ORNAMENTALS.



Of all the sumachs, the dwarf shining one, *Rhus copallina*, makes the best display of all. When in flower it is most beautiful. It grows but a few feet in height, and flowers when not more than two feet high, bearing large panicles of yellowish-white flowers (and how the bees enjoy the flowers!); then, when fall comes, the foliage changes to the beautiful yellow and scarlet that most sumachs are noted for.

Too much praise cannot be given to the Rose of Sharon, *Hibiscus Syriacus*. It exists in perhaps half a hundred good varieties, some single, some double, and some with variegated foliage. Besides this, there are early sorts and late ones, so that by getting a dozen sorts, flowers from one of the other would be had from early August to October.

When the fruit of magnolias is ripe, the trees are even prettier than when in flower. *Acuminata*, *hypoleuca* and *tripetala* are full of carmine-colored fruit, which contrasts nicely with their large green leaves. *Tripetala* has conical-shaped cones of rich carmine, and it is a worthy tree at all seasons of the year.

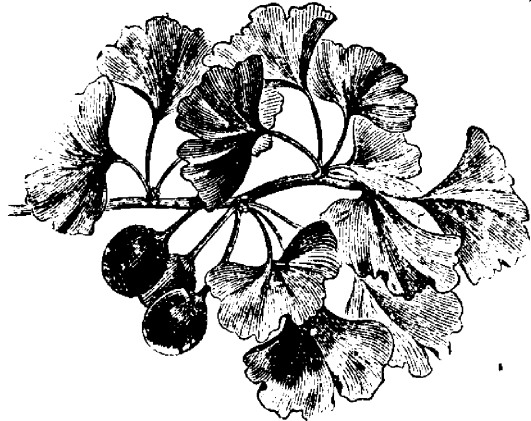


FIG. 723 — *SALISBURIA ADIANTIFOLIA*.

Another tree in fruit is the gingko, or maiden hair tree, *Salisburia adiantifolia*. This singular looking Japanese tree has rather inconspicuous flowers, but it bears round, yellow, plum like seeds. There is an avenue of this tree in front of the agricultural building, Washington, Chief Saunders deciding on this tree, after considerable thought, as he told me, as being well in keeping with the surroundings. There are now many fruiting trees of it about Philadelphia, though not until a few years ago did they begin to bear fruit.—Country Gentleman.

SUCCESS WITH GRAFTING THE GRAPE.—Mr. A. Young, of Wellandport, writes, that last summer, having some poor varieties of grapes, and much neglected, he sawed them off a little below the surface and grafted six with Vergennes. Four of the grafts grew, one of them 10 feet 6 inches; another bore two bunches of grapes.

COLD STORAGE PLANT.



HE experiments with cold storage were made in New York eighteen years ago, and developed into a commercial industry three years later, says Garden and Forest. Since then the knowledge of scientists and inventors has been combined with the practical experience and capital of warehousemen, until now the business of cold storage and freezing is a considerable factor in the market supply of the world. At first cold air for refrigerators on the ground floor was forced to storerooms above, but this plan was soon given up for the system, still in limited use, of massing ice at the top of the building, so that a current of cold air is drawn by gravity through shafts to the lower floors. By this system only cold storage at 38 degrees and above is possible, while actual freezing is necessary for many classes of goods.

One of the nine large cold storage warehouses in New York uses a system of metal pipes ten inches in diameter, which encircle storage rooms. These begin below the "charging floor," the upper story of the building. Here ice is broken by hand power, the sectional trap doors are lifted, and the pipes set close beside each other and extending down on the floors below, are closely packed with ice and salt. The drainage from these, which is collected on the second floor, is utilized to cool rooms on the ground floor to a temperature of 40 degrees. This method of cold storage is especially adapted for holding comparatively small amounts of perishable goods, without the cost of expensive machinery.

The system most generally in use, however, is that of producing intense cold by the evaporation of ammonia, and one of the largest and best-equipped cold warehouses uses the so called "direct expansion" system, which it is not necessary here to explain. In this immense establishment which comprises in two warehouses 1,500,000 cubic feet of cold storage and freezing space, eight boilers, each of 75 horse power, are used in the smaller building alone.

The engines, compressors, and all parts of the machinery are in duplicate, so that if one set is disabled the other set of machinery may be started and the requisite temperature throughout the building steadily maintained. Whatever method used, the effect aimed at is the reverse of steam heating, that is to grasp and carry heat out of the rooms which it is desired to refrigerate. The brine which is produced by the ammoniacal gas process, and conveyed throughout the building in main pipes and smaller coils, leaves the manufacturing room in the basement at zero and returns from the circuit only five degrees higher. All this apparatus is especially constructed: buildings cost money, and at the present time more than \$4,000,000 are invested in cold storage in New York alone.

The first floor of these great buildings is usually occupied by offices and

open space necessary for receiving and discharging goods, and the storage floors above are reached by heavy freight elevators. Passing through a small ante-room on leaving the elevator, the "bulkhead," or thick wall, which is air-spaced and padded so as to be nearly as possible a non-conductor of heat, is reached. The heavy door swings open, and a change of 50 degrees to 70 degrees is realized in a second of time. The purity of the atmosphere and the uniform temperature of each room or "box" are evident.

Tiers of goods extend to the ceiling, closely packed along immense floor spaces, or in smaller lots in separated rooms. To the visitor, who, as well as the guide, is protected with heavy wraps, the long stretches of pipes and rafters covered with frost crystals glittering in the electric light present a strange and beautiful spectacle. Poultry, meats, fish, butter and eggs are stored in largest quantity, and actual experiments show that these usually perishable goods can be held in cold storage almost indefinitely, and meat and fish frozen and kept for five years have come out in good, marketable condition.

By this preservative process a glut is prevented in periods of too plentiful supply, the season for perishable goods is lengthened to extend the year through, and prices are equalized, to the profit of both producer and consumer. For example, yearling turkeys, which last February were stored and frozen, and since kept in a dry air of 10 to 15 degrees, now bring in the markets three cents a pound more than the best spring turkeys. But even in this favoring market there is not much profit to the merchant, since a cent per pound is charged for the cold storage of poultry a month, and the higher rate of half a cent a pound each month for freezing. The prices charged for storage are, however, nearly 50 per cent. lower than they were ten, or even five years ago.

The artificial low temperatures, besides their uses in arresting the decay and retarding the maturity of fruits and vegetables, are applied to horticulture. Nursery stock has been kept in a cool temperature in good condition for three years, with the roots ready for growing when taken out. Hardy plants which are intended for forcing are often frozen after they are lifted, so as to give them their needed experience of a winter, after which they will push forward with energy. Imported pips of lily of the valley are largely held in cold storage, not only to preserve them, but because they start more quickly and strongly after having been frozen. Bermuda lily bulbs and other stock of this sort are also treated successfully in this way.

THE BEN DAVIS apple will come up as a competitor for the first place in the commercial orchard, notwithstanding all that is said against its quality. After all, it is about as good as the Baldwin in quality, and in productiveness of late years it is far in advance. Certainly in the South and West it takes the lead of all apples for commercial purposes, and sells at above the average price of winter stock in the Chicago market.

GOOSEBERRIES FOR PROFIT.



THINK it is a fact that will not be questioned by any of your readers at all acquainted with our local fruit markets, that the supply of gooseberries is by no means equal to the demand ; and that for those who can command a suitable soil and location, a sure and liberal profit can be realized, at a very moderate outlay of money, time and labor, by their cultivation.

The soil best suited to gooseberry growing has been found to be thoroughly drained, rich, and deeply-worked clay loam. These qualities of soil are imperative, as the plant is very impatient either of excessive dryness or heat. This is the only cause why success with it is at all uncertain. Therefore, with a moderate amount of protection from dryness and heat, the success of gooseberry culture may be looked upon as assured.

To secure these conditions, location must be skilfully used. The plants should be two years old, strong and well rooted, and, if carefully planted, their after growth will be rapid. The ground should be well prepared and marked off in lines four feet apart each way. Thus planting at the intersection of each line makes 2,725 plants to the acre, and will give satisfaction to the workers and pickers, and form a fine plantation after the first year's growth. The ground must be kept stirred by means of a one-horse cultivator, between the rows both ways, and not a weed allowed to be seen. Thus treated, the young bushes make extraordinary growth of wood and the set of fruit buds will be astonishing, repaying all the care bestowed on them. Of course in gooseberry growing, as in every other kind of fruit culture, if one would wish to reap the highest results, increasing vigilance and constant application must be certainly and freely given.

