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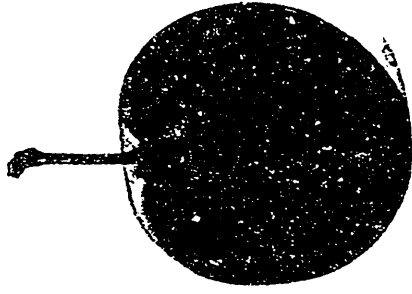


FIG. 2574. GREEN GAGE.

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GREEN GAGE

THE Green Gage is a good representative of a very important group of domestic plums, which is both very ancient and very desirable. Other well known varieties of the Green Gage group are Reine Claude, Imperial Gage, McLaughlin, Jefferson, Washington, General Hand, Peter's Gage, Golden Gage, etc.

In Ontario the most popular variety of the Green Gage group of plums, especially for cooking purposes, is the Reine Claude de Bavay, commonly known among us as Reine Claude; but in the catalogue of the American Pomological Society called Bavay. The fruit of this plum is larger than that of the Green Gage; the tree is a stronger grower and hence perhaps better suited to the commercial orchard, but in quality no one of the group excels this old typical kind, the Green Gage.

Dr. Robert Hogg, author of the "Fruit Manual" of Great Britain, gives the following history of the origin of this plum:

This universally known and highly esteemed fruit has been longer in this country (England) than has been generally supposed. It is said to have been introduced at the beginning of the last century by Sir Thomas Gage, of Hengrave Hall, near Bury St. Edmunds, who procured it from his brother, the Rev. John Gage, a Roman Catholic priest, then resident in Paris. In

course of time it became known as the Green Gage plum. In France, although it has many names, that by which it is best known is Grosse Reine Claude to distinguish it from a smaller and much inferior plum called Reine Claude Petite. The Green Gage is supposed to be a native of Greece, and to have been introduced at an early period from Italy, where it is called Verdochia. From Italy it has passed into France, during the reign of Francis I., and was named in honor of his consort, Queen Claude. Shortly afterwards it found its way into England under its original Italian name, Verdochia, from which we may infer that it was brought direct from Italy. It is mentioned by Parkinson in 1629 under the name of Verdoch, and from the way in which he speaks of it, it seems to have been not at all rare, nor even new. Even so late as the middle of the last century, after it had been reintroduced and extensively grown under the name of Green Gage, it continued to bear its original title, and to be regarded as a distinct sort from the Green Gage.

If any of our readers is making a selection of plums for his home garden, we would advise him not to omit a tree of the Green Gage for kitchen uses; or, if he wishes to combine both kitchen and market purposes, then let him plant the Reine Claude.

The Green Gage tree is not a rapid grower, but it is healthy and fairly productive. The fruit is smaller than Reine Claude, and must be thinned to make it reach a proper size. The skin is greenish, yellowing toward ma-

turity; the flesh is pale green in color, and the texture melting and juicy; the flavor is rich, sweet and agreeable. In season it is earlier than Reine Claude, coming in about the middle of August.

OPINIONS OF OTHERS.

HAROLD JONES, Maitland (St. Lawrence District):—The Green Gage plum has not proved generally satisfactory in this section. Trees that I planted in 1897 are partly dead, and have never blossomed. They suffered during the winter of 1902. I know of two trees that are protected by buildings from the north wind that have given good crops of fruit in favorable years; but generally speaking, the Green Gage is an uncertain cropper here and not profitable.

My experience and observation teach that European plums are generally unsatisfactory in this latitude, but some plums of the native American class are of good quality and succeed well.

A. E. SHERRINGTON, Walkerton:—The Green Gage plum is hardy and productive here, but in my opinion not as valuable as the Imperial Gage.

J. G. MITCHELL, Clarksburg:—The market demands large and showy fruit, and the

Green Gage, being rather small, has always sold at a low price here. Where the Reine Claude succeeds, which is really a large Green Gage, I think there is little use in growing the small Green Gage.

W. M. ORR, Fruitland:—We do not grow the Green Gage. Although the quality of the fruit is good, I consider it too small, and the tree is a poor grower. I prefer the Imperial Gage, of which the fruit is large and of good quality, and the tree vigorous and productive.

CHARLES ELLIS, Meaford:—Very few Green Gage plums are grown about here. The Reine Claude is often sold under that name; but the true Green Gage is small and not very productive so far as I have seen it, but it is very good for home use.

CHARLES LOWRY, Queenston:—The Green Gage is highly esteemed both as to productiveness of tree and quality of fruit; but the sale is limited. Every year I think the price of plums grows less, and unless some foreign market opens for them it seems to me there is little hope for plum growers.

F. G. STEWART, Homers:—The Green Gage is considered the best canning plum, and we get more for it at the factories than for any other. For home use it is superseded by the Reine Claude.

Editorial Notes and Comments

PLUM GROWING.

UNDER the auspices of that progressive body of fruit growers, the Niagara Peninsula United Fruit Growers' Association, a splendid meeting was held in the Town Hall, Stoney Creek, on the 12th March. The President, Mr. D. J. McKinnon, of Grimsby, occupied the chair, and the principal speaker was Mr. J. S.

Woodward, of Lockport, one of New York State's foremost teachers of advanced methods in fruit growing.

CONSCIENCE AND FRUIT GROWING.

IN Mr. Woodward's opinion fruit growers might be divided into two classes. (1) Those who grow fruit for fun; (2) Those who grow it for money. The first class

may, of course, plant whatever varieties please their fancy, but to the latter class he had some advice to offer. He had no sympathy with men who had no conscience in their business so long as it paid in dollars and cents; who would grow fruit to sell which they knew was unfit to eat; who grew Kieffer pears, for example, and sold them on their exterior appearance, knowing the buyer would be cheated in his purchase.

Kieffer pears often do not bring 10 cents a basket in Philadelphia market, for in that city their real value is beginning to be known; and the worst is not yet, for there are immense orchards of this variety coming into bearing, and shortly there will be more Kieffer pears than can be sold at a paying price. "I had the first Kieffer pear orchard in Western New York," said he, "and might have been a rich man if I had at the beginning planted it largely, but to-day I have not twenty Kieffer trees, and shall never plant another." He thought perhaps the Kieffer would make a good stock on which to top graft the Bosc.

PROPER SOIL FOR PLUMS.

ONE of the frequent mistakes made by beginners when planting an orchard is in the choice of soil. They plant a plum orchard on light sand, a soil quite unsuited to the plum, and then when the trees never give paying crops they say plum culture is unprofitable. Probably sandy loam encourages too great wood growth, while a clay soil gives but moderate wood growth and throws the tree into fruit bearing. In some parts of the Niagara district we have a sandy loam at the surface and a clay subsoil, and on such soils excellent plum crops are produced, the roots of the trees reaching down into the heavier ground beneath, thus affording excellent conditions. In Mr. Woodward's opinion the ideal soil for the plum is rather heavy, with a good proportion of clay, and not too wet. Thomas and

vises applications of potash and ground bone to increase the fruitfulness of the plum tree.

SOURCES OF TREE NOURISHMENT.

WE too little consider the great importance of the foliage in tree growth. The great bulk of the carbon which enters into the woody structure of the plant is taken in directly through its leaves. What the stomach and lungs are to animals, those delicate complex organs, the leaves, are to the trees. They, however, act the reverse of the process of animal breathing, for they purify the air for us, taking from it the carbonic acid gas, and restoring its oxygen, under the wonderful influence of the sunshine.

Mr. Woodward emphasized this point, showing the importance of using insecticides and fungicides in order to keep the foliage healthy and intact, so that it might fully perform its natural functions. In speaking of the mineral elements taken up from the soil, he explained how necessary it was that they should be available, for, as he expressed it, "all plants and trees are soap eaters," and must have their food in a soluble form.

BIG PLUMS PAY.

SLOWLY but surely we are learning the lesson that it does not pay to grow small second class fruit of any kind. We are losers in two ways by it, (1) in the low price received for the second class article, and (2) in the exhaustion of our trees and our soil. This last point is seldom considered, but it is true that it requires more nourishment from the soil and is more exhaustive to the vitality of a tree to produce a basket of small sized plums or peaches than a basket of large sized ones, and the reason is that it is the seed that takes the strength of the tree and not the flesh.

Mr. Woodward put this very strongly at the Stoney Creek meeting. "What I want

to sell," said he "is the water, which does not cost me anything. The flesh of my plums is nearly all water, while the pit contains 4 per cent of mineral matter. There is a law against selling water and calling it milk, but there is no law against selling water in the shape of fruit, and the more you can get in it the better the buyer is pleased. We want *big fruit*, the *bigger the better*." The way to get it was to give attention to all cultural details, e. g., we must *spray* to keep the foliage clean—he would use Bordeaux, $\frac{1}{4}$ strength for plum trees, and do it thoroughly; we must *cultivate*; we must *feed*; plums will take any quantity of manure, it will not hurt them. Mr. Woodward had picked six consecutive crops of Bradshaw off the same trees while most people only took a crop in alternate years. He fully expected another crop in 1903; he did not expect to skip any fruit season; and what was the explanation? It was *high manuring*. He applied eight or ten loads of stable manure an acre every year, and it paid him well. We must also *prune*; the branches and twigs must not grow so thick as to exclude the sunlight, so they must be well separated; and then they must be cut back annually to prevent a sprawling habit. And we must *thin*. By this thinning he had raised Bradshaw plums—well "not quite as big as my fist," said he, "but very near it."

By attention to these details we can grow plums that will bring high prices. Size has a wonderful effect upon the price. "Last year," said Mr. Woodward, "my Bradshaw plums brought me 60c. a basket, and a neighbor's Bradshaws only brought him 6c. a basket! What made the difference? Just the size."

DISTANCES TO PLANT FRUIT TREES.

THERE has been a tendency among fruit growers to plant trees too close together. Some have planted apples 25 or 30 feet apart; cherries, plums and pears, 15

feet; peaches, 12, and dwarf pears, 10. There may be some varieties of less vigorous habit that will flourish at such distances, with close pruning. Indeed, we all know about the miniature old trees of the Japanese gardens, and the possibilities in this direction. Mr. Brennan, of Grimsby, has his peach trees 12 feet apart, and gives them such close and constant shortening in that he has excellent results, and is an ardent advocate of his system. But in general practice close setting is a serious mistake, for in after years when the trees reach full maturity, unless much greater attention is given to pruning than is usual among fruit growers, the orchard will be a tangle, into which the owner can neither get his wagon or his spray pump; and into which the rays of the sun can scarcely penetrate.

Generally speaking, the following distances are advisable: Apples, 40 feet; pears (standard), peaches, plums and cherries (sweet), 20 feet; sour cherries, 15 feet; dwarf pears, 12 feet. Of course this general rule must be varied in some cases; for example, we know of a row of magnificent Flemish Beauty pears at Mr. E. C. Beman's place at Newcastle, each of which covers an area much greater than 20 feet in diameter; but this has a more spreading habit than most varieties.

Mr. Woodward plants his plum trees 20 feet apart each way, and he considers it a great mistake to plant trees too close together. "They need to have the sunshine on the *ground* itself between the trees," was his way of putting it.

VARIETIES OF PLUMS.

THE Bradshaw seemed to be Mr. Woodward's great favorite. Among other varieties he mentioned Reine Claude, Grand Duke, Felleberg, Monarch, Arch Duke and Prince Englebert.

What do you think of the Red June? we asked.

"I have no use whatever for the Japans," said he. They are not good enough in quality, and he had found them almost as subject to yellows as the peach. He had considerable experience with them, but it was all unfavorable. He had tried an orchard first of Abundance, and then of Burbank, but had finally rooted them out entirely.

In growing Reine Claude he had found it apt to die of severe cold when root grafted or budded in the nursery, and thus having its own trunk. He much preferred this plum top worked on the Lombard, which gives it a good healthy body.

PLUM ROT.

How do you destroy plum rot?

In reply to this question Mr. Woodward stated that he began by gathering all the mummy plums found remaining on the tree in early spring, and burned them up. Then he sprayed his trees with weak Bordeaux, say 2 oz. to 50 gallons of water.

Would it answer to plow them under?

No; not nearly so well. They should be burned up, and thus the spores will be totally destroyed. Some varieties are much more subject to rot than others, and he had given up growing certain varieties, particularly the Washington, on this account.

LIME AND SULPHUR.

MR. WOODWARD would make this without boiling, by using caustic potash; and so far as tested it was just as effective as the boiled mixture. The same proportions of lime and sulphur were used; the lime was put to slake with hot water, and the sulphur added while slaking. After this was done, one-half pound of potash or one pound of caustic soda was added to every pound of sulphur. We were all much interested in hearing of any simpler method of making this valuable lime and sulphur wash than by the troublesome method of boiling, even if a threshing engine be convenient.

SMALL HOSE BEST.

ORDINARILY the spray pump makers provide a hose altogether too large. The smallest usually furnished is $\frac{1}{2}$ inch, and when one has high trees to reach the weight of hose is unnecessarily heavy. Mr. Woodward never uses a hose larger than $\frac{3}{8}$ of an inch in diameter. He elevates it by means of a bamboo pole, to the top of which he wires the hose, and continues it down for four or five feet. This he finds much more convenient than using the extension rods furnished by the pump makers.

SHALLOW CULTIVATION IN SUMMER.

CONSTANT cultivation was advocated by Mr. Woodward to open up soil to influence of sun and air, and to conserve its moisture by a shallow dust mulch all summer.

How deep would you cultivate in summer?

"I would not stir the soil more than two inches below the surface," said Mr. Woodward. "Just deep enough to keep down the weeds. I would not use a plow at all in an orchard if I could avoid it, but when necessary I would use a four-furrow gang plough early in the season." Deep ploughing, especially when the trees are in full leaf, cuts off millions of those little feeding roots which take up soil nourishment, and which should not be disturbed at that season. These are of annual growth, and so small that they escape the notice of the ploughman, but it is these tiny root hairs that are essential to tree and plant growth, and not those great branching underground stems which serve merely to anchor the tree and enable it to stand against wind and storm.

