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FIG. 233. *BEGONIODEA GUERRA*.

THE CANADIAN HORTICULTURIST

JULY, 1902

VOLUME XXV



NUMBER 7

BOUGANVILLEA GLABRA

VAR. SANDERANA

BY

A. ALEXANDER

PRESIDENT HAMILTON HORTICULTURAL SOCIETY

THIS plant, which is shown as the frontispiece to our magazine this month, is creating quite a large amount of interest among flower dealers in many parts of our country because of the ease with which it is cultivated, its great beauty and long period of blooming, as well as its lasting qualities when cut for table decoration.

When given liberty, by being planted out in the bed of a conservatory, it will grow to a length of twenty feet or more if desired, and be covered with its beautiful masses of rosy red bracts for at least six months of the year. The plant from which the photograph was taken began to bloom last November, and is still covered with masses of bloom. So persistent is it in flowering that the stumps, left in cutting the graceful wreaths of blossoms, break out afresh, and are soon a rosy mass.

It makes a fine pot-plant also, and a very small one will bloom for a long time, and on this account it is beginning to figure largely among our Easter plants.

It is named after Bouganville, a celebrated French navigator who flourished at the latter part of the 18th and beginning of the 19th centuries. It is common in the forests Brazil and Argentina, as well as some parts Southern Europe, where it is used to cover the fronts of cottages.

It is easily propagated by cuttings in sand.

The plant referred to above is trained to the centre pillar of the conservatory, then right and left to the beam 15 feet in one direction and 12 in the other, and from these two arms hang down hundreds of slender twigs covered with beautiful dark glossy leaves and multitudes of flowers. I know of no insect enemy infesting it, which is much in its favor. It is altogether a most desirable addition to make to a greenhouse or conservatory, especially if it can be planted in a bed. It is not at all particular about what soil it grows in, and it is no uncommon thing for me to have to cut canes of nearly 10 feet coming from the root in very sandy soil.

Notes and Comments

SMALL SIZED FRUIT FARMS

WE are more and more convinced that many of our Ontario fruit farms are too large for the best results. How often do we read of the immense crops of strawberries taken from a small garden, where every inch of ground received the best of cultivation and was enriched in the highest degree. Eight thousand quarts to the acre are seldom harvested in field culture, but frequently the small plot oversteps this exceedingly remunerative yield; and we say, how is it that we get 2,000 quarts of berries from the quarter acre garden, and sometimes only same quantity from a whole acre under field culture?

On the 10th ultimo we visited a fruit grower who had only one acre and a half of ground, and nearly the half acre was occupied with house yard, wood shed and barn. The rest was given intensive cultivation, mostly by hand. It was planted with peach, cherry and plum trees, with currants, raspberries and strawberries between the rows and under the trees. In 1901, a year when some of the large fruit farms barely paid expenses, he sold about three hundred dollars worth of fruit off his small garden, besides having abundance for his own table. All this he had done, without losing much time at the nursery at which he was employed. This man had been in Canada some years cultivating a fifty acre farm, which he found too hard work for his advanced years. He is greatly pleased with the change in his life, and says "I actually take in just about as much cash off my garden as I did off my farm."

Now this might not be the result in every

case. Some men are born gardeners, and succeed at the business, while others would sadly fail. Besides conditions count, and our friend is situated along one of those electric trolley lines which gather up the fruit at his door, and carry it to the city; and he is saved all expense of teaming his fruit.

Of course it is impossible for the 100 acre man to get such results from fruit growing, else he would soon be a millionaire. Usually if he gets a gross average of \$40 per acre, year after year, he is counted to be doing very well, for he has off years when crops fail, or gluts in the markets which stagger him, and prove that to succeed it is *quality* and not always *quantity* that counts.

CANKER WORM

THREE ounces of Paris Green to 40 gallons of water, as recommended on page 214, we find is not effective in killing this worm. Trees so sprayed were still full of them and hung down by threads almost as numerous as ever; so we doubled the dose, with eight pounds of lime to the barrel, and this worked like a charm.

THE PLUM CURCULIO

"THE plum curculio," says Mr. M. Pettit of Winona, "is my most persistent enemy, and I am anxious to spray it just at the time when the poison will do the most good. I have been advised," said he, "to wait until the blossom has fallen, and that there was no use treating the plum trees until the young plum was exposed." In our opinion this advice was bad. The young and tender foliage of the plum tree cannot be poisoned too early, for the little Turk

enjoys a bite from a tender leaf before oviposition, and if you can destroy the mother, you destroy her offspring. So we advise spraying for plum curculio much earlier than is usual.

"Well," said Mr. Pettit, "I believe you are right, for I waited for the fall of the blossom of my Washington plums, as advised on very good authority, that of a horticultural expert, an entomologist indeed, and by that time I found there was scarce one of those plums that was not stung." Now science and practice should agree; but unless the student is a practical observer, his theories often fail, and the theorist should work out his plans in an orchard and not always in a laboratory.

THE BORER

THE borer should be guarded against this month, if indeed he has not already done much injury. The flatheaded borer often completely girdles a tree, although worst on weak growing apple trees. To promote a vigorous wood growth is therefore a most effectual method of treatment. Indeed it is the neglected orchard in which we find these pests thriving, just as lice thrive on neglected chickens, and fleas on poorly kept dogs. But when once the borer is in the orchard he must be routed even if stern measures are necessary; and the knife must cut out and destroy the flatheaded larvae. Some plum trees (*Domestica*) at Maplehurst, are badly affected, and must first be cut to remove the larva and then washed with whale oil soap and washing soda (dissolved) as a protection from its further attacks.

THE EXPORT OF TENDER FRUITS

SOME Winona fruit growers are anxious to join in the export of early apples, pears and peaches, to Great Britain, in cold storage. Mr. Pettit says he has already had some correspondence with Mr. Alex. McNeill, Department of Agriculture,

Ottawa, into whose hands the superintendence of this work will fall during the present season, and who says it is his intention to encourage this trade.

BEST TOOLS FOR THE ORCHARD

THE best tools for orchard cultivation are no doubt the cheapest, and it is always a waste of money to work with a poor one. In our vineyards and orchards the hoe and the spade well sharpened were at one time indispensable; but, since the introduction of the grape hoe, the horses can do nearly all the work, and leave very little hand work. This enables the orchardist to cover a large area with comparatively little outlay for hired help, a most important item when waiting for an orchard to reach bearing

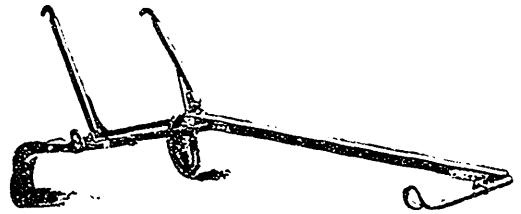


FIG. 2354. GRAPE HOE.

age. The grape hoe is drawn by one horse and easily guided so as to clear the ground closely about the rows of trees and vines. Another most useful implement introduced only of last years is the disc harrow, by means of which land, having once been plowed or which is not too hard, may be quickly worked up for any purpose. Those provided with an extension head, as shown in the illustration, will be still more useful than the discs made for ordinary agricultural work. "The disc harrow," says Van Deman, in *Green's Fruit Grower*, "is used more generally and with better effects in orchards than any other implement. Plows dig too deep, disturbing the roots, and are not used in orchards as formerly, except to

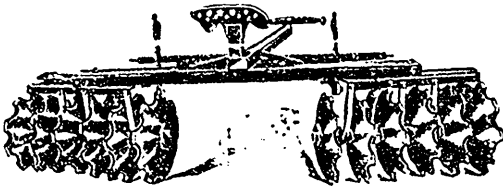


FIG. 2335. DISC HARROW.

turn sod on crops grown as fertilizers. The disc harrow goes over the ground much more rapidly than the plow, and does the work of plowing and harrowing at the same time. It is not desirable to cultivate deeply in the orchard, vineyard or berry field; in fact, it is injurious. One great object in cultivating an orchard or any kind of fruit plants, trees or vines, is to preserve continually two or three inches of loose soil over the entire surface, which acts as mulch, holding moisture in the soil and preventing evaporation. This cover of loose soil over the earth produces the same result as though the surface were covered with layers of straw. All you need to do is to move this soil with a disc harrow, or occasionally with an Acme harrow, at least once in two weeks, or once after each rain. Disc harrows are made to be adjusted so as to run at one side of the team, running closely to the rows of trees or other objects, without crowding the team or whippetrees onto the row. Every fruit grower or farmer must have a sharp tooth harrow. These are similar to the old style of harrow, excepting that the frames are of iron, and that they are made to cover a wider surface. No one should be satisfied without the best plow made, and it should never be used without a good sharp point. There are numerous one-horse cultivators made in various styles, and constructed so that by changing the teeth or other parts, one cultivator can be made to do many kinds of work, throwing the dirt towards the plant or away from it."

DESTROY THE FALLEN FRUIT

ALTHOUGH spraying for insect pests is a most important means of destroying them, success is not attained without the employment of every means available. Wormy fruit, allowed to remain as it usually does in great quantities under the tree, forms just so many feeding places for young larvæ of codling moth and curculio, which soon develop into native insects, ready to fly and sting other fruits and cause them to drop also.

Poultry, pigs and sheep will all help in the destruction of the infested fruit with its worm inhabitant, but, if these friendly animals are not at hand, it would pay to gather up the fallen fruit and destroy it. Brazelton in *Western Fruit Grower* speaks very decidedly of the excellent results attained by attention of this kind. He says:—

"After an experiment covering the past three years of picking up and disposing in some way of fallen fruit in our orchards, we find that our fruit becomes better and better each year, and our faith in spraying as the sole preventive of insect and fungus pests considerably lessened. Yet we do not decry spraying, but on the contrary we most heartily believe in it, and practise it. As a result of our observations, however, we are more and more of the opinion that, where both spraying and removing the fallen fruit are thoroughly done, that the latter is of very nearly as much benefit as the former. We believe that all such stuff should be hauled away to some creek, or other body of water, until the fruit attains sufficient size to be merchantable, after which the receipts from sales will about cover the cost picking up and disposing of it. We figure that, if the returns from sales balance the expenses, we realize a good profit in the increased quality of our No. 1 fruit. Spraying alone will not do, but every way of destroying the insects and fungi that is prac-

tical should be employed. We intend to try banding the trees in the future, and have no doubt that this will prove beneficial. If those who pick their apples and pile them on the ground in the orchard, will cover the piles with burlap, or any other old cloth, they will be astonished to see the number of worms that will collect on the under side of the cloth. Thousands of worms could be destroyed by dipping these rags in boiling water every few days. These worms will also be found in considerable numbers around the hoops and between the staves of barrels in which apples have been stored for the winter, and they can also be destroyed with boiling water. As evidence that this work pays we submit the fact that our fruit always sells at a premium this year of from 50 to 65 cents per barrel, and the proportion of firsts to seconds and culls is greater than it used to be."

GATHERING PLUMS

PROF. WAUGH, of Burlington, Vt., gives the following pointers under this head. Plums which are used for jelly should be picked as soon as they begin to color, and long before they are mature. Those which are picked for canning should be taken in the early stages of maturity, while those which are destined for dessert or table use should be allowed to become dead ripe before they are removed from the trees. Plums for shipment to market must be picked about as soon as they are well colored, some varieties even earlier. They must be taken from the trees before they show any tendency to soften. Many varieties, particularly of the Japanese group, will bear earlier picking and will ripen up well in the fruit packages in which they are shipped to market.

MARKETING

VARIETIES of plums which crack badly, or become soft in ripening, are not suitable for market, especially when long

shipments are to be made. The best prices for plums are usually realized late in the season, since this fruit is used chiefly for canning, and since housewives prefer to do the canning as late as possible, after hot weather is passed.

QUANTITY OF FERTILIZER FOR EACH TREE

MAYNARD, of Massachusetts, gives three formulas for the treatment of apple orchards on land that cannot be cultivated and the amount of fertilizer to be applied upon the growth of the trees. Of course such trees, standing on sod, would need more fertilizing material than they would require if the land were cultivated. The following shows the amounts per tree grown in sod:

- (No. 1) 1 lb. to 5 lbs, Nitrate of Soda.
- 1 " " " Sulphate of Potash.
- 2 " " 10 " Acid Phosphate.
- (No. 2) 1 " " 5 " Nitrate of Soda.
- 10 " " 25 " Good hard wood ashes.

(No. 3) Stable manure, 5 to 20 large forkfuls, apples in fall or winter, and the same amount of potash and phosphoric acid, or wood ashes as in formulas No. 1 and 2. Orchards that are making less than from six to ten inches of new wood each year, are in no condition to bear fruit that will be satisfactory in respect to either quantity or quality; yet it is evident that more than half of our apple orchards are lacking in vitality as a result of neglect.

THE CHERRY HARVEST

THE cherry harvest is now becoming important in some sections in the Provinces. In that portion bordering on the south shore of Lake Ontario, and the north shore of Lake Erie, and indeed nearly all the east shore of Lake Huron, the more tender varieties of the sweet cherry class seem to be worthy of a place in a commer-

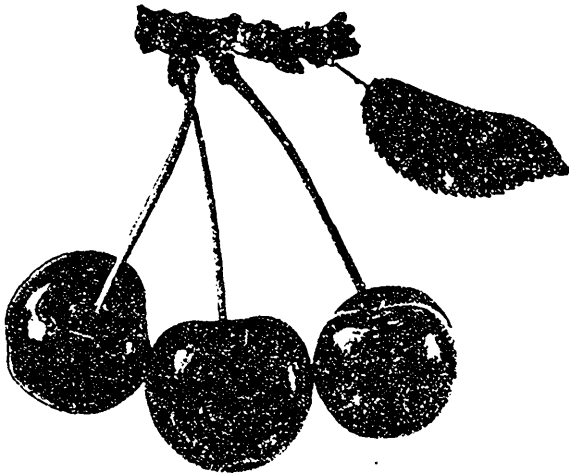


FIG. 2339. EARLY PURPLE

cial way, but even in these sections a frost at the end of May or beginning of June is often fatal to the crop.