The annual pruning consists of shortening the summer's growth to a moderate extent, and thinning out the crowding shoots. This operation is best done (though very often neglected) in the early summer, as the growth of wood and fruit buds, on that which is left, will be so much better and more encouraging to the grower. After the wood has borne fruit for three or four years, and becomes somewhat old and feeble, cut it entirely out, and encourage young growth in its place. This renewing is very important in all pruning for fruitfulness. I have known a gooseberry plantation to remain profitable for twenty years and over, by proper attention to pruning and cultivation, but at the same time I am no advocate for this kind of thing ; as I believe the best results come from young and vigorous plants, as in other fruits, and would advise changing the plantation after ten years' service, as young plants are produced so cheaply, that there is no economy in running a plantation after its prime is passed.

The ordinary enemies of the gooseberry are insects, mildews and blights. The most common insects are the caterpillar of the gooseberry sawfly (*Nematus*

ventricosus) and what is commonly known as the gooseberry worm (*Tempelia grossularia*). The first of these insects is hatched early in May, and so numerous do they become that they will completely defoliate an entire plantation, unless given an application of white hellebore, which will effectually stop their ravages and save the crop. This insect is not nearly so abundant or destructive as formerly. The gooseberry worm mentioned was also a threatening scourge, but its numbers are less and it may disappear from our gooseberry bushes altogether. After hatching, the worm eats its way to the inside of the berry and devours its contents, then immediately joins itself to another berry, enters and devours it also, and so continues. No remedy is known for this insect aside from hand-picking.

Occasionally plantations are attacked with a form of mildew, destroying the fruit and rendering the bushes unprofitable and worthless. In my opinion, the cause of these diseases is atmospheric, and the remedies, to forbear planting varieties that are subject to such parasitic growths. Happily several varieties have been introduced within the past few years that are seldom, if ever, attacked by this mildew.

In conclusion, I may state that our standard varieties of gooseberries are limited to three or four, as a variety must be at once hardy to stand our climate, free from mildew, a good grower, and an abundant bearer, with fruit of first-class quality; these points are fully developed in Industry, Smith's Improved, Downing and Houghton's Seedling.—Ohio Farmer.

Early Tomatoes.—The experiments with tomatoes at the Maine station are reported by W. M. Munson (B. 9) 'as emphasizing the value of setting tomato plants as early in the spring as possible. Plants handled in pots previous to setting in the field are more vigorous and productive than those not so handled. This fact is of much importance to the market gardener, who wishes hardy plants which give large returns. The individual variation of plants of any one variety is often so marked as to obscure the effects of different methods of culture, and to prevent the forming of reliable conclusions from one season's crop. The productiveness of any given variety may be largely increased by crossing with some of the smaller, less valuable sorts. But the new variety will often quickly deteriorate, and the increased productiveness be wholly lost in a few years, even under good culture. Seeds from plants grown under the best house culture may give the best results. In the crosses made, the combining of the Lorillard-Currant hybrid with Lorillard, the size was doubled and the quality much improved, but the number of fruits was lessened. The most promising novelties were the Burpee's Climax, the Maule's Earliest, and Brinton's Best. In the cool climate of Maine, Ponderosa, Buckeye State, Royal Red and Stone were too late; Lemon Blush lacked its distinguishing characteristic, and Terra Cotta was of inferior quality.—American Agriculturist

TOMATO CULTURE.

CHAPTER I.

SELECTING AND SAVING SEED AND ITS VITALITY.

The first thing that is wanted for growing a fine crop of tomatoes is *good seed*, saved in good condition.

In selecting tomatoes for seed, observe carefully the following points :—

1st. Select the earliest fruit.

2nd. Select the largest fruit.

3rd. Select the smoothest and best shaped specimens. With reference to shape, I would say that for market purposes a round or globular shape is not to be desired. The reason being that when carried or shipped to a distant market, their round shape causes their weight to be concentrated on a very small surface, and consequently causes them to become too bruised and cracked. I consider the best shape is a tomato nearly flat at the stem end, smooth and moderately full at the blossom end, and in general nearly oval.

4th. Select fruit from healthy, productive vines. By selecting from very fruitful vines for a number of seasons you will largely increase the productiveness of the variety.

5th. Do not pick the fruit until very ripe. The fruit should remain on the vines five or six days after all the green has disappeared.

VITALITY OF THE SEED.

The vitality of tomato seed has by most horticultural writers been estimated to last three or four years. If the seed is well saved as directed, and kept from damp air, it will be found to germinate satisfactorily after seven or eight years. I once grew good plants from seed ten years old. Some of the same lot of seed was tried the eleventh year, but failed to grow. I am quite sure that, even when seed is carefully selected, still where the same variety has been grown a number of years in the same location and on the same soil, it deteriorates, or, to use a common phrase, runs out. I have been in the habit for years, when I have obtained a good new variety, suitable for my soil and adapted to my wants for market and shipping purposes, to keep selected seed for seven or eight years, so that, instead of having seed that had grown seven or eight crops, I had seed that had produced only one crop from the original stock. Seed can then be saved again and kept the same length of time and so on. The variety may thus be kept a life time with little or no deterioration. Just here let me say that as far as my experience and observation go, I have been led to believe that seed five or six years of age produces plants that have a tendency to grow less vine, and to fruit somewhat more freely than seed that is fresh.

HOW TO SAVE THE SEED.

With a very sharp knife cut the tomato into halves through the centre between the stem and blossom ends. Then take the halves in your hand so as not to cover the cut surface, and squeeze the seed out into a tub or barrel. Set the seed away in a warm place until fermentation takes place. It will ferment in from twenty-four to forty-eight hours, according to the state of the atmosphere and degree of heat there may be during the time. After fermentation commences it should stand from five to ten hours, until the strings and pulp separate freely from the seed. Be careful not to let it stand too long, or the seed will sprout and be useless. To test it, put a little of the seed into a dish, and add water and wash it, if the seed separates readily from the pulp, and will sink to the bottom, it is ready to clean.

To clean the seed, add about one-half water, and then stir vigorously for two or three minutes. Let it stand until the seed sinks to the bottom, then pour off the water very slowly and as much as possible without wasting any of the seed; add more water and repeat the washing process until the seed has been entirely freed from the pulp. Then transfer the seed to a fine wire sieve, and let it drain a few minutes. Then squeeze it into balls with your hands until it is as dry as you can get it. Spread it thinly on shutters or tables, and set it in the sun; out of the reach of winds which might blow it away when it becomes dry. As soon as thoroughly dry, store away out of the reach of mice or insects. If there is considerable quantity of it put it in an open box in a dry room for a week or two, and stir it up with your hand every day or two to prevent it from heating. Be sure and label the seed very plainly, and enter also the day of month and year when it was saved.

CHAPTER II.

SOWING SEED AND RAISING PLANTS.

To raise early, strong plants, the best place is a greenhouse heated with hot water. The best size is a house 12 feet wide and the length necessary to grow the quantity of plants required. The passage in the centre should be two feet wide; the benches should be made so as to hold 8 inches of very rich soil. Two four-inch hot water pipes under each bench, with boiler large enough to keep a heat of 70 degrees in the coldest weather, will be required.

It is not my intention to describe in this work different modes of building and heating hothouses for plant raising, but to mention briefly those conditions which I have found best adapted for this purpose.

The soil should be very rich and mellow, and contain about one fifth part of medium fine sand. The first sowing should be made the last week in February or first of March in this part of Canada. If plenty of heat can be

obtained whenever wanted, the first of March will be soon enough. It should be borne in mind that plants grown in a heat of 70° at night, which is increased in the daytime to 80° or 90° , will make more growth in a week than plants kept in an average temperature of 50° will make in four weeks, and the plants, if given plenty of room, will be far more vigorous and healthy. Some growers make a practice of keeping the plants in a temperature of from 40° to 50° , in order to harden them before setting them out where they are to fruit. But it should be borne in mind that a tomato plant cannot be hardened so as to improve it in the same way as other plants may. What it needs is a high temperature all the time. Half-hardy plants, such as cabbage, cauliflower, celery, etc., can and should be hardened off in a moderately low temperature. But the tomato being a semi-tropical plant, can not be kept in a low temperature without sustaining injury. They catch cold and become sickly and stunted.

Seed may also be sown in a hot-bed when a greenhouse accommodation is not available, but in this event it should not be sown so early—the first of April will be soon enough. The bed should be got into a heat of 70° or 80° before sowing the seed. Great care should be taken to keep up the heat of the bed, when fermentation begins to cease, by banking the outside of the bed with hot manure.

Care should be taken to air the plants so as not to chill them and, at the same time, to air them sufficiently to prevent them from being drawn up and becoming long and spindling. As soon as the heat ceases they should be transplanted into another hot bed with good bottom heat, setting them six or eight inches apart each way according to the size of the plants.

SOWING SEED.

As the growing of good plants is absolutely indispensable in order to insure a good crop of tomatoes, I shall be particular to describe the process in detail. Seed should be sown in drills about one foot apart and three-fourths of an inch deep and quite thin. Press the earth down level and quite firmly. As soon as the plants are up and show the first rough leaf, thin them out so they will stand at least two inches apart. The plants should be grown rapidly. As they grow spread them out carefully with the hands, one to the right and the next one to the left; spread them a little every day until they fill the space between the rows.