WORK OF THESE ROOT HAIRS.

TO discuss these minute organisms the aid of a pocket magnifier is needed. They form in the growing season in great numbers, developing just behind the root

tips. They are so delicate and easily broken that the soil about them needs to be removed most carefully, which can be done if it is sandy; then with the glass these silky light root hairs may be seen filling the fine pores of the soil or enveloping its particles.

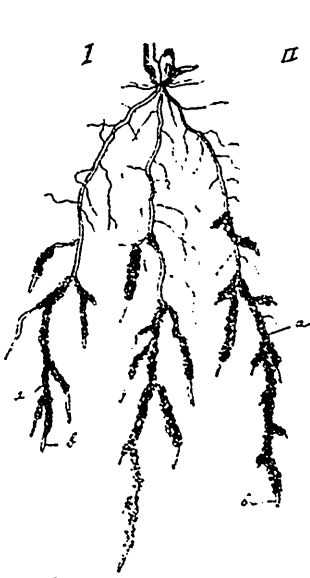


FIG. 2575. ROOT HAIRS.

- I. Roots of a young wheat plant.
 (a) The sand surrounded by root hairs.
 (b) Root tips.
 II. Turnip Seedling showing root hairs.
 (After Frank and Tschirch.)

cell filled with that element of plant life called protoplasm, and, besides absorbing the moisture from the soil, they have the wonderful faculty of so dissolving much of the mineral matter in the soil by their excretions as to render it available by the plant or tree. Our illustration is drawn by Frank and Tschirch from wheat and turnip root tips as they appeared under a microscope. They will help to give our readers a fair idea of these wonderful little root hairs.

A GOOD TOOL FOR THE ORCHARD.

THERE is no doubt that we in Ontario are still behind the times in respect to the tools used for orchard work. Many still

cling to the old-fashioned square tooth harrow and the horse killer cultivator. About the best tool we have adopted is the disc harrow, which is certainly excellent; but for a large orchard which needs constant cultivation all these are too slow and cost too much money to operate, in these days of high wages; and we should economise labor by purchasing better implements if they can be had.

What tools do you use in the orchard? some one asked of Mr. Woodward. He replied that after the four-furrow plow in early spring, the only tool he used was the *smoothing harrow*. This was so called because the teeth could be set at any angle; he set them pointing backward at such an angle that they would not gather rubbish. Each section of this harrow was six feet wide, and he used three sections, thus covering eighteen feet of ground at a time with a team of three horses. He could cultivate twenty acres of orchard in half a day with this harrow. It is not, therefore, very expensive to go through the orchard once every week or ten days in this way, up to August 1st, at which time a cover crop should be sown and cultivation discontinued.

COVER CROPS.

HERE is one of the puzzles of the Ontario fruit grower, to know just what is the best cover crop to use in the orchard. We have tried crimson clover, but as a rule only a small portion of the seed grows, and the result is a cover so thin that it is of little use as winter protection. In one or two instances it has been a grand success, particularly in the pear orchard of Mr. D. J. McKinnon, Grimsby, on a dark, moderately heavy soil, well underdrained. Every year it has grown up thicker, and no more useful or more beautiful crop could be desired.

Rye has been used by a great many, but unless ploughed in very early in spring it

robs the soil of much moisture, and is difficult to plough under.

Woodward said he had tried rape, turnips, oats, rye, and other things, but had found the hairy vetch the best of all. He had given it three years' trial, and found it very hardy and afforded an excellent cover for winter protection. Besides, being a leguminous crop, it gathered nitrogen for the enriching of the soil. The only hindrance to its general use was the cost of the seed, which was 9 cents a pound, but he saw no reason it could not be grown in Canada and sold for less money.

It was quite a consolation to some of us when Mr. Woodward mentioned chickweed as a good cover crop—one that makes a perfect mat of protecting material against the winter's cold, catches the leaves so they are not blown away by the wind, and affords a large quantity of humus when ploughed under in spring. Many of us had been looking upon this as a most troublesome weed that would grow up late in the fall when the fruit harvest prevented its destruction, and gave the orchard an appearance of being uncultivated. Henceforth then are we to encourage the growth of chickweed in the orchard?

OVERDOSE OF NITROGEN POSSIBLE.

POWELL (Representative N. J. Hort. Society, 1902) thinks there is a limit beyond which it may not be wise to sow clover in an orchard. He believes it possible to give too much nitrogen to the soil, and advises that, after three years of crimson clover in an orchard, a crop of rye or of some other non-leguminous crop should be sown. He thinks too much nitrogen tends to make lighter colored fruit and to lessen its keeping qualities. We should be glad to have further light upon this point, which so far as we know has not been so stated by any other authority.

What do you think of oats as a cover crop?

Oats, said Mr. Woodward, are excellent; but I would advise sowing rye with the oats, for they would remain alive through the winter. The hairy vetch was, in his opinion, the best cover crop, because it takes easily and forms a complete winter protection. He advised sowing five pounds per acre.

QUANTITY OF SEED PER ACRE.

FOR cover crops the following quantities of seed are recommended: Buckwheat, 1 bush.; crimson clover, 8 to 16 lbs.; corn, 2½ to 3 bush.; cow pea, 2 bush.; oats, 2½ to 3 bush.; peas, 2 to 3 bush.; rye, 1½ to 2½ bush.; vetch, 1 bush.

VARIETIES OF PEARS.

THE DUCHESS.

"I AM losing faith in the Duchess dwarf pear," said Mr. Woodward. His reason was that of late it grew knotty, uneven and inferior in quality. He had given it the same treatment as has been advised above for the plum, giving shallow cultivation, careful spraying and fertilizers, only less stable manure and more potash and phosphoric acid. Still it did not succeed as well as formerly, and this spring he had cut off the heads of a good many of his trees, hoping thereby to secure finer fruit. But even if first class, the markets do not call for it as formerly.

We have noticed this same difficulty at Maplehurst with the Duchess, and this spring we have cut at least two feet off the tops of our Duchess trees, hoping thereby to secure better growth of tree and consequently more perfect fruit. We notice too a poor demand for this fine pear in our home markets; indeed, for almost any pear. It would seem as if our markets are too limited to take the quantities produced, and that our only hope is in export. For this the Duch-

ess is one of our best, for it carries well, is large in size, and very good in quality.

THE BOSCH.

Here is a pear that is worth attention, and Mr. Woodward finds that it succeeds well top worked on Duchess bodies, becoming quite productive. It is a pear that is wanted in the markets, will ship grandly, and give good satisfaction for export. It is a poor grower, and for that reason needs to be top worked on some better growing variety, such possibly as the Kieffer. On the quince it is a failure, and therefore it is useless to plant as a dwarf.

THE LAWRENCE AND OTHERS.

Here is a pear that is wanted in the home garden, for it is uniformly excellent in quality, ripens easily, and is unexcelled as a December table pear. It is too bad that it is not more in demand in the market, but it seems to be little appreciated, and therefore not profitable.

The Anjou is first-class, but will not hang on the trees long enough; and the Clairgeau is large and beautiful, but not good enough in quality to be very highly commended.

SMALL SIZED FRUIT FARMS BEST.

EVERY year we are more convinced that many of our Ontario fruit growers are trying to cultivate too much land for their capital. To buy the trees, plant, cultivate, spray and prune them for ten or fifteen years, until they begin to give a proportional income, means an expenditure of \$200 or \$300 per acre, and this added to the first cost of the land, means a greater investment than the average man dreams of. Instead, therefore, of attempting to plant one hundred acres in fruit, and starve for ten or fifteen years while it comes into bearing, it is wiser for the man with limited capital to begin with ten, fifteen, or twenty acres,

according to his ability, and give the best cultivation to this area. The usual farming methods in Ontario agriculture will not answer; he must treat his orchard as a large garden, and while adopting horse cultivation, and economical methods, he must give in the most intensive cultivation and the closest attention if he would really make a good percentage on his investment, in addition to his annual expenses. W. H. Covert, of Grand Forks, B. C., has a fruit ranch of 11,000 trees, of apples, pears, prunes, peaches, plums and cherries, but he does not manage it as a whole, but in sections; probably this is the only way he can make so large an orchard give paying returns. He says:

The tendency of the times is to cut the large tracts of land up into small plots. This system I have strongly advocated, and have myself subdivided my property into five and ten-acre lots. There has been a considerable influx of people desirous of engaging in diversified farming during the past year, and as the possibilities of the valley become better known on the outside, it will rapidly fill up. In my opinion no section of the province offers better opportunities for fruit growing than the Kettle River Valley, and a 10-acre plot is quite sufficient to maintain a family and give a good livelihood.

PLANT MIXED ORCHARDS.

SINCE it has become evident that certain varieties of apples are more in demand than others, as well as more productive, it has been the custom to advise planting large blocks of a single variety. In consequence we have very large orchards of Baldwin apples, for example; but when the trees reached bearing age, and then continued barren for many years, the owners became disgusted and set to work to dig out these magnificent trees because they were wholly unremunerative.

Gradually we are solving the problem and coming to an understanding of the difficulty. We find, from the results of careful experiments, that nearly all varieties of apples are unproductive unless their blossoms are fertilized by the pollen of other varieties, brought to them by the bees, which are far more re-

liable agents in carrying pollen than the prevailing winds. Waugh (Vermont Sta., Rept. 1890) covered with muslin sacks 2,500 Baldwin blossoms, from 10 to 30 being covered by each sack. These blossoms were therefore safely protected from the visits of insects and from all foreign pollen. The result was that only three apples set out of all these blossoms.

The practical conclusion is that *large blocks* of a single variety should never be planted, but always two or more varieties in alternating rows. In case of established orchards, the mistake can easily be remedied by top grafting another good variety here and there upon the trees.

FANCY FRUIT NEVER A GLUT.

SOME people always see gloomy prospects and glutted markets; they always look on the dark side of everything and seem never to catch even a glimpse to the silver edging of a cloud. We do, indeed, find our markets at times over supplied with certain fruits, but if we look into the condi-

tions we find either that the fruit was poor or that it was badly distributed. Perhaps one market was receiving three-fourths of the shipments from our Canadian growers, and hundreds of smaller markets throughout Ontario were almost bare of supply.

We do not believe that too much really high grade fruit, of good shipping quality, can be grown. There is an axiom about this which we believe will hold good, viz., that "the more good fruit put into a market the greater will be the consumption and the better the prices in the end," while no doubt the reverse of this statement is equally true. The fact is that when people cannot get good apples, for example, they will look out for choice fruits of other kinds, whether fresh or preserved, to take their place, and so on throughout the chapter.

The moral then is plain—grow only fancy high grade fruit, and place such goods only on the markets, and the chances are that we shall seldom see a glut, unless it be of over-ripe fruit that must be hurriedly disposed of.

WATERING SEEDS IN BOXES.

WHEN seeds are planted in boxes in the house there is great danger that in watering the earth the seeds will be washed out. This is particularly the case if the seeds are small and but lightly cov-



FIG. 2576. WATERING SEEDS IN BOXES.

ered, as is the case with pansy seeds, and many others. A good plan for watering such seed boxes is shown in the cut. A piece of cotton cloth is laid smoothly over the soil and the water poured upon that, when it spreads out all over the surface of the cloth and gently soaks into the soil. As much or as little water can in this way be added to the soil as may be desired, and the earth will not be disturbed in the least.--
American Agriculturist.

THE BUD MOTH

(TMETOCERA OCELLANA.)

EARLY in spring, just as they commence to swell and open, the buds of the apple, pear, plum, cherry, quince and peach trees are sometimes attacked by a small, naked caterpillar about one-fifth of an inch long and dirty white in color. The head and thoracic shield are black or very dark brown. These caterpillars voraciously devour the opening buds and later feed on the tender leaves, binding several of them together at the end of a shoot.

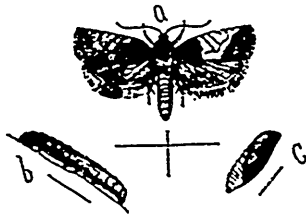


FIG. 2577. BUD MOTH.

In this nest the caterpillar lives and feeds, after a time attaining half an inch in size. Specimens sent us from Bad Axe, Mich., and placed in breeding cages, became full-grown about June 1. On June 15 they pupated inside the nest of leaves. On June 28 they commenced to emerge as ashy-grey winged moths, expanding about three-fifths of an inch from tip to tip of their wings. This delicate little moth (Fig. 2577) is very prettily marked near the centre of each fore wing with a large, ill-defined creamy spot, while the base and tip of the wing are marked with black and dull blue. The hind wings and the abdomen are grey. According to Professor Slingerland,* the moths lay their eggs three or four days after emerging, usually on the under side of the leaves. They are de-

scribed by him as transparent, flat, dish-like bodies, oval and very small. The egg stage is said to last from seven to ten days. The little caterpillars immediately commence to eat the outer coverings of the leaves, usually on the under side, leaving the skeleton of veins untouched. The young larvæ spin a delicate tube of silk, in which they live. When they are grown to about one-fifth of an inch in length they spin a tube in some protected place on the bark, and in this pass the winter. In the spring they come out and attack the bark as described.

REMEDIES.

The bud-moth may be destroyed most easily at the time when it first attacks the buds in spring. Prof. Slingerland says:

“Undoubtedly it can be checked somewhat by spraying in July, when the larvæ are at work on the under side of the leaves, but the time to combat the pest most profitably and successfully is in the spring when a little poison can easily be sprayed upon the opening buds, and thus the little larvæ, hungry from its long winter's fast, will be quite certain to get the fatal dose at its first meal.”

This spraying should be repeated several times, as the period during which the insects can be reached is a short one, and they do not all come out together. The opening buds should be kept thoroughly poisoned, and the trees should be sprayed once or twice after the blossoms fall.—*Mich. Exp. Station.*

THE NEED OF HIGH CULTURE.