The earliest cherry of this class is the Early Purple, which occasionally gives a full crop at highest prices, though a cherry of only medium size and ordinary quality. Some old trees have made a good record for productiveness, and made the owner a fine return, but as a rule the birds take a good share of the crop, and, if gathered before ripe enough to please the appetite of

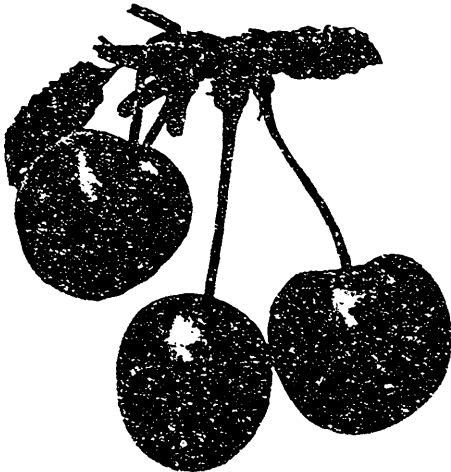


FIG. 2337. WINDSOR.

the birds, they are but skin and bones, and not deserving the name of Purple. In Eng-
land it is customary to protect valuable cherry trees from the birds by means of large nets, which are spread over the trees, a good suggestion for us if we want to succeed with certain varieties of oxhearts.

This netting is sold very reasonable, as we note in a recent issue of the Journal of

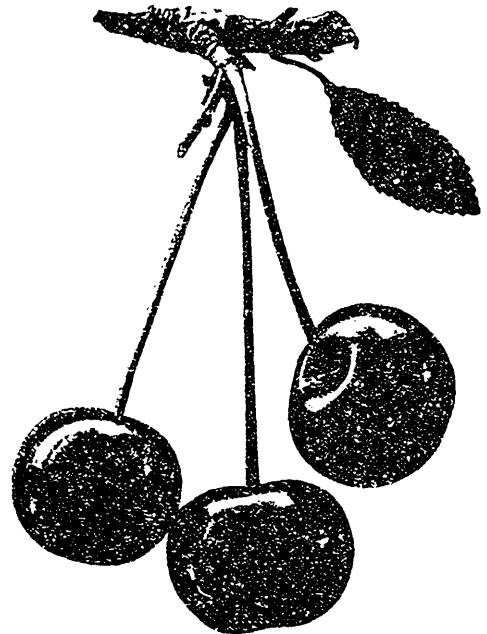


FIG. 2338. LATE DUKE.

Horticulture several such advertisements as the following :

Garden Netting.—Small mesh, keep out the smallest birds, oiled and dressed; will not rot if left out in all weathers. 105 yards by one yard wide, 72 cents; by two yards wide, \$1.44; by three yards wide, \$2.16, and so on to any width. G. H. Netting Works. Rye.

Edge, of Maryland, says:—

"For protecting cherries from the birds I bought a lot of damaged mosquito netting, and sewed it into a piece six yards square. This I put over an Early Richmond tree and drew it together at the bottom. The sun shines through, but the birds are kept out. It stays on only a few days while the cherries are ripening, and is then taken off and laid away for another year."

In our commercial orchards, however, we will find it best to plant those which are

not subject to the attack of the birds, as for example the Bigarreau class, which have a flesh too firm for their beaks. Without attempting to make reference to the other desirable varieties of sweet cherries, we show two of our latest market kinds, the Elkhorn and the Windsor. This latter has been introduced with a great flourish, and since it is of Canadian origin, we hope it may prove the best of its class. We have planted a few hundred trees, being so well pleased with the first samples borne in our experimental plot; but a few years' experience may be needed to determine whether it, or the Elkhorn, is the more valuable for main crop. The latter has been grown for forty years at Maplehurst, and often bears a prodigious crop of fine dark fruit. Both ripen about the middle of July when other varieties are out of the market, and consequently bring good prices. Both are subject to rot in wet seasons, but possibly we can control this by treatment with copper sulphate.

The English Morello is the best late sour cherry. It is a famous cropper, dark in

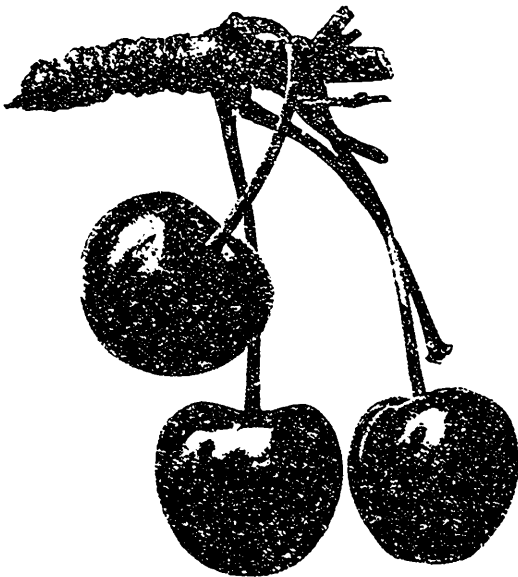


FIG. 2330. ELKHORN.

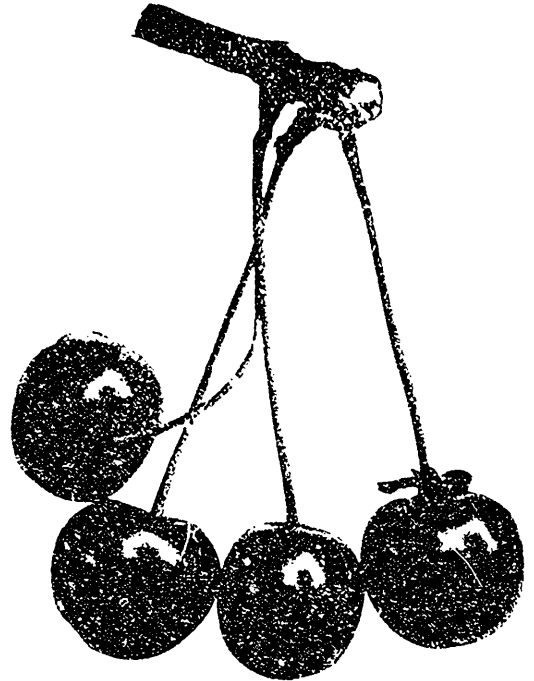


FIG. 2340. ENGLISH MORELLO.

color, and will hang long after it is ripe. In the Western States it has been sold under the name of Wragg, and no doubt some nurserymen have been making money out of fruit growers by selling this old variety under a new name. We have them both side by side in our experimental plot, and can see no difference whatever.

Of cooking cherries none can compare with Dukes, a class of semi-sour, red cherries, that cannot be excelled for sauce and pies. The May Duke is a familiar example of this class, which is frequently ready for use the latter part

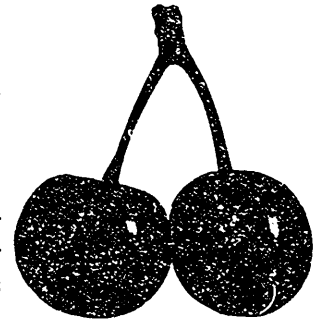


FIG. 2341.

of June. Among the others of the class, we have the Olive, a sparse bearer, and most

excellent in quality, and the Late Duke which considerably prolongs the season, though otherwise very similar to the well known May Duke.

MULCH FOR APPLE ORCHARDS

HITCHINGS, of Onondaga County, N. Y., is an ardent advocate of mulching for apples in preference to cultivation. Instead of ploughing his orchard he cuts the grass and places it about the trees. This he claims answers a double purpose; it saves the fruit from bruising when it drops, and it retains the moisture in the soil, and this latter is surely as good as a dust mulch made by cultivation, and much less expensive. He claims also that it is superior to Mr. Woodward's method of growing an orchard in sod, and keeping sheep in it to fertilize it, and eat up the fallen apples.

In a recent issue of the R. N. Y. Mr. Hitchings writes:—

Mr. Woodward gives an estimated gain of \$6 per acre in fertility and \$8 in pasturage. During the time his sheep were making this \$14 gain per acre eating fallen apples, I was picking up from the grass mulch the Astrachan, Oldenburg, Wealthy and Gravenstein, practically uninjured, and selling them for top prices. For these kinds of apples should be left on the trees as long as possible to be at their best. Those picked up brought at least \$200 per acre, pretty expensive sheep food. I think, furthermore, that the yield per tree was increased by leaving the apples until fully matured. I fight the Codling moth by spraying; have had no trouble with the apple maggot; am saved the expense of building fences to enclose the sheep, and can employ the time that would be spent in caring for the sheep in growing strawberries, which pay one much better.

My first experience in apple growing was watching the sheep to keep them from girdling some young trees set among the older ones. I came to the conclusion then that growing fruit trees and sheep were a poor combination, so first the sheep went, then the hogs, and then the cows, all but one, and I have never missed them, financially, out of all the stock put together. For a full-grown orchard where the roots have full possession of the soil, with trees headed high and strictly commercial varieties, Mr. Woodward's method is a right; but for a young orchard and a local market I differ with him. After all, whatever method is followed, the man at the helm is the deciding factor between success or failure.

MULCH FOR PEAR TREES

MR. E. C. BEMAN, of Newcastle, Ont., has for years practiced this treatment of his pear orchard, with excellent results. The accumulated cut grass of many years deeply covers the ground about the trees and protects the fallen pears from injury, and through gradual decay is furnishing fertility to the soil. Providing material is at hand in sufficient quantity no doubt mulching the ground under orchard trees is commendable, and in heavy clay soil much less laborious than constant cultivation.

THE ROXBURY RUSSET

THE Roxbury Russet has more value than it usually gets credit for. Only recently, May 20, 1902, this apple was worth \$4.00 a barrel in the markets, and no apple comes out of the cellar in such excellent condition in the month of May. The tree is spreading, reminding one of Greening, and in its appearance the fruit often resembles that old variety. Not usually on the list for planting, the Roxbury has been little considered, and yet no apple we grow may be counted upon to come out in the spring with a better showing. It has one fault, in that it is very subject to Codling moth.

MICHEL, THE FIRST EARLY STRAWBERRY

BY general consent the commercial growers of strawberries in Ontario, give this the first place for earliness. They plant Michel and Williams to cover the season, the latter for main crop. This season Michels were offered in Hamilton market about the 1st of June; they were grown in a specially favored location, but the crop generally was having its first picking between the 5th and the 9th; while as yet no other variety generally grown was showing a ripe berry.

This characteristic makes Michel a profit-

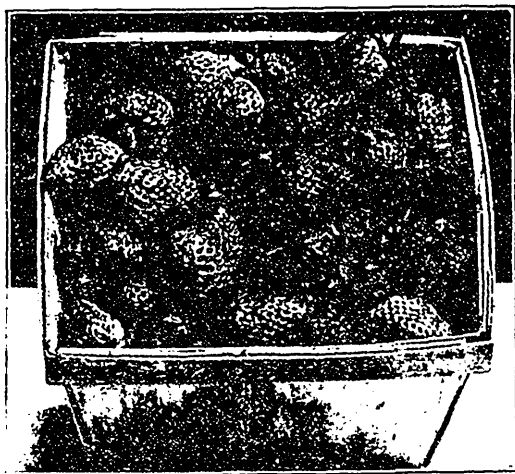


FIG. 2342. MICHEL.

able market berry. It often brings 10 to 12 cents a quart, while the late ones only bring 6 or 7; and when you count off three or four cents for packages, growing and picking, you have a net profit of say 7 cents a quart for Michel opposite 4 cents for Williams. It would require a big difference in yield to make the latter the more profitable. On some soils Michel does very poorly, giving a very light yield and, after the first picking, very small berries. It is by no means the "Lazy Man's Berry," but given proper soil, cultivation and manure, a good yield can be secured.

On the 10th ultimo we took a photograph of a box of Michel, which gives an idea of the berry just as it came from the patch. It was selling then at ten cents a box. Michel has a perfect blossom, and is thought to be a chance seedling from Crescent on the grounds of J. G. Michel, Judsonia, Ark. The berry is sweet in flavor and much valued as a table variety.

The Sunrise is being grown for first early berry, by some growers, in place of Michel;

and they say it is on the whole rather more productive than Michel, and if anything averaging a little larger. From the experience of others however we infer that this superiority is purely local. We shall be pleased to have the opinion of some of our readers.

A BOYS' INSTITUTE

THE Broadview Boys' Institute, under the management of C. J. Atkinson, affords invaluable opportunities to city boys who have a taste for country life. Here they are not only associated together as a kind of club, with opportunities of engaging in healthful sports, but they are privileged to have special courses of study fitting them for their life work. A most important adjunct is the practical work afforded to each boy, wherein his own individuality is allowed full play. The large garden is laid out in the form of a township, with farm for each boy, represented by a plot of ground twenty by forty feet in extent, for which he pays taxes by a certain number of hours' work a week in the general kitchen garden, otherwise all the proceeds of the garden are his own. The boy farmers elect their own reeve and councillors; inspectors are appointed who view the condition of the farms and report cases of neglect. Tenants convicted of neglect are ejected, and their farms leased to other boys.

A walk through the garden on the 10th of June was full of interest. Each farm was named, and some were kept with scrupulous care, while others showed evidences of neglect; but on the whole the interest in this part of the work on the part of the boys was most marked, and the training must be of the greatest benefit.



FIG. 2313. HUMBOLDT BLACKBERRY, ONE OF MR. BURBANK'S "NEW CREATIONS."

MEN WHO HAVE SUCCEEDED—IV

LUTHER BURBANK CONTINUED—HIS
WORK—A CHAPTER OF SUCCESS

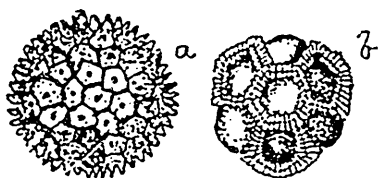
THE RESULTS attained by Luther Burbank have been so numerous and wonderful, that we must make special reference to some features of his work.

Methods.—Starting out with a theory contrary to the usual one of fixity of species, he held that the Universe is “eternally unstable in form, eternally immutable in substance. There is,” says he, “Not one weed or flower, wild or domesticated, which will not, sooner or later, respond liberally to good cultivation and persistent selection. What can be more delightful than to adopt the promising individual from among a race of vile, neglected weeds, down-trodden and despised by all; to see it gradually change its sprawling habits, its coarse, ill smelling foliage, its insignificant blossoms of dull color to an upright plant with handsome, glossy, fragrant leaves, blossoms of every hue, and with fragrance as pure and lasting as could be desired. Weeds are weeds because they are jostled, crowded, cropped and trampled upon, scorched by fierce heat, starved or, perhaps, suffering with cold, wet feet, tormented by insect pests or lack of nourishing foods and sunshine. Most of them have no opportunity for blossoming out in luxurious beauty and abundance. A few are so fixed in their habits that it is better to select an individual for adoption and improvement from a race which is more pliable. This stability of character cannot often be known except by careful trial, therefore members from several races at the same time may be selected with advantage; and the most pliable and

easily educated ones will soon make the fact manifest by showing a tendency to “break” or vary slightly, or perhaps profoundly, from the wild state. Any variation should be at once seized upon and numerous seedlings raised from this individual. In the next generation, one or several even more marked variations will be almost certain to appear, for when a plant once wakes up to the new influences brought to bear upon it, the road is opened for endless improvement in all directions, and the operator finds himself with a wealth of new forms which is almost discouraging to select from as, in the first place, it was to induce the plant to vary in the least.”