I am aware that most growers will say that in following the above directions there is a great waste of room, and that four times as many plants can be grown just as well as not on the same area. And so there can. Even six times as many plants can be grown on the same space. If you wish to transplant them when small, say about three or four inches high, such plants will be well enough and be large enough to prick into small boxes for market, or they may be pricked out in other beds and do well.

The question then arises, why give so much room? In reply I would say

that, from long experience, I am convinced that every time a tomato plant is transplanted it loses to some extent its productiveness. Most of my readers will have observed that where plants spring up from self-sown seed a single plant in a place, if kept hoed and clean, they are, as a rule, always more productive than those that have been transplanted several times. But the crop will be late in ripening and consequently will be unprofitable.

My object, therefore, in advocating plenty of room is to instruct how to grow large, early plants with but few removals, and at the same time to remove them in such a manner as to check the plants but very little. When the plants have plenty of room they can be left in the seed bed till they are stocky and old enough for the wood to have become hardened, then they can be transplanted with very little check. The directions for the second and third shiftings are such as will scarcely check them at all.

As soon as the plants are up, care must be taken to keep an even degree of heat from the bottom, and, at the same time, air from the top when required. Especial care should be taken on bright, sunny days lest too much heat is allowed to accumulate next the glass, else the plants will be overdrawn and thereby injured. Grow the plants as large and strong as possible until the leaves touch each other. Then no time must be lost in shifting at once. Take a trowel and dig them so as to break the roots as little as possible. Now mark out the soil on the benches in rows, twelve inches apart, and dibble them into the ground, setting them up to the seed leaf. Set the plants seven inches apart in the row. Let them grow until the leaves touch again, and they are ready for the second removal. This time they are to be boxed off.

(To be continued)

St. Mary's.

S. H. MITCHELL.

Loudon's Rules of Horticulture. -- 1. Perform every operation in the proper season and in the best manner.

2. Complete every operation consecutively.
3. Never, if possible, perform one operation in such a manner as to render another necessary.
4. When called off from any operation, leave your work and tools in an orderly manner.
5. In leaving off work make a temporary finish, and clean your tools and carry them to the tool-house.
6. Never do that in the garden or hot-houses which can be equally well done in the reserve ground or in the back sheds.
7. Never pass a weed or an insect without pulling it up or taking it off, unless time forbids.
8. In gathering a crop, take away the useless as well as the useful parts.
9. Let no plant ripen seeds unless they are wanted for some purpose, useful or ornamental, and remove all parts which are in a state of decay.

THE COMMONEST FAULTS IN HOME GROUNDS.



THE one greatest fault with ornamental or landscape grounds, it seems to me, is the lack of open areas of sward. The selection of plants may be ever so good, and the location of the buildings and even of the walks may be perfect, and yet the whole effect may be ruined by purposeless arrangement of planting. This fault is particularly noticeable in home grounds. Most yards are mere nurseries,—a scattered and meaningless bit of planting. I am constantly more and more impressed that the first and most important lesson to be taught by the landscape gardener is essentially this: "Avoid scattered planting. Leave broad, open spaces of greensward. The garden should be a picture, but this can be attained only with broad, restful spaces." If a person once perceives this truth, all other essentials of landscape adornment follow easily and naturally. This is the core of landscape gardening.

My neighbor has a front lawn forty feet deep and one hundred feet wide. It contains about thirty bushes and trees scattered equidistantly over the entire area. The result is that people admire the individual bushes, but never the yard as a whole. There is no pleasing or continuous effect of the place as a whole, no one bit of sward larger or finer than another, no variety, no feeling of seclusion, no picture. Yet these same bushes, if grouped about the sides of the lawn, would have furnished the place with perennial attractions.

Another common fault in the planting of home grounds is the feeling that shrubs are desirable in proportion as they have beautiful flowers. But flowers are temporary at best, while the bush itself should be a source of pleasure throughout the twelve months. Roses, especially, are apt to be used too freely in conspicuous places. There are few roses which make attractive bushes, and the foliage is greatly subject to attacks of insects and fungi. While I should not discourage the planting of roses, I always call attention to the fact that their effects are of short duration, and that, therefore, the plants should be considered a part of the flower garden, rather than a part of a lawn or landscape garden. Plant them well at the rear or at one side, and where the bushes themselves, when flowers are passed, shall not be too conspicuous.

Much is said and written against the habit of planting in rows, but instruction should really begin farther back. The planter should be made to feel that, first of all, he needs open spaces, and then that the best effects are not obtained by a mere flower garden. With these two principles well understood, most other matters will solve themselves.—Landscape Architect.

WINTER PRUNING IN THE ORCHARD.



THE pruning of orchards, aside from any stated time, presents many perplexing problems, for the reason that no conclusions have been reached as yet, or at least recognized, sufficient for the establishment of a perfect science of such practical importance that its application may be easily understood and followed. Although the art of pruning has been conducted from time immemorial, no set rule has as yet been evolved and adopted, and perhaps never will, as to how much or how little, when and how, our fruits should be properly pruned. The clearest solution is the application of judgment acquired by practice, or the observance and enforcing of a few general principles which are attended with the best results. If in the pruning of any plant these principles are wrongly applied, it resolves itself into one of the most injurious operations that can take place, but if, on the other hand, they are well directed, it becomes one of the most useful operations for the mutual benefit of the plant and pruner. The winter pruning of fruit trees tends to encourage the growth of wood and the building up of the tree generally, while summer pruning, usually carried on in the month of June, when the leaves are two-thirds formed, assists greatly in the production of fruit. So at this season of the year we are confronted with the often repeated query: "Is the winter pruning of apples and other fruits advisable, and under what conditions should it be done; when and how?"

In pruning the apple in winter, warm days should be selected during the latter part of the season, after the severity of the young winter has passed away, especially in climates where the thermometer is liable to register several degrees below zero. The exposure of cut surfaces may cause it to become injured, and would fail to heal over as readily or as perfectly. Large limbs in orchards that have been neglected are best removed during the warm winter days, enforcing judgment so as not to make too large a removal, as it is liable to bring about too great a shock to the vitality of the tree, and should be practiced only when necessity calls for it. This removal of large limbs is delicate work, and may be avoided in the orchard by inspecting the trees every winter during their young days, removing cross limbs or overgrown abundant shoots. These shoots occur generally where orchards are pruned the following season, and should be removed by breaking off. In pruning, remove the limbs or branches close to the trunk or stem, making the surface smooth with a knife, cutting away ragged edges of bark to prevent liability to decay.

The wound should then be treated with a composition material, serving the purpose of preserving the wood, excluding the air, preventing injury to cell structure and cracking of the surface of the wound, and assisting the new bark in forming over the cut made. Any surface of an inch in diameter should be

treated. An efficient composition is alcohol and gum shellac, mixed to form the consistency of paint, applied with a brush. Common white lead paint is equally as good. Coal tar may also be used. Winter pruning of enfeebled trees will give them a stimulating vigor, if done judiciously, causing the cell development to become larger by increasing the nourishment in a less number of branches. If young trees are pruned in the early part of the winter, especially in a north latitude, the ends of the shoots will die back, and if wounds are exposed, will not heal over as readily as if treated later on in the season. The best time is the latter part of February and the first half of March.

The pear is treated the same as is the apple. Winter pruning is of great value, as the wounds heal over perfectly.

Where it is necessary to prune a plum, it should be done in the middle of the winter season, as it is dangerous and very injurious to prune after the sap has started in the spring. The culling or heading back of the shoots which have made an over-luxuriant growth during the season, should take place usually in February, about the time peaches are being cut back. These shoots should be pruned back from one-third to one-half of their growth, making the cut as small as possible, just above a bud, not too close or too far above, bearing in mind that leaving a bud on the inside tends to produce a straight one, while the outside bud more of a horizontal growth.

The cherry should be pruned but little, pinching and shortening-in being practiced to produce a compact, spreading top. If pruned in winter, it is apt to form gum in the wound and cause decay.

In the vineyards in the north, grapevines should all be pruned and laid down by this time. Those who have only a few vines in the garden, who have not done this, should see to it at once, and prune severely, as the fruit has borne the season's growth and should be pruned back to at least three lateral buds, from which new bearing vines will form. If left on the trellis over winter, the evaporation will weaken the vines, as winter circulation is very great. In conclusion, if winter pruning is judiciously carried on, paying results may be looked for.—PROF. E. E. FAVILLE, in *Farmers' Advocate*.

