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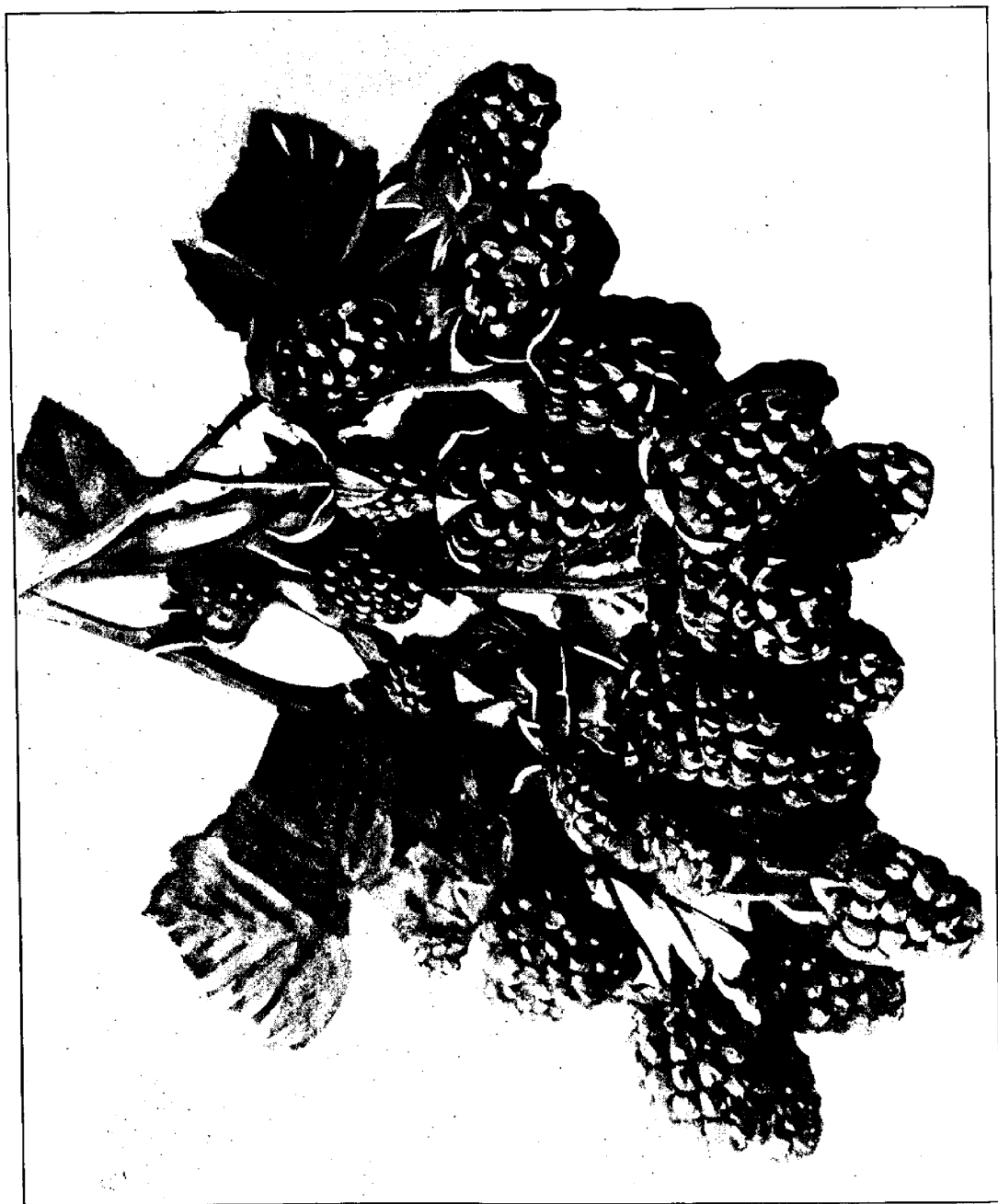
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“HUBOLT.” (Slightly less than life size.)

THE CANADIAN HORTICULTURIST.

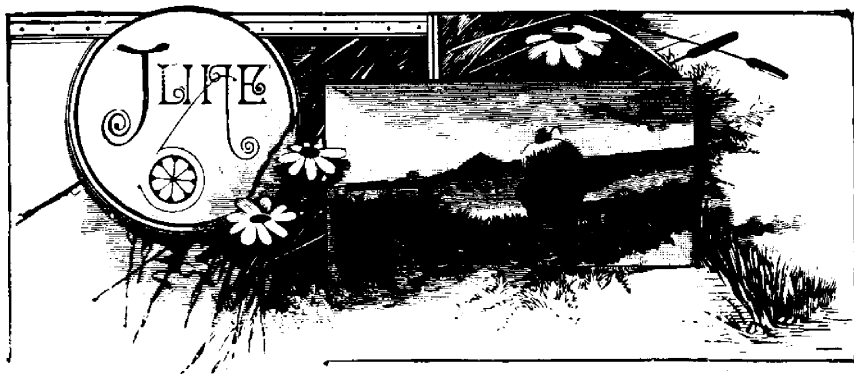
VOL. XXI.