Cultivation and environment are, in Mr. Burbank's view, capable of producing wonderful changes in the common forms of plant life, and his first aim, in consistency with his theory, is to so treat the species to be improved that it will have extraordinary vigor stored up, which will sooner or later be manifest in its breaking away in some details from its usual characteristics. When this stage has been reached the greater possibilities are open by crossing with other species, in order to breed into the subject such traits as shall bring about the ideal fruit or flower. Nor has Mr. Burbank confined his operations to individuals of one genus to pollinate individuals of another, but he has succeeded in crossing plants belonging to entirely different genera, thus producing true hybrids.

Since Botany has become one of the school subjects, no one needs to be told how plants are pollinated by applying the pollen grains



(a) Morning Glory. (b) Black Oyster Plant.



(a) Hollyhock. (b) Passion Flower.

FIG. 2344. POLLEN GRAINS (HIGHLY MAGNIFIED).

of one flower to the pistils of another, either by natural or artificial means. These grains, so alike to the naked eye, reveal great difference under the microscope, as may be seen from our illustrations. Mr. Burbank gathers his pollen about a day in advance, and after drying it carefully, shakes it out on a watch crystal, until he gathers a sufficient quantity. Properly dried pollen he finds, retains its efficiency about a week.

Prof. Wickson in the *Sunset*, says:—

“The preparation of the blooms of the seed parent consists in removing about nine-tenths of the bloom buds when they begin to show the petal color, leaving, in the trees which bloom freely, about one in ten of the natural bloom to be operated upon. This is for convenience of operation and to avoid the setting of too many seeds for the tree to be properly perfect. Before the petals open, each of these buds is carefully cut into with a small sharp knife blade, in such a way that the petals and a part of the sepals and all the attached anthers are removed as the knife makes its circuit, leaving the pistils exposed but uninjured by the operation. The removal of the corolla balks the bees and other honey-seeking insects, either by the loss of color or by absence of a lighting

place, or both. The buzzing Archimedes finds no place for his lever and wearily goes his way, the honey unsipped and the pistil free from contact with its pollen-dusted body. Mr. Burbank finds it, in most cases, unnecessary to cover the emasculated bloom to avoid intrusion of undesirable pollen by insect agency.

He chooses for pollination the time when the first hum of the bees is heard in the trees. He finds all conditions at that time most favorable, and believes that the pistil is then in its most receptive state. The instrument of pollination is the finger tip. Applied to the dusted surface of the plate, either by a mere touch or a slight rubbing, enough pollen adheres. The finger tip is then quickly touched to the pistils of the prepared blossoms one after another. They welcome the pollen and the fructifying agency begins at once its journey to the ovule. No matter what comes now, on the wind or otherwise, the opportunity for outside pollen has passed. The touch of the finger has covered the stigma with the chosen element and sealed it safe from further intrusion. In his choice



FIG. 2345.

“The human hand enters directly for man's specific benefit.”



FIG. 2346. HYBRID PLUM, GOLDEN, AND ITS
MALE PARENT, ROBINSON
(both life size.)

of the unaided hand as the instrument of pollination, Mr. Burbank has not only vastly simplified and made more expeditious the act of pollination, but there is also involved a profound tribute to the superiority of the trained hand in directness and delicacy for what lies within its unaided scope. Recourse to instruments and appliances is often essential, but in many lines of human effort, the direct contact of the finger tip works.

The seed resulting from such pollination is of course gathered with greatest care, and from these seedlings are produced perhaps thousands, of which only an occasional one is selected as giving promise of value.

Results.—One object in view was to obtain varieties that would be more productive; and by mingling the native American

with Japanese plums, a new era in plum culture has been introduced. For example our illustration shows one of the new hybrids, the "Golden," a hybrid between the Robinson (American Chicasaw) and the Japanese Sweet Botan. (Fig. 2346).

An example of the successful crossing of different genera, usually thought impossible, is seen in the blackberry and raspberry crosses, some of which are likely to prove of value to the fruit grower, one of which is shown in Fig. 2343, a hybrid berry, grown from seed on improved California Dewberry, fertilized by the well known Cuthbert raspberry. Wonderful changes in color, flavor and aroma have been secured, as for example, the Bartlett plum, and Pine-apple quince; and still more surprising changes



FIG. 2347. VINE OF BOT. ANVILLEA.
(See Bot. Spec. C.)



FIG. 2348. ICEBERG, THE NEW WHITE BLACKBERRY.

in the natural structure of fruits, or in the case of the stoneless prunes, in which the kernel is fully developed but naked, having no hard substance between it and the pulp. Changes in the seasons of ripening and the production of varieties which show remarkable precocity of fruit bearing have also been brought about, as for example a chestnut which was in fruit at eighteen months from the sowing of the seed, the seedlings of which seem to possess similar precocity.

The new White Blackberry, the so-called paradox of the fruit world, which our Association distributed to its members this spring, is another example of the results of Mr. Burbank's success. Of this we give Mr. Burbank's own description, and hope soon to have its verification in all parts of our province.

"Owing to the somewhat unsatisfactory qualities of white blackberries so far known, the impression may have been entertained by some that no white blackberry

could be as productive and hardy, with berries as early, abundant, large, handsome and delicious, as the best black ones.

"The well-known Lawton is when ripened, unsurpassed, and very generally known as the most productive market berry. Owing to its fixity of race, it will reproduce itself from seed almost exactly, and its seedlings will not be influenced, when raised from seed pollinated by other varieties, but it steadily imparts its good qualities when employed as the staminate parent. One of the great grandparents of 'Iceberg' was Lawton. The first generation of seedlings when crossed with Crystal White, was all black; the second also, though varying much in other respects; but the third produced this wonderful plant bearing the snowiest white berries ever seen.

"Very little attention was paid to the long rows of cross-bred descendants, until one day this berry was discovered, among its black relatives, with the canes bending in various directions with their load of delicious, snowy berries, which are not only white but so transparent that the seeds, which are unusually small, may be seen in the berries when ripe.

"Clusters, larger than those of Lawton;



FIG. 2349. SHASTA DAISY.

berries, as near as could be judged, were at least as large, earlier, sweeter, and more tender and melting throughout, though as firm as Lawton is when ripe."

Nor is it alone in fruits that this success is apparent but in flowers also many surprises have been brought about, and more are in expectation. For example the new Clematis, a hybrid of *C. coccinea* and *C. crispa* is a beautiful production. It is a vigorous grower and produces flowers in abundance from June until frost, with a blending of colors and shadings not elsewhere found in the Clematis family.

Another and still more recent is the Shasta Daisy, which is very popular. It is a hardy plant, and blooms for several months; the flower is large, fully three inches in diameter, and has three or more rows of petals of remarkable whiteness. This plant is a cross between the weedy American species of *Chrysanthemum Leucanthemum* with the European and Japanese species, followed by a long period of rigid selection. Our engraving shows this Daisy reduced very much, with one of its insignificant looking parents in the background.

BURBANK'S "SHASTA DAISIES."

He took the little daisy
By the dusty roadside growing;
He touched it with his magic wand
And set its petals blowing.

From the dingy, ragged blossom,
(A weed of the weeds that grow)
He made a stately flower,
As white as the drifting snow.

No longer by the roadsides,
But in garden and mansion and hall,
It sheds its queenly beauty,
Admired and praised by all.

It crowds each great occasion,
To the fair bride lends its grace;
And its delicate purity softens
Even the dead, cold face.

O, matchless Wizard, a lesson,
We would learn of your patience and art,
Then we, too, may make flowers
From the weeds of the human heart.

Taking the weeds of inaction
That crowd in the dusty glooms,
By loving thoughts and words and deeds
Make character's snowy blooms.

Santa Rosa, June 21.

- *Press Democrat.*

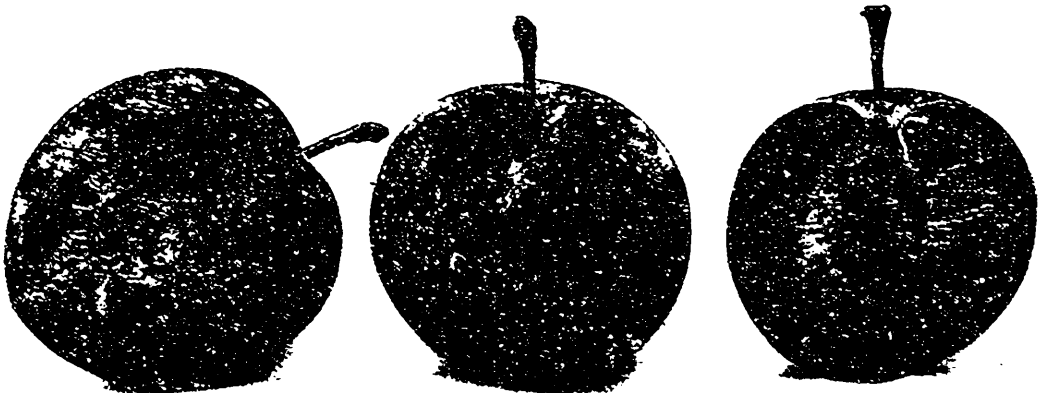


FIG. 2350. BURBANK PUM.

THE BURBANK PLUM

THE Japanese plums are proving of much wider adaption than was dreamed of on their first introduction. It was a surprise when a few years ago, they were proven to be hardy at the Central Experimental Farm, Ottawa, and still greater when the Burbank was found by Messrs. Hutt and Woolverton growing and producing fruit in quantity away up in St. Joseph Island, and even on the north

cribbed it in his report of that year, under the name of Burbank, in honor of the introducer.

Mr. Willard of Geneva, N. Y., was one of the first fruit growers to become convinced of the value of this plum for orchard planting, and stated before the Western New York Horticultural Society in 1894 that he had planted an orchard of 1500 trees, and knew of no plum that was more profitable,

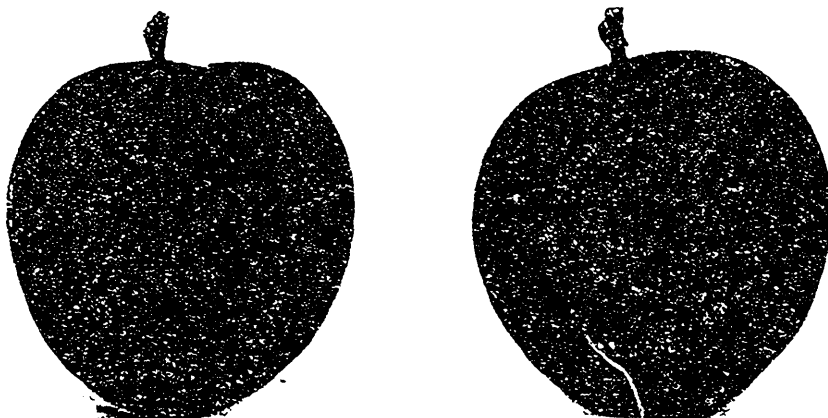


FIG. 2351. BURBANK PLUM.

shore of Georgian Bay, near the "Soo." Prof. Bailey finds an explanation of this hardiness in their Botanical relationship with our native American species, and notes herein another evidence that once there was a land connection between North-western America and Asia.

It was in 1885 that Mr. Burbank imported some plum trees from Japan and when they fruited he selected this as one of the best, and most worthy of propagation. In 1891 he sent samples to the Department of Agriculture at Washington, and Mr. H. E. Van Deman, Pomologist of the Department, des-

This plum has now been before us for about ten years and notwithstanding the great number of Japan varieties now sold by the nurserymen, none seem to hold a higher place for commercial purposes than the Burbank. Next to it in value comes the Abundance, which however is not a competitor, being nearly a fortnight earlier in season.

Compared with the *Domestica* class, the Japans are inferior in quality, but when fully ripened are fairly good eating. Like the Kieffer pear, the Burbank plum is making its reputation rather on quantity than quality.

DESCRIPTION.

Origin. Imported from Japan in 1885, by Luther Burbank of Santa Rosa, California, and introduced to the trade in 1890. Named after the introducer, by H. E. Van Deman.

Tree. Hardy; a very vigorous wayward grower, making a very badly shaped tree, unless severely headed back and kept within bounds; an early and most abundant bearer; the fruit needs thinning to secure a good size; class, *Prunus triflora*.

Fruit, two inches in diameter, nearly round, but slightly conical; skin, orange yellow ground, shaded with red, and almost purple on side exposed to the sun; very smooth, with a slight bloom; peels easily when ripe; suture traceable; apex a small point; stem half to five-eighths of an inch long, stout; cavity deep, abrupt, with leather crack marks.

Flesh. Color amber, texture juicy, tender when fully ripe; flavor sweet, fairly agreeable; stone, medium, pointed, cling.

Quality, good for cooking, fair for dessert.

Value, first-rate for market. **Season,** end of August. **Adaptation,** general.

The following notes on this plum have been given us by some prominent fruit growers:

G. E. Fisher, Freeman, Ont.:—"I have not a large number of trees of this variety, but they have cropped well from the first, and the trees seem healthy notwithstanding the large annual yield. They are not loaded heavily this year. My crop of plums is light outside of Reine Claude, which have enough for two crops. This is, I think, an exception as so far as I have observed the crop of Reine Claude will be light. My Burbanks, when the trees were not over-loaded, were good size but ripened unevenly. It is a good shipper. The tree is a spreading grower and requires to be heavily cut back to keep it in anything like a decent shape.

Japan plums are all of an indifferent quality, but my trees have been hardy and the fruit profitable."

W. H. Dempsey, Trenton: "Have found it hardy here as to wood, none has been held back. The blossoms have been injured once with a late frost. A very rapid grower. Then the branches come down making ill-shaped trees very productive. Three trees planted in 1896 produced 25 baskets of fruit last year, which sold well. I consider it one of the best commercial plums I have."