The Brilliant Grape.—The following from the report of the pomologist of the Department of Agriculture tells the whole story:—"This is a seedling originated by Prof. T. V. Munson, of Denison, Texas. It is the result of a carefully made cross between Lindley and Delaware, effected in 1883. It has been tested by a few of the best grape-growers in the country, and proves hardy in vine. The growth is quite vigorous, and, so far as can be judged, it bears abundantly. The cluster is about the size and shape of the Concord, being compact and slightly shouldered. The berry is large and hangs well to the stem. The color is red, nearly resembling the Catawba. In flavor it is about equal to the Delaware, being delicate, yet rich and aromatic. The pulp is very tender and the seeds seldom exceed two or three. The skin is thin, yet tough enough to ship well.

FORCING VEGETABLES.

The hot beds are prepared in November. The site should be one well drained, and if it has a gentle slope to the south or south-east it will be better. A tight board fence, six and one-half feet high, and slanting one foot toward the north, should be built along the north side of the range. The land south of the fence should be enriched with fine manure, or chemical fertilizer; harrowed until thoroughly fine, and so graded that the surface shall slope a little from the fence, but be nearly level from east to west. The plank for the sides should be of pine, spruce or cypress; that for the north side 2 x 12 inches, and for the south, 2 x 10 inches. The former is set two feet from the fence, and held in place by stakes driven into the ground outside the plank, then nailed to them. The plank on the south side must be set exactly six feet, outside measure, from that on the north side, and so adjusted as to be about four or five inches lower than the other; that is sufficient for drainage. Braces will be needed every ten feet to keep the planks from springing. Earth should be banked against the outside of the plank to within five inches of the top, and before the ground freezes the whole should be covered with straw, coarse hay or coarse manure, to prevent freezing until the bed is required for use. When that time comes the covering is removed, and the soil thrown out to the depth necessary to accommodate the required "heat" (hot dung) and soil, and leave room for the plants under the glass. The "heat" varies from six to fourteen inches deep, and the loam from six to eight inches, according to crop and season.

The greenhouses now devoted to these purposes are built, some of them, fifty feet wide and four hundred feet long; the roofs have a pitch of twenty to twenty-five degrees, and the ridge is twenty feet above the beds. The materials now preferred for roofs are cypress wood sash-bars, supported by iron-pipe posts, and covered with 18 x 24 inch plates of glass.

The vegetables forced for market are the following, which are named in the order of importance: Lettuce, cucumbers, radishes, dandelions, beets and beet greens, parsley, mint, and cress. Mushrooms are also largely forced, but not under glass; dark pits being used for this purpose. Lettuce is by far most largely grown and used. Most establishments produce two or three crops each winter; followed by a crop of cucumbers. The immensely increased annual demand has fully equalled the supply until this season, when the general depression of business and consequent decrease of incomes among those who usually have bought these delicacies, together with the unusually good supply from Southern growers, has forced the prices below the cost of production. But this is a temporary condition; already the reaction has set in, and probably the near future will bring an equivalent return. Prices may not again average as high as in the past, and it is not desirable that they should. Nothing contributes so surely to the health of a family as a liberal use of fresh-grown salads,

and they should be sold at prices within the reach of people of moderate incomes ; the increased use of them should be regarded as a sign of appreciation of the healthful effects of the free use of fresh vegetables. Forcing-houses for growing vegetables require constant attention, day and night, seven days in a week during the season. A little neglect will convert a valuable crop into a sickening mass of frozen or scorched rubbish ; but for those who love to watch and care for growing plants, there is an indescribable fascination in this work when all nature outside is locked up in snow and ice.

But there are many difficulties to be met and overcome. In our fickle climate, the maintenance of a suitable temperature and degree of moisture for the proper growth of each class of plants requires constant watchfulness. A sudden fall in the outside temperature of 20° or 30° during the night, or an equally great increase during the day, may work irreparable disaster ; and lesser changes also, if not observed, and needed attention given, will produce harmful effects. The treatment of insect pests and fungous diseases is still but imperfectly understood by many culturists. The aphid is a very destructive pest in greenhouses and hot-beds. It thrives best in a rather warm temperature, especially if fed upon lettuce and cucumber plants. Smoking with tobacco, frequently but carefully, is a good remedy, and fine tobacco is the best form to use. The various mildews and rots of lettuce and cucumber plants are but little understood pests. For preventives—the surest treatment—begin by cleansing the vacant greenhouse with a strong sulphur smoke. Then provide clean plants, and after setting them, keep them growing vigorously in a congenial heat and moisture. Plants thus conditioned are far less liable to suffer from either insects or the fungous diseases than are the stunted, weak or any-wise unhealthy stock.

The first crop of lettuce or cucumbers grown in a new greenhouse, in fresh soil, is generally the best it ever produces. Succeeding crops are more liable to suffer from insects or diseases. This fact suggests the importance of rotating crops where it is possible to do so, in order to avoid the spores of fungi, which rapidly accumulate in the soil and the surroundings where the same kind of crops are grown in succession. This is difficult to accomplish, but may be worth the cost.—W. D. PHILBRICK, before Mass. Hort. Society.

Clematis Jackmanii and all others of its type require to be planted in a deep, well-enriched soil, and to be manured freely every season. As they flower on the young, vigorous shoots, they should be trimmed back before growth commences in the spring. In November they should be given a good mulch of coarse, littersy manure, and this should be well worked into the soil in the spring. Thus treated, they will commence to bloom in July, and will continue to flower as long as the plants have strength to throw out lateral shoots.—Popular Gardening.

A HINT TO HORTICULTURAL AND AGRICULTURAL SOCIETIES.



Those who have given the subject due consideration, it seems incredible that the Horticultural Journal and the Annual Report of this Association, when it contains so much useful information to fruit growers, whether they be villagers having their quarter-acre lot, or orchardists having large farms, should have such a limited circulation. The membership, which is but little over 2,000, should and may be increased in a few years to ten times that number.

Upon a careful survey of the subject for the purpose of finding some way of materially increasing our membership, it has been found that the means by which it may be accomplished is already provided in the Agriculture and Arts Act.

The provisions of the Act relating to this subject are upon such broad and liberal principles that the reader of the Act may well be astonished that every township and horticultural society in the Province has not long ago become affiliated with this Association. Sections 46, 47 and 48 provide for the organization and maintenance of township and horticultural societies in a liberal manner. It is quite evident, however, that the officers and members of these societies have generally given no attention to the provisions of the Act relating to the several purposes to which the money may be applied, and I here copy in full Section 37, so as to give its provisions prominence :

“ 37—(1) The objects of the said societies and of the township societies in connection therewith, shall be to encourage improvement in agriculture, horticulture, manufacture and the useful arts.”

“(a) By holding meetings for discussion and for hearing lectures on subjects connected with the theory and practice of improved husbandry or other industrial processes.”

“(b) By promoting the circulation of agricultural, horticultural and mechanical periodicals.”

“(c) By importing and otherwise procuring seeds, plants and animals of new and valuable kinds.”

“(d) By offering prizes for essays on questions of scientific inquiry relating to agriculture, horticulture, manufacture and the useful arts.”

“(e) By awarding premiums for excellence in the raising or introduction of stock, the invention or improvement of agricultural or horticultural implements

and machinery, the production of grain and of all kinds of vegetables, plants, flowers and fruits, and generally for excellence in any agricultural or horticultural production or operation, article of manufacture or work of art."

"(2) The objects of horticultural societies shall be the same as those of district and township agricultural societies, but in relation to horticulture and arts only."

It is evident, therefore, that there are five ways in which the funds of these societies may be used. These may be summarized as follows, viz. :

1. By holding meetings for discussing and for hearing lectures on subjects connected with the objects of the society.
2. By promoting the circulation of agricultural and horticultural literature.
3. By importing and otherwise procuring new and valuable seeds, plants, etc.
4. By giving prizes for essays on subjects connected with the objects of the society.
5. By holding exhibitions and awarding premiums for things connected with agriculture, horticulture, etc.

The fifth and last sub-division—that permitting the holding of exhibitions—is the only one generally acted on, but it must be apparent that if the funds were expended as provided by either of the other sub-divisions, or partly under all of them, the expenditure would be as legal as under the fifth.

It is difficult to understand why towns and villages have not further availed themselves of the provisions of the Act and established horticultural societies in their midst, except on the supposition that the directors of such societies supposed they had of necessity to expend the funds in holding exhibitions, and in no other way, while they know that but little or no public good has resulted for many years from such local exhibitions, and this applies also to many of the township societies. Not to all; some of them are yet doing good work.

There are, however, many other reasons why so little interest is taken in township and horticultural societies under the present prevailing system of management. It is well known that the labor and care of managing such exhibitions devolves mostly on the same persons from year to year in each society, and they must also expend much time every year in begging their fellow-citizens for their membership fees. Not a pleasant job at best, and this unpleasantness is greatly increased by the knowledge that but comparatively few of the members partake of the pecuniary benefits resulting from such exhibitions. Those who receive the prize money generally render the least assistance.