TORONTO,

1898.

JUNE.

No. 6



NEW CREATIONS IN THE VEGETABLE KINGDOM.

CREATIONS is here used not in the sense of bringing into existence something out of nothing, but by new combinations of that which exists to produce a new object. Doubtless there are limitations to man's power to create even in this sense, but as yet we do not know where they lie. Confining ourselves to what man has produced in new plants, we shall see wonderful creations which open to us a vista of possibilities to which we dare not set a limit. Space at our command will only admit of a few examples, and with only one exception we will confine our attention to what has been done in this Province of Ontario, where every statement can be fully verified.

The late Charles Arnold of Paris, perceiving that the dwarf peas of our gardens were sadly lacking in the rich delicious flavor of many of our tall-growing varieties which required the often inconvenient care of being fur-

nished with support, set himself to produce a dwarf pea having all the desirable sweetness and flavor of the tall-growing sorts. The result of his work was the well-known dwarf pea, the "American Wonder," which was bought by a seedsman who felt himself so greatly benefited by his purchase that he subsequently presented Mr. Arnold with a valuable gold watch. One more of his creations, and this in the line of our cultivated fruits; he undertook to produce an apple having many of the good qualities of the Northern Spy and the early bearing habit of the Wagener. His labors have given us the "Ontario" apple, to the value of which our energetic Director, Mr. Thos Beall, of Lindsay, and our fruit experimenter, Mr. Walter Dempsey, of Hastings, can testify.

Mr. H. H. Groff, of Simcoe, has given us many very beautiful creations in gladioli and cannas. His gladioli are widely known and highly prized by growers of this late summer flower,



(FIG. 1354 — A branch of *Pyrus baccata* in fruit, half natural size.

many of which surpass in vigor and perfection of form and coloring any hitherto known. His dark foliaged cannas of the French type excel in quantity and vigor the latest continental introductions. About a dozen of these creations are described in his catalogue for 1898.

Mr. Wm. Saunders, Director of the Experimental Farms of the Dominion, has produced new varieties of wheat, barley and peas. From the report of 1896 we gather that seven of the fifteen

varieties of cross-bred spring wheat rank among the twelve sorts which averaged the heaviest crops at the six experimental farms. One of them, the Preston, a cross between the Ladoga and Red Fife, in a three years' test at all these farms, exceeded every other sort by two bushels per acre, and at the Central Farm, Ottawa, by three bushels per acre. The object sought has been achieved, namely, to increase the number of vigorous and productive sorts of high quality and early ripening. In barley, where it was sought to induce earlier ripening in the two-rowed; and in the six-rowed longer heads and a greater propensity to stooling; in addition to increasing the number of vigorous and productive varieties, remarkable results have been secured.

Seven of the new creations in the two-rowed appear in the fourteen sorts that in the tests at all the farms took rank among the six most productive, and four in the six-rowed out of the fifteen. In peas, sixteen of the cross-breeds take their place among the thirty-two sorts which ranked in like tests as of the twelve most productive.

Seven years of experiment in our North West has demonstrated that the hardiest fruit trees obtained from Russia and elsewhere give no reasonable hope of



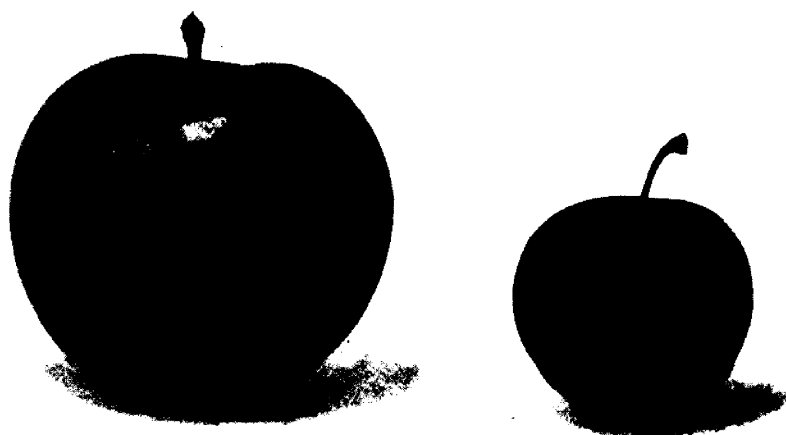
(FIG. 1355.—A branch from one of the seedlings of *Prunus pumila* grown at the Central Farm by Mr. Craig.)

yielding fruit in satisfactory quantity in that climate. One Siberian crab, *Pyrus baccata*, yielding fruit not much larger than a cherry, has endured the climate for five years at Brandon and Indian Head. Mr. Saunders has taken in hand to improve this crab in size and quality, and has a number of cross-bred seedlings, the fruiting of which he awaits. (See Fig. 1354.)