Mr. Harold Jones, Maitland: "The Burbank plum is one of the best of the Japanese for this section, though it has the defect of all of its class in being tender in the fruit bud. In my experience the tree is a strong grower with hardy wood and will bear fruit with me on years that the Lombard bears, and is free from black knot and shohole fungus so troublesome on many of the European varieties."

Frank Metcalf, Blyth:—"I planted a number of Burbank plum trees five years ago. They are all doing well. They are very vigorous growers and perfectly hardy. They are heavy bearers. The fourth year some of my trees yielded over four baskets per tree. The fruit has a splendid appearance and is a ready seller, although the quality is only fair. Everything considered I can recommend it as decidedly above the average."

W. H. Bunting, St. Catharines:—"The Burbank is probably the most valuable of the Japan plums yet tested, and is the most largely planted. It is an annual and enormous bearer. To obtain a good sample it must be thinned severely; owing to the abnormal and erratic growth of the tree it must be carefully pruned in order to keep it within bounds."

A. M. Smith, St. Catharines:—"I consider it the best of all of the Japan type I have yet tested, and I have a dozen or more of them,

I have fruited it five or six years and find it an early and constant bearer, when not allowed to overbear. Its quality is good and it is a good shipper, and for a canning plum it is second only to Reine Claude, according to a report of expert canners made at Rochester N. Y., where a committee tested ten or twelve varieties not knowing what they were.

J. G. Mitchell:—Burbank is perfectly hardy here, and succeeds all through the County of Grey. A strong grower but very sprawling in habit. It is unequalled for productiveness. The fruit is a fairly good shipper, and has sold with us about the same as Lombards. In quality, I would place it about second or third among the Japans, but away behind as compared with our best European varieties.

G. C. Caston:—My experience with the Burbank is very satisfactory. It is ahead of anything in the plum line I have ever tested.

There are better plums in point of quality, but my customers like it well for canning. In yield it is away ahead of all others. Last year I had five trees in bearing, that were only four years planted, and we picked twenty-six 12-quart baskets.

W. W. Hillborn, Leamington:—The Burbank plum is quite hardy with me. No other variety withstood the severe test of that cold winter, which destroyed so many peach and plum trees in this locality. I have twenty-four trees seven years planted. Last year I sold one hundred dollars worth of fruit from them. I find it one of the best shippers we have. It ripens just before the European varieties, therefore sells well. It is not of as good quality as some of the Japan and most of the European sorts. For this district it is one of the best money makers we have.

J. H. HALE ON THINNING FRUIT

IT IS the large, fine fruit that brings the profit; pays the mortgage, labor, fertilizer and cost of everything. To have high grade fruit we must thin. Fine peaches will bring from ten to sixteen times as much, besides not weakening the trees, as little peaches, which are nothing but seed, skin and wool. You have a law that will not allow you to sell milk which is more than so much water. We fruit growers have the advantage over every other producer: the more we water our stock the more they will pay us for it, and the more solids the less they pay us for it. Peaches that are 15 per cent. solids and 85 per cent. water are worth 50 cents, but those only 10 per cent. solids and 90 per cent. water are worth \$3 or \$4. I say, dose

them with water; soak them, and this is easiest done by thinning and so getting large fruit full of water. When the manufacturer turns out damaged goods he is wise enough to keep them separate and sells them for whatever anybody will give. He means to have as few damaged goods as possible, however. We fruit growers have been producing a great many damaged goods, and then, instead of using good judgment and culling them out, we mix good ones with them and send them to market and sell the whole business for the price of damaged goods. We had to throw in the good ones. By proper thinning we can get the damaged goods down so we will not have more than 5 or 10 per cent. of inferior goods.

SOME POINTERS ON THE COLD STORAGE OF FRUITS

MUCH YET TO BE LEARNED—SOME SELECTIONS FROM A PAPER READ BEFORE THE WESTERN NEW YORK HORTICULTURAL SOCIETY LAST JANUARY

BY

G. H. POWELL

OF WASHINGTON

THERE is still much to be accomplished before the engineering of refrigeration will have reached its highest perfection. The relative merits of different systems of cooling, of different refrigerating media, of ventilating systems, a clearer knowledge of the methods of maintaining a desirable degree of humidity, and of a more even distribution of temperature most desirable for different fruits; and for the same fruit in different conditions, or of different varieties of a given fruit; the influence of sudden versus gradual cooling when fruit is put into storage, and of warming it up when it is removed; of tight versus closed packages, of the exact temperature at which different fruits will freeze, of the degree of maturity at which fruits should be removed from storage—these are a few of the points on which more exact information will need to be worked out from the standpoint of the storage men.

There is little exact information concerning the influence of cultural methods, and of various stages through which a fruit passes before it reaches the storage compartment, or its durability after it once reaches there. It is highly desirable in the interests of both storage men and fruit growers that we know more of the influence of young versus of old trees, of cultivated and well-fed versus uncultivated and starved orchards, of the character of the soil, the

exposure and altitude of the orchards, of moist versus dry seasons, of the degree of maturity of the fruit, of the length of time that elapsed before the fruit should be stored after picking, and of many other factors that pertain primarily to the orchard, on the storage durability of the fruit.

I would not convey the impression that the refrigeration of fruits—especially of the apple—is a chaotic condition. On the other hand, the evolution of the system of refrigerating plants has been so rapid that modern storage houses carry enormous quantities of apples, of citrous fruits, and of vegetables for months in a satisfactory condition, and with little loss. I would emphasize the fact, however, that the definite knowledge of many of the phases of the storage question often leads to important losses in the storage houses, and to serious misunderstandings between storage men and fruit growers. There is a popular misconception among fruit growers that a low temperature will preserve fruits almost indefinitely, and the losses in the storage house are usually attributed to a faulty management of the storage plant itself. As a matter of fact, there are many factors that enter into the making of a fruit with good keeping qualities, and these factors operate while the fruit is growing, during the period between the picking of the fruit and its storage, and during the storage period.

In the future it is hoped that the investigations may be broadened so that eventually the various fruits and vegetables may be included in the experiments. During 1901 the principal winter apples and the Kieffer pear have been under investigation, an outline of which and a report of progress follows :

The Kieffer is the great business pear for the masses of planters and consumers outside of the Pacific coast district. It is grown in enormous quantities in the tide-water States, from New Jersey southward to Florida, in Texas, Pennsylvania, Illinois, Indiana and Ohio; smaller, but important, plantings in New York, Western Michigan, Missouri, Arkansas, Kansas and in the Niagara Peninsula of Ontario, Canada, and still smaller orchard areas in nearly every other State where pears will grow. New orchards of Kieffer are still being planted throughout the Kieffer belt, though the extension is less rapid than previous to 1899.

The production of the Kieffer has become so vast that the cost of production is hardly realized when there is a general apple crop, and when peaches are abundant for canning. The bulk of the crop is used for canning while the fresh fruit needs to be sold in a comparatively short time. The over-production of the Kieffer could be greatly relieved by a more equitable distribution of the fruit in the domestic and foreign market season. It was shipped abroad in considerable numbers, with most encouraging results, for the first time in 1901. The Kieffer has not been successfully held in many storage houses. It sometimes discolors on the outside before it softens. At other times it decays at the core while still firm outside, while a further difficulty has been its rapid discoloration and deterioration on withdrawal. In fact so great have been the difficulties in the past that some

storage houses refused to accept Kieffer in 1901.

General Conclusions.—The following general conclusions may be drawn from the behavior of the pears in all lots stored in cold storage, up to date, February 10 :

1. A temperature of 32 prolonged the durability of the fruit in storage beyond a temperature of 36.

2. A wrapper prolonged the durability of the fruit in storage.

3. The Kieffers that were ripened in cold storage were apparently as good as the same fruit ripened in the ordinary manner.

4. The Kieffers that were taken out from a temperature of 32, if firm when withdrawn, kept in a temperature of 50 to 60 for two or three weeks without discoloration or loss of quality. From a temperature of 36 they did not keep more than ten days.

5. Discoloration at the core was due to delay in the storage of the fruit after it is picked, except that undeveloped Kieffers may be stored after ripening without subsequent discoloration. Wormy Kieffers discolor at the core in any treatment.

6. Discoloration of the skin was due to bad handling, i. e., rough picking, packing, or any other factor that causes bruising.

Kieffers in Storage.—It will be seen from observations which we have made that the principal troubles with the Kieffers in storage were due, primarily to their treatment before they reached the storage compartment. Our experiments indicate that the fruit should be picked when green, hard, graded well, stored immediately after picking, in a temperature not above 32 (and possibly as low as 31), and no serious difficulty may be expected from such treatment. Fruit growers should realize that the successful storing of the Kieffer depends as much upon them as upon the conditions in the storage house. Refrigeration will not make first quality fruit of seconds, nor

can it correct the evils of bad orchard handling. Successful refrigeration is possible only when both storage men and fruit growers understand the underlying principles of refrigeration and co-operate intelligently.

The Apple is the most important fruit that is stored in refrigeration, in fact it is stored in greater quantities than all other fruits combined. The following statement of the National Apple Shippers' Association, taken from a recent number of COLD STORAGE, gives a conception of the magnitude of the industry.

APPLES IN STORAGE ON DECEMBER 1.

	Barrels in Cold Storage	Barrels in Common Storage
1898.....	891,000	400,000
1899.....	1,518,750	634,000
1900.....	1,226,900	794,000
1901.....	1,771,200	138,000

1. The apples used in the experiments appear to keep best when picked just before they mature, i. e., when very firm and only fairly colored.

2. The fruit that was stored immediately after picking is keeping better than that in which there was delay before the fruit was placed in storage.

3. The fruit is keeping better in a temperature of 31 to 32 than in a temperature of 34 to 36.

4. The wrapped fruit is keeping better than the unwrapped fruit. It shows less shrinkage.

6. A temperature of 31 to 32 appears to retard the scald. The York Imperials in this temperature shows about 3 per cent., while in a temperature of 34 to 36 there is about 17 per cent. The Rhode Island Greenings show about 5 per cent., in the higher temperature.

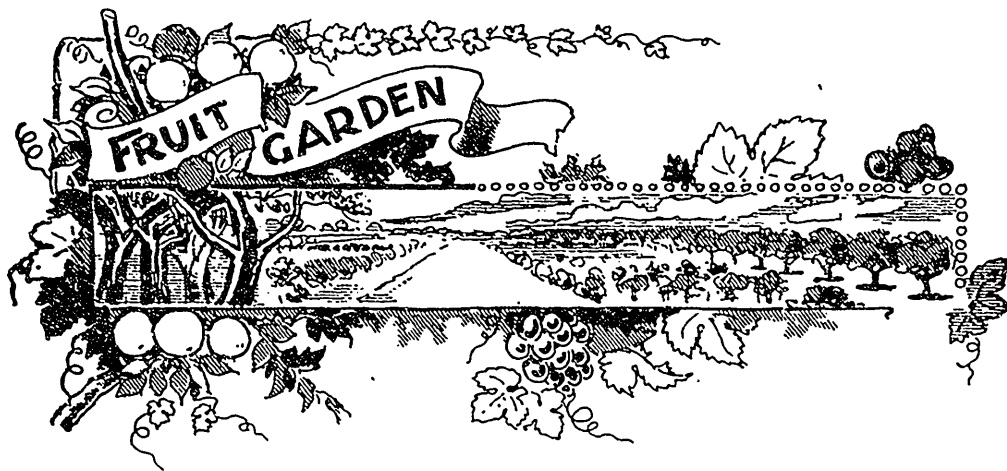
CURRANTS AS ORCHARD FILLERS

AN EASY CROP TO RAISE

CURRANTS are about the cheapest and easiest crop of fruit to produce, requiring very little time and labor as compared with many others, states American Gardening. For fillers, or what might be termed a catch crop, they are indispensable when grown between plum, pear, peach, cherry and quince trees. They can be grown in an orchard of any of these fruits without retarding or injuring the trees. When currants are fruited in this way it is merely a question of more manure or fertilizer. Every intelligent fruit grower will understand this at once. Under this system of intensive gardening you have a nice income from your currants, while your fruit trees are developing and getting ready for fruiting.

It depends entirely upon yourself as to how long these bushes will bear large, marketable fruit.

Remove the New Wood.—No matter how great a sacrifice it may seem, you should remove two-thirds of the new wood each season. Failing to do this you will soon have a lot of overgrown bushes on your hands, and the fruit will dwindle in size and be imperfect in many ways. On the other hand, if you prune judiciously, spray as often as it is necessary, manure well and cultivate thoroughly, you can keep your plantation of currants in perfect order for at least ten years, and one year with another, you will be well recompensed for your investment and labor.



LESSON ON LEAVES

BY

PROF. H. L. HUTT, B. S. A.

O. A. C., GUELPH, ONT.

TREES and shrubs may be divided into two classes, depending upon whether they retain or annually shed their leaves. Those which retain their leaves are evergreens, while those which shed their leaves are deciduous. In this country our commonest evergreens are the pines, spruces, cedars, etc., while all of our fruit trees are deciduous. In warmer climes, where the tropical fruits are grown, even the fruit trees, such as orange and lemon, are evergreens.

Leaves afford an interesting subject for study, not only because of their great variety, but because of their wonderful modifications of form to suit varied conditions. This part of the subject, however, we must leave the reader to study for himself. At present, we shall deal more particularly with a few of the most important functions which the leaves perform in the economy of plant growth.

THE STRUCTURE OF A LEAF

A leaf is usually made up of two principal parts, the broad expanded part called the **blade**; and the stalk which supports it, known as the **leaf-stalk** or **petiole**. The blade is one of Nature's adaptations for the purpose of exposing as much surface as possible to the action of sunlight, for although a leaf may be small in itself, the area exposed by the foliage of a large apple tree in full leaf may amount to several acres.

The petiole or leaf-stalk, is not always an essential part of the leaf, for in some cases it is absent, as in the Honeysuckle, in which the blade rests directly upon the branch.

If, for instance, we examine a maple leaf, it will be seen that the petiole divides at its upper end into a number of parts, and these divide again and again into smaller parts forming what are usually spoken of as the nerves or veins of the leaf. With the petiole, they make up the skeleton or framework

of the leaf, and are composed of woody fibre with a central pith similar to the woody parts of the stem and branches. They are in fact the farthest extensions of the branching of the tree, and convey the sap to the remotest parts of the leaf where it can be spread out and exposed to sunlight.