The suggestions offered as a remedy for this state of affairs are: That township and horticultural fairs or exhibitions—as a rule—should be given up and that the provisions of the Act be so administered that each and every member of such societies should receive equal advantage. And this can be

done by spending the societies' money as provided by any or all of the first four sub-divisions of sub-section 1 of section 37 of the Act. By referring to these sub-divisions and to sections 58 and 59 it will be seen that under intelligent management every member of such societies may also be a member of the Fruit Growers' Association, which will entitle him to the Horticultural Journal for one year, a bound copy of the report, and a share in its distribution of plants. He may also receive two or three dollars' worth of the choicest plants, bulbs, shrubs or trees procurable, all for the usual fee of one dollar, and the directors should still have funds on hand sufficient to defray the cost of holding two or three meetings each year for discussing local agricultural and horticultural matters.

If these suggestions are carried into effect, the Fruit Growers' Association of Ontario will very soon number 10,000 members, and who can estimate the benefits which would be derived by the circulation of so many thousands of copies of our publication amongst an interested agricultural population? At present the circulation of our journal is mostly confined to our towns and villages. The agricultural population—those who are most in need of the information sent out—are not yet reached.

When the agricultural population of that portion of Ontario embraced between the 44th and 45th degree of North latitude become fully aware of its possibilities for the production of fruit, and have proven by practical experience that in this belt there can be profitably the best winter apples on this continent, then the Province of Ontario will become known as the best home for the surplus Anglo-Saxon race on the face of this globe.

THE APPLE AS MEDICINE.

Mr. L. Foote replies to M. D., in Open Letters of November, but as our journal has no room for discussion of the merits of the medical profession, we simply give our readers an extract on the above subject, enclosed in his letter, which, we believe is true, at least to a large extent.

Dr. G. R. Searls, of Brooklyn, N. Y., thus discoursed on the apple as medicine:—"The apple is such common fruit that very few persons are familiar with its remarkably efficacious medical properties. Everybody ought to know the very best thing they can do is to eat an apple just before retiring for the night. Persons uninitiated in the mysteries of the fruit are liable to throw up their hands in horror at the visions of dyspepsia which such a suggestion may summon up, but no harm can come to even a delicate system by the eating of ripe and juicy apples just before going to bed. The apple is an excellent brain food, because it has more phosphoric acid in easily digestible shape than any other vegetable known. It excites the action of the liver, promotes sound and healthy sleep, and thoroughly disinfects the mouth. This is not all. The apple agglutinates the surplus acids of the stomach, helps the kidney secretions and prevents calculus growth, while it obviates indigestion and is one of the best preventives known of diseases of the throat. Everybody should be familiar with such knowledge."

A NEW PEST—THE SAN JOSE SCALE.

(*Aspidiotus perniciosus*, Comstock).



THE unexpected discovery, in the Eastern United States and British Columbia, of this scourge of the Pacific Coast orchards, makes it all important to draw the attention of Ontario fruit growers to the subject, so that they may become familiar with its appearance and be prepared to adopt active measures to eradicate it, should it, as it is more than probable, appear in our province.

In August, 1893, the first eastern specimens of the San José scale were brought to the notice of the United States Entomologist, and he at once took active measures to find out all that was to be learned concerning its distribution and injuries, with the object of stamping out such a formidable enemy. In April, 1894, Mr. Howard issued a circular under the caption "An Important Enemy to Fruit Trees," in which he gave a short history of the insect and the most approved remedies. He has been kind enough to lend the following illustration from that Bulletin, which will be of great service in giving an idea of the appearance of the insect.

The San José Scale was first brought to California, it is thought, from Chili, about 1870, and it was first noticed as injuriously abundant at San José in 1873, and called the San José Scale. "It does not seem to have been named scientifically until 1880, when Prof. Comstock described it in his annual report to the United States Department of Agriculture—he designated it *perniciosus*, because he considered it the most pernicious scale insect known in the country. It swarmed in countless numbers upon the trees in certain orchards, and infested all the deciduous fruits grown in California, except the apricot and Black Tartarian cherry. In the course of twelve years, the insect spread through all the fruit growing regions of California, through Oregon, and into the State of Washington. It is known as the worst insect pest of deciduous fruit trees on the Pacific coast, and has caused great pecuniary loss. Many crops of fruit have been ruined, and thousands of trees have been killed." (L. O. Howard, Circular 3.)

In 1892 the insect was found in New Mexico, on apple, pear, plum, peach, quince and rose. It had been brought into New Mexico upon young trees from California. Nearly all the other instances of infestation east of the Rocky Mountains can be traced to two nurseries in New Jersey, where the pest had been introduced in 1886 or 1887 on trees of the Japanese plum "Kelsey," which had been procured from the San José district in California. Idaho pear trees had also been frequently imported from California, which were most probably infested. In 1891 and 1892 several blocks of young apple trees were badly infested. It is on pear trees chiefly that this pernicious scale has been

distributed through the State of New Jersey. Prof. J. B. Smith says (*Insect Life*, VII., p. 166): "The Idaho pear has been the most dangerous because it came infested whenever imported direct, and after it came in close order, Madame Von Siebold, Garber, Lawson, Seckel, Lawrence and Bartlett. Other varieties are also infested, but less frequently, and the scales do not do so well. Kieffers alone are absolutely exempt, and closely following comes the Leconte, which is rarely infested in the nursery, and never in the orchard, in my experience. One tree grafted with Lawson and Kieffer had the Lawson branch and fruit covered with scales, while the Kieffer branch was entirely free. Currants, black and red, became rapidly infested, and the scales were certainly distributed on these plants."

Mr. Howard says that this insect spreads rapidly for a scale insect, and is the most dangerous scale known. It is, too, inconspicuous, and would be overlooked by many. Specimens of infested apple boughs received from British Columbia were entirely incrustated with the scales so as to give them the appearance of having been dusted with ashes. Mr. Howard gives the following description of the scale in his circular above referred to: "The San José Scale belongs to the same group of scale insects—the Diaspineæ, or armoured scales—to which the Oyster-shell Bark-louse of the apple belongs. It differs from this species, and in fact from all other eastern species found upon deciduous fruit trees, in that the scale is perfectly round, or at most very slightly elongated or irregular. It is flat, pressed close to the bark, resembles the bark of the twigs in color, and when fully grown is about one eighth of an inch in diameter. At or near the middle of each scale is a small, round, slightly elongated, black point; or this point may sometimes appear yellowish. When occurring upon the bark of the twigs or leaves, in large numbers, the scales lie close to each other, frequently overlapping, and are at such times difficult to distinguish without a magnifying glass. The general appearance which they present is of a grayish, very slightly roughened scurfy deposit.

The natural rich reddish color of the limbs of the peach and apple is quite obscured when these trees are thickly infested, and they have then every appearance of being coated with lime or ashes. When the scales are crushed by scraping, a yellowish oily liquid will appear, resulting from the crushing of the soft yellow insect beneath the scales, and this will at once indicate to one who is not familiar with their appearance the existence of healthy living scales on the trees. During winter the insect is to be found in the half-grown or nearly full grown condition. The young begin to hatch and to crawl from under the female scales shortly after the trees leaf out, and from this time through the summer there is a constant succession of generations. The insect affects not only the young twigs and limbs, and with young trees, the entire plant, but is also found upon the leaves and upon the fruit. When abundant the fruit is destroyed. One of the most characteristic points in the appearance of the insect upon fruit, is the purple discoloration around the edge of each scale.

The above description will enable fruit growers to recognize this enemy, should they be unfortunate enough to get their orchards infested with it.

REMEDIES.

With regard to remedies, we have the advantage of all the experience of Californian experiments and the careful work of the Division of Entomology at Washington, as well as of Prof. J. B. Smith, of New Jersey, during the past year. There are three methods which have proved effective in fighting the San José Scale. In cases of severe attack it is recommended to cut down the infested trees and burn them. The other methods are, spraying with insecticidal washes, or fumigating the trees with poisonous gases. The insecticidal washes may be divided into summer washes, which can be applied while the trees are in leaf, and winter washes of a stronger nature, which would injure the foliage but will do no harm to the trees during the winter, when they are in a dormant condi-

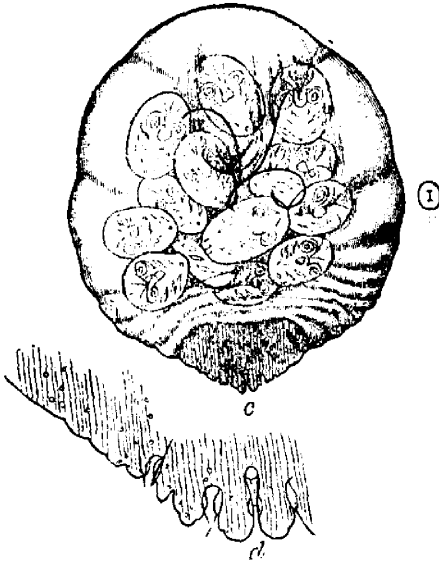


FIG. 724.
SAN JOSÉ SCALE



FIG. 725.
(Part of infested branch, life size.)

tion, and yet will have the effect of destroying the scale insect. Of the *summer washes*, the ordinary kerosene emulsion (Riley-Hubbard formula) and a resin wash [resin 20 lbs., caustic soda (70 per cent. strength) 5 lbs., fish oil 3 pints, water 100 gallons] were recommended by Mr. Howard, and used with success during the past summer. On peach trees, owing to the susceptibility of the foliage to injury, the stock kerosene emulsion was diluted with fifteen times its volume of water, instead of nine times, the usual strength advised for most other plants. It was found advisable to repeat the spraying at intervals of about a

week. The young scale insects were noticed on May 19th at Riverside, Md., and the females, viviparous in habit, gave birth to young for a full month. This was upon peach trees, and it was found that the resin wash killed the scales more quickly than the very diluted kerosene emulsion, and, as Mr. Howard points out, this rapidity of the work is important, since where a full-grown female is sprayed with kerosene emulsion, she may live for three or four days, during which time she may bring forth young; whereas, if sprayed with the resin wash, fewer young scales are produced. The resin wash, however, is readily carried off by the rains, while the kerosene is more resistant.