He is also working to improve the hardy Sand Cherry, *Prunus pumila*. (See Fig. 1355.)

So much for our Canadian workers in

this most interesting field. A brief glance at a few of the creations of Mr. Luther Burbank of San Diego, California, who has been working for twenty-five years, must suffice. One of his new plums is named "Golden," a hybrid between the American Chickasaw and the Japanese Sweet Botan. Ellwanger & Barry, of Rochester, N.Y., say of it, "we never saw a more beautiful plum," and S. D. Willard, of Geneva, N.Y., an extensive grower of plums for market, says, "in quality all that could be desired." (See Fig. 1356.)



(FIG. 1356.—HYBRID PLUM GOLDEN, and its male parent (both life size) ROBINSON PLUM.

Mr. Burbank says of the tree, "I have never seen a plum tree which perfects so much fruit." His hybrid berry which he named Humboldt, grown from seed of an improved California Dewberry fertilized by the well known Cuthbert Raspberry, is shewn in the frontispiece. Its very large fruit is a dark crimson, exquisite in flavor, unexcelled for cooking or canning.

By fertilizing our common Black Walnut (*Juglans nigra*) with the Walnut of California, (*Juglans Californica*) he has produced a walnut larger than either parent, with meat superior in quality to theirs, and that parts more readily from the shell. The tree is an early bearer and very productive.

His new race of Clematis, the offspring of *Clematis coccinea* with *Clematis crispa*, is a most beautiful production. The plants are vigorous, produce a profusion of flowers from June until frost, which are generally broadly bell shaped, with a beautiful frosted appearance and a blending "of colors and shadings not found elsewhere in the Clematis family." (Figure 1358 is a representation of the flowers of this hybrid.)

These few instances of what has been done in the way of new creations in plant life naturally start the inquiry, *how* has it been done. That our answer may be intelligible also to those who are not familiar with the plant organs concerned in the formation of seed, the



FIG. 1357 —JUGLANS CALIFORNICA
Staminate Parent.

JUGLANS NIGRA.
Pistillate Parent.

HYBRID WALNUT.
All Life Size.

NEW CREATIONS IN THE VEGETABLE KINGDOM.

indulgence of students of botany is craved while a brief account is given of those organs and of their office. They are of two kinds, one is called "stamens" the other "pistils," and are the only essential organs; when these are present the flower is said to be perfect,

parts, ovary, style, and stigma. The filament merely supports the anther, in some flowers is very short; the office of the anther is to produce a quantity of small dust like grains called pollen which are extruded when matured through (Fig. 1360 highly magnified pollen grains.)



FIG. 1358.—CLEMATIS. (Sample blooms of the new race.)

though it have neither sepals or petals. Fig. 1359 represents the essential organs of a lily; the organ at the left is the stamen, consisting of two parts, the filament and anther; the one at the right is the pistil, consisting of three

openings which then appear in the anther. The style serves to connect the stigma with the ovary, in some instances it is wholly wanting, and when present varies in length in different flowers. The office of the stigma is to receive

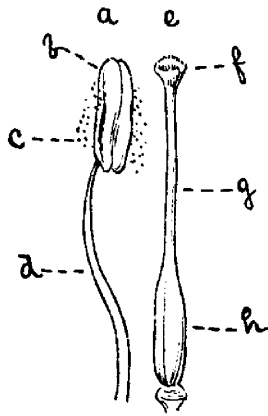


FIG. 1359.—Essential organs of a Lily (Lilium).

a—Stamen. b—Anther. c—Pollen. d—Filament. e—Pistil. f—Stigma. g—Style. h—Ovary. (After Gray.)

and retain the pollen, to this end it is when mature quite viscid; the ovary is the body within which the seeds are formed, which in their early stage are termed ovules. The pollen, falling on the moist sticky surface of the stigma which is quite naked, that is, not covered as is all other parts of the plant by

vary greatly in number and form. Frequently the stamens appear in one plant and the pistils in another of the same species. Some idea of the great diversity of form may be gathered from examining. He should also be able to judge when the stigma is in condition to receive the pollen. (See Fig. 1361.)

The operator, having decided upon the qualities he desires to produce, selects for the parents two plants each possessing in a marked degree such qualities that if united in one plant the desired result would be attained; from one of which he will get the pollen with which to fertilize the pistil of the other. It sometimes happens that the pollen is ripe and falling before the stigmas in the flowers of the other plant are mature. In such case the pollen can be gathered into a small vial, care being taken that everything is perfectly dry, then tightly corked and kept in a cool dark place. Pollen absorbs moisture, which results in the extrusion of the pol-

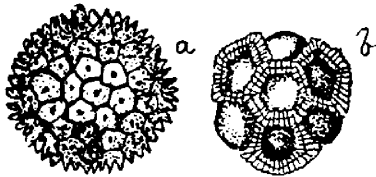
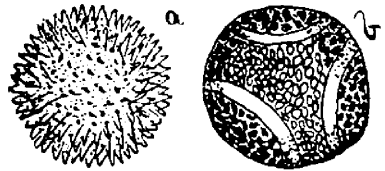


FIG. 1360.—Pollen grains highly magnified. a—Morning Glory (*Ipomœa purpurea*). b—Black Oyster-plant (*Scorzonera Hispanica*).