The spaces between the veins are made up of a soft, cellular substance, filled with minute chlorophyll granules which give to the leaf its green coloring matter. The whole structure is covered above and below with a thin transparent skin or epidermis, through which may be seen, when the leaf is placed under a microscope, numerous small openings called the stomata. Each stoma is an automatic valve by means of which the leaf performs its most important functions.

THE FUNCTIONS OF LEAVES

A careful study of all of the functions performed by the leaves and the chemical changes which take place in them would lead us farther afield than we have time at present to go. Those which are more directly dependent upon the care and management of the tree, it is important, however for us to consider.

THE TRANSPIRATION OF MOISTURE

The soil water which is taken up by the roots is to a great extent merely a carrying agent, and the greater portion of has to be gotten rid of after it has brought the plant food from the soil to the leaves. This giving off of the water takes place through the stomata. It is this transpiration of water from the leaves which causes plants to wilt, when in a very hot sun or dry atmosphere, the direct cause of the wilting being that the leaves are giving off the moisture faster than the roots can take it up.

The stomata open and close according to the conditions surrounding them. In hot,

dry weather, particularly when it is windy, they are inclined to open and give off water very rapidly. Hence it is important during such seasons to have the soil, in which the plant is growing, well cultivated so that it may retain plenty of moisture where the roots can get at it.

As the roots absorb water and the leaves give it off, there must be an equilibrium between the roots and the leaves of the plant, if it is to maintain growth. Hence when trees are taken up and transplanted and the greater part of the root-system is destroyed, it is usually necessary to cut back the top to correspond with the roots left.

THE LEAVES ACT AS LUNGS

The leaves are often spoken of as the plant. They inhale carbonic acid gas and exhale oxygen, just the reverse of what takes place in the breathing of animals. In this respect, animal and plant life are complimentary one to the other. As it is important for the health of animals that they have vigorous, strong lungs, so it is important for the growth of the plant that it has vigorous, healthy foliage. For this reason, it often becomes necessary to spray the foliage of trees, even when not bearing, where they are subject to the attacks of fungus diseases which develop in the foliage; for without healthy foliage, the tree will not make satisfactory growth.

Another important function of the leaves is to assimilate or make use of the plant food taken in from the soil and air. In this respect the leaves might also be called the digestive organs of the plant. The carbonic acid gas taken in by the leaves is combined with the sugar of the sap forming starch. This formation of starch is brought about in the chlorophyll granules by the action of sunlight. If the leaves do not get sufficient light, or if the foliage has been half eaten by insects, the plant will be starved to that extent.

CRITICISM ON THE ONTARIO SPY

OUR BEST FANCY WINTER APPLE—
HOW TO HANDLE FOR EXPORT

MR. P. J. Carey, fruit inspector, writing in the Sun, says:—In our talk at orchard Institute meetings I was sorry to have to discourage the planting of Spys and Kings, the Spy, because it is so long in coming into bearing and the King, because it is a shy bearer. The chief objection to the Spy can, however be overcome in a measure by top grafting ; but even when it is produced, it is not the most profitable for our export trade. Shippers have in fact, received more black eyes from the Spy than from any other variety, this being due to the fact that the apple is not suited to the rough usage it receives during transport on shipboard. "Yes." agreed Mr. Carey, in reply to a question, "the Spy is perhaps the most popular apple in the American market, but then the duty which stands in the way renders it practically impossible to ship any apples to the big cities of the United States".

But, while the Spy is not suited for shipment to England and is shut out of the American market, there is still, the Sun believes, a possibility that it will ere long prove the most profitable variety in Ontario, because, as Mr. Carey said, we shall ultimately find in our own country a market for first-class apples, quite as large as that now found in Great Britain. The development of the North West promises to go on at a rate of which at present we have no conception. If anything like 200,000 people go in there this year that will mark the beginning of an inrush for which we shall have to go back for a parallel, to the tide which spread over the American prairies half a century ago, and with this increased population in our North West will come an increasing demand for Ontario apples, and among these apples none better than the Spy. There is too, as Mr. Carey added, a large home market here in Ontario for the produce of Ontario apple orchards, but the cold storage facilities must be more fully developed in order to admit of the holding of fruit in good

condition for the late winter market, before this opening can be utilized to the greatest advantage. In this respect the Georgian Bay fruit growers are setting an example to the rest of the Province, in preparing to develop cold storage facilities on the co-operative plan.

As ordinarily handled the Northern Spy, no doubt, has justly earned the criticisms of our friend Mr. Carey ; it is we grant a great many years in coming into bearing as we have proved in an orchard now twenty years planted, which has only yielded two or three good crops ; but, now that that period is passed, we are convinced that it was worth waiting for, since it is yielding annual crops of magnificent fruit ; it is, we also grant, a difficult apple to export in perfect condition because of its tender skin, and while this may be an objection on the part of the careless fruit grower, who handles his fruit roughly and packs carelessly, it is one of the very incentives to its planting on the part of the enterprising fruit grower.

That the Spy is the finest general purpose winter apple in Ontario, both in beauty of appearance, and quality of flesh, is acknowledged by all who know it ; and it is most unfair to condemn its planting in these days when we are aiming at building up a reputation in the foreign markets for our best apples. The Baldwin and the Ben Davis may do for the careless shipper, but he who would build an enduring reputation for quality and beauty can succeed with the Spy better than any other apple grown in our province.

How to Handle Fancy Spys.—The writer speaks from personal experience, and not from "hearsay". In a sixty acre apple

orchard in full bearing, from which he is annually exporting to Great Britain and Germany in car lots, he has ten acres of Spy apples now in full bearing. These are harvested later than such apples as Baldwins and Greenings, and not until they have on their richest coloring and when their flesh is at its best stage of crisp, juicy texture. The smaller sizes, and the No. 2 grade are barreled in the orchard from the packing table but all the A No. 1 grade are sent into the fruit house and graded into uniform sizes, the smallest grade being $2\frac{1}{2}$ inch and the largest 3 inch, those below or above these sizes not being considered up to the grade.

This delicate variety is handled with the greatest care, wrapped in tissue paper, and packed in boxes weighing when filled, from forty to fifty pounds each. A padding of fine excelsior is laid in the bottom and top and also between the layers of fruit, thus entirely preventing the least marking of the fruit by the pressing, or by handling upon the journey. Packed in this way the Spy may be kept in cold storage, or shipped

around the world, and come out in perfect condition. In proof of this the writer has only to mention the magnificent Ontario Spys shown at Glasgow in the summer of 1901, which he had packed in cases as above described, in the fall of 1900. These were kept in cold storage until needed, and brought on the tables as required, and attracted so much attention that Mr. Robert Hamilton, who was one of the Canadians in charge, reported that he could have sold ten thousand bushel cases in the month of July at \$3.50 a case!!

Where the Canadian Spy is known in Great Britain, no other apple is wanted for a fancy trade. For three successive years, the writer has had a special enquiry for this apple from a dealer in Leeds: and one season finding the crop short, he asked to be allowed to substitute Kings and selected Baldwins in place of Spys, but would not consent, because, said he, I have built up my reputation on this apple, and I want no other for my special trade.

*IRRIGATION OF APPLES AND PEARS

A HAND book for the proper application of water has just been published by the Orange Judd Co. It is written by Lucius M. Wilcox, and this revised and enlarged edition seems to bring the whole matter quite up to date. In looking over the book we have made a selection which is just now of practical interest to fruit growers, being a portion of the chapter on Irrigation for the Orchard.

Apples. - This king of fruits may be irrigated in many ways, and a liberal quantity

of water is advisable. We have noticed one thing about growing apples under irrigation. By giving them plenty of water when they are attaining full size, or are nearly full grown, they receive more sap and attain fully one-eighth more weight, or specific gravity, compared with similar fruit of the same size. The color of the apple is also greatly improved in this way, and it puts on a polish that could not be attained without irrigation. The characteristic of polishing nicely is noticed principally in the Ben Davis and Jonathan varieties. If the early spring season has been dry the orchard should be irrigated just as soon as the canals are

*Irrigation Farming a guide book for the proper application of water in the production of crops.

carrying water. If no other circumstances arise it may be deemed advisable to irrigate again every month until the last of August, when water should be discontinued from all fruits. Young trees will take more water than older ones, and a wetting at the time the fruit buds are appearing is quite essential. Give no water at the time of blossoming. After the fruit is half grown it can be forced to greater size by copious irrigation. The apple attains one-tenth of its final size during the last month of maturity. Russian varieties have thick, leathery foliage which cannot readily transpire, and for this reason but very little water should be given them at any time.

Of course it must be understood that the management of an orchard in the fall must depend largely on the dryness of the season, the age and fruitage of the trees, as well as their variety and general condition. While young trees not yet in bearing, or those not carrying a load of fruit, may need no water after the 15th of August, it may be quite essential to give waterings to trees heavy in fruit to more thoroughly develop the fruit itself and aid in the picking. It has often been observed at harvest time that the apples do not come off easily and do not feel right in the hand. Under these circumstances to postpone the picking and irrigate the orchard may require four or five days'

time. In twelve hours there will be a noticeable difference; in thirty-six hours the apples will gain in color, plumpness and size. When picking is resumed the apples will come off nicely and be larger and more highly colored. The gain may be at least ten per cent. The last irrigation effects cherries, plums, and grapes as much or more than apples, and we always irrigate heavily while they are ripening. The keeping qualities are also better.

Pears.—This valuable fruit will succeed in most kinds of soil, but flourishes best in rich loamy, or heavy red clayish, or sandy soils. The latter is especially adapted to it if it carries the oxide of iron, an element quite common in many of the mountain districts of the far west. The best kinds to plant for permanent orchard are standard sorts budded on pear stock, which, if well cared for, should stand for two hundred years. The planting should be sixteen or twenty feet apart. Dwarf pears are best budded on the quince, although this practice forces their blooming period and places them in more imminent danger of spring frosts. Generally speaking the same amount of water is required as for the apple and plum, and the same general rules, particularly as to cultivation, should be followed. The fruit should never be allowed to become thoroughly ripe on the trees.

Mr. R. Cullis, Secretary West Durham Farmers' Institute, writes us of a successful orchard demonstration meeting held on 8th inst. at Camborne, in the orchard of Mr. Wm. Parsons. Messrs. E. Lick, of Oshawa, and T. J. Carey, of Cobourg, Dominion Fruit Inspectors, were the speakers. As a result of the meeting a local Fruit Growers' Association was organized,

to be known as the Township of Hamilton Local Fruit Growers' Association. The following officers were elected: *Pres.*—Mr. Thos. Davidson, Camborne; *Vice-Pres.*—Wm. S. Case, Cobourg; *Sec.-Treas.*—R. Cullis, Camborne. Nearly every one present joined the Association. An adjourned meeting of the Society will be held in Cobourg on June 10th at 2.30 p. m.



SEASONABLE NOTES FOR JULY

BY

WM. HUNT

G. A. C., GUELPH, ONT.

FLOWER GARDEN.—Constant surface stirring of the soil in flower beds or borders will not only destroy weed crops, but will also materially help the growth of all kinds of bedding plants. Deep stirring of the soil is not necessary, if the ground was properly prepared before planting. A very small three or four-toothed rake, or a light scuffle hoe are the best tools for this work, which should be done when the soil is fairly dry and before it has had time to crust over very hard on the surface.

Staking and Tying.—These operations are often left until the plants are badly damaged by wind or rain storms, or perhaps entirely ruined by not being attended to earlier. It is always a good plan to have stakes for such plants as dahlias, ricinus, etc., driven in near the plants requiring support. Many a fine plant has come to grief because a stake could not be found handily just when the plant needed tying.

In the matter of tying up plants always endeavor to stake and tie plants so that they are as natural looking as possible after the operation is performed. Avoid the close bunching process of tying that makes the plants look more like bundles of stems and foliage, than growing plants. Another point deserving attention when tying plants is to endeavor to place the stakes in such a position that they will be hidden from view as much as possible by the foliage. Use soft twine for tying purposes, so as to prevent as much as possible damage from friction, and use neat sizeable stakes.

Decayed Flowers.—These should be kept picked off regularly, unless required to remain on the plants to help produce seed. Decayed blossoms are not only unsightly, but also exhaust uselessly the vitality of the plant. In this respect do not forget that daily picking of sweet-pea blossoms, and not allowing them to go to seed, not only improves the size and depth of color of later



FIG. 2352. FREESIA.

blossoms, but also helps materially to extend the flowering period of the plants.

The Greenhouse.—If ferns and exotic plants occupy the greenhouse during the summer months, the glass must be heavily shaded. These plants will require plenty of water at the roots and a moist atmosphere maintained by daily syringing, as well as heavy sprinklings of water on the floor when the ventilators are closed. Where choice ferns and exotic plants are growing the ventilators should be closed an hour or two before the sun ceases to shine on the greenhouse.

Roses and Chrysanthemums.—If roses and chrysanthemums occupy the greenhouse, much more ventilation is necessary, and far less shading required than for ferns, etc. In fact the shading for both roses and chrysanthemums should be very light, as close shading induces a weak spindled growth that is not conducive to good flowering results. Roses and chrysanthemums should have liberal supplies of water at the roots and daily syringing on bright days. Pick every bud off the roses as soon as the bud

is formed, so that the whole strength of the plant can be used to produce a good stocky growth of wood.

Freesias.—These useful winter flowering bulbs should now be kept quite dry and dormant, until they are potted on. They can be left in the soil they were grown in, and the pots stood away in a dry cool shed, or the bulbs can be picked out from the soil and put in a pot or box with sufficient dry sand or earth thrown over them to keep them from getting too dry and shrivelled. In either case keep the bulbs quite dry, and in a cool place. A shelf in a shed is a good place for them. August and September are the best months for starting freesias into growth.