In Professor J. B., Smith's investigations in Pennsylvania, it is recorded (Insect Life, VII, p. 159) that, "he has visited the locality at Atglen, Pa., and found that in an orchard of over 7,000 trees, all of certain varieties, and a few of others, were infested by the scale. As a result of his recommendations, kerosene emulsion has been applied three times to most of the trees at intervals of ten days, up to the first week in June. The treatment has been absolutely successful."

For *winter washes* the kerosene emulsion and resin washes may be made stronger. The stock kerosene emulsion has been used diluted with only four and a half parts of water, and for the resin wash the same ingredients were used in the following proportions: Resin, 30 lbs.; caustic soda, 9 lbs.; fish oil, 4½ pints; water, 100 gallons.

"The most favored winter remedy in California, however, is the lime, salt, and sulphur mixture. This consists of unslacked lime, 10 lbs.; sulphur, 5 lbs.; stock salt, 5 lbs.; water to make 15 gallons. This wash will do great damage to the trees if applied during the growing season, *and should be used only in winter*. All the sulphur and half the lime are placed in a kettle and 8½ gallons of water added, after which the contents of the kettle are boiled briskly for about an hour. The solution, which at first is yellow from the sulphur, will turn very dark brown, assuming more or less of a reddish tint, and will finally change from a thick batter to a thoroughly liquid condition, the products being ordinary sulphide of lime. All the salt is added to the remaining 5 pounds of lime and the latter slaked, after which the slacked lime and salt are added to the sulphide of lime already obtained, the whole being then diluted with water to make 15 gallons. This should be strained before application, as it does not form a perfect liquid solution on account of the considerable quantity of undissolved lime, which will soon sink to the bottom unless the solution is constantly stirred while being sprayed."

The third method of fighting scale insects is known as the Gas Treatment. This has been extensively used in California but is an expensive operation, and the materials necessary are very poisonous and dangerous to have about. It consists, briefly, of covering the trees to be treated with an air-tight tent and then filling the tent with the poisonous fumes of hydrocyanic acid gas, which is generated by placing 1 oz. of cyanide of potassium, 1 fluid oz. of sulphuric acid, and

3 fluid ozs. of water in an earthenware vessel beneath the tent. The gas is very light and rises to the top of the tent, and if this be kept on the tree for half an hour, every scale will be destroyed. The quantity of ingredients given above is sufficient for a tent enclosing 150 cubic feet.

What is wanted, however, is to know *the best remedy*, and it is satisfactory to learn that on the whole the standard remedy for scale insects, kerosene emulsion, is the best. In summing up his experience of the year, Mr. Howard says as follows: "Remedial work against this insect is onerous, but our experience has shown that three sprayings at intervals of ten days during the latter part of May and June, will practically destroy the insect, whether the spraying be conducted with very considerably diluted kerosene emulsion or with a resin wash, while during the winter a single application of either of the three winter washes will greatly reduce the numbers of the insect. Among the winter washes our experience leads us to give the preference to strong kerosene emulsion: next to the winter resin wash; and finally, to the lime, salt, and sulphur mixture.

The kerosene emulsion is now well-known to most Canadian fruit growers; but it may be well to give it here:

Kerosene (coal oil).....	2 gallons.
Common soap or whale oil soap.....	$\frac{1}{2}$ pound.
Water.....	1 gallon.

Cut up the soap and boil the water till all is dissolved, then add it boiling hot to the coal oil; churn the whole briskly for five minutes with a syringe or force pump. When the emulsion is perfect, it will adhere without oiliness to the surface of glass, and when cooling forms a jelly-like mass, which can be kept indefinitely if stored in a cool place and covered from dust.

When required for use, for a summer wash, dilute one part of the stock made as above with nine or fifteen parts of water. To make the stock dissolve easily, take first three parts of hot water to one of the emulsion, and then, when all is thoroughly mixed, add sufficient cold water to make the nine or fifteen parts required: for a winter wash mix with four and a half or nine parts of water.—J. FLETCHER, in Report Entomological Society.

THE NEW HORTICULTURAL SOCIETY at Woodstock promises to be a very large and successful organization. On the evening of the 23rd of January, Mr. Thos. Beall and the Secretary addressed a special meeting of citizens called together by the President of the Board of Trade, Mr. D. W. Karn. The work of our Association was clearly presented, showing the various departments of work we have in hand: as Spraying, Experiments, Prevention of Fraudulent Fruit Packing, Study of Fertilization of Flowers, of Fungi and Insects, etc. Then Mr. Beall placed before them the best method of conducting a Horticultural Society, in order to give the most good to the largest number: after which it was decided to form a Society at once.

A BUDGET OF QUESTIONS.

The following are some replies kindly made by Mr. John Craig, of the Central Experimental Farm, Ottawa, to a budget of questions sent in for consideration at Orillia, but not taken up for want of time :

Query. (1) *What kinds of tomatoes are most liable to rot?*
(2) *What is the best preventive?*

Answer (1) As a rule, wrinkled tomatoes crack and rot more than the smooth, round kinds ; rarely do the small egg and plum tomatoes show any disposition to rot. Yet this matter of rotting is less a characteristic of varieties than it is systems of training. That is to say, the same variety may not show the same amount of rot every year. Prof Bailey cites an instance of the same variety from different sources, showing marked differences in amount of rot, and the differences seem more accidental than varietal.

(2) Tomato rot is due to a fungus (*Macrosporium tomato*). This fungus can be prevented by spraying the plants with Bordeaux mixture on its first appearance. Careful watch over the plants should be maintained so that an early application can be made. One or two later sprayings may be necessary. Methods of training the plants undoubtedly influence the development of the disease to a considerable extent. In our experiments we have found that vines which are staked, or even hilled up, have less rotten fruit, and ripen their fruit earlier than plants which are not so treated ; but it is yet an open question whether or not the operation pays.

(3) *Irrigation?*

(3) I had nothing new to offer on this line ; but in suggesting the subject it was done with the object of hearing it discussed by the members present, and possibly by some who have tried it during the past very dry season.

There is no doubt that almost any system of irrigation would have richly repaid many fruit growers in the Niagara district during the past season, even to the extent of spending a considerable amount of money in hauling water upon their orchards. I had the opportunity of seeing the injury sustained, principally by the dwarf pear orchards, in that vicinity, and this damage is not easily estimated, and certainly is not measured by the loss of fruit this year. A striking object lesson of the benefits of irrigation, even after the most primitive methods, came under my notice while noting the results of spraying experiments being carried on at Grimsby. Two orchards of dwarf Duchess pear, lying almost alongside and on somewhat similar soils, about the 1st August showed unmistakable signs of injury from lack of moisture. The owner of one decided to try the benefit of applying a few pailfuls of water to the ground about the base of each tree. The water was hauled by horse power, with a barrel on a stoneboat. Four or five pails of water were given to each tree, covering about half of the

orchard; a week later another watering was given, this time the whole of the orchard being watered. On the 1st September the difference between these two orchards was most striking. The unwatered one had lost at least one-third of its foliage and the remainder was in a very badly dried-up condition, while the fruit had only obtained about half its normal size, and was at that time soft and considerably shrivelled. In the case of the watered trees, while they lost some of their foliage, yet the fruit was much larger, was unshrivelled and quite firm. In the one case the crop was saved to the owner and the trees may be able to bear fruit next year. In the case of the unwatered orchard, I question whether the trees will make much growth next year, to say nothing of bearing fruit; and it is even probable that many will die.