Pollen grains highly magnified. a—Hollyhock (*Althœa rosea*). b.—Passion flower (*Passiflora carnea*).

cuticle (epidermis), absorbs moisture, swells, thrusts out a tube which passes through the stigma, down the style, enters the ovary to the ovule, into which it is supposed to discharge its semi-fluid contents through a tiny opening. When this takes place not only the ovule but also the ovary increase in size and the product becomes a living seed. When this does not take place the ovule perishes. It is important that every one who wishes to produce new plants become familiar with these organs, for they

len tube, or, if the moisture is in excess, in the bursting of the coats of the pollen grain and the loss of its contents. Too much moisture, either as rain or fog at the critical period of inflorescence when fertilization should take place, is often the cause of failure of fruit. A soft camel's-hair pencil is an excellent instrument with which to collect pollen, and also to apply it to the stigma.

The flowers to be pollenized must be cared for to prevent other pollen from being deposited on the stigma, both by

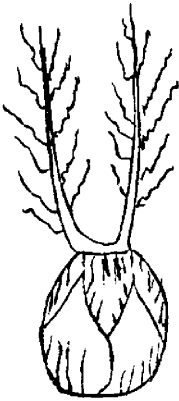


FIG. 1361. —Pistil of wheat magnified.

removing all the anthers from that flower before they are mature, and by preventing it from being afterwards brought from other flowers, on air-currents or insects, by covering the flower with fine gauze. Sometimes it is necessary to remove the anthers and cover with gauze before the flowers open, as in the case of wheat, etc. Having secured a pistil free from pollen, it is pollinated by applying to its stigma pollen grains taken from the plant selected for that purpose. The hand-pollinated flower is again covered to exclude any possible interference with what has been done, and the operator waits for the ripening of the seed.

From seed obtained in this way we may expect plants combining in some proportion the several qualities of each parent. Sometimes the seedlings show such combination, or only some of them, or all may appear like one of the parents, or a part like the one and a part like the other; yet when plants are raised from seed of these seedlings they "often break away into various forms and combinations"; or such break may not take place until the third or even some subsequent generation. In experimenting with the progeny of hand-pollination, it is important to so isolate them that their flowers shall not be fertilized by pollen of ancestors. Often the desired result is secured, when the seedlings manifest the characteristics of one of the parents, by pollinating flowers of such with pollen from the other parent.

Here as elsewhere success is not achieved without labor, patience and skill. Mr. Burbank says, "sometimes hybridized or crossed seedlings" (when the progeny of two species, they are called 'hybrids'; when of two varieties of the same species, 'cross-breeds') "show considerable or even great variation for weeks and then change at once to one or the other of the original types; or they may show no change from one or the other parent forms until nearly ready to bloom or bear fruit, when they suddenly change in foliage, growth, and general appearance."

It is to the enthusiastic lover of Nature that she reveals her secrets. His eye catches her slightest hints, his patience never tires with her seeming waywardness; from unexpected results he often learns his most valuable lessons. The beginner will find more encouragement if he selects pure species for his experiments. Our cultivated plants are largely the result of selection, cross-breeding or hybridization, or a combination of all three; hence the result of working with them is often a return towards primitive forms. Hand-pollination between species as they exist in nature will eventuate in due time in new forms; when this occurs, then with wise selection and careful isolation patiently carried out, satisfactory results will reward patient perseverance. Many of the forms will not be of any use; Mr. Groff's seedling gladioli of 1897 gave him 150,000 new varieties, and he expects some 200,000 more this year from the material now in hand. Not very many of these are likely ever to find a place in florists' catalogues.

Mr. Saunders, speaking of his new grain creations, says, "after selecting the most desirable type or types from a cross, all other forms are discarded,

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and only those retained from year to year which are true to the types selected. After several seasons of careful selection the type usually becomes established and is then fairly permanent."

Arguing from the known sterility of the mule, it was supposed that all true hybrids were sterile. It is evident that in the vegetable kingdom we must either abandon such a position or introduce a new factor into our classification. Botanically, *Juglans nigra* and *Californica* are different species, so are *Rubus Idaeus* and *triflorus*, *Clematis crispa* and *C. coccinea*, and so on; more than this, we say all the Raspberries belong to the genus *Rubus* and the Strawberries to the genus *Fragaria*, and yet plants have been raised by fertilizing the raspberry with pollen of the strawberry. Genera and species, after all, are but our inventions for convenience of classification; to which genus or species a given plant belongs depends upon the opinion of experts, and they are not all of one mind.