WE cannot obtain good fruit that will have shipping and keeping qualities from trees that are trying to produce in an impoverished soil. Not only should thorough cultivation be given to soil in orchards, but the soil may need the application of some fertilizer. If there is a deficiency of mineral elements, fruit will have poor shipping and keeping quality. Light soils are usually deficient in potash and phosphates, while heavy or clay soils may have an abundance of these. For this reason apples grown on light soils should be sent to our home markets, while those grown upon clay soil can be shipped with

greater safety to foreign and distant markets.

Another very important factor in long keeping of fruit is a perfect and healthy foliage upon trees. It is the function of the foliage to elaborate the food that goes to the building up of vigorous growth of tree and branch, to the development of the fruit bud. If the leaves are eaten and mutilated by insects or diseased by fungous attack, there can be only an imperfect development of fruit that will be deficient in color and flavor, that will slack in the box or barrel and will not hold or keep long in the market.

New York. GEO. T. POWELL.

APPLES IN STORAGE.

Mr. Walter Snyder, president National Apple Shippers Association of the United States, states that on the 1st of December, 1902, there were in cold and common storage in the United States 4,364,800 barrels of

apples, and in Canada 470,000, making a grand total of 4,838,800. Surely the result of the cold storage system will be an evening up of the supply during the whole year, so that the prices will be much more steady.

APPLE SCAB.

SIR.—I would like to obtain information from practical experience on the use of Carbonate of Soda for apple scab, also Hyposulphite of Soda

1. Which of these would be the best and safest to use?

2. The quantities to use in solution with water?

3. Will this injure foliage?

This information will be very thankfully received through our Horticulturist.

Stoney Creek.

W. C. WESSIER.

1st. Neither carbonate of soda nor hyposulphite of soda are at all reliable remedies for the apple scab. Of the two the hyposulphite of soda has the greater fungicidal value, and is a safer solution to use.

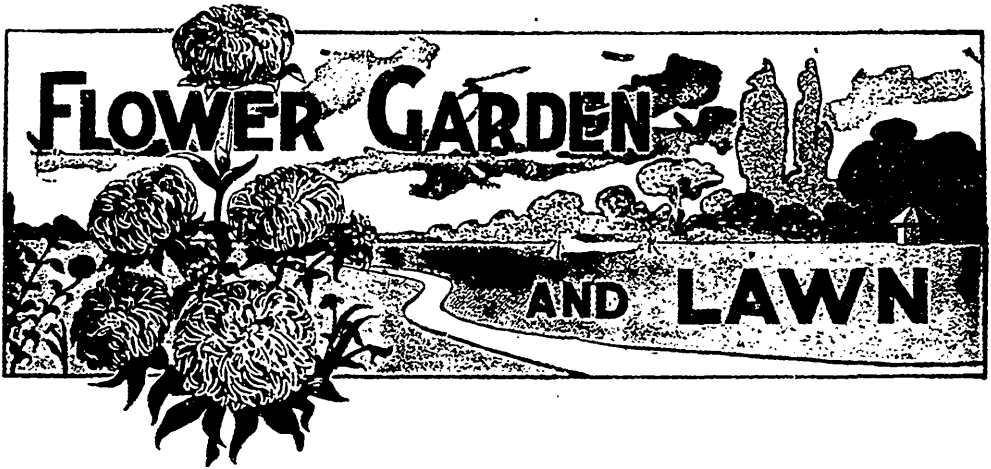
2nd. The carbonate of soda solution, which is sometimes used as an insecticide, but only upon dormant wood against borers and scale insects, is made by dissolving one-

half pound of washing soda in two gallons of water. It is very probable that by weakening the solution the caustic action upon the foliage will be reduced, but I have never seen it recommended as a fungicide. The hyposulphite of soda solution is made by dissolving one pound in ten to twenty gallons of water. This solution has been somewhat thoroughly tested with but unsatisfactory results.

3rd. The carbonate of soda (one-half pound to two gallons of water) has a strong caustic action upon leaves, and should be used, as I have before stated, only upon dormant wood. The hyposulphite of soda, of the strength given above, is not injurious to the foliage.

O. A. C., Guelph.

W. LOCHHEAD.



SCALE INSECTS IN GREENHOUSES

BY

PROF. W. LOCHHEAD,

OF THE BIOLOGICAL DEPT. OF A. C., CLEVELAND.

MOST PERSONS who have ever attempted to grow the larger house plants, such as crotons, oleanders, lemons, date palms, ferns and acahyphs, which find their habitat in tropical regions, have no doubt felt frequently aggrieved on account of the presence of soft insects which do considerable harm. These soft insects are very diverse in character, some of them having a mealy appearance, while others are quite scale-like. The crotons and the Oleanders are especially troubled with the mealy-bugs, while the lemons and ferns harbor a species of a soft scale called lécanium.

There are usually two species of the mealy-bugs common in greenhouses, the *destructive* and the *long-threaded*. Unlike most scale insects, they can move about the plant somewhat freely. It is only when they become mature that they secrete the cottony sack which is so characteristic of them. Within this cottony sack are de-

posited the cream-colored eggs, which in a short time hatch out the young mealy-bugs. Fig. 2578 shows clearly the appearance of these two mealy-bugs. With regard to remedial treatment, probably the best method of dealing with these insects is to wash the plants with a soap solution, or to dip the entire plant in the solution, if such is practicable. In either case the plant should be drenched with clear cold water to wash off the solution. Another remedy which has been highly commended is an alcoholic extract of Persian insect powder. This is made as follows: Alcohol, $\frac{1}{2}$ pint; insect powder, 2 ounces. These are allowed to stand for about a week, then filtered and diluted with an equal quantity of water. The solution is then applied with an atomizer. It will be necessary in most cases to repeat the treatment.

Mealy-bugs require about six weeks to complete their life circle, that is, from the eggs of one generation to the eggs of the

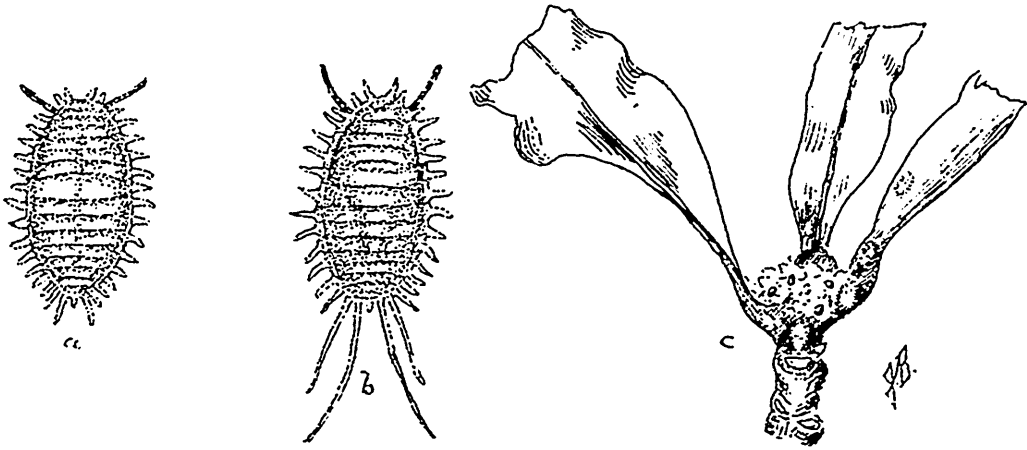


FIG. 2578. MEALY BUGS.

(a) Destructive Mealy-bug ; (b) Long-threaded Mealy-bug ; (c) Eggs in Cottony Sacks.

next. The soft scales, or lecaniums, are frequently quite troublesome to greenhouse and indoor plants. They may be readily recognized by their oval-shaped bodies. Most of them are oviparous, that is, egg-

layers. The eggs are produced in large numbers under the scale. Perhaps the most common lecanium of the greenhouse is the oleander scale (*lecanium oleae*). Fig. 2579 shows the form of the scale and the way the

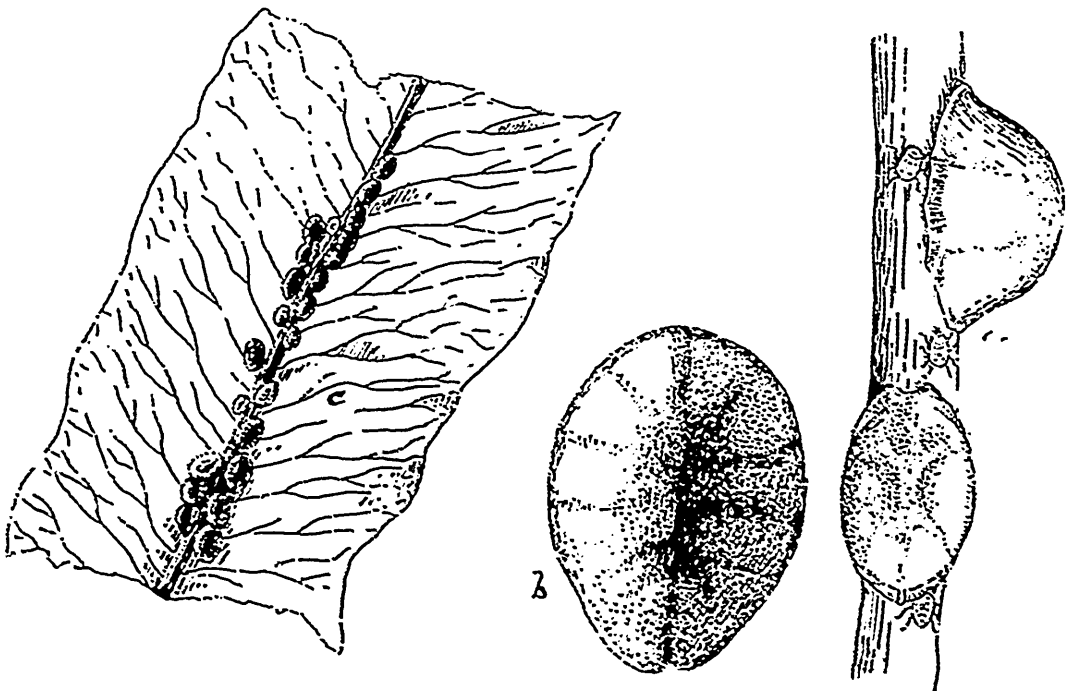


FIG. 2579. A SOFT SCALE on oleander. (a) Mature females with young escaping from beneath scale; (b) flat male scale; (c) arrangement of scales along mid-rib of leaf.

scales are arranged on oleander leaves.

Lecaniums are also frequently found on indoor ferns, on oranges, on lemon plants, and on acalyphs, which resemble the oleander scale to a large extent, but are referred to different species, such as the *hemispherical scale* and the *orange scale*.

The treatment for the soft scales is similar to that used against the mealy-bugs. Small plants are often dipped in soap or tobacco solutions. The most certain remedy is the hydrocyanic acid gas treatment, similar to the method adopted in the nurseries against the San Jose scale. A special compartment is necessary for this work, and special precautions must be taken with regard to quantities used and against possible poisoning. The writer will be pleased to give full directions to anyone who would like to try this method.

Among the armored scales which infest

greenhouse plants are the Florida red scale (*Aspidiotus ficus*), and Bouche's scale (*Aspidiotus hederæ*, or *nerii*). Fig. 2580 shows the form of the scales. The former scale is nearly circular in outline, about 1-25 inch in diameter, and dark brown in color. The latter is not so circular, and is white. It is found on a large number of greenhouse plants, such as oleanders, cycas, yucca, acacia, etc.

With these scales the treatment with soap or tobacco solutions is to be commended. Repetition is necessary, and when the plants are dipped they should be rinsed afterwards with clear water.

There are many other scales which are usually found in every large greenhouse containing tropical plants, but enough has probably been said to draw the attention of the owners to the commoner scales and to the best methods of treatment.

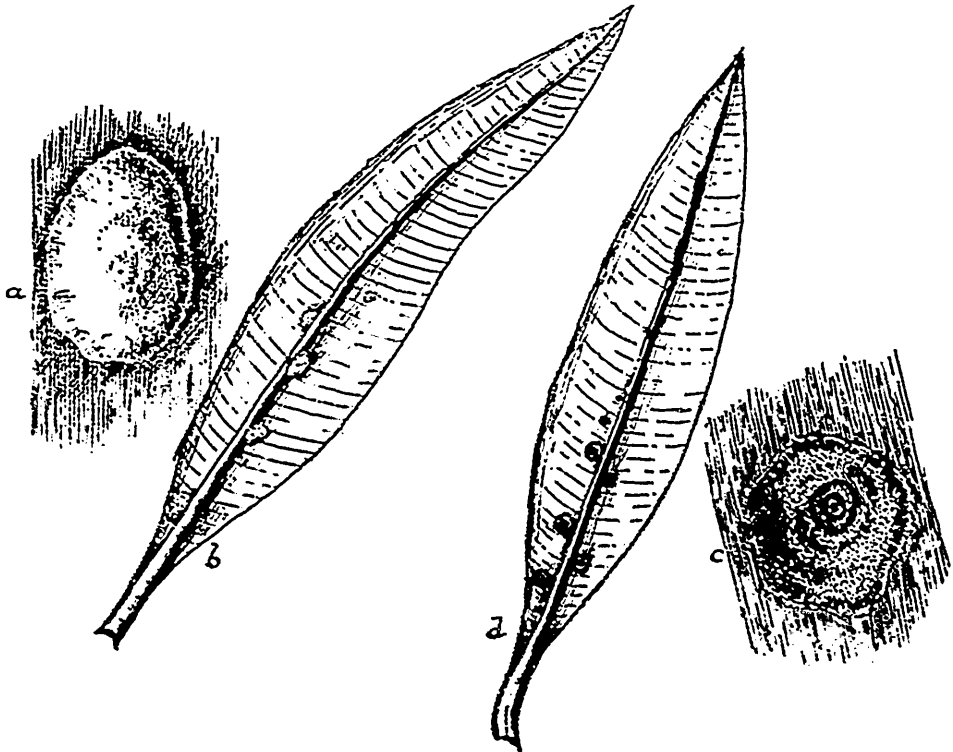


FIG 2580 (a) Bouche's scale, (b) Bouche's scale on a leaf, (c) Florida red scale, (d) Florida red scale on a leaf.