THE WINDOW GARDEN

Window-boxes form the most prominent feature for window decoration during the summer months. It is oftentimes a difficult matter to secure flowering plants that are suited for shaded positions on the north side of the house. Foliage plants and ferns can be easily selected for these positions, flowering plants in variety are not so easily ob-

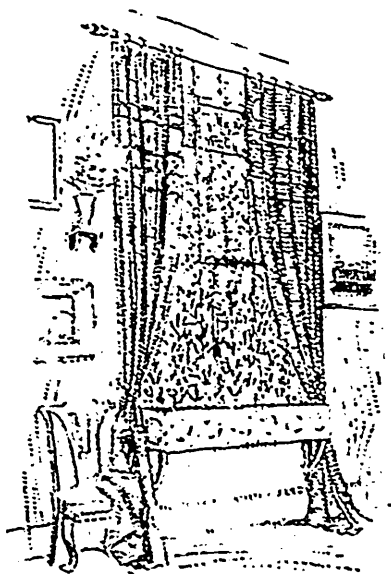


FIG. 2354. WINDOW GARDEN.



FIG. 2354. BEGONIA, WELTONIENSIS ALBA.

tained. Many varieties of summer flowering begonias can be had however that will give splendid results in windows or on verandahs where the sun shines for perhaps only an hour or two, morning and evening. Amongst the most effective and easily grown kinds is the pink flowering *Weltoniensis* begonia, also the white flowering variety *Weltoniensis alba* (Fig. 2354), the former being the most robust and easiest to grow of the two kinds. Being of a semi-tuberous nature both of them can be kept partially dormant during the winter, but must not be dried off completely in the same way that the tuberous varieties are.

Another good variety for summer flowering is the dwarf growing, white flowering begonia *Bruant* (Fig. 2355). This pretty little begonia can be easily kept during the winter, its bright glossy green foliage being most acceptable even when not brightened up with its ivory white blossoms. It must not be given as much water however during the winter as when it is in active growth in

summer time, The Begonias mentioned as bedding varieties in last month's journal are also good varieties for culture in windows, either as pot plants or in window boxes. These Begonias will be found to be quite an acquisition to the comparatively limited list of flowering plants suited for window boxes in shaded positions.

Geraniums for Winter.—This is a good time to commence preparing a stock of these ever popular and useful plants for winter flowering in the window.

It is quite possible that many readers of this journal have a favorite geranium plant that has become gaunt and unshapely in growth, similar to the one shown in the accompanying cut (Fig. 2356). Instead of planting it out in the border, as is often done to try and make a shapely plant of it before autumn, it would be far better to treat it as shown in Fig. 2357 by giving it a severe cutting back. If the growth of the plant is very soft and sappy the cutting back process should be deferred until the plant has been stood outside in the pot in a sunny position for the wood to harden a little. It can then be pruned back as shown in the cut, by pruning the growth back to within



FIG. 2355. BEGONIA, BRUANT.

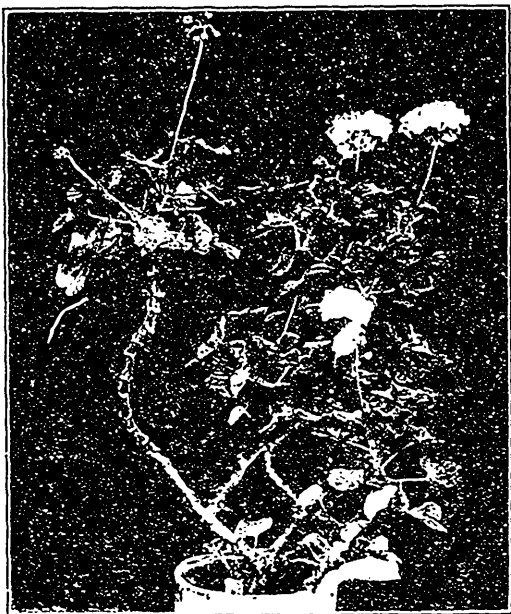


FIG. 2356.
GERANIUM BEFORE BEING CUT BACK.

a few joints of the hard growth of the stem. After the pruning back, the plant should be put in a partially shaded position near a building or fence. Very little water should be given it until it shows signs of growth but the soil should never become really dust dry. As soon as growth commences, shake the plant out of the earth and repot it into a size smaller pot in rather sandy soil. Plunge the pot up to the rim in sand or coal ashes, and water well once, after that water only when the soil shows signs of dryness. In about five or six weeks the plant will require a larger pot, probably two sizes larger than what it was potted back into before. When it has become established in this size pot it will probably be time to take it into the window where it should give good flowering results. Old geranium plants give

good results if treated in this way, much better oftentimes than young plants taken from cuttings. The cuttings however taken from the plant when cut back should be placed in sand, either in a pot or shallow box. These will also make nice little plants by autumn for the window. The tips of the shoots should be taken for the cuttings, five or six inches being a good length for the cutting. By treating overgrown, gaunt specimens of geraniums in the way I have attempted to describe, many plants that gave good flowering results last winter can be had in even better shape and condition than during last season. It is useless and unnatural to expect even the all-enduring geranium to flower and grow continuously the whole year round. This pruning back and partial resting process, as described, gives a good shapely plant as well as allowing it a partial rest which all plants require in a greater or lesser degree to be successful.



FIG. 2357.
GERANIUM AFTER BEING CUT BACK.

THE KNACK OF BOUQUET MAKING

HINTS AS TO HARMONY OF
COLOR, ARRANGEMENT, ETC.

BY

EBEN E. REXFORD

PERSONS who are not particularly successful at bouquet-making generally assert that there is a "knack" about it which not everybody can hope to discover. I admit that some persons seem to have born with them the knowledge of just what kinds of flowers to use, just how many and just how to put them together. They do not have to learn these things. But that does not prove that there is really any "knack" about the matter. It only goes to show that some persons naturally have good taste—an intuitive taste, we may call it—while others must cultivate taste, or acquire it, in order to do successful work at bouquet-making. Most persons who have a good eye for color and a sense of harmonious proportion may become able, by a little practice, to do creditable work along this line.

The first thing to do is to learn what colors go well together, and the only way to learn this is by experience. You may read about "complementary colors" and all that, but to know all about them you must see them together. There must be an object lesson, in order to get the idea firmly fixed in your mind by the effect harmonious colors have on the eye. Therefore, try all colors together and find out which you can safely use in combination. These experiments will soon convince you that the line can not be drawn at positive colors. Intermediate shades and modifications of the primary colors must receive quite as much consideration as the primary colors themselves.

Then the principle of contrast must be taken into consideration. There are contrasts and contrasts, and not all contrasts are harmonious ones, you will find. Scarlet and yellow afford striking contrast, but not always a harmonious one. Blue and orange are not discordant, and their contrast is very decided, but it is not a pleasant combination by any means, except in rare instances where strong, high colors are depended upon to produce certain results which we would not care for under ordinary conditions. In bouquet-making we find that the most satisfactory contrasts are those by which the use of a subordinate color heightens the effect of the predominating color. We may often secure this result by using two shades of the same color.

One color or shade must be subordinate to the other in importance. They can not have equal value in the combination without detracting from or entirely spoiling the effect aimed at. Suppose, for illustration of the idea, we have some maroon and white dahlias to arrange. If we have just as many of one color as of the other, our bouquet will not please us. But if we have but two or three white flowers among a dozen dark ones, the effect is pleasing, because the contrast afforded by the small amount of white used emphasizes the darker color work effectively. We see beauties in it that we would not see if there was no contrast. Reverse the positions and let white predominate. The few dark flowers used make the purity and loveliness of the white

ones stand out prominently, as it would not if there was nothing to afford contrast. By these contrasts we secure a sort of background, dark or light, as the case may be, against which to display the predominating color and bring out the full beauty of it. In every arrangement of flowers there should be some such contrast. Sometimes the foliage of the flowers used will supply all that is needed, but generally the flowers themselves should supply it.

As a general thing, we use a great many more flowers than there is any need of in our floral arrangements. We forget or overlook, if we have learned the fact, that strength is not so much in quantity as in quality. An excess of quantity may produce a weak result. The artist, who paints a picture of flowers which you would be glad to hang upon the wall of your parlor, does not crowd his canvas with color. He depends upon the effective distribution of it and the use of contrast to bring out the decorative idea fully. I have seen pictures

which seemed one great glow of color, and the careless observer would naturally conclude that the luminous effect was secured by the mass of color used. But analyze the picture and you discovered that the result was secured by a really small amount of color. A few roses scattered considerably against a background of green foliage will give the effect of a great wealth of color, because all the artistic possibilities have been realized by the combination. Try combinations by which this principle is illustrated and you will be surprised to see what strong and satisfactory effects are secured by the use of a small amount of material. You will learn from it how to "make a little go a long way."

And bear in mind the fact that most flowers are most effective when kept by themselves. There may be harmony in color without harmony in habit. There are very few flowers which do not suffer by being massed with others.

—*Home and Flowers.*

ATTRACTIVE CACTI-IV

GRAFTING THE CACTUS—HOW
IT IS DONE—FANTASTIC FORMS

BY

J. H. CALLANDER

WOODSTOCK, ONT.

SOME of the Cacti, which make most desirable specimens when of good size, are so very slow in growth on their own roots that a collector would get tired waiting for them. This is one of the principal reasons for grafting cacti, although it is also done for other reasons. Better effects are obtained by having a trailing or drooping part grafted on a tall stout stem of cereus, as thus, a speci-

men can be set on a table without having to hang over the sides. Then other curious effects are obtained by putting a globular part on a cereus stock, when, in a very short time the scion is full grown, and blooming freely. To improve the bloom and get it sooner is another object in grafting.

The process is not at all hard, and any one who has some good strong rooted cut-

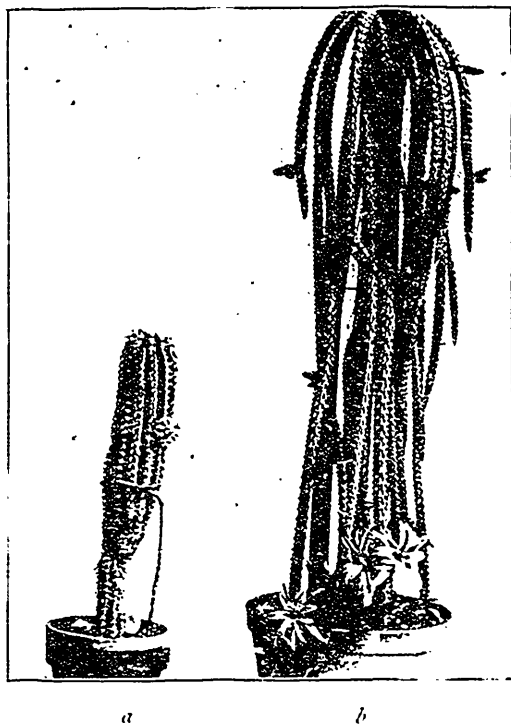


FIG. 2358.

LACE CACTUS (*a*) AND RAT TAIL CACTUS (*b*)
Both grafted on *Cereus Colubrinus*.

tings of *cereus nycitcalus*, *grandiflorus*, or *colubrinus*, and has some slow grower like the *epiphyllums*, *cristates*, or the globular sorts, can do as well at producing these curiosities as an old hand at the business. First, be sure that both the scion and stock are in a good healthy, growing condition, preferably in the spring. For instance, if it is desired to use a stock of *C. colubrinus*, and put a top on it of *C. flagelliformis* or rat-tail cactus, select a stock about two feet high, and take two nice pieces of new growth of the rat-tail, about three inches in length. Cut the top square off the stock

and split it down the centre about an inch. Then, with a sharp knife cut the scions to a wedge shape, and insert in the split top of the stock. To hold them in place you only require to run a long cactus spine through both stock and scion, and tie a string firmly around the stock to keep the cut edges together. For a few days set in a partially shady place, and do not wet the graft when watering. Growth will very quickly commence, and you will be surprised at how fast a large head will form on the tall stock. The illustration shows what can be done with this combination in only two years. The large head, which was in bloom at the time the photo was taken, nearly all grew in one season.

The crab cactus is grafted in the same way, but the best stock to use is the *pereskia*, which forces a fast growth, and is better when old than a *cereus* stock. The globular sorts can be put on in any way that seems to suit best, either set flat on top of the stock, care being taken to have the cut edges about the same size, or by wedging either the stock or scion, and inserting into the other, always fastening the two together as firmly as possible with spines, and by tying string around to hold the edges together till they unite.

The small specimen shown in the engraving is only one season's growth of *echinocereus coespitosus* or lace cactus on *C. colubrinus*. The scion, when put on, was only about the size of a walnut, but grew so fast it looked as though the skin must burst. A specimen of *C. flagelliformis cristata* or *opuntia tessellata cristata*, makes a very odd plant when grafted, and assumes all sorts of fantastic forms in coxcomb style.



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.

ORCHARD MEETING NOTES

BY THE SECRETARY

WE had a call last week from Mr. McNeill and Mr. Carey on their return from their series of orchard meetings. They report excellent meetings, and in spite of the pressure of work at this busy season from thirty to one hundred eager fruit growers attended each meeting. "The most pleasing feature of these meetings," said Mr. McNeill, "was the intelligent interest taken in the discussions back and forward of each disease, defect and insect that might be found in passing through the orchard. There the principles of orchard cultivation would be taken up and specific instructions given in the practice of

pruning. This kind of instruction has double the value of that given at indoor meetings in that one cannot only hear but actually see the things done."

Mr. Carey took up the apple question from the packer's and shipper's standpoint, explaining how the fruit could best be handled from the time it was taken from the tree until it was packed and labelled or left the grower's farm. He pointed out that the salableness of fruit is effected by being picked too early or too late in the season. It is better, said Mr. Carey, to harvest the fruit in two or at most three weeks while it is in the pink of condition, than to have the picking

season extended from the first of September until the last of November and get too green and over ripe fruit. One should study his land and locality and then get the right varieties. We want a large vigorous productive tree, an apple of a red color, and one that on being bruised will dry instead of rot. A shipping apple of this kind will rarely be classed as "slack" and will give a minimum amount of waste in packing. On being asked what variety he would recommend as having those characteristics, Mr. Carey said "From twelve years experience as a shipper, I like the Phoenix, they handle well; as a packer, I always liked to get into a Phoenix orchard."

Secretary Mitchell, of the Port Elgin branch of the Lake Huron Fruit Growers' Association, reports lively interest in the orchard meetings in his section and sends a list of new memberships.