We learn from Mr. Burbank that when we change the condition of plants from that of a state of nature, give them plenty of room and of suitable food in the form most readily assimilated, proper light and heat, and add to these potent forces those of hand-pollination and judicious selection, great changes are sure to occur. Possibly in time the relative potency of these several forces may be ascertained, and certain lines of procedure laid down whereby definite results can be secured.

Here is a field for study open to the lovers of natural science. Will not Canadians contribute something to its solution? Hand-pollination is taught at the Ontario Agricultural College, perhaps thence shall come some who shall reveal to us these as yet unknown laws. Professor J. I. Budd, Iowa Agri-

cultural College, tells us he has found that in the case of cross-bred apples, "hardiness follows largely the mother variety, and that the fruit is most frequently modified by the male parent." Is this a universal law? Questions in abundance cluster around this matter of our control of the vegetable kingdom. These problems await solution. Mr. Burbank has given us no further light regarding them than the assurance that "there is no barrier to obtaining fruits of any size, form, or flavor desired; and none to producing plants or flowers of any form, color, or fragrance; all that is needed is a knowledge to guide our efforts in the right direction, untiring patience, and cultivated eyes to detect variations of value."



FIG. 1362.—DR. D. W. BEADLE.

MR. D. W. BEADLE, the writer of the foregoing article, is a well-known figure in Canadian Horticultural circles. Being a B.A. of Yale, and LL.B. of Harvard University, Mr. Beadle was well fitted to take the position of Secretary of the Ontario Fruit Growers' Association, to which he was elected in January,

ABOUT THINNING PEACHES.

1861. In 1878 the *CANADIAN HORTICULTURIST* was first issued as a magazine of 16 pages, under the editorial charge of Mr. Beadle; and was by him most ably conducted until the year 1887, when, upon his resignation, the present secretary-editor was elected to the position.

Thus for twenty-six years Mr. Beadle was Secretary of our Association, and his literary ability, coupled with his practical knowledge of nursery work in the raising of trees and plants, made him well fitted to be a leading spirit in horticultural circles.

ABOUT THINNING PEACHES.

FORTY cents per dozen was the price of some large, well-colored peaches we saw in a Toronto fruiterer's window, whilst a whole basket of small ones was offered for thirty cents, a striking object lesson on the advantage of securing size and quality in fruit. In years of abundant crops what a surplus of small peaches we see, and how few are the fancy specimens which alone those who have the money to pay fancy prices desire. Last year the crop of the Niagara Peninsula was enormous, yet a very small proportion of the baskets marketed were of such dessert fruit as the well-to-do citizen of Montreal, Ottawa, Hamilton or Toronto would consider an addition to that beauty and attractiveness of the table, which he is quite willing to pay for, and which in the case of floral decorations he actually gives very substantial proof of his readiness to pay for. The peach being the rightful monarch of all dessert fruits, and being by its native right, as it were, such a lovely, attractive-looking object, it would seem that size and perfection were more essential in its case than with any other fruit. Its possibilities being greater the buyer expects more of it. The canning factories moreover desire an article that will be able to compete with the Californian product, and dislike being obliged to put up a plethora of "pie fruit," which brings only poor prices and is as much trouble to put up as the best

fruit. The practice of thinning has become part of the regular routine work of the Californian fruit farms, as the canning establishments will not accept peaches under a certain size in some cases $2\frac{1}{2}$ inches being the required diameter.

If the trees form a large number of fruits the grower has it all his own way, and by bold yet judicious thinning, may have his matured specimens any size within reason he pleases. Boldness is usually required to lead him to sacrifice enough of the growing crop to make an appreciable difference, and it often seems reckless to throw away one-half or two thirds, or more, of what is on the tree. Judgment must also be used in the choice of the specimens to be retained or removed, and in performing the operation to obtain the best results for the future welfare of the tree. Among the principles that underlie the practice of thinning, and the conclusions readily deducible therefrom, the following may be briefly noted:

The forming of the pit is the chief drain on the vitality of the tree in fruit-bearing. It is therefore most essential that thinning be done early if the strength of the tree is to be reserved for maturing the fruit. Could we win the same triumphs with the peach as have been gained in the case of the California seedless Navel orange, or Sultana raisin, and have a crop without stones at all, the principle would have full play. But

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as we cannot have this we must let the tree have as little ripening of pits as possible to do. In general it may be said that the peach may be thinned after attaining the size of a hickory-nut (by which time some idea can be formed of what each particular specimen is going to be like), till about the time the pit hardens.

Only if the operation is done early let the grower be careful to spray with Paris green, or the curculio may take all he has left. Some recommend a thinning at an earlier date "by cutting back the branches or shortening in," so as to reduce the number of blossoms, and this is also undoubtedly the best method to adopt in pruning. Yet, sometimes the skilled workmen of the farm cannot overtake this in the rush of spring work, but would be able to find time for thinning later on, or women, or other cheap labor could be employed to perform the latter operation. If trees are thinned early and leaf-curl comes on, they have all the more strength reserved to carry their burden despite their enfeeblement from that malady.