HYBRID REX BEGONIAS



FIG. 2581. BERTHA MCGREGOR.
(Hybrid Rex.)

THE new hybrid Rex Begonias of recent introduction are certainly quite an acquisition and improvement on the true and original type of Rex Begonias, more especially for window gardening. The new hybrid Rex have quite a dash of the shrubby begonia type in them, the habit of growth, form of foliage, as well as the more glabrous or glossy surface of their leaves, show most decidedly the characteristics of *Begonia Diadema*, a favorite shrubby begonia still with many plant growers.

The variety, *Bertha McGregor* (Fig. 2581), is a splendid variety for the window, and shows strong traces of *Begonia Diadema* parentage, its leaves being deeply cut and very similarly marked to *Begonia Diadema*. *Begonia Mrs. A. G. Shepherd* is another showy easy grown variety, the centre of its large glossy leaves being of a

bright silvery grey, beautifully margined with an emerald bronze-shaded green, with distinctive white spots dotted here and there. (Fig. 2582).

But the gem of all, in my opinion, is the variety known as *Lady Annesley* (Fig. 2583). Its delicately cut and sharply pointed leaves that glimmer and glisten like frosted silver, with a soft sheen of pink scarcely perceptible on the silvery ground color, together with the delicate tracings of reddish green leaf veins and leaf stem, are features that make this variety pleasingly conspicuous amongst the many beautiful varieties of the Rex Begonia. All of these begonias mentioned have the upright habit of the shrubby begonia, and are easier grown than most of the rough or



FIG. 2582. MRS. A. G. SHEPHERD.
(Hybrid Rex.)

hirsute leaved varieties of the true Rex Begonia. These varieties propagate from the leaves (or sections of the leaves), similar to the Rex Begonia, and are not as liable to suffer from leaf rot in winter time as the rougher leaved varieties are. The illustrations, as shown, give a very true idea of the form and color of these comparatively new varieties of this interesting class of begonias.—*Wm. Hunt, O. A. C., Guelph.*

THE PÆONIA belongs to the vast family or natural order of ranunculacæ, among which are found many plants of medicinal value. The pæonia is a hardy, perennial plant, a native of Europe, northern and temperate parts of Asia, northwestern America, China and Japan, so you can see it is an accommodating plant to nearly all tolerably cold climates. The situation should be remembered at the time of planting, for the cooler the situation the better will be the quality of the flowers, and the longer the season of flowering. It is only within the last twenty or thirty years that this now becoming popular flower has been considered

of much intrinsic value, excepting as an early, summer-flowering plant for the herbaceous border.



FIG. 2583. LADY ANNESLEY.
(Hybrid Rex).

OTTAWA CHILDREN'S EXHIBIT.

FOR a number of years the Ottawa Horticultural Society has considered that some effort should be made to interest the school children of the city in the cultivation of flowers, and instill them with a greater love for nature. Owing, however, to the small government grant which the society receives, nothing has been done up to the present, but this year the children will be given an opportunity to show how well they can grow flowers.

Mr. R. B. Whyte, late president of the society, offered at the directors' meeting Saturday night to give special prizes to school children for flowers grown from aster seeds,

which he would provide, if the directors would give space for the exhibits during the September show and provide judges. The directors readily agreed to the plan.

MR. WHYTE'S PLAN.

Mr. Whyte's scheme is to furnish ten children in each fourth form in the city with three packets of seed, each containing two hundred seeds, one white, the other two mixed of different varieties. The children are to show a certain number of blooms of each variety at the September show. Four prizes are offered for each variety, making twelve prizes in all. The first prize is \$2

and eighty gladiolus bulbs; second prize, \$1.50 and sixty gladiolus bulbs; third prize, \$ and fifty gladiolus bulbs; fourth prize, 50c. and thirty gladiolus bulbs. The prizes amount to \$15 in money and 660 gladiolus bulbs of Groff's best mixture. This generous offer of Mr. Whyte, it is considered, will create greater interest amongst the school

children in the cultivation and study of plants and have an educational effect.

Ald. Ellis also gave a number of special prizes for sweet peas, to be shown in August. These prizes are for the members of the society who have never won a prize in sweet peas at any previous show of the society.

CIVIC BETTERMENT AT ST. LOUIS

IN speaking of civic betterment it is impossible to ignore St. Louis for more than a few months at a time. The energy, persistence and fertility of resource displayed by the young civic league of that city is remarkable. While keeping free from politics, this organization has for its object "to unite the efforts of all citizens who want to make St. Louis a good place in which to live." Its success is shown by its growth. Organized about ten months ago with 100 members, it has to-day nearly 2,000 members. Its accomplishments have already been many.

The league first used its influence toward having a bill passed removing the exposition building from a public park in order that the new Carnegie library might be placed there. St. Louis has no free public baths. The improvement league built three, in conjunction with playgrounds, and gave 14,665 poor children baths during last summer. The baths proved so popular that the city itself will build five in a very short time. The league has succeeded in having the present bill-board ordinances lived up to, whenever new boards were erected, and to having many old bill-boards rebuilt. A grand boulevard and park system is being planned.

The president of the Civic Improvement League was made chairman of the commis-

sion by the mayor in appreciation of the good work of the league. This commission is about ready to report. The league was an active factor in the "keep our city clean" movement last summer, and distributed many thousand bulletins, giving all the city ordinances relating to that subject, for the information of citizens ignorant of their own personal responsibilities in such a movement. A special sanitary committee has followed up the movement, and encouraging results have been reached. Reports are made to the health department whenever garbage is not properly removed. The league sent a special representative to other cities to investigate the employment of women as sanitary inspectors. The report was so impressive that the city authorities are making arrangements to employ women sanitary and tenement house inspectors. The matter of keeping waste paper off the streets has been given attention. Sample waste-paper boxes have been put out with the league's name on them. The latest triumph of this hustling betterment organization is the appointment by the health commissioner, at its suggestion, of a woman sanitary inspector. Dr. Mary Tucker, the new official, will teach families in the crowded districts the need of clean homes and clean streets.—*Home and Flowers.*

BULBS AND BULBOUS PLANTS

THIS was the subject of a very valuable address by Mr. R. B. Whyte, of Ottawa, before the Hamilton Horticultural Society on Monday evening, March 6th. After the reading of the minutes, pads and pencils were distributed for the convenience of those wishing to take notes or to ask questions, and points of individual experience called for.

In Mr. Whyte we certainly have a model amateur gardener, for he has been growing flowers, and bulbous plants in particular, for twenty-five years past, and all purely out of his love for them. Truly in him and Mr. A. Alexander, of Hamilton, who from a child has loved and cultivated flowers and spends his morning and evening hours even yet in their cultivation, we have amateurs superior to many who claim to be professionals. Mr. Whyte has a large retail business in Ottawa requiring his close attention from 8.30 in the morning to 6 p. m., and yet he finds two hours a day, from 6 to 8 a. m., to give to his favorites in the garden.

WHEN TO PLANT.

After showing from samples, what really constituted a bulb, and how in it was stored up nourishment for most rapid growth in spring, Mr. Whyte divided the bulbous plants as follows:

(1) Those that must be planted in the fall, in order to have their roots established for their rapid development in early spring, such as snowdrop, crocus, scilla, chionodoxa, tulip, narcissus, hyacinth, fritillaria, etc.

(2) Those that may be planted in fall or spring, as lily, pæonia, iris, hemerocallis, funkia, for they do not shoot up so rapidly, and give time for root development in spring: only in that case being later in blooming.

(3) Those that can be planted in spring

only, as gladiolus, tigrida, montbretia, caladium, oxalis and canna, for there are too tender to be left in the ground through the winter.

Mr. Whyte favored early planting in the fall for Ottawa; sometimes between the middle of September and the middle of October he considered much better than later, in order to secure good root development before winter.

WHAT TO PLANT.

For very early bloom we must never omit the snowdrop, the crocus, the scilla and chionodoxa. In planting crocuses Mr. Whyte would plant mixed colors together in masses. A good broad band eight or ten inches wide along the border of the lawn would show up well. But of all the spring flowering bulbs he singled out the narcissus as the most elegant and beautiful. It was far superior to the tulip, which is almost the only bulb planted by the gardener in Gore Park at Hamilton, and he could not understand why it was so studiously omitted.

Of seventy-five varieties of narcissus grown by Mr. Whyte, the finest is the Emperor.

The following is a list of the more desirable kinds for Ontario:

1. Coffee Cup Narcissi:—Emperor, Golden Spur, Yellow Horsfieldi, Bicolor grandis, Princeps.

2. Tea Cup Narcissi:—Sir Watkin, Barri conspicuous, Cynosure.

3. Tea Saucer Narcissi—Poeticus, P. ornatus, Bisflorus.

BEST TULIPS.

Being asked to give a list of the best varieties of tulips for the amateur's garden, Mr. Whyte gave the following:

Early Single Tulips:—(White) Joost van Vondell; (rose and White), College Maid;

(crimson and white), Joost van Vondell; (red and yellow), Keizer Kroon; (violet and red), Proserpina; (cardinal), Couleur de Cardinal; (blush), Marianne; (carmine and white), Le Matelas; (red and orange), Parma; (scarlet), Brilliant.

Late Single Tulips:—(Carmine and yellow), Macrospila; (yellow), Bouton d'Or; (scarlet and blue), Gesneriana; (yellow and red), Yellow Crown; (scarlet), Elegans; (rose and white), Rosalind.

Early Double:—G. Solis, Rex Rubrorum, Yellow Rose, Purple Crown.

Late Double:—Red Crown, Salamander.

BEST LILIES IN ORDER OF BLOOMING.

Umbellatum, Croceum, Citrinum, Tenuifolium, Excelsum, Browni, Candidum, Superbum, Longiflorum, Auratum, Tigrinum, Speciosum.

We might extend these lists indefinitely, but these are perhaps the ones of greatest general interest.

PLANNING AND PLANTING.

IN improving one's grounds the first thing to do is to prepare a definite plan. This should be drawn to a scale, and should show just where the paths are to be and the location of each group of flowering shrubs, trees, hardy perennials or bulbous plants. For a small yard house, where economy is necessary, one may do this for himself, but where an undertaking of any extent is proposed a landscape gardener should be consulted before setting to work.

SOME NECESSARY CONDITIONS

Mr. Wm. Hunt, of the O. A. C., Guelph, in addressing the Grimsby Horticultural Society recently, emphasized three important conditions necessary to a site desirable as a home, viz.: drainage, windbreaks, and a plentiful supply of pure water. Any one who has been unfortunate enough to place his house where it is surrounded with mud, and where the cellar fills with water in spring, will fully appreciate the importance of what he said.

THE LAWN.

The easiest method of securing a good lawn at the least expense in Mr. Hunt's opinion, was by seedling, using half a pound of seed to the square rod, and sowing in early spring. Preliminary to this the edges of the roadways and paths should first be

laid with well cut sod, the borders planted with hardy perennials, and the trees and shrubs set as desired. The importance of a first-class lawn can hardly be estimated, and a poor one is a constant eyesore; indeed, it might be compared to a beautiful picture painted upon an ugly background.

ORNAMENTATION.

Vines, climbers, rockeries and rustic work are all useful in completing a lawn picture, while summer houses and rockeries may be employed with excellent effect. In Great Britain so much importance is attached to such adjuncts that men sometimes make the building of rockeries a profession and find themselves kept well employed.

On a small lot a straight walk to the front door is often best, but where possible a curve will add beauty as one advances, and increases interest.

OVERPLANTING.

The nursery or orchard style of planting a front lawn should be carefully avoided, and instead the shrubs should for the most part be disposed along the sides in a mixed border. Here may be planted hardy perennials, with a few such shrubs as hydrangea paniculata, Forsythia, Spirea, or Deutzia, making the border five or six feet in width.

HYDRANGEAS

WE have in general cultivation two classes of hydrangea. One hardy, so much so that it will stand the most severe northern winter without protection, and will grow wherever the lilac will; and that is saying a great deal for it, for we have come to consider the lilac an iron-clad plant. This class is chiefly represented by the variety catalogued and sold as *H. paniculata grandiflora*. The other class has several representatives, the most prominent of which is *otaska*. This is a Japanese variety, of wonderful merit, popular with all who undertake its cultivation, because of its great floriferousness, and, probably, the favorite of all large-growing, shrubby plants for porch and veranda decoration during summer. Being too tender to withstand the rigor of our northern winters, it is necessary to house it from the cold by giving it a place in the cellar or a cold-storage building about the first of November. There are several varieties quite similar in general habit, but this one easily takes the lead.

The hardy hydrangea is a shrub having many merits. It grows well in any ordinary soil, but in order to do itself justice it should be given rich earth and encouraged to make vigorous development. When properly fed and well cared for generally it will grow to a height of six or seven feet, with a proportionate spread of branches from the ground up. As its branches freely, and each branch as a general thing bears a cluster of blossoms, the effect produced by a well-grown specimen is very ornamental, and especially so because of the enormous size of its flower clusters. These are sometimes more than a foot across, and often nearly that in length. When they first open the flowers are a creamy white. They afterward become ivory in tint, and change toward the last to a dull pink tinged with green. They last for many weeks—indeed, until the coming of winter. They appear in

early September, therefore it will be readily understood that in this shrub we have one that is at its best during the late fall when other shrubs are flowerless. This habit of late flowering is one of its chief merits.