W. W. Hilborn of the Essex Experiment Station, writes: I believe these orchard meetings do much good to help farmers to adopt more careful methods of orchard treatment. In travelling over the country, one sees much need of this, for neglected orchards are everywhere apparent. Many orchards get no trimming but the browsing of the cows, and it is little reason therefore, that the trees

are dying out and the investment becoming an unprofitable one. The time has come when to grow apples successfully, we must give proper cultivation, and annual pruning, and spraying. There is no other line of fruit growing today that requires so much attention as the apple, and few crops that can be more easily injured by improper methods of cultivation. Just in this connection one sees the value of such instruction as that given in orchards now by Mr. McNeill. If we had more men doing work like Mr. McNeill, I think apple culture would receive more attention. I believe the future for apple culture in Canada is brighter than for any other fruit we grow, if we can induce the growers to give as much thought to their apple orchards as they do to other farm crops.

Trenton.—Mr. Walter Dempsey, Director of the O. F. G. A. for District (4) reports a good meeting in Mr. Frazer's orchard on the 12th ult. Mr. Lick was present and gave a very interesting talk on spraying which led to a good discussion. Mr. Lick answered questions and spoke briefly on cultivation, thinning fruit, cover crops, etc. There were twenty-one fruit growers present, coming about twelve miles each way from Trenton. All took part in the discussions.

NOTES FROM OUR SECRETARIES

COLLATED BY THE SECRETARY

Mr. Frank Metcalf, Secretary of the Lake Huron Fruit Growers' Association reports that their association is attracting considerable attention among the farmers. On Monday, May 12th, an orchard demonstration meeting was held in the orchard of Mr. A. W. Sloan. Mr. Alex. McNeil, of Walk-

erville, Dominion Fruit Inspector, and Mr. A. E. Sherrington, of the Experimental Fruit Station at Walkerton, gave practical demonstration in spraying and in talks on general orchard management.

We had a call at our office this week from Mr. Elmer Lick, after finishing his series of

orchard meetings in the Lake Ontario, Bay of Quinte and St. Lawrence valley regions. Mr. Lick reports good meetings. In some cases in spite of very inclement weather for orchard demonstration work, and at this very busy season of the year when large crowds are not to be expected, the attendance at many of the meetings was a surprise to the speakers. Farmers seem very anxious for this definite, practical sort of information. They want information on the actual work and practice of fruit growing, by men who have made a success right in this line of business. Farmers are beginning to realize that the orchard is worthy of care and attention, that proper spraying and pruning will ensure a good quality of fruit, and that manuring and cultivation of the orchard will pay a profit the same as for other crops. In short, farmers all over the province are becoming alive to the possibilities of apple growing.

In nearly every district local Fruit Growers' Associations are being formed. At Camborne Mr. Lick was able to assist in the organization of a branch known as the Hamilton Township Association. The officers are, Thos. Davidson, president; Stephen Kerr, vice-president, and R. Cullis, secretary-treasurer. This is likely to be a live organization, and to be useful in advancing the fruit interests of this part of the country.

At Belleville, Mr. Lick reports an especially good meeting. It was held in the orchard of Mr. J. K. McCarger. A very lively interest was evinced, and many questions were asked and answered. Here, too, a branch organization was formed, with J. K. McCarger as president, J. R. Anderson, vice-president, and Francis S. Wallbridge, secretary-treasurer.

At Maitland the meeting was very encouraging, "due largely," Mr. Lick remarked, "to the earnest and able assistance of Mr. Harold Jones. Mr. Jones has

a large and constantly increasing apple orchard, which is an object lesson that makes the best educator along the lines of apple growing that can be given in any neighborhood."

Word comes from Mr. A. E. Sherrington, of the Walkerton Fruit Experiment Station, of good meetings in the Georgian Bay District. At Port Elgin and Teeswater there was great interest shown in the work. At the latter place a branch association was formed, with a paid membership of twenty-four. Mr. Sherrington writes: "These object lessons in the orchard are just what the people want. As the counties of Bruce and Huron are large, in order to reach all our people, we are going to organize branch associations in every locality. I am calling a meeting in Lucknow on June 11th, and am asking each branch association to send two delegates in order that we may organize the District Association, and arrange our work for the future. I am advising every grower to grade and pack his own fruit, and that we may have a uniform brand on our fruit I am suggesting that we adopt the following:

Lake Huron Fruit Growers' Association.
Grown and Packed by.
Variety

"At the present time we nearly all have no system of grading and packing, and this does not inspire confidence among the growers, packers, shippers and consumers."

We also have the following letter from Mr. Sherrington—"I attended a meeting of the Teeswater branch of the Fruit Growers' Association yesterday, and we had a grand meeting, nearly all the members being present. Some that were not members became so before leaving, and every one was much interested in the work. After organizing them I addressed the meeting on 'Orchard Cultivation.' There is a marked improvement in the orchards throughout the coun-

try this season. I think fully one third of the orchards are now being cultivated. Enclosed you will find a list of officers and members of the Teeswater Branch."

The Walnut Grove planted at Walkerton by Mr. Shaw was visited by Mr. T. H. Race of Mitchel and the writer, on the occasion of a recent meeting of the Walkerton Horticultural Society. The grove is now about twenty years planted; trees are beautiful in form, the trunks are straight and clear of limbs about twenty feet high; and at the base they would measure from 8 to 10 inches in diameter. Mr. Race was interested to know the object in planting such a large grove of walnut trees. "Was it for the lumber," he said "which twenty five or thirty years ago was worth \$75 a thousand; or for nuts which would surely sell at a good price in the large cities, or was it purely for ornament?"

Mr. Sherrington on who also accompanied us thought that little had been done with them for any purpose. The double row had robbed the ground of its fertility for a width of at least thirty feet from the fence, and the ill effects were noticeable upon the apple trees nearest them.

To settle the questions satisfactorily we appealed to Mr. Shaw himself for some definite information.

"How long have these trees been planted?" we inquired.

"The two rows of walnut trees" said Mr. Shaw "running north and south along a part of the west side of my grounds grew from nuts planted there in the autumn of 1882, the same time that the apple orchard growing east of them was planted. You would observe a row of maple trees had also been planted west of these two rows, but most of the maples were killed by caterpillars two years since. These caterpillars

did not eat the leaves of the walnut trees."

"These trees were planted thus — — —

so that each tree east and west was not opposite each other. There are in the two rows of walnut trees 250 trees, besides you might notice many others in the grounds. The nuts were planted 12 feet apart, 3 or 4 together but only one was left to grow, the others were removed when 2 years old and replanted."

"What object had you in planting this grove?"

"My object in planting these three rows of trees one maple and two walnut, was to form a wind break to protect the orchard from the southwest and west in this country. You would likely observe that towards the south, where these rows reach higher and drier ground, they were about $\frac{1}{3}$ smaller in diameter than where they grew on low moist land.

"What use do you make of the nuts."

"Nuts have grown on these trees for several years but not in great abundance, no doubt my having the lower limbs removed so as to increase the height of the trees prevented this. Several bushels grew on them last year, some of which I planted and gave the rest to my neighbors to plant, and one gentleman has planted two or three bushels of them. I have made no effort to ascertain the value of the wood of these trees as they now stand. I think these walnut trees are as rapid growers as our hard maples and make as good shade trees, and they are proof against caterpillars."

Georgetown.—A Horticultural Society, with very bright prospects of usefulness, was formed in Georgetown on the 2nd of May, and a good membership secured. The first public meeting will be held this fall.

Question Drawer

Hollyhock Rust.

1296. SIR,—Enclosed herewith I send you a leaf from one of my hollyhocks affected with a blight or rust that is doing my collection much damage. It is fastened so closely to the leaf that it cannot be washed off. Can you tell me how I may rid my plants of this? I hope it is not a recurrence of the pest that caused the growing of this fine flower to be abandoned for a time some years ago.

Mr. Clement's hollyhocks are affected with the Hollyhock Rust, a disease which originated in Chili, but first appeared as a pest in Australia. It entered Europe soon afterwards through France, and is to be found now wherever the hollyhock is cultivated. The peculiar feature of this rust is that only one spore form is known—the teleutospore. This appears on the leaves as pale brown warts. These spores will germinate at once, so the disease is continued throughout the season. It is likely also that the teleutospore form may pass the winter in the resting stage. The common Round-Leaf Mallow is also attacked by the same rust; and, if hollyhocks are to be free from this rust, the wild mallow must be looked after carefully.

There are two methods of treating this rust, 1st, by spraying with Bordeaux mixture two or three times during the growing season; and, 2d, by collecting and burning the fading and falling leaves, and not allowing them to decay on the ground under the plants. It is possible for every hollyhock enthusiast who fears the attack of this rust to use both of these methods, as they are simple and effective.

O. A. C. Guelph. W. LOCHHEAD.

Effect of Cold Storage on Fruit.

1297. SIR,—Does cold storage spoil the quality of fruit? Is ice more natural than chemical cold storage? I found that chemical cold storage

changed my Flemish Beauty pears into fruit no better than turnips: they would not ripen when brought out.

Montreal.

R. BRODIE.

The Flemish Beauty pear does not ripen well if gathered before it is mature. In this respect it differs materially from the Bartlett which will ripen even if immature when harvested. The Flemish Beauty, on the other hand, wilts and becomes leathery and insipid, if gathered too soon. Probably this explains the difficulty with those referred to by Mr. Brodie, and not the cold storage at all.

To Spray or not to Spray.

1298. SIR,—I enclose you the following clipping from a Buffalo paper which seems to be very much opposed to spraying.

"As last year was an off year with the apple crop, it is believed that the yield this year will be a large one. For several years past hundreds of farmers in Niagara and Orleans counties have persistently practised spraying the trees. Now, those who were the most ardent believers in the benefit derived, declare themselves opposed to it, and they say that this year they will take chances and let nature take its course.

Two years ago it was observed when there was such a large crop that the orchards that were not sprayed bore the best fruit and last year the result was the same."

I intended purchasing a machine but such reports as these are very discouraging. I should like to have your opinion.

Southend, Ont.

GEORGE SLADE.

A newspaper report such as this has no weight with us whatever. There is no more sense in it than if one were to give up insuring his house because for several years he had noticed that his neighbor's house, which was not insured, had not been burned. There are seasons when scab, aphid and canker worm, do not trouble us, and in such seasons the unsprayed orchard yields as good fruit as the sprayed one, but nevertheless it pays to be on the safe side.

Snow Ball Leaves Withering.

1299. SIR,—I am sending under separate cover a sample of Snow Ball leaves. The whole tree seems to be withering up and dying. I sprayed it twice with Paris green. Can you give cause and remedy?

Walkerton.

JAS. WHITEHEAD.

This beautiful shrub is suffering most severely, in all parts of the country, from a kind of aphid which gathers in great numbers on the under side of the leaves and sucks out the juice, causing them to wither

and dry up. We have referred the matter to a specialist, and in the meantime would advise spraying with kerosene emulsion. In spring, when the buds are bursting, a thorough drenching of the whole tree from the ground up to the ends of the limbs with crude petroleum emulsion or with a strong solution of whale oil soap, would probably destroy the young aphidæ, just as they are hatching out.

Open Letters

INDUSTRIAL EXHIBITION, WOLVERHAMPTON, ENG.

CANADIAN APPLES—BRIGHT PROSPECTS— A LETTER FROM THE SUPERINTENDENT

A. McD. ALLAN

ALTHOUGH during an Atlantic voyage there is time which might be profitably expended in the study of horticulture in theory, there is but a limited space for practice! It was, however, interesting to find daily upon the dining tables fine specimens of Baldwin and Spy apples and Drouard pears from the cold storage chamber in the ship. But the few days on ship were spent pleasantly or otherwise according to the condition of each passenger. Some taking exercise at "shuffle board" or "ring toss" on deck, others engaged in trying to walk as if quite at home upon the rocking ocean liner, a few reading and some otherwise engaged possibly in exercise more violent than agreeable! But landing day soon comes and ship's company parts never to meet again in all probability.

A short run from Liverpool brings me to the site of the exhibition at Wolverhampton, a town of about 7,000 inhabitants, situated

conveniently for the residents in the Midland counties.

The exhibition is held in part of a beautiful public park, and occupies probably about fifteen acres. The park, like all English parks, is well planted with a great variety of trees and plants, contains a chain of lakes in which are fine specimens of the swan, duck, water hen, etc. The walks, which are numerous and cut out in easy sweeps and curves, are made of a reddish fine gravel which, when rolled, becomes almost as smooth as our cement sidewalks.

The exhibition grounds are a marvel of neatness and cleanliness; buildings are good and well filled with exhibits practical rather than fancy. It is pretty generally acknowledged that the Canadian building is not only possessed of the most attractive exhibits in the grounds, but also the most practical!

Our display of fresh fruit from storage is

confined chiefly to Baldwin, Spy, Ben Davis, King, Phoenix, Seek, Fameuse, Wealthy, Fallawater, Mann, Swazie, Golden Russet, Nonpariel, Grimes, Canada Red, Scot's Red, Stark, Peck's Pleasant, Pewaukee, Spitzenberg and Dronard and Vicar pears. Arrangements had not been completed in time to make a selection from the crop of last year for this exhibition, hence the government had to take these fruits from some packed in Montreal storage, and although they are not by any means such as we would select for this purpose, people generally are delighted and astonished at their excellent appearance, especially when they read the printed notices "Canadian fruit picked in Sept. and Oct., 1901, and kept in cool air." Besides this display we have four handsome octagonal shaped stands covered with many specimens of fruits and vegetables preserved in fluid, and these are admired greatly.

Our system of cold storage leaves little to desire, and it is evident that all specimens that were perfect when packed are still in a good state of preservation, and even the small, spotted and wormy specimens carried well and most of them landed in the same order as when packed. These of course have been discarded as unfit for exhibition and only the best specimens used. The "Wilson" case was used, each specimen being wrapped in tissue covered with light brown paper. Greening, Ribston and Blue Pearmain were quite unfit for the tables, but of the list I name above we have fairly good specimens under all the circumstances. I look forward with interest for a selection from this year's crop of all such as can be used before closing day, and feel sure it will pay to use every care in selecting and forwarding. It is chiefly with such a display that we can dispel the still too prevalent idea the ordinary Britisher has of the coldness of our climate, and this is certainly

the only point that stands in the way of a much larger emigration to our shores.

I made several enquiries regarding the effect of our "Marks Act" upon the trade and am pleased to hear that some at all events have remarked an improvement in packing. I have shown the act to many dealers and all express themselves strongly in favor of it, and state openly that if the act is carried into full effect it will do more than anything else to establish confidence between shipper and buyer. It will undoubtedly take time to do this as confidence has been rudely shaken in the past, and only persistence in honest packing can place us where every honest shipper should be. Possibly if boxes instead of barrels were used we could regain confidence more quickly. The Tasmanian apples are all shipped in this way, and, although generally a softer fruit than ours, arrive in prime condition.