The power of carrying fruit differs with the variety and with the age of the individual. Soft, watery varieties such as Early Rivers, will load much heavier without injury to the tree than firmer varieties such as Wager. Trees only three years old should be allowed to carry only a very small crop. Hale, the great Southern grower, allows his three-year-old trees to carry about three fifths of what he suffers his full-grown trees to bear. In Canada, probably a greater proportion even than this should be removed.

The individuals on a tree should be

kept apart and not allowed to touch each other, and in wet seasons great loss from rot will thus be avoided. At Maplehurst, in 1897, two Alexander trees thinned just before a wet period, produced 8 and 11½ baskets of fruit respectively, while their companion trees equally loaded at time of thinning, gave only 4½ and 9½ baskets. When the fruits were crowded together on the trees not thinned, the rot spread, and entire clusters were destroyed, whereas on the thinned trees the individual peaches being isolated, did not rot so much. In general, 4 or 5 inches apart is the best distance, but as laborers usually will not thin so much as instructed, it is sometimes advisable to direct them to thin more freely. As the sap in the peach-tree tends most powerfully to the top of the tree and produces the finest fruit there, the fruit on the lower parts and the minor twigs should be thinned the most. When a twig or shoot has no leaves nearer its extremity than its fruit, such fruit is liable to drop, and is a suitable subject for removal.

The weight of a peach at the extremity of a branch is a greater strain on the strength of the tree than the weight of one at the base of the branch, and other things being equal should be discarded sooner.

All misshapen, wormy, mildewed and undersized specimens should, of course, be removed.

It is to be hoped that the practice of thinning will be more generally adopted, and that it will take its place with pruning and cultivating as part of the regular work of the farm.

A. E. MICKLE,
Maplehurst.

THINNING FRUIT.

SINCE our experience of 1897 in thinning peaches and apples, we are resolved to give it much more attention during the coming season. We must avoid producing poor fruit, and we must not allow our trees to carry a poor article to maturity, else we have the temptation before us of trying to dispose of it for money, when it should never be offered for sale.

We are pleased to note what our friend L. A. Goodman, of Missouri, says about it in the *Rural World*, as follows :

1st. No tree should have more fruit on it than it can hold up well and mature in perfection ; that is to say, that the trees should not be so loaded as to require their being propped, or so much that the branches bend very severely. This checks the growth of the fruit to such an extent as to injure the quality.

2nd. Every time a tree has too much fruit it weakens its vitality to such an extent as to require two or three years to recover, or so checks its growth that it begins to decline, and is permanently injured.

3rd. In the production of an over-crop it costs the tree more to ripen the seeds than to make the fruit.

4th. If from a tree heavily loaded there is taken one-half or even three-fourths of the fruit, there will be more bushels of fruit than there would be if it all were left on the trees.

5th. By this practice there will be less poor fruit put upon the market, and the good will bring better prices and give infinitely better satisfaction.

6th. Thinning makes the fruit of much better quality, makes it keep longer, and produces finer, handsomer, more attractive, and much more desirable and salable fruit.

7th. When our orchardists shall look upon thinning as important as cultivation, pruning, care and attention, they will succeed in supplying our markets with perfect fruit, and of the very best quality, and thus increase the demand, enhance the value, and give vastly more satisfaction to both the producer and consumer.

COAL ASHES.

FORMERLY the dust from the sifting of our furnace ashes flew about and was a nuisance.

I procured a packing case at a shop, got a piece of wire cloth, made a three-inch deep, square sieve, put slits on side of box for it to run on, used an old broom handle for a shaker. With this rig, and the lid on case, ashes can be sifted easily and with almost entire absence of dust by giving them a few shakes and letting the dust settle before removing the lid.

A USE FOR THEM.

I have at last found a use for our sifted ashes.

As a stable absorbant and drier, sprinkle them on floor of stalls, the ammonia smell will at once disappear and the stable air be purified. As to their value beyond as an absorbent I know not, but they no doubt carry out with them a certain amount of valuable ingredients when so used.

I. SMALL.

Medalta, Port Hope.

IN GROWING SMALL FRUITS.

TEN years ago I began to raise small fruit. In the fall I prepared 12 rods of ground—manured it well. In the spring I bought first-class strawberry plants. These were set out 18 inches apart in the rows, the rows being 4 feet apart. To plant my ground it required 600 plants, which cost me \$10. During the summer the ground was hoed and kept free from weeds. By fall the rows were nicely matted. When the ground froze in the fall the rows were covered with basswood sawdust, the coarsest of this was raked between the rows in the spring.

That season brought plenty of nice large berries. After the crop was harvested the vines were mowed and the thickly matted rows were narrowed to a foot in width by cultivating between them. Late in the fall the ground between the rows was again manured.