It can be grown as a single specimen with good effect if properly trained, but it is most effective when grouped. Set from half a dozen to a dozen plants together, according to the size of the space you wish to fill, and you get from them a great mass of foliage against which their enormous clusters of bloom will be displayed most strikingly. In grouping this shrub set the plants about two feet apart each way. When they have begun to grow cut away the greater share of the old top and encourage them to push shoots from the base. To grow them as standards defeats the effect you aim at in grouping them, to a great extent, as you want them to branch low and form a mass of branches close to the ground. Every spring go over the bushes and cut them back well. Shorten every branch in order to induce a vigorous new growth, upon which you must depend for flowers. At the same time manure the soil well, working it in well about the roots of the plants. After plants become old it is a good plan to remove nearly all the old branches and let them renew themselves. This can be done from time to time and old bushes be made as vigorous as new ones. The roots never seem to lose their vitality, therefore they can be depended on to produce new and healthy tops whenever there is a demand for them.

For hedges of an ornamental character on the home grounds this plant deserves especial notice. By pruning we can make it compact and keep it of any size to suit us. To make a good hedge of it set two rows of plants eighteen inches apart, so setting them that the plants do not come opposite in the rows. Treat as advised for groups, but prune more closely, unless you desire a large hedge. If allowed to grow to suit them-

selves the plants will be more pleasing than they are likely to be when closely clipped, as they will have less formality.

This shrub should preferably be set in spring, though fall planting can be done if necessary, without any risk of losing the plants. Spring-set plants get a better and earlier start.

If a standard is desired for some prominent place on the lawn, select for the purpose a strong, well-rooted plant. Cut away all but one shoot, and do not allow this to branch until it has reached the height where you desire the head of your little tree to be. Then nip off the end of it. This will induce branching below. Allow only five or six branches near the top to grow. In this way you secure a foundation for the body of your plant.

Hydrangea otaska is grown from cuttings. The most satisfactory method of securing a plant is to purchase a young one from the florist. Pot it in rich loam, and give it plenty of water when growing. It will generally make its strongest growth during the early part of the season, though it grows more or less all summer. Small plants not more than six or eight inches in height often produce clusters of flowers larger than the pot they are growing in. But if you want a large plant with which to decorate your porch discourage early blooming and force the plant to throw all its energies into the production of branches. If allowed to bloom it will grow vigorously, but if a small plant is permitted to develop flowers you can not expect much else from it that season. Better postpone flowering until you have formed a strong plant with at least a dozen branches, each of which ought to give you a cluster of blossoms next season. Make the soil strong and rich, and keep it so as long as growth is going on. See that the plant never gets dry at the roots. As a general thing buds are formed soon after growth begins. These develop into flowers along about midsummer—sometimes

earlier—and they last until the time comes to put the plant in the cellar for winter, though in September they take on a reddish green look which is far less ornamental than the pink tints which characterize them while in their prime. To secure a fine specimen repot it whenever its roots fill the old pot, and keep on doing this until you have a plant of the size you desire. After that do not shift to a larger pot or tub, but depend on liquid fertilizers to keep it vigorous. Frequent cutting back has a tendency to thicken up a plant and make it compact. For example, we know a plant which is grown in a tub eighteen inches across, and goes into the cellar in November each year and remains there until March. Last season it had over two hundred flower clusters on it at one time. While in the cellar it is kept quite dry. Frequently it loses many of its old leaves, but no harm is done if this occurs. While in cold storage keep it as dormant as possible, thus imitating the process by which nature cares for deciduous plants out-of-doors during the winter. If kept in too warm a place, and especially one where there is considerable light, premature growth often sets in. This must be prevented if you want a strong plant. Keeping it dry at the roots discourages early growth, but a low temperature is also necessary, and the absence of light is quite desirable in order to secure complete dormancy.

Whatever pruning is done should be done early in spring before much growth is made. Cut away superfluous branches and all weak ones, and shorten those which have outgrown others, until you have brought the plant to symmetrical shape. If repotting is to be done, do it then. If your plant has reached the limit of root room which you feel disposed to give it, apply whatever fertilizer you prefer as soon as active growth begins, *but not before*. Some persons do their pruning after the young branches have got well started.—*Home and Flowers*.

SOME FLOWER LEGENDS

BY

EDWARD TYRRELL, TORONO.

I HAVE intended for some time to send you occasionally some of the pieces of history I have picked up in my wanderings through books; but reading a piece in your February number on "The Care of Plants in the Window," in which the writer says "make friends with your plants, be on intimate terms with them," and this so harmonizing with my own ideas, I thought I would second his suggestion by giving some of the history of legends connected with plants which I have found, although to some they may be familiar.

The love of flowers is one of the universal sentiments. How pleasant it is to have some living object to tend or nurture, and which "though tongueless shall talk with you of days that are passed, of friends and kindred with whom it may be many happy hours were spent or sorrow shared," or historical events brought to remembrance. It is pleasant to imagine when looking upon our plants that they are a glad company of friends, each one with something interesting to tell, or have reveal to us, if we will only stop and listen—histories of men and events.

There is a little shrub, a species of bloom we see in the greenhouses and just now in bloom, which was one of the popular plants of the middle ages. Its modern Latin name is *Cytisus*, but its original name was *Planta Genista*. It has great beauties which cannot be overlooked; with its graceful habit and yellow flowers it attracts the attention of the most careless observer. The story in connection with this plant is: The Earl of Anjou, having committed a sin in connection with his church, was enjoined to make a pilgrimage to the Holy Land as penance. He went habited in lowly attire with a sprig

of bloom in his hat to denote his humility. The expiation finished, he adopted the name of Plantagenet from *Planta* and *Genista*, hence the name of the *Plantagenet* family.

X. R. Santine gives us that beautiful story of "Picciola, or the Prison Flower," a book that has been translated into almost every known language, and which probably most of your contributors have read; if not, they should do so. It tells how the Count de Charney, a rich and highly accomplished gentleman, maddened by solitude, although his station and fortune afforded him every opportunity of surrounding himself with all that could gratify his desires or tastes, but he denied his Maker, and with the increasing anxieties of a troubled mind, and wrapped in his own self-sufficiency, esteemed by no one, joined the company of those who wished to subvert the order of government,



FIG 2584.

spoke words which caused his arrest, and while expiating his folly within the walls of a prison, a little flower springs up between the chinks of the stones in the court yard and became to him a messenger of love and mercy and his acknowledgment of God.

This plant is known to us as the wall-flower, and it is familiar to all. It was introduced in England in 1573, and is a native of the south of Europe, Egypt and Morocco.

It does not appear to be a wild flower, and is, I believe, only found where men have lived or are living. It is the flower with which the romance writers embellish all their decaying battlements, falling towers, and monastic ruins. The English name refers to the habit of the plant as an inhabitant of walls and rocks. The Latin name, *Cheiranthus-Cheiri*, implies that it is in an especial manner a nosegay or handflower.

APHIDS OR PLANT LICE.

THEIR EGGS BEGIN TO HATCH WITH FIRST WARM WEATHER.

AMONG the very first insect eggs to hatch are those of the various species of aphid, or plant lice. These are among the most destructive and difficult to suppress of all insect pests, and where it is possible to prevent them from getting a start, measures to accomplish this should not be neglected. The eggs of aphidae are minute, oval, shining black bodies, that are to be found at the base of buds of various trees and shrubs, in many cases easily distinguishable by the naked eye. In some instances they are in dense clusters surrounding each bud, as in the case of the species infesting the "silver berry," a very ornamental shrub or small tree of the "false olive" family, while those found on the apple, plum, honeysuckle and other buds are more scattering. Some of these are even now hatching into

the "stem mothers," which bring forth their young alive and ready to begin their sap-sucking at once, and which are the progenitors of innumerable generations in the course of the season.

Wherever these are noticed—and it is worth while to make careful observations on all trees and shrubby plants that are subject to such attacks—the kerosene emulsion spray cannot be brought into requisition any too soon. Fruit and flower buds are still too undeveloped to be injured by the application, and it is much easier to bring it in contact with the newly-hatched insects at his season than after the foliage has come out, among which they hide, and often curl the leaves to that no spray can be brought in contact with them.

ART OF JAPANESE GARDENERS.—A Japanese gardener does not strive after bright colors. His object is to counterfeit a natural scene as nearly as possible. He cheats your eye into a loss of all sense of perspective. By judiciously selecting his trees and

keeping every object on a small scale he can make you imagine that his garden is very much longer than it is, and somehow he manages to deceive you as to its boundaries by artful arrangements of shrubs and stone work.

Civic Improvement

A DEPARTMENT DEVOTED TO THE INTERESTS OF THE HORTICULTURAL SOCIETIES OF ONTARIO, AND OF ALL OTHER BODIES INTERESTED IN THE IMPROVEMENT OF THE SURROUNDINGS OF OUR CANADIAN TOWN AND COUNTRY HOMES.

EXECUTIVE BOARD.

THE Executive Board of the Canadian Civic Improvement League met in the Engineer's club rooms, 96 King street west, Toronto, on the 16th inst., the rooms having been kindly granted the league for three months. The objects of the meeting, as defined in the secretary's letter, were to perfect the organization, and to arrange for the appointment of a field secretary, and to transact other important business.

VAST EXTENT OF THE WORK.

The vast extent of the work in hand was dwelt upon, covering as it does not only the improvement of our city streets and public parks, and the removal of the disfiguring bill boards; but also good roads and home sanitation. It should interest every one,

—Galley 8. 1.
whether doctor, lawyer, merchant or farmer, for it aims at the betterment of the conditions of living for us all, and the beautification of our surroundings.

THE WOMEN SHOULD BE INTERESTED.

Major Ellis pointed out the fitness of women for the study of the aesthetic, they were naturally disposed to love the beautiful in nature and art, and had more time than men to devote to its advancement. In the American cities the ladies are taking a very prominent part in the work of civic improve-

ment, and clubs are being formed in many places. Why should not such clubs be formed in every town in Ontario, even if only containing five or six members each? They could be a wonderful power for the advancement of this work.

A FIELD SECRETARY.

Mr. G. R. Patullo, of Woodstock, ably advocated the appointment of a field secretary, who could stir up public interest. He should be a man who understood landscape gardening, and who could give addresses in every town on Improvement Work. Such a man could form clubs everywhere, and these clubs would co-operate with this league.

Finally the title of Honorary Field Secretary was accepted by Mr. G. R. Patullo himself, who was generous enough to say that in his intended summer tour to the great Northwest he would be pleased to give addresses on Civic Improvement in the principal cities and encourage the formation of local improvement clubs.

WAYS AND MEANS.

A Committee of Ways and Means was appointed, with a quorum resident in the city of Toronto, and the following is the list of members, viz.: Major Ellis, H. F. Duck, H. P. Hynes, J. D. Hayden (the president), and Major H. J. Snelgrove (the secretary).

These gentlemen have a hand in the ques-

tion of finances, and we hope they may receive much encouragement. Besides this committee, the whole province was divided into five districts, with a member of the executive board representing each, who would be expected to do pioneer work in the meantime until the appointment of a regular field secretary. The following are the divisions:

Western district, represented by G. R. Patullo, Woodstock.

Niagara district, represented by Mr. R. Tasker Steele, Hamilton.

Toronto district, represented by Major Ellis, Toronto.

Midland district, represented by J. D. Hayden, Cobourg.

Eastern district, represented by Major Smallfield, Renfrew.

THE ORGAN OF CIVIC IMPROVEMENT.

The Board had under consideration the best means of publishing the proceedings and its literature, and it was unanimously agreed that the Canadian Horticulturist be made the organ of the League for Canada. Already much space has been given to this kind of work in this journal, and now it is proposed to make it a special feature, because the improvement of our homes, the beautifying of our cities, towns and villages, and attention to sanitary conditions, these subjects interest everybody.

Further, it is proposed to issue bulletins that can be distributed very freely and published in the various newspapers, the first to be written by the secretary, the second by Mr. G. R. Patullo, and the third by Mr. L. Woolverton.

A YEAR OF PROGRESS IN PARK MAKING.

On every side we hear news of advance along the lines of park making. In Chicago the Lincoln Park commissioners are preparing to spend from two to four millions of dollars on extensions and improvements; and

the South Park commissioners are securing legislation to increase their powers and to improve their opportunities from Jackson Park almost to the mouth of the Chicago river. A boulevard to connect the north and south park systems, to cross the river by a commodious subway, is also under consideration. In Ontario we find Toronto and Hamilton both seeking to lay aside large areas of land in reserve for city parks, and soon we doubt not they will have plans prepared for an extensive and beautiful park system. Even the smaller towns, such as Brantford, Brampton and Walkerton, are securing land now to be made into parks as soon as public opinion warrants the expenditure.

ARBOR DAY.

Has not been kept in the schools in the manner that its importance deserves. Too often the only observance is a half-day tidying up the yard; and, even if it go so far as the planting of a few trees, the teachers do not sufficiently realize the higher end in view, that of directing the attention of the children upon outdoor beauty, and of teaching them how to use nature's material in improving the immediate surroundings of their homes and school houses.

RAILROAD PARKS.

Much of the work so far executed along the lines of our Grand Trunk and Canadian Pacific roads belong to the geometrical rather than to landscape gardening. While the lawns are pretty and well kept, the beds well planted and pretty, not the slightest effort has yet been made in any case that we have noticed toward unity of design or the making of the whole to harmonize into a picture. No attempt has been made to hide ugly views by appropriate grouping of trees, nor to add picturesqueness to the lawns by carefully disposed clumps of choice shrub-

bery; nor in any case have we noticed any effort made to make the place inviting to the waiting traveller by rustic or other seats in shady spots. On the other hand, the places are to be seen and not touched; they are guarded by ugly and forbidding palings, and woe betide the passenger who would dare to set foot inside! We commend the action of the Rio Grande Railroad in deciding to park nearly all of its stations in Colorado and Utah, and in placing this work in the hands of capable men to prepare suitable plans for the same.

PARK DEVELOPMENT.

It will take much time and much effort on the part of the members of our improvement clubs to educate public sentiment so far in favor of park development in Ontario, that the large sums required for the best work will be freely voted. Newark, N. J., has spent \$938,000 for improvements to Branch Park, and \$41,000 in improvements to East Side Park, besides similar amounts for many other parks in the same city. Toronto and Hamilton have as yet done very little in this direction.