A very interesting experiment in irrigating a peach orchard was made by Mr. Barnes, of St. Catharines, who has a large peach orchard situated along the bank of the Welland Canal and slopes towards that sheet of water gradually, in two directions. He purchased an engine, connected it with the canal by means of pipes and forced the water up the highest portion in his orchard. From this point it was distributed throughout by means of surface drains having a slope in two directions. By constructing a main channel along the highest elevation, and from this, running at right angles, laterals, the water was conducted in a manner which covered the whole orchard. When I examined the orchard about 1st September, I found the trees showing no ill effects from the drought, and the fruit ripening well. I think that Mr. Barnes would, on account of increased size and retarded maturity of his peaches, be more than repaid the amount of the initial cost of the purchase of the engine and other material.

In connection with this, it is always well to bear in mind that the next best thing to irrigation for supplying moisture to the soil is good cultivation. The principle involved in this statement has often been enunciated, viz., that by stirring up the soil frequently, and beginning to do this before a hard crust forms after a period of wet weather, a dry mulch or blanket is formed over the surface, which prevents the evaporation of moisture from below. This evaporation goes on most rapidly where the soil has been undisturbed and where air channels have been allowed to form.

(4) *Cold Storage Buildings?*

(4) I regret that I am not able to give anything just now on this subject which would be of service to the fruit growers. I have lately had a communication from Col. J. M. Rosse, of Orillia. He has patented a cooling house, or cold storage building, which seems to me has some commendable features. But the system being patented somewhat complicates matters in regard to giving the public the benefit of his mode of operation.



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. ✦

GIVING PRIZES FOR LARGE COLLECTIONS of apples at fairs, was condemned by the meeting at Orillia, in the following resolution, moved by Mr. A. H. Pettit, and seconded by Mr. Thomas Beall, That in the opinion of this Association the offering of awards on large collections of varieties of apples at our exhibitions is not productive of profitable results, but in lieu thereof that prizes ought to be offered for the best collection of apples for export purposes.

PRUNING APPLE TREES.—This work may be done in the mild weather of winter, any time until the middle of April. After that it is perhaps best to wait till toward the end of June, when the sap is in condition to repair the cuts, instead of oozing out. Wounds made during the winter may be left until the wood has dried, and then painted over, in order to protect it from the action of the air and the wet, until healed over.

At Maplehurst, we aim to favor the natural growth of the tree in pruning. To attempt to make a Spy grow like a Greening is foolish. The one will grow upright and pyramidal, the other will spread.

LOCAL FRUIT GROWERS' SOCIETIES are being formed in several places by Director Beall. The one at Lindsay and the one at Port Hope, formed by him, have much enthusiasm, and the members scarcely need be canvassed for, so great are the recognized benefits. Societies are also being formed at Niagara Falls South, Port Colborne, Grimsby, Woodstock and other places—under the provisions of the Agricultural and Arts Act for Horticultural Societies. These societies can only be formed in cities, towns and incorporated villages. We

shall be pleased to hear from any such place where a society might be formed. Information will be freely given, and Mr. Beall will visit the place and explain the whole scheme, if desired.

ORCHARD SPRAYERS.—Now that the advantages of spraying our orchards for fungi and insects are so clearly proven, there is no doubt that Ontario fruit growers will be very active during the coming season in treating their orchards. The great question before us now is the most economical and effective spraying apparatus. Some of our more enterprising fruit growers have been experimenting with horse-power machines which cost from \$50 to \$90 each, but the result of our experience is that these are not so useful for the orchard as for the vineyard and other plantations of low-growing plants.

For an extensive orchard the best spraying outfit is probably a large tank or cask, holding one or two hundred gallons of water placed in a lumbré-wagon. This tank is made fast to the wagon and a hand-force-pump is bolted in proper position. Bulletin 74 of the New York Experiment Station advises the use of two leads of hose, and at the end of each hose a metal Y. The ends of each are about eighteen inches apart and furnished with a Vermorel nozzle. When spraying small trees, such as plums and cherries that have been kept well headed in, one side of a row is sprayed at a time: the wagon is kept slowly moving, and the driver directs his spray from the two nozzles at the lower branches, while a man standing on a platform in the rear is able to reach the upper part of the tree. The third man is required to work the pump. In spraying large trees it is necessary to stop at each tree, and the hose should be provided with a bamboo extension. Such an outfit cheaply rigged up, is thought to be more satisfactory for orchards than the expensive power machines.

APPLES are found by Prof. Waite of Washington to be more inclined to be sterile than pears. Indeed as a rule, he says very little fruit, on either apple or pear, is the result of self-pollination. The great barrenness of the Baldwin orchards in Southern Ontario is perhaps due to this fact. We wait further investigations with great interest.

Of PEARS, Prof. Waite found the following either wholly or in part incapable of setting fruit from self-fertilization, and require pollen from some other variety to render them fertile: Anjou, Bartlett, Boussock, Clairgeau, Clapp Favorite, Easter Beurre, Howell, Lawrence, L. Bonne, Mt. Vernon, Pound, Sheldon, S. du Congress, Winter Nelis, etc.

Self-fertile sorts: Duchess, Bosc, Buffum, Flemish Beauty, Kieffer, Le Conte, M. Elizabeth, Seckel, Tyson, White Doyenne, etc.

A great contrast was noticed between self-pollinated and cross-pollinated fruits. Self-pollinated fruit is narrower and not well filled out towards the blossom end. Some varieties, however, produced perfect fruit. Self-pollinated fruit is slightly later ripening than the crosses, as well as somewhat smaller, and was seedless or nearly so.

His conclusions are that many varieties of pears require cross-pollination; the pollen from another tree of the same variety is no better than from the same tree. Impotency of the pollen is not due to any deficiency of its own; pollen of two varieties may be absolutely self-sterile, but perfectly cross-fertile. Plant mixed orchards, or at least avoid solid blocks of one variety. Plant only three or four rows of a variety together, unless experience has shown it to be perfectly self-fertile. Be sure there are bees in the neighborhood or within two or three miles, to properly visit the blossoms.

WORK AT MAPLEHURST.

Perhaps other fruit growers would like to compare notes with us about work. So we will keep a kind of journal during 1895. What is done here may be suggestive of work to others and, if so, will repay us well.

Jan. 12th.—In our big orchard the pruning is a gigantic undertaking and if left till spring will never be completed. So on principle we begin with the vineyard in the fall, but in practise seldom get fairly at work till mild days in winter, and the days must be mild indeed, or one is chilled to the bone with such a slow job. The foreman is the only man on regularly now, and perhaps he would not be if our time were not so occupied with the work of the Association. We have pruned our grape vines mostly on the Fuller system, cutting Concords back to fifty or sixty buds. The Wilder we prune longer, as it bears better, with long pruning. The best method is a problem but grapes yield so little money, that we must study the most economical method before the best

Our foreman is intelligent, studies his work, and tries to follow out our ideas pretty faithfully. So many men want to run things, if placed in charge. We did feel vexed to find about two hundred young peach trees just in bearing age, pulled out by the roots: but on investigation we found all were touched with yellows, and our rule, now long standing, is to dig out and burn every tree so affected.

There need be very few vacant hours. There is no time to sit around in a bar room or in a village grocery, spinning yarns, even in winter. Our foreman is always busy. When, mild he prunes: when cold, he cuts up the brush and stumps into fire wood, or hauls out manure; when stormy, he makes barrels, or boxes: repairs or sharpens tools; paints wagons, and numerous other things. Last week it stormed, and he re-floored the stables, and thus saved a carpenter's bill.

We encourage our men to read, especially on our line of work. During January and February we only require eight hours for a day's work, and expect the leisure time to be given to reading the best works on horticulture. It pays too. We only wish gardeners and fruit growers generally would follow out this plan for their own benefit.

❖ Question Drawer. ❖

Spray for Black Knot.

688. SIR,—Do you think there is any kind of spray which would help the black spot or sun scald?

W. BUTCHART, *Port Moody, B. C.*

Reply by Mr. John Craig, Ottawa.

If by "black spot" is meant the apple spot or apple scab, we are glad to say that we have in the Bordeaux mixture a well recognized preventive remedy. Three applications of this fungicide made at intervals of two or three weeks apart, and beginning before the leaf buds open, will certainly prove beneficial; and effective in proportion as it has been thoroughly applied.

The black spots which appear on the bark of young trees are undoubtedly due in some instances to the bacterial disease which causes the blight on apples and pears. In other cases it might, and is generally called sun-scalding, and is probably due to sudden extremes of temperature in spring, intermingled with warm sunshine. Some orchardists in the Western States prevent this injury in a measure, by shading the stems of their young trees on the south and west sides, by laths fastened together and held about the tree with wire. Undoubtedly, a valuable aid towards keeping the bark of fruit trees in a healthy growing condition is the practice of washing the stems and main branches with alkaline washes; a strong solution of washing soda thickened to the consistency of paint with soft soap, and applied by means of a white-wash brush early in June, will have an exceedingly beneficial effect.

The Ritson Pear.