The following summer again brought forth a fine crop of berries. Not counting what was used in my family, I harvested that year \$50 worth.

I began now to think that with more land it would pay to raise small fruit. I then bought 4 acres of sodded ground. With a jointer on my plow I worked $\frac{1}{4}$ acre up in good shape, set it, as at first, but using my own runners from plants which had grown their second crop. This was my first mistake, although I hadn't yet discovered it. I cultivated, weeded and covered with sawdust as before. The spring brought every appearance of a good crop. I began to figure: if 12 rods of ground will bring \$50, 40 rods will bring —. But when the crop began to ripen, there were quantities of scrubs not fit for market, and very few fine berries.

The 12 rods, now in its third year, bore a fine crop as before, though not so large. I kept no account of the amount sold that season, but began to try to discover the cause of the failure by reading and from talking with men of experience. I found I had made the mistake in using runners from plants having grown their second crop.

I then prepared $\frac{1}{2}$ acre of ground. As my own plants were now run out, I bought 4,000 plants of different varieties, at a cost of \$50. I had now learned my first lesson. After that I used the first year's runners, taking up all in the rows except the old plants, and the newest runners; these I plow under, as they are too weak to give the best results.

I do not use barnyard manure now on my strawberry ground, because it brings so large a crop of weeds. Now, after harvesting two crops of berries, I plow the vines under, and the last of August or the first of September I sow the ground to rye. The following spring when the rye is up about three feet, I plow it under, roll the ground well and set out to plants.

In the spring I sow it well with unleached ashes, using about 50 bushels to the acre, the same as plaster would be used. This saves much labor in hoeing and weeding and also keeps the ground in good shape.

I have been very successful in always having nice large berries. I have only given my experience with strawberries. Aside from these I set out the balance of my 4 acres to asparagus, currants, gooseberries, raspberries and blackberries. The blackberries I consider the most profitable.

This year from $\frac{1}{8}$ of an acre, of mostly

the Minnewaski variety, a large round berry, I sold 500 quarts at an average of 7 cents per quart. Being unable to buy more land, I leased 20 acres, which are also set out mostly to small fruit,

including 300 peach trees and 150 grape vines. These have not yet borne much fruit, but look well.

J. D. McCRIMMON.

St. Louis, Mich.

BARREL STRAWBERRY CULTURE.



OUR recent reference to this subject has attracted so much attention and made so much correspondence that we again refer to the matter and present the following working details which are reproduced from a circular of J. P. Ohmer, Dayton, Ohio, who is a successful cultivator by this method.

“Take any iron-bound barrel, except one which has been used for pickles, sauerkraut or vinegar; remove all hoops but four, and bore four holes in the bottom. Then space holes around the barrel so that twelve plants will go around it; five rows high will make sixty plants to the barrel, (the fifth row can be placed five inches from top of barrel). So as to make the holes of proper depth, bore two holes, one above the other, using a bit one and one-half inches, and cut out the wood between the two holes, you will then have a hole one and one-half by three inches. Put about two inches of firm gravel or coarse sand in the bottom of the barrel. When planting put the plants as near the top of the holes as possible, to allow for settling of the soil. Use clay, well mixed with rotted manure; put in till about three inches above the first row of holes, being careful not to have it too wet.

“The first row of holes must be eight inches from the bottom of the barrel. Get in and tramp the soil solid, then loosen with a trowel where the plants go and plant that row. Spread the roots out well, then put soil about one-half way up to the next row of holes.

Now take a common drain tile, twelve inches long by three or four inches in diameter, put it in the centre of the barrel, and fill the tile with coarse sand, then fill up the barrel with soil a little above the next row of holes and tramp again. Be careful not to move the tile and when adding soil to the barrel, cover up the tile, so as not to get any dirt in it. After planting the second row, lift the tile, see that the sand settles and fill the tile with sand again. Then put in soil above the next row of holes, tramp again, and plant that row; and repeat operation until the five rows are planted. But don't fail to tramp.

“After planting, the tile remains in the barrel; have it empty so as to take the water. In watering you water in the tile for the lower rows; on top of the barrel for the two top rows. It would be impossible to water the lower plants without the tile and the core of sand. You can water the plants too much. Fill the tile once per day, and put about two quarts of water on the outside of the tile. After cold weather sets in we quit watering. The plants want no winter protection. Set the barrel on brick, to keep it off the ground. If any should die in the summer, you can re-plant by taking a runner and putting the young plant in the hole, making it fast with two little sticks.

“Use the largest fruiting variety that does well in your locality, and a perfect blooming sort, if possible. Planted early in the spring, a fair crop may be expected the same season.”—American Gardening.

THE KIEFFER AND LE CONTE PEARS.