THE HORTICULTURAL SOCIETIES.

I HAVE just completed a tour among the horticultural societies. My special mission was to point out to them the aim and purpose of the societies, the character of the work they are supposed to be engaged, and the results hoped for. I hope to contribute a series of articles to this department during the summer months, setting out in detail my conceptions of the work, and my experiences gained during the past few weeks. For the present I will only intimate that the purpose of the horticultural society is not to distribute seed potatoes nor any other work that properly belongs to the agricultural societies; but, on the contrary, to beautify the home, to purify home life, to promote a greater love of home by making it and its environments more attractive, and thereby lay the foundation of a patriotism worthy the land that we possess.

Nature has done much for us: we have a beautiful land, but as yet we are not doing much for ourselves with the natural advantages we possess. There is much work for the horticultural societies and the Civic Im-

provement League to do. Upon this, or these topics, I will dwell in detail later. I might suggest, however, as a good beginning, that the Civic Improvement League appoint a strong delegation to wait upon the great railway companies and request them to do something in the way of cleaning up their station grounds and freight yards. I may just here instance the pretty and progressive town of Orillia. The first impression the visitor gets of the town is exceedingly bad, all owing to the wretched disorder about the railway premises.

I must not forget that I promised several societies to give a list of hardy roses in this issue. Beginning with the dark shades, the following list will cover the range of colors. Baron de Bonstetten, Gen. Jacqueminot, Alfred Colomb, Lady Helen Stewart, Mad. Chas. Wood, Magna Charta, Francois Levet, Mrs. Sherman, Crawford, Common Moss, Crested Moss, Mad. Plantier, and the climbing Caroline Goodrich.

Mitchell.

T. H. RACE.

A SIMPLE METHOD OF DISPOSING OF HOUSE SEWAGE FOR FARM HOMES.

A LINE OF IMPROVEMENT WORK.

BY

THE SANITARY INSPECTOR,

DEPT. OF PUBLIC WORKS, TORONTO.

IN these days of popular education, when the people throughout the Province have the benefit of free lectures in dairying, fruit growing, domestic science, etc., it is noteworthy that a knowledge of so important a subject and one so closely allied to the physical and moral welfare of the people as sanitary science is confined to a limited number.

True, the principles of the science is an open book to the medical profession, and is freely discussed at medical conventions, but these discussions are mainly reported in professional journals and do not reach the great mass of the people at all.

In the matter of public sanitation the question of effectually disposing of sewage in small towns and villages is one of the most important problems that has engaged the attention of scientific men. The great cost of a system of sewage as used in large places has rendered this course impracticable while the use of privy vaults and cess-pools has been found objectionable and dangerous. That there is a desire on the part of those living in towns and villages, as well as in less populated districts for what are known as the "Modern Conveniences" of the city is evidenced by the thousands of cess-pools in existence or being built for the purpose of hiding away far beneath the surface of the earth the various organic and liquid wastes from the private residence, public house or institution as the case may be.

Those in authority labor under the dangerous yet common delusion that "so long as the stuff is put down deep enough there is no danger." and herein lies one of the great-

est causes of many of the diseases which at times are epidemic in whole communities, viz., the pollution of the water supply.

How is the water supply polluted by decaying organic matter buried deep under the surface of the earth?

In answer to this question a brief explanation of the existing physical conditions may be more convincing than bald assertions without the reasons being given therefor.

Over the whole surface of the earth, where vegetation is possible, nature has provided a most wonderful scavenger system, composed of millions of little workers to the cubic foot; these little workers are known as microbes, other species are also found in vast numbers in the water and air.

The natural functions of many of these microbes tend to produce one result, viz., purification, and when one comprehends that both the sun and air are essential to the life of the various species of microbes which are necessary to the proper decomposition of waste matter, it will be unnecessary to state that in the deep sub-soil where both are impossible, microbe life cannot exist, and hence it is stated that instead of being converted into life-producing matter at the surface of the earth, with its dangerous properties destroyed, organic matter is allowed to decay and putrify in the deep dead earth until it is washed into some near by well or stream, there to cause the innumerable ills produced by drinking impure water.

It may be said that wells are too far removed from cess-pools to be in any danger from this source, but the experience of the village of Lawson, near Basle, in Switzer-

land, will be sufficient to controvert any assertion to that effect.

In the village referred to, which has not within the memory of man been visited by epidemic typhoid, and in which not a single case had occurred for many years, there broke out in the year 1882 an epidemic which simultaneously attacked a large portion of the inhabitants.

About a mile from Lawson, and separated from it by the mountainous ridge of the Stockhalden, which was probably an old moraine of the glacial epoch, lies a small parallel valley, the Furlenthal. In an isolated house situated in the valley, a farmer who had just returned from a long journey, was attacked by typhoid, and within the next two months three other members of the family contracted the disease: the dejecta from the patients, together with all the house slops having been emptied into a small brook which flowed past the door.

Ten years previously it had been proven that direct connection existed between this brook and the springs on the mountain side, which supplied the village with water, and as the disease had not occurred in a single house supplied with well water, the authorities suspected that the water supply derived from the springs was infected with the disease germs, and on investigating found conditions existing as related above. In order that the connection between the brook and the springs might be proven beyond doubt, the following ingenious experiment was made: Eighteen hundredweight of salt was dissolved in water and then emptied into the brook, with the result that within a few hours the water coming from the springs was of a decidedly salty flavor. A similar experiment with two and one half tons of flour produced no result, showing that while the earth was capable of filtering the water so well that even such minute particles as wheat flour were prevented from passing through it was incapable, without the pres-

ence of air and microbes, to properly purify and oxidise it.

This remarkable case shows:

1st. That the power of mischief possessed by sewage placed beyond the action of bacteria, is enormous.

2nd. That the diffusibility of typhoid poison in water is practically infinite.

3rd. That water containing the germs of disease may not be purified by filtration through a mile of solid earth (a filter so fine as to arrest particles of wheat flour.

The moral to be drawn from the foregoing is that the greatest care should be exercised in the disposal of waste matters, and that under no circumstances should they be buried deeply under the surface of the earth.

The question will be asked, "How is decaying matter to be disposed of at the surface of the earth without creating a nuisance?" In answer to this question it may be said that as far as it applies to human excreta, two methods have been found to work successfully, viz.—the dry earth closet, the contents of which are dug into shallow trenches at regular intervals, and the septic tank system, the latter being preferable for the reasons that while it performs all the work of the dry earth closet it will also take care of all the liquid wastes from the house, and it requires little attention, while the former depends for its success upon unremitting care.

A brief explanation of the construction and operation of the septic tank system will be of value to those who are anxious to have their premises in the best possible sanitary condition, and who are willing to go to a comparatively small amount of trouble to produce the desired results.

Referring to the accompanying cut, it will be seen that a tank (fig. 1) constructed preferably of bricks or stone well bedded in cement to prevent leakage, is built at such a level as to allow the discharge pipe "D," which is of glazed tiles 4 inches in diameter,

to leave it at a depth of not more than twelve inches beneath the surface of the earth. Where the surrounding land is level this tank may be located quite close to the building where, if covered with earth (and sodded over if desired), it will not cause any inconvenience. If more convenient, it may be placed any distance from the house, and the inlet pipe "E" laid along a mound or ridge of earth, and covered with earth to protect it from the frost; this pipe must, under any circumstances, have a slight continuous fall from the building too, and must enter the tank at the top as shown. If, however, there is a considerable slope to the land, the tank may be buried beneath the surface, it being borne in mind that the branches from pipe "D," which may be taken off at any distance from the tank, must not be more than twelve inches beneath the surface and must be perfectly level. From pipe "D" about every two feet ordinary "T" fitting will give just the desired length, are run branches of field tiles (Fig. 2). 4 inches in diameter, the total contents of which should be equal to the amount of water which will be discharged at each operation of the valve, and allowing 13 tiles to every cubic foot to be discharged, the

number required will be readily found. The bend connecting the tank to the system of sub-surface tiles should be of iron, solidly cemented into the bottom of the tank to allow of the caulking in of the valve with lead.

The valve described in this article, which is manufactured by the Dominion Flushing Valve Co., of 558 Dufferin street, Toronto, is the only thing of its kind which can be set at any level, will open and close automatically, and, as it needs no adjusting it can be put in by almost any person. It overcomes the only objection ever made to the septic tank system, viz., that when the emptying of the tank depended upon a servant or some other member of the family to put a plug at regular intervals, replacing it when all the liquid had escaped, it was sometimes forgotten and the tank overflowing caused the pipe between it and the house to fill up, thereby causing a great deal of annoyance and expense.

It will be noticed that a dividing wall is built in the centre of the tank to a height of about two inches from the top, the latter space being left for the free passage of fresh air. In this partition is built overflow "F," the lower end of which should be "caged" with wire netting, $\frac{1}{4}$ inch mesh, to prevent

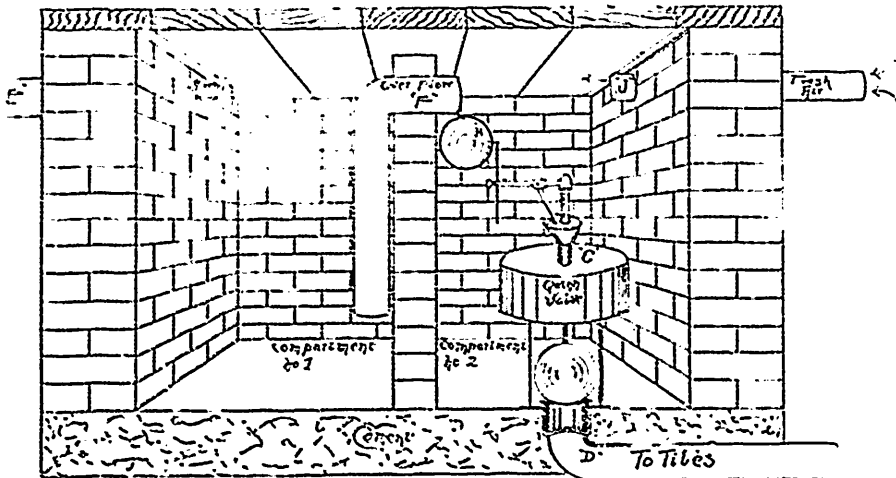


Fig 1.

paper, etc., from passing through with the water. Pipe "J" permits the entry of fresh air, which passes over the sewage and up through the soil pipe "E" to the roof. Manholes "G" "G" provide access to both tanks.

The operation of the tank is as follows: All the sewage from the building enters the tank through pipe "E" filling compartment No. 1, the solids being compelled to float by the gasses generated underneath. When this compartment is filled the liquid overflows through "F" into compartment No. 2, the valve "C" of which is closed. When, however, the liquid rises to the level at which float "H" is set the valve opens, discharging the whole contents of compartment No. 2, be it fifty or five thousand gallons into the system of sub-surface tiles through which it soaks into the earth, there to be taken care of by nature as already explained.

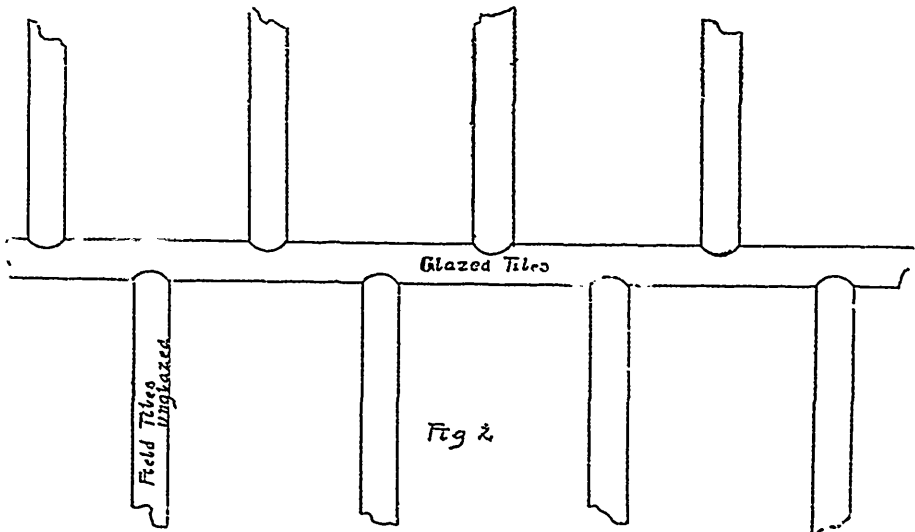
As the valve closes automatically when the tank is nearly empty, it will be seen that sufficient time will be given for that which has just been discharged to soak away before the tank fills again and the operation is repeated.

A word respecting the solid portion of the sewage retained in compartment No. 1. The value of the system will be appreciated when it is stated that so thorough is the action of

the millions of bacteria on this body, causing the almost immediate disintegration and decomposition of everything entering the tank, that tanks when opened after a year's use, and into which the sewage from buildings containing many inmates was emptied, were found to contain not more than two or three pails full of a kind of earthy substance, from which scarcely any odor was perceptible. It must be borne in mind, of course, that no disinfectants are necessary with this system, and nothing in the shape of chemicals should be allowed to enter the tank if the life of the bacteria, which is so essential to its success, is to be preserved.

Regarding the size of the tank necessary, it may be said that for an ordinary family a tank four feet long by three feet wide, and from thirty to thirty-six inches high would be sufficient, while for hotels or institutions one large enough to hold about twelve gallons for each inmate would be ample.

The septic tank system has the endorsement of all scientific men who have given the subject of sewage disposal close study. It will not give any trouble if built according to the directions given, and, contrary to the general supposition it will not freeze in winter: if the tiles are placed under a garden most valuable results may be obtained in flowers, fruit or vegetables.





The Canadian Horticulturist

COPY for journal should reach the editor as early in the month as possible, never later than the 12th. It should be addressed to L. Woolverton, Grimsby, Ontario.