689. Would the Ritson Pear be of any value in this locality?

JOHN SPENCER, *Henrysburg, Que.*

Reply by Mr. John Craig, Ottawa.

I am unable to answer this question satisfactorily. Ritson killed out the second year of its trial at the Experimental Farm, while Flemish Beauty trees, though injured, are making some headway each year, but have borne no fruit. Ritson having originated in Oshawa, was supposed to be valuable on account of special hardiness. This is only our experience with two trees. I am inclined to think that Flemish Beauty might be cultivated with profit in the more favored portions of Mississquoi and St. John counties. If Flemish Beauty has succeeded at or near Henrysburg, then it might be advisable to try a few trees of Ritson, but it would not be wise to plant largely of it at first.

Spraying Pumps.

690. SIR.—You would greatly oblige me if you would give me the names of some of the best spraying pumps and necessary outfits for spraying apple, cherry and pear trees, and which you think is the most desirable pump, to use in an orchard of six hundred trees. The greater part of my apples are scabby every year and seem to be growing worse, and I would like to experiment with spraying. The Alexanders shown at the World's Fair from British Columbia were mine, and at one time I used to take the first prizes at British Columbia fairs for apples of this variety, but of late they have been too scabby.

GEORGE MEAD, *New Westminster, B.C.*

There is no doubt that our correspondent will find most satisfactory results from spraying his trees with sulphate of copper, as directed in other parts of this Journal. There are two pumps manufactured in Ontario, both of which seem to work satisfactorily. We believe both firms intend to advertise in our Journal, so that our correspondent may write to each of them regarding terms.

Norway Spruce From Seed.

691. SIR.—How do you raise Norway Spruce from seed? I am a young man on a new place
D. N. ANDERSON, *Wyoming.*

You would do better to buy seedling Norway Spruce trees from some one who makes a business of raising them. You can buy them very cheap. The seeds are gathered as soon as ripe and branches with cones hung in a dry place, surrounded with fine muslin, which catches the seed. They are kept in sand or a dry place until early spring and then sown thickly in a damp, partially shaded spot. One great secret is to keep them in a uniform state of moisture. Soaking the seeds in hot water a few days in advance of sowing will hasten sprouting; but the water should be changed daily for fear of fermentation.

Variety of Pear to Fertilize Anjou.

692. SIR.—What would be the best variety of pear to fertilize the Anjou; as this latter is self-sterile?
G. H. STANFORD, *Hamilton.*

Reply by Prof. Beach, of New York Experiment Station.

Concerning the best pear to fertilize the Anjou, I will say, that any pear blossoming at the same time might be expected to fertilize the Anjou satisfactorily except during unfavorable weather. I submit herewith a list of pears which blossom at the same time as the Anjou, from which your correspondent can select varieties most satisfactory to him: Angouleme, Bartlett, Boussock, Buffum, Clairgeau, Easter Beurree, Flemish Beauty. Kieffer begins to blossom here shortly before the Anjou, and does not remain in blossom quite so long as that variety. I may also add Lawrence, Manning's Elizabeth, Seckel and White Doyenne.

Spraying Pumps.

693. SIR, —Would you please name, in an early number, the best spray pump for fruit trees?
S. B. SMALE, *Wrozetser*.

There are at least two excellent spray pumps advertised from time to time, in our columns, either of which give excellent satisfaction provided a good nozzle, such as the McGowan is used.

Planting and Pruning Raspberries.

691. SIR, —Which is the better way to plant raspberries, in hills or in rows? I notice "J. C." in the *Montreal Family Herald*, says to plant 3 feet apart in rows 7 feet apart; and "L. B. Pierce," in *Green's Fruit Grower*, is thankful that his are in hills. Which is the best variety for a commercial plantation? Should the tops be pinched off? if so, at what height from the ground and at what season of the year? Is wiring or any other kind of support necessary? A reply in next *CANADIAN HORTICULTURIST* will greatly oblige

AMATEUR. *St. Catharines*.

The choice of planting raspberries in hills, or in rows, would depend largely on the extent of the grounds. If it were important to economize space, the rows are most desirable, because in this way the most fruit may be grown on a given plot: but where land is plentiful, it will be a great saving of labor to plant in hills four feet apart each way, so that all the cultivation may be done with a horse. The best variety at present grown is the Cuthbert, although there are many new claimants for favor, among which possibly something superior. The tops of the raspberry canes may be shorn off in spring with a hedge or grape vine shears. The height depends upon the vigor of growth. The object is simply to cut away the weak portion, and thus direct the energies of the plant to the stronger buds and thus produce the finest possible fruit. No support is necessary with raspberries if cut back as indicated.

Answers to Queries. (See pages 39 and 40.)

Plum Growing.—(Question by Alum Stone, Cedar Springs.)

Washington, Lombard, Bradshaw, Imperial Gage, and Reine Claude are leading plums. The Japan plums are new and promising. Clay loam well drained is perhaps best soil: I have for sixteen years continuously gathered plums from trees on a soil that is called sandy. Barnyard manure suits plums; ashes or muriate of potash on soils previously named, might often be useful. Apricots cannot be relied upon.

In addition to hardy peaches named by Mr. Hillborn, Early Rivers and Smock may be noted. We have no peaches that are hardy beyond question.

W. I. R., *Oshawa*.

For Raspberries on a strong clay loam containing sufficient potash, barnyard manure would be better than artificial fertilizers. Ashes or muriate of potash on lighter soils are called for. Bone dust or superphosphate might be useful on a soil otherwise rich.

Varieties to Plant.—(Question by W. Campbell.)

(1) **Peaches.**—Early Rivers, Hyne's Surprise, Mountain Rose, Yellow St. John, Crawford, Elberta, Crosby and Smock, are now leading peaches. Alexander and other very early clingstones are of very little use.

(2) **Plums.**—See list of plums above. If sour plums, slow growers, or varieties especially liable to short crops or rot, are wanted, the list could be lengthened easily.

(3) **Pears.**—If Mr. Campbell has a nice warm soil in Southern Ontario, he will get the earliest returns and the handsomest orchard by planting Keiffer pears. In many localities they would produce fruit that could scarcely be eaten. With me the Keiffer produces annual crops of beautiful pears, which, in November, are good enough for the best subjects that Her Majesty possesses. Bartlett has led hitherto, but too many have been started.

(4) **Cherries.**—100 Early Richmond cherries would give the best results in the shortest time. A few of other varieties of sour cherries might be useful.

(5) **Grapes.**—Concord and Morden grapes are the safest: Moore's Early is a slower grower and less productive. If there is a call for white grapes try Niagara.

(6) **Profits.**—If you have a good, well-drained soil, well manured and well cultivated for seven months each year, you ought on the sixth year to harvest a crop that would pay the expenses of that year and a share of the original cost of trees and vines. A successful plantation might do very much better. To plant the necessary fifteen acres and care for it, it would cost a large sum, and if the sixth year could square the accounts there would be room for thankfulness. Many practical farmers try to grow fruit at a profit and many fail to do so. The right man with the right soil and good market facilities is very likely to succeed. The possession of capital, practical dexterity, persistent pluck and technical knowledge, are some of the qualifications of the right man.

E. MORDEN, *Niagara Falls, South.*

* Open Letters. *

Report on Plants.

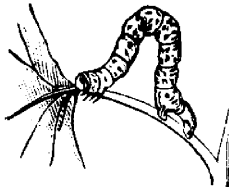
SIR,—The Fay's Prolific currant which I received in 1885 has not been productive, nor is it hardy enough for this part, as it is frequently winter-killed. The Early Victor grape received in 1886 is a good grower and hardy, but a poor bearer. The berries are small and the bunches small and scattered. The Niagara grape received in 1887 is a good grower, hardy and productive. It ripens about the middle of September. The Triomphe de Vienne pear received in 1891 is growing well, but does not seem hardy enough for this part. It was frozen level to the snow in the winter of 1893, but has grown up again.

A. STEWART, *Stewartsville, Ont.*

Vegetable Gardening.

SIR,—I think it would be of great benefit to us farmers in Nova Scotia if you were to have an article every month on the farm garden suited to this climate. The cultivation of the vegetable patch is by no means so usual as it might be here. My extra stuff I have had no trouble in disposing of in the neighborhood at remunerative prices, and I intend this spring to pay more attention to this branch than formerly. I am of the opinion that, providing there is a near market, more money can be made by the personal attention to a few acres of vegetables than by running a large farm of roots and cereals. I would say, seed down to hay all surplus land for stock running, and concentrate energy, barnyard manure on the orchard and truck garden. Wishing a happy and prosperous year to yourself and our own valuable Journal, I am, yours truly,

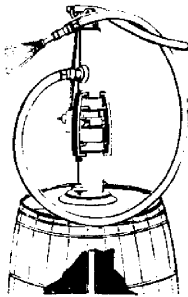
H. O'KEY, *Port Williams, N.S.*



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