THE Kieffer and Le Conte pears were introduced many years ago, and at first found favor. In California they were soon discarded, the Kieffer especially being treated to columns of sarcasm anent its pumpkin-like flavor. Those, however, like many in the southern and southwestern states who have persevered, have discovered

color, and not till then should it be put on the market. Both varieties are vigorous growers, with large, shining leaves, and both are good and regular bearers. The Le Conte is particularly a success in the southern states, and its cultivation has assumed large proportions commercially. These pears seem almost exempt from disease, which

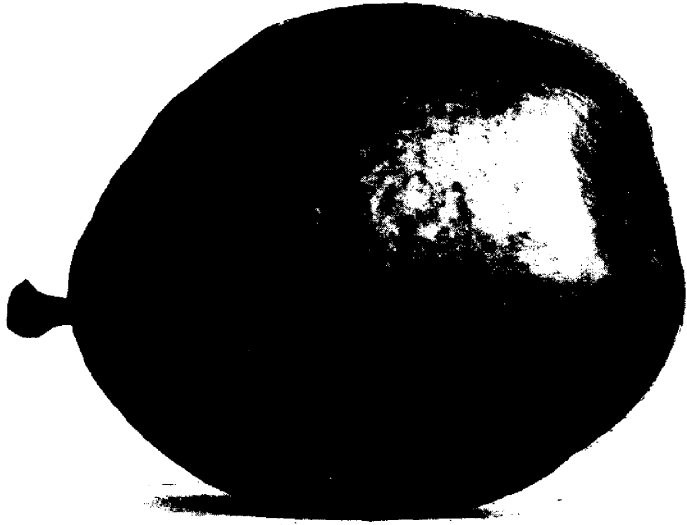


FIG. 1363.—KIEFFER PEAR.

great value even in the Kieffer when it is properly harvested. This variety is a cross between the Bartlett and the Sand pear of Asia, the Le Conte also being a hybrid with Oriental blood, and both show it plainly in habit of growth. It is necessary that the Kieffer be laid away in a store room until it gets its

is not the least recommendation. Planted even as a stock on which to subsequently graft other varieties, they are valuable, and as such they should be on their own roots (raised from cuttings), or on their own seedlings. The Asiatic pears make admirable stocks, and will no doubt supersede all others.

PEAR BLIGHT.

Look over your pear trees and cut out all limbs that show blight — and mind this to cut 15 to 20 inches in the sound wood below the dead bark. Be careful about this. If you only just cut out the dead wood, before the summer is half gone you will find your trees just about in as bad fix as if you had not cut any. Have a heap of courage and a sharp saw and you may save valuable trees to bear crops of fruit for a number of years. I know what I am writing

about, for I have been all along this line for over twenty years. Now, I will say this: The Bartlett is a variety that will blight, and still live and bear fruit, maybe for some years, but it is the only one that I know of, and it will help the Bartlett to cut the blight out. I am satisfied that we have as yet no such a thing as blight proof pear trees, and all who offer such for sale should be regarded as frauds or fools. — Rural World.

SOUR CHERRIES IN WESTERN NEW YORK.

THE growing of sour cherries in Western New York is largely confined to two varieties, the Montmorency and English Morello, and it is not yet fully determined which of the two is the more profitable in the long run. The preference has generally been given to the English Morello, as it bears younger than the other, and its dark colored and very acid flesh have made it popular with the canning factories. Just now, however, the canners are calling for the Montmorency in preference, for, whilst not so sour as the other in the natural state, it "cooks sour," and the Morello is apt to develop a bitterish or acid taste in the cans. The Morello is also much subject to leaf-blight, while the Montmorency is almost free from it; and the Montmorency is a stronger and more upright grower. The present drift is decidedly towards the Montmorency. The two varieties complement each other, however, for the Montmorency is about gone by the time the other is fit to pick.

This Montmorency of Western New York is a very light red, long-stemmed cherry, broad, and flattened on the ends, the flesh nearly colorless and only moderately sour. The tree is an upright vase-like grower.

Amongst the Griottes, or red-juiced cherries, three have gained some notoriety in Western New York,—the Ostheim, Louis Phillippe, and Morello.

The Ostheim is a very productive variety, ripening about a week after early Richmond, but it is too small and too early to be valuable for general cultivation here.

The Morello variously known as English, Large Dutch and Ronald's Morello, is nearly two weeks later than Montmorency, a bushy and finally a drooping grower, with medium-sized, roundish or round-cordate fruits which become red-black when fully ripe. Flesh very dark, much sourer than the Montmorency. In Western New York the Morello harvest begins from the 8th to the middle of July.—Cornell Bulletin

THE DYEHOUSE CHERRY AND THE EARLY RICHMOND.

THE difference in the fruit of the two varieties is not a great deal until both are ripe, though Dyehouse generally ripens a week or ten days in advance of Early Richmond. But the fully ripe fruit of Dyehouse is superior to the fully ripe fruit of Early Richmond. Another difference, as noted by Prof. Powell, of the Delaware Station (Bulletin No. 35), is in the juice of Dyehouse