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

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LOCAL NEWS.—Correspondents will greatly oblige by sending to the Editor early intelligence of local events or doings of Horticultural Societies likely to be of interest to our readers, or of any matters which it is desirable to bring under the notice of Horticulturists.

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

NEWSPAPERS.—Correspondents sending newspapers should be careful to mark the paragraphs they wish the Editor to see.

DISCONTINUANCES.—Remember that the publisher must be notified by letter or post-card when a subscriber wishes his paper stopped. All arrearages must be paid. Returning your paper will not enable us to discontinue it, as we cannot find your name on our books unless your Post Office address is given. Societies should send in their revised lists in January, if possible, otherwise we take it for granted that all will continue members.

ADDRESS money letters, subscriptions and business letters of every kind to the Secretary of the Ontario Fruit Growers Association, Department of Agriculture, Toronto.

POST OFFICE ORDERS, cheques, postal notes, etc., should be made payable to G. C. Creelman, Toronto.

SPRAY CALENDAR—PART No. II.

BY

PROF. WM. LOCHHEAD,

O. A. C., GUELPH, ONT.

TREATMENT.

APPLE AND PEAR.

A.—Against Leaf-eating Insects and Fungous Diseases.

Treatment.	When to Spray.	Insect pests and diseases controlled.
1. Paris green in water. (Formula 6.) (Important.)	Just as leaf-buds are expanding.	Bud-moth, case-bearers.
2. Bordeaux mixture and Paris green. (Formula 2.)	About a week later.	Bud-moth, case-bearers, canker-worms, tent-caterpillars. Scab, leaf-spot and mildew.
3. Bordeaux and Paris green. (Formula 2.) (Important.)	Just before blossoms open.	Canker-worms, tent-caterpillars, etc.
4. Bordeaux and Paris green. (Formula 2.) (Important.)	Just after blossoms fall.	Scab and leaf-spot, etc. Codling-moth, canker-worms, tent-caterpillars, pear slug.
5. Bordeaux and Paris green. (Formula 2.)	Ten days or two weeks later.	Scab and leaf-spot. Codling-moth, Palmer worm, apple Bucculatrix. Scab and leaf-spot, etc.

Codling-moths cannot always be controlled by spraying, especially in the southwestern section of Ontario, where a second brood appears later in the season.

In addition to spraying, in this district, use bandages around the trees. Make them from four to six inches wide, three or four inches thick, of any kind of cloth. Old bags, sacks, coarse material of any kind will do. Bands of straw and tow have been used with some success. During the first week in June bind one around each tree three or four feet from the ground; secure it either with cord or small nails; take it off every twelve days, and carefully examine for codling cocoons. These may be readily destroyed by crushing. Replace the bands as before.

Tent-caterpillars are controlled by burning the webs or nests in May; by collecting and destroying the clusters of eggs in fall and winter, by banding the trees, and by spraying the young caterpillars with Paris green.

Canker-worms may be largely controlled by banding the trees in autumn and early spring, and by spraying with Paris green when the worms appear.

B.—Against Sucking Insects, such as Plant-lice and Scale Insects, and against Pear Leaf Blister-mites.

Treatment.	When to Spray.	Insects controlled.
1. Kerosene emulsion. (Formula 10), (1 part in 10 parts water).	Before buds start in spring.	Pear-leaf blister-mite.
2. Kerosene emulsion solution (1 part emulsion to 10 parts water). Or whale-oil soap solution (Formula 12), (1 lb. to 7 gals. water).	As leaves are unfolding.	Pear psylla and aphids.
3. Kerosene emulsion (Formula 10), whale-oil soap as before.	Ten days later.	Psylla and aphids.
4. Kerosene emulsion (Formula 10), or whale-oil soap as before. Or lime wash (No. 16).	About end of May or first of June. During winter.	Oyster-shell bark-lice.

C.—Treatment for destroying borers:

- (a) Dig out the borers whenever possible.
- (b) Apply the soap-soda wash (Formula 15) in early June.

PLUM AND CHERRY.

A.—Against Curculio, Brown Rot, Shot-hole Fungus, and Leaf-eating Insects.

Treatment.	When to Spray.	Insects and diseases controlled.
1. Bordeaux and Paris green. (Formula 2.)	When leaf-buds are opening.	Brown rot, shot-hole fungus.
2. Bordeaux and Paris green. (Formula 2.)	When fruit is formed.	Curculio, green fruit worms, brown rot, etc.
3. Bordeaux and Paris green. (Formula 2.)	Two weeks later.	Brown rot, curculio, etc.
4. Ammonia-copper carbonate solution. (Formula 4.)	When fruit is large.	Brown rot, etc.

The Curculios are most readily controlled by jarring the trees in early morning, and collecting them on a sheet spread under the tree. The jarring should be begun when the fruit has set, and continued for three weeks. Thrice a week is often enough to jar.

B.—Against Plant-lice and Scale Insects.

Treatment.	When to Spray.	Insects controlled.
1. Kerosene emulsion (Formula 10), (1 part to 4 parts water.) Or whale-oil soap (2 lbs. to 1 gal. hot water). Or petroleum soap emulsion (Formula 14a).	In winter or early spring.	Plum scale, San Jose scale, etc.
2. Kerosene emulsion (Formula 10), (1 part to 10 parts water). Or whale-oil soap solution (Formula 12), (1 lb. to 7 gals. water). Or tobacco solution (Formula 11).	As soon as lice appear on young leaves.	Plant-lice.

PEACH.

A.—Against Peach-leaf Curl, Brown Rot, Curculio, Bud-moth.

Treatment.	When to Spray.	Insects and diseases controlled.
1. Bordeaux and Paris green. (Formula 2.)	Before flower buds open.	Bud-moth and peach leaf curl, brown rot.
2. Bordeaux and Paris green. (Formula 2.)	After blossoms fall.	Peach-leaf curl, brown rot, bud-moth and curculio.
3. Bordeaux and Paris green. (Formula 2.)	Two weeks later.	Brown rot, etc.
4. Ammonia-copper carbonate (Formula 4.)	When fruit is well formed.	Brown rot, etc.

B.—Against Aphis, and Scale Insects.

1. Kerosene emulsion (Formula 10), (1 part in 10 parts). Or whale-oil soap (Formula 12), (1 lb. in 7 gals. water).	Whenever young lice appear.	Aphis.
2. Whale-oil soap (2 lbs. in 1 gal. hot water). Or crude petroleum, 25 per cent. mechanical emulsion. (Slightly dangerous.)	In early spring before buds open.	San Jose scale.

C.—Against Peach Tree Borer.

1. Prof. Slingerland recommends gas tar as a trunk wash. A trial experiment should be made first on a few trees to find out if it injures the trees, for gas tar varies in comparison.
2. Dig out or probe the borers every fall and spring; and mound up a new base with earth for six inches; remove and examine in September.
3. Apply Formula in early June.

GRAPE.

A.—Against Black Rot, Mildews and Leaf-eating Insects.

Treatment.	When to spray.	Insects and fungi controlled.
1. Bordeaux and Paris green. (Formula 2.)	As buds begin to swell.	Flea-beetle, black rot, mildews.
2. Bordeaux and Paris green. (Formula 2.)	Ten days or two weeks later, before blossoms open.	Black rot, mildews and flea-beetles.
3. Bordeaux and Paris green. (Formula 2.)	Just after blossoming.	Black rot and mildews.
4. Bordeaux and Paris green. (Formula 2.)	Two weeks later.	Flea-beetle and black rot.
5. Ammonia-copper carbonate. (Formula 4.)	When fruit is well formed.	Black rot and mildews.

B.—Against Grape Thrip.

1. Kerosene emulsion, 1 part Soon after leaves are formed. Thrip of leaf-hopper.
in 9 parts water.

CUCUMBER AND SQUASH.

For the Squash Bug.—Kill the early bugs, and the yellowish eggs on the underside of the leaves; kill the bugs every morning which collect under chips and boards placed near the vines.

For the Striped Cucumber Beetle.—Keep vines well covered with Bordeaux mixture; cleanliness in garden in fall; protect young vines with muslin, or cheesecloth netting; insect powder and flour as for cabbage worm; tobacco water and soft soap mixture sprinkled on vines, followed by a dusting of lime.

ASPARAGUS.

For Beetles.—Spray plants after cutting season with Paris green; regular cutting of all shoots.

For Rust.—Cut and burn all plants in fall.

CABBAGE.

For Cabbage Worms and Lice.—Pyrethrum applied in solution (1 ounce to 3 gallons of water) or dusted on (1 part pyrethrum to 5 parts flour).

For Cabbage Root Maggots.—No thoroughly reliable remedy is known, but good results have been obtained by using Goff's tarred paper cards. These are pieces of tarred building paper, 3 inches in diameter. In the centre is a hole through which the root of the young cabbage is placed on transplanting. Card lies flat on ground.

STRAWBERRY.

The Rust or Leaf Blight.—Bordeaux mixture, when it can be applied without disfiguring the fruit, will control this disease. Apply at intervals of two or three weeks on new beds after they begin to make runners.

TOMATO.

Rot and Blight.—Spray with Bordeaux mixture as soon as rot or blight appears, three times if necessary, at intervals of 10 to 15 days.

POTATO.

Scab, Blight, and Beetles.—For the Scab: Soak the "seed" potatoes or tubers for two hours in a solution of formalin (8 oz. in. in 15 gals. of water).

For Blight and Beetles: First spraying: Paris green as soon as the beetles appear (one pound to 100 gallons of water).

Second spraying: Bordeaux mixture and Paris green when plants are six inches high.

Third and fourth sprayings: Bordeaux mixture at intervals of 10 to 15 days, if necessary.

Spraying with Bordeaux mixture will prevent the blighting of the plants and the rotting of the tubers.

RASPBERRY.

Anthraxose, Leaf-Blight and Saw-fly Larvae.—First spraying: Bordeaux mixture and Paris green just before growth begins.

Second spraying: Bordeaux mixture and Paris green about when first blossoms open.

Third spraying: Bordeaux mixture when the fruit is gathered.

CURRANT AND GOOSEBERRY.

For Worms and Mildew.—First spraying: Potassium sulphide or Bordeaux mixture and Paris green before the buds expand.

Second spraying: The same 10 to 15 days later.

For worms alone, hellebore or Paris green will be effective.

For Currant Plant Lice.—Spray with kerosene emulsion or whale-oil soap solutions as

soon as lice appear ; or dust carefully with ne wood ashes.

CELERY.

Leaf Blight.—First spraying : Bordeaux mixture (Formula 1) while in the seed bed.

Second spraying : Bordeaux mixture a week after transplanting.

PEAS.

Pea-weevil or Pea " bug."—Fumigate the peas as soon as threshed in tight bins, boxes or oil barrels, by placing carbon bisulphide in shallow pans on top of the peas, and covering the whole tightly for 36 hours. Use 1 lb. for 100 bushels ; 1 oz. for 100 lbs. of peas ; and a tablespoonful to every cubic foot. The same treatment may be used to kill weevils in grain and in meal. As this gas is explosive great care should be taken not to bring a light near it until it has been ventilated.

MISCELLANEOUS.

Cow Horn Fly.—Apply with a brush on the parts most usually attacked a mixture of one quart of seal or fish-oil and one tablespoonful of carbolic acid.

Mustard.—Spray just before the plants come into bloom, on a calm day. Use formula 3, and an ordinary barrel spray pump. A barrel of solution is enough for an acre.

Buffalo Carpet Beetle and Black Carpet Beetle.—Take up infested carpets and spray with benzine : fill cracks in floor with putty or plaster paris ; lay pieces of red flannel in closets as traps, which should be examined every week.

Red Ants.—Attract to a sponge filled with sugared water, and kill the collected ants by dropping them into boiling water. Repeat.

Rose Slugs.—Apply hellebore before buds open, and at intervals of a week or ten days.

Thrip, or Leaf-Hopper, on Rose or Virginia Creeper.—Use tobacco solution ; whole-oil soap solution (1 teaspoonful in 2 quarts of water).

Red Spider.—Spray or spray with cold water, or tobacco water.

TABLE OF FERTILIZERS FOR THE GARDENER.

Given Before the Hamilton Horticultural Society by Mr. F. T. Shutt, Chemist Experimental Farm, Ottawa.

ROSES AND FLOWERING PLANTS.
(Out of Doors).

Ground bone 4 parts.
Sulphate of potash 1 part.

Well worked into the soil at the rate of, say, 4 lbs. per square rod. If leaves are yellow, apply nitrate of soda, one-third to two-thirds lbs. per square rod, as top dressing.

POTTING SOIL AND FOR USE IN FRAMES, GREENHOUSES, ETC.

For potting soil (house plants, etc.), $\frac{3}{4}$ lbs. to 1 $\frac{1}{2}$ lbs. of above mixture of ground bone and sulphate of potash, thoroughly incorporated

with every 100 lbs. of soil. (N. B.—It is better to commence with the smaller application and subsequently enrich, if necessary). If growth lacks vigor, nitrogen can be applied as nitrate of soda to the pots. This is most easily done by making a solution of 1 oz. nitrate of soda to 1 gallon water. Two ounces, once every fortnight or three weeks, per 6-inch pot, will be sufficient.

For soil in greenhouses, 2 lbs. of above mixture of ground bone and sulphate of potash for 100 square feet. If growth is not vigorous, follow with nitrate of soda 1 lb., sulphate of potash 1 lb., per 100 square feet.

Instead of the foregoing formula, the following may be used for hothouse work, for frames and vegetable growing:

Nitrate of soda	$\frac{1}{2}$ lb.	} Per 100 square feet of surface.
Superphosphate of lime	1 lb.	
Ground bone	1 lb.	
Muriate of potash	$\frac{1}{2}$ lb.	

N. B.—To facilitate the distribution, mix with 4 to 5 times its volume of dry earth.

After growth has commenced, nitrate of soda at the rate of 4 oz. per 100 square feet may be applied—and repeated, if necessary, every second or third week during growth.