I find that harm is done by shippers sending a variety of apple under different names. The retailer here only knows a few kinds, and does not attach much value to any outside of what he knows. It is therefore very important that nomenclature should be studied and that inspectors see most carefully to correctness in this respect so as to accustom the buyers here to find varieties properly classified from all sections of Canada and from all shippers. It is only in this way we can hope to establish a market value for other kinds besides Baldwin, Spy, Greening, King, etc. At present markets here only recognise value in about seven or eight varieties which come forward properly named from all shippers. All others have to take a secondary place or come in with "culls."

If time permits I shall examine all the varieties coming into Britain from Tasmania and give you the results of my humble judgment in another letter.

British Columbia, a Competitor in Winnipeg.

Sir.—I am just in receipt of a letter from Peachland B. C., in which the writer is most enthusiastic over the future of that country. He says that last year the Cold Stream Ranch (Lord Aberdeen's) produced, from one hundred acres apples which

sold for thirteen thousand dollars! I think that Ontario fruit growers should be aroused to a sense of the danger of this western province stealing away from them their best market.

Ottawa, J. J. PHILL,
Fruit Inspector.

Our Affiliated Societies

Hamilton.—The Spectator flower garden competition has been finally closed, all the entries having been tabulated and arranged in order and the list handed over to the committee of the City Improvement and Horticultural societies. Nearly 100 boys and girls are working in the junior competition and over 50 adults are interested in the contest for grown-up people. The entries are from all parts of the city, and the judges will have a good deal of traveling to do in making their several inspections during the season. These inspections will be unannounced, and it is expected that there will be at least three of them before the end of the season and before the awards are made. In the meantime the contestants are all working to make sure that their gardens are the very best in the whole city and that the first prize is coming their way.

Paris.—The Horticultural Society has interested itself in the improvement of the school grounds, and especially in the planting of a large collection of trees and shrubs, in order that the children may become familiar with the varieties. A gentleman who has travelled much, has expressed great appreciation of the work, and says that no where else has he seen so excellent a collection of varieties planted on school grounds. The society furnished elms, walnuts, basswoods, horse chestnuts, white oaks, hickory, white birch, cut leaf and negundo maples, Colorado blue spruces and tulip trees in sufficient number to surround the large school grounds, and besides this there is a large collection of flowering and ornamental shrubs, spiræas, deutzias, weigelas, syringas, hydrangeas, flowering thorns, forsythias, and a variety of native shrubs, which have been planted to give the best effects.

Our Book Table

AMERICAN HORTICULTURAL MANUAL, PART I.—Comprising the leading principles and practices connected with the propagation, culture and improvement of fruits, nuts, ornamental trees, shrubs and plants in the United States and Canada, by Prof. J. L. Budd, of Ames, Iowa. Cloth, \$1.50.

The plan of this work seems to be somewhat after that of Downing's *Fruits and Fruit Trees of America*, except that the part giving cultural methods is published in a separate volume, and the Systematic Descriptions will follow as Part II in the same manner. That many changes and advances have been made in horticulture since Downing's work was published, is evident from the many appendices which are being made to that valuable work, and we welcome this work of Prof. Budd's as an effort to bring up to date the Pomology of North America. With such excellent manuals at hand, no fruit grower needs to be ignorant of either the best varieties to plant, or the best methods of cultivation.

IRRIGATION FARMING, a hand book for the proper application of water in the production of crops, by L. M. Wilcox, editor of "Field and Farm." Revised and enlarged edition. Illustrated 1902.

The chapter on "Irrigation of the Garden" will alone commend the book to market gardeners, and that on "Irrigation of the Orchard" will make it indispensable to the many fruit growers in Ontario who have suffered serious loss of late years from long continued drouths, and conse-

quent small sized fruit. The principal chapters treat very fully of the advantages of irrigation; relations of soils to irrigation; treatment of alkali; water supply; canal construction; reservoirs and ponds; pipes for irrigation purposes; flumes and their structure; duty and measurement of water; methods of applying water; irrigation of field crops, the garden, the orchard, the vineyard and small fruits; all about alfalfa; windmills and pumps; devices, appliances and contrivances; sub-irrigation and subsoiling; sewage and drainage; irrigation in humid regions; common law of irrigation; glossary of irrigation terms, etc. The volume is profusely, handsomely and practically illustrated.

COMMISSIONER OF HIGHWAYS.—Sixth Annual Report, 1901, by W. A. Campbell.

WESTERN FAIR.—Prize List, London, Canada, September 12th to 20th, 1902.

NOVA SCOTIA.—Annual Report of the Fruit Growers' Association, 1902.

ONTARIO FRUIT EXHIBIT AT PAN AMERICAN, 1901, W. H. Bunting, of St. Catharines, Supt. This report has been published as an appendix to the report of the Ontario Fruit Growers' Association. Mr. Bunting first gives a capital summary of such fruits in connection with the exhibits as are of the most practical importance to our fruit growers; then follows an official list of awards; a list of collective exhibits with dates; and a complete alphabetical list of all varieties of fruits shown.

ONTARIO FRUIT CROP REPORT FOR 1902.

COUNTIES.	APPLES.					PEARS.			
	Summer	Baldwin	Spy	King	Greening	Bartlett	Duchess	Anfore	Other kinds.
ESSEX. W. W. Hilborn, Leamington.	under good	under good	under good		average.	over good	over good	over	under
WENTWORTH. M. Petit, Winona.		under good	average good	over good	over good	under good	over good	average good	
A. W. Peart, Burlington.	over good	over good	over good	average good	over good	under good	average good	under good	
LINCOLN. L. Woolverton, Grimsby.	over good	under good	average good	over good	over good	under good	over good		
S. M. Culp, Beamsville		under good	average good	over good	over good	under good	over good		
W. H. Bunting, St. Catharines.	over good	under good	under good	over good	over good	under good	average		average
SIMCOE. C. L. Stephens, Orillia.	over good	most varieties under average.							
G. C. Caston, Craighurst.	over good	most varieties about average.							
W. W. Cox, Collingwood.	average good	average good	average good	average good	average good	All varieties an average.			
GREY. J. G. Mitchell, Clarksburg.	average good	under good	average good	over good	over good	average good	average good	average good	
BRUCE. A. E. Sherrington, Walkerton.	average good					All varieties average crop.			
ONTARIO. R. L. Huggard, Whitby.	average good		over good	over good	over good	average good	under good	under good	over good
NORTHUMBERLAND. H. J. Snelgrove, Cobourg.	over good	under good	over good	over good		All varieties an average crop.			
PRINCE EDWARD Co.— W. H. Dempsey, Trenton. Harold Jones, Maitland	over good	under good	over good	over good		All varieties an average crop.			
		Most varieties			over average.				
VICTORIA. Thos. Beall, Lindsay.		Most varieties			average.	average good	average good		
RENFREW. R. B. Whyte, Ottawa.	average good	Most varieties			average.				
ALGOMA. Chas. Young, Richard's Landing.	most varieties grown are over.					Varieties grown average.			

ONTARIO FRUIT CROP REPORT.

Key—QUANTITY denoted by average.
 over “
 undr “
 QUALITY by Good.
 Fair.
 Bad.

PEACHES.					PLUMS.					GRAPES.	
Alexander.	Triumph	Crawford	Elberta	Smock	Bradshaw	Washington	Yellow Egg	Barbank	Lombard	Concord	Rogers
over good	over				under					over	
over good	over good	average good	over good	over good	over good	average bad	average good	over good	over good		
over good	over	average good	over good	over good	average good	average bad	average good	under good	under good	over good	average good
over good	over good	under good	average good	over good	average good	over bad	over good				
									over	over good	average good
over good	over good	under		over good							
					Most varieties		under.				
					Most varieties		under.				
	All varieties	average.									
	All varieties	average.			over good	over good	over good		over good		
					over good	over good	over good	under good			
					Most varieties		under.				
					Most varieties		under; rotting				
					Most varieties		under.				
					Not much		grown.				under.
					Most varieties		average.				

Notes on Fruit Crop Reports.

W. W. HILLBORN:—Very few grape vines about Leamington old enough to bear fruit; nearly all were killed at the same time the peach trees were destroyed.

M. PETTIT:—All kinds of fruit trees are looking healthy and free from fungus. There are fewer insect enemies than usual.

A. W. PEART:—Conditions have been unfavorable for fungi, and the canker worm and tent caterpillar are being kept pretty well under control.

W. H. BUNTING:—The most serious effects of the frosts of May 9th and 10th are found in the Early Crawford peach orchards; where far removed from water, nearly all crops destroyed. A large percentage of the fruit buds were destroyed. Insects and fungi very little; the tent caterpillar has appeared in unsprayed orchards; the peach curl is not serious; apples are particularly fine and clear of scab; and altogether the fruit crop should be fairly satisfactory this season if a proper distribution of it can be made.

STANLEY SPILLETT:—A small mite attacked the pear leaves, causing the leaf to have a blistered appearance; currants last year were attacked by the same or a similar insect, which works from the under side of the leaf. I found dusting with powder of Paris green and lime beneficial. The gooseberry worm made its appearance ten days ago in myriads, but one application of twelve ounces of Paris green to 45 gals. of water, with milk of lime destroyed them. Gooseberry mildew has not yet appeared.

I. G. MITCHELL:—No trouble whatever from insects or fungi so far.

W. W. COX:—I am surprised the pears and apples look so clean and good, for it rains everytime we spray. We had it wet and cold all spring, and I am surprised that so much fruit has set.

H. J. SNEEGROVE:—There is a marked absence of noxious insects and fungi this season. June bugs destroyed the buds and blossoms of the plum trees in many places. In Northumberland County, horticulturists have found the Fameuse apple stung with an insect which appears in effect to resemble the curculio. This pest has not been noticed in this district before and is a mystery. Spraying was never practised so generally as this season.

W. H. DEMPSEY:—Insects have not been as numerous as in other seasons. Fungus is growing fast on some varieties of fruit.

H. JONES:—Fameuse, which is largely grown here, has set a good crop, and are well formed and growing rapidly. Fungi is showing where spraying has been omitted. Very few insects, but the Tussock moth is appearing in large numbers in some orchards.

THOS BEALL:—The outlook for fruit growers is rather gloomy this season. Pear bloom first upon May 17th; from that date until June 14th, 28 days, rain fell on twenty-one days. Consequently the apple crops in this section will be much under the average. Grape vines are healthy but late, and I think they will not ripen their fruit this season.

CHARLES YOUNG:—A cold, wet spring, but fruit trees have set twice the fruit they ought to mature. If the crops throughout Ontario can be judged by that in St. Joseph Island, there will no \$5.00 a barrel paid this season. I have no hesitation in saying that all Japan plums are harder than European, and even harder than some of the Americans

BOOKS FOR FRUIT GROWERS.

Orders for any of the following books, accompanied by the Cash may be sent to Editor Canadian Horticulturist, Grimsby, and the books will be forwarded at prices noted, postpaid.

FRUIT, FLOWERS, ETC.

Apple Culture, Field Notes on. Bailey.	\$0.75
Bulbs and Tuberos Rooted Plants. C. L. Allen.	1.50
Bush Fruits Prof. A. Card.	1.50
Chrysanthemum Culture. Morton. Cloth.	1.00
Chrysanthemums, How to Grow. . . . .	.25
Cider Makers' Handbook. Trowbridge.	1.00
Cranberries, Cape Cod. James Webb. Paper. . . . .	.40
Cranberry Culture. White.	1.00
Crops, Spraying. Clarence M. Weed. . . . .	.25
Dahlia, The. Lawrence K. Peacock. . . . .	.30
Floriculture, Practical. Peter Henderson.	1.50
Florida Fruits, and How to Raise Them. Harcourt.	1.25
Flower Garden, Beautiful. Matthews. . . . .	.40
Fruit Culturist, American. Thomas.	2.50
Fruit Grower, Practical. Maynard. . . . .	.50
Fruit Harvesting, Marketing, etc. F. A. Waugh.	1.00
Fruit, The. P. Barry.	1.50
Fumigation Methods. Willis G. Johnson.	1.50
Fungi and Fungicides. Clarence M. Weed. Cloth \$1.00, paper. . . . .	.50
Garden Making. Prof. L. H. Bailey.	1.00
Grape Culturist. A. S. Fuller.	1.50
Grape Grower's Guide. Charlton. . . . .	.75
Grape Growing and Wine Making, American. Prof. George Husmann.	1.50
Greenhouse Construction. Prof. I. R. Taft.	1.50
Greenhouse Management. Prof. L. R. Taft.	1.50
Horticulture, Annals of. Prof. L. H. Bailey.	1.00
Horticulturist's Rule Book. Prof. L. H. Bailey. . . . .	.75
House Plants and How to Succeed with Them. Lizzie Page Hillhouse.	1.00
Insects Injurious to Fruits. Saunders.	2.00
Irrigation Farming. L. M. Wilcox.	2.00
New Horticulture, The. H. A. Stringfellow.	1.00
Nursery Book. Prof. L. H. Bailey. Cloth.	1.00
Nut Culturist, The. Andrew S. Fuller.	1.50
Peach Culture. Fulton. Revised edition.	1.00
Pear Culture for Profit. Quinn. New and revised edition.	1.00
Plants, Handbook of. Peter Henderson. New enlarged edition.	3.00
Plants, Propagation of. A. S. Fuller.	1.50
Plants, Your. James Sheehan. . . . .	.40
Plums and Plum Culture. F. A. Waugh.	1.50
Principles of Fruit Growing. Prof. L. H. Bailey.	1.25
Pruning Book, The. Prof. L. H. Bailey.	1.50
Quince Culture. W. W. Meech.	1.00
Rose, The. Its Cultivation, Varieties, etc. H. B. Ellwanger.	1.25
Rose, Parsons on the.	1.00
Small Fruit Culturist. A. S. Fuller.	1.00
Spraying of Plants, The. E. G. Loefeman.	1.00
Strawberry, The A B C of the. T. B. Terry A. I. Root. . . . .	.50
Strawberry Culturist. A. S. Fuller. Illustrated. . . . .	.25
Vineyard at Lakeview. My. . . . .	.50
Violet Culture, Commercial. B. T. Galloway.	1.50
Water Garden, The. William Tricker.	2.00
Window Flower Garden. Heinrich. . . . .	.50