Note.—If rich garden loam, reinforced with well rotted manure, is used, there is no occasion usually to apply fertilizers.

LIQUID FERTILIZERS FOR HOUSE PLANTS, VEGETABLES, ETC.

Nitrate of soda	3 parts.
Sulphate of potash	1 part.
Phosphate of soda	1 part.

Dissolve in water at the rate of 1 oz. to 1 gallon, and apply once every fortnight or three weeks at the rate of 1 to 2 fluid ounces per pot. If soil is very rich in organic matter (i. e., rotted manure), and plants run to foliage, omit the nitrate of soda from above formula.

STRAWBERRY AND SMALL FRUITS, ALSO USEFUL FOR GENERAL GARDEN CROPS.

A—Ground bone	1 part	500 lbs.
Superphosphate	1 part	800 lbs. per
Muriate of potash	1 part	acre.

For Strawberries—Top dress with 100 lbs. of nitrate of soda per acre after blossoming.

In place of "A," the following may be substituted, and is frequently better by reason of its larger percentage of soluble acid.

B—Ground bone	1 $\frac{1}{2}$ parts.
Superphosphate of lime	1 $\frac{1}{2}$ parts.
Muriate of potash	1 part.

Apply at the rate of 500 lbs. to 800 lbs. per acre, and follow with nitrate of soda, as already indicated.

LAWNS.

Preparation of the soil is most important. Before seeding, work into the soil :

Ground bone	5 parts.
Muriate of potash	1 part.

At the rate of 5 lbs. per square rod. Top dress with muriate of potash at the rate of $\frac{1}{2}$ lb. per square rod 2 or 3 times during the season.

ORCHARD MEETINGS CONDUCTED BY DOMINION FRUIT INSPECTORS.

THE FRUIT DIVISION of the Dominion Department of Agriculture is co-operating with the Provincial Departments of Agriculture in the holding of practical orchard meetings to demonstrate such subjects as pruning, grafting and spraying. In Ontario, these meetings have been held under the auspices of the Farmers' Institutes. Messrs. McNeill, Lick and Carey, Dominion Fruit Inspectors, each accompanied a delegation of speakers at a series of meetings lasting about three weeks. These were held in the orchards and, as stated, consisted chiefly of practical demonstration in orchard management. The farmers, who attended in goodly numbers, also took part freely in the discussions which ensued; these were usually continued at evening meetings held in a local hall. In many cases local fruit growers' associations were formed with the object of meeting regularly during the season and carrying on similar work amongst themselves.

A series of orchard meetings has just been arranged for certain counties in Quebec. The Quebec Department of Agriculture will co-operate with this department, and furnish a speaker on the delegation. The representatives of the Dominion Fruit Division are Inspectors Scriver and Dery, of Hemmingford and Montreal respectively. These meetings begin on the 20th of April and will last nearly the end of May. A similar series has been organized in conjunction with the New Brunswick Department of Agriculture, extending through the same period. At these meetings, Inspector McNeill of Walkerville, Ont., and Inspector Vroon of Middleton, N. S., will be the speakers representing the Dominion Department of Agriculture.

A NEW AND VALUABLE RASPBERRY.

R. B. Whyte, a director of the Ontario Fruit Growers' Association, some time since developed a raspberry which has been spoken of most highly by those who have tested its quality. The origin of the raspberry was peculiar. Some years ago Mr. Whyte kept chickens, and amongst other refuse given them was some raspberries. Finding that his chickens inter-

ferred with garden work, he killed them off and pulled down the hen house. Where the hen house had stood there grew thirty raspberry vines, started from the seeds in the berries which had been thrown to the chickens. These were such hardy, vigorous plants that the owner transplanted them and kept them well cultivated. Of the thirty vines one of them, the Herbert, by name, proved of special value, and this was kept, whilst the rest were destroyed. This was the origin of the new raspberry which Mr. Whyte has recently sold to a nursery for \$450.

THE WORLD'S FAIR AT ST. LOUIS.

According to press notices of the World's Fair, St. Louis, sent out by Mr. F. W. Taylor, there will be twice the space devoted to fruit at St. Louis that has been given it at any previous World's Fair. All states, societies and individuals are urged to begin at once to make preparations for an exhibit that shall surpass anything ever yet attempted. We trust that Canada will be creditably represented.

THE AMERICAN PARK and Out Door Art Association will this year hold its annual convention in Buffalo, N. Y., on July 7-9. One day will be spent in the beautiful park reservations about Niagara Falls. Special Sessions will be devoted to School Gardens and Park Interests.

THE INDUSTRIAL FAIR will this year be made a Dominion exhibition, and will no doubt be the best fair ever held in Canada. With the new main building completed, and the other buildings renovated; and with the prospect of a liberal grant from the Dominion and of special grants from the Province of Ontario, there is no reason why it should not surpass the most sanguine expectations. The Experimental Station exhibit of fruits will attract more attention than ever because of the great number of new varieties of fruits now in bearing, concerning which planters will want information before purchasing.

Open Letters

AUSTRALIAN APPLES.

An important factor in the future of our long keeping varieties of apples, like the Baldwin and Ben Davis, is the shipments of Tasmania and Australian apples. These shipments have been increasing from year to year, and the New York Fruit Trade Journal has received definite advices of shipments amounting during the season of 1902 to 307,400 (Denis & Sons makes the shipment 415,000) cases to London and Liverpool. The first of these shipments

will reach London about March 30th, and there will be regular arrivals until June 15th, when the season closes.

Ottawa.

A. McNEILL.

EXPRESS COMPANY FAVORS BRITISH COLUMBIA.

Sir.—I enclose you clipping from our local paper, for your own information or use, if you please.

By the February number of Horticulturist.

page 52, Mr. Smith practically states that plums cannot now be shipped to Northwest owing to lack of favorable rates and conditions. Yet, as you will see by the clipping enclosed, the express company can, and have done so in the past, make both favorable rates and conditions for B. C. shippers, from the coast to Winnipeg, a greater distance than from Ontario fruit points to the prairie capital, and even on such perishable fruits as strawberries. Plums in large quantities are shipped (California style packages), and arrive in splendid condition.

Last season a friend sent me by express a case (Wilson) of pears from Beamsville, just as a test of keeping qualities of Bartlett. About three-fourths proved to be in perfect condition. The balance were quite soft. The square apartments in the drawers were not suitable for the larger pears. Wrapped in paper, in boxes, pears should carry safely to any Northwest point. Yours truly,

A. W. FINBOW.

(From Daily News-Advertiser, Vancouver, B.C.)

If plans now pending between the fruit growers of British Columbia and the officials of the Dominion Express Company are completed, three times as much fruit will be shipped this year from Vancouver to Winnipeg as was ever the case in any previous year.

Inspector Kirby, of the Dominion Express Company, this morning announced that his company is prepared to run a daily car all summer especially for the fruit export of the province. This will be attached to the through express, and will make a three-day trip to Winnipeg.

Last year cars of the pattern that will be used this season every day were operated many times during the season. No regular schedule was arranged, but the car was run only whenever sufficient business offered to make it worth while. The car has special ventilators, and has every convenience for the transportation of fruit in the best and most practicable manner.

"This car will be run every day after June 1," said Mr. Kirby. "The strawberry crop will be the first handled, and then the other fruits as they ripen. We will give the best possible service to Winnipeg, and at rates that should meet all the requirements of the growers. A meeting of the local association will be held in Victoria on March 4, and by that time we will be able to announce a tariff."

PLUMS ON THE WILD PLUM STOCK.

Some time ago the question was asked, How will plums grow on the wild or Chickasaw stock?

We have about four hundred grafted or budded on the wild stock. They are quite vigorous, and regular annual bearers of heavy crops. In fact, most of our best show plums are gathered from these trees. They should, however, be grafted or budded very low down, otherwise the more vigorous growing varieties for a time would outgrow the stock. But when they get into bearing the top will not grow so fast and

the stock seems to catch up. Where only a few trees are wanted a good way is to take sucker roots about half to three-quarters inch in diameter, plant in nursery row for one year, then cut off low to the ground and graft with the required varieties. They will make trees wonderfully fast, and are as easily grown as potatoes.

J. G. MITCHELL,

Georgian Bay Experimental Station.
Clarksburg, Ont.

MR. T. H. RACE AT KINCARDINE.

Sir: We had a treat last week, consisting of two addresses on the following subjects (by Mr. T. H. Race, of Mitchell, one of the best amateur rose culturists of Ontario), viz., Bulb and Rose Culture, and Their Influence Upon the Home.

The subject of bulb culture was treated on to the students of the various schools in our town in the Town Hall, beginning at 4.15 p.m. and was listened to with a great deal of interest, and no doubt there was implanted on the minds of many the seeds of knowledge that will lead to the beautifying and adornment of homes in the future.

In the evening Mr. Race lectured to an appreciative audience in a fairly filled hall. It being St. Patrick's day in the evening, the Methodists had a social for the benefit of their church, and so many were prevented from hearing the refining lecture, but when we know that about 150 students in the afternoon and about 300 grown up people in the evening listened with marked attention to such an experienced amateur, the refining influence will be widespread.

Mr. Race contends that the culture of flowers and plants gives an interest to the young and makes home attractive, and also that "love of country" is only seen in and by a home-loving people.

The Culture and Care of Roses was very interesting, and many took notes.

The speaker said that rose bushes for outside planting should be about two years old and be planted in rows 5 feet apart and 3 feet apart in the rows, and when sufficiently grown to bend one cane of each bush and tip it near the root of the next and train this so that the shoots rising therefrom will form the flowering stems.

To destroy the thrip he has found nothing equal to hen manure put beneath the plants, the ammonia from same proving certain death to this pest of the rose bush, and that soap suds sprinkled over and under the leaves also kill the thrip.

We spoke very highly of the usefulness of the toad in the garden, particularly in destroying ants, which are so troublesome in many gardens. He places a toad under a box set close to an ant hill, and so quickly does master toad catch them that very soon not an ant can be found. The prejudice against toads should be taught to be wrong and every means taken to preserve them.

All who listened seemed pleased, and a crowded hall is sure to greet Mr. Race should he ever speak again in Kincardine.

WM. WELSH,
President K. H. S.

Kincardine, March 24, 1903.

FRUIT PROSPECTS AT WHITBY.

Sir: As we have nearly finished pruning our orchard, we have a good opportunity of examining the buds, wood growth, etc., of the different varieties we are experimenting with. We find no frozen or injured buds on any of our apple trees; but some of the pears that were very heavily laden last year are not as perfect as usual, notably Dr. Reeder, Fred. Baudry, President Drouard, Doyenne d'Été, and some others, while Clapp's Favorite, Bartlett, Dempsey, Lawrence and W. Nelis are pretty well filled with perfect buds. Kieffer Angouleme, Louise Bonne, Ester Buerre, Clairgeau, Tyson, Jules Guyott, Lucrative, and some of the newer sorts, as Rutter, Koonce, Wilder, Lawson, etc., were never in better showing at this season. Should the spring be favorable I have hopes of a heavy crop of pears. The month of March, so far, has been so fine and springlike, that the buds are swelling already, which is at least two weeks earlier than last year. Although the frost is all out of the ground, the land is too soft to drive over. We have two sprayers all ready to operate as soon as the land is solid enough. Owing to so much rain at spraying time last year, our spraying was not done in time, and we suffered the consequence in having too many scabby apples. The prices of apples has ruled very low from the start last fall, and is still low for anything but No. 1 stock, and this is only about half the price they were at this date last year. I hope the committee appointed at our last annual meeting on transportation will accomplish some good work before we have another fruit crop to handle, as the present and past rates charged are simply prohibitive between here and the eastern markets. It is absurd that the railway companies should charge more for 100 lbs. of pears than for the same weight of apples. When the freight and commission is taken from the selling price there is often a loss, when the packages are counted in, and I hope that the carrying rates will be so adjusted that we will not be asked to pay more from here to Montreal than the fruit men of California do for the same kind of goods and packages and fruit. There is another grievance that ought to be remedied, that is the supplying of cars on the G. T. R., which was very badly done last year: several car loads of apples, which were packed and delivered on their platform, lay there for weeks and were frozen, so that they were simply dumped on the commons and left to rot, although the railway company were requested for cars weeks ahead. These losses should be remedied, and the railway company should be made to feel that others have rights as well as themselves.

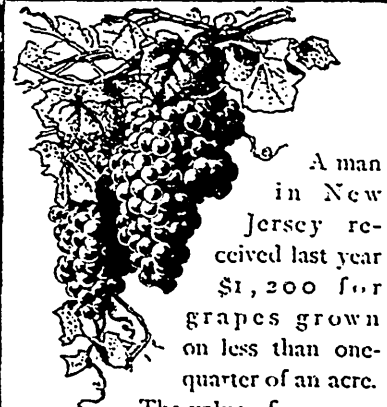
Subscribers here speak appreciatingly of the improvement of the Horticulturist, and hope its success will continue. Yours respectfully,

Whitby.

R. L. HUGGARD.

CLEMATIS FAILING.

Sir,—I have planted Jockmanii, Henryii, and other varieties of Clematis for three years in succession to shade a verandah having an easterly frontage, close to Lake Ontario. They are carefully planted, and do well until they commence to bloom, then something happens to them, the blooms droop; and the plant gradually dies. Out of the five Clematis planted last spring, only one survived the summer. I have found "cut worms" about the roots of some that have been destroyed, but could find none in this instance. Clematis on verandahs having a north and southerly exposure have always done well.



A man
in New
Jersey re-
ceived last year
\$1,200 for
grapes grown
on less than one-
quarter of an acre.

The value of
NITRATE OF SODA
in increasing the quantity and quality
of grapes is explained in a paper by
Prof. PAUL H. WAGNER,
copies of which will be sent free.
WILLIAM S. MYERS, Director,
12 John Street, New York.

New Catalogue for 1903 just out.
Send for it.

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Prices reasonable. Quotations cheerfully given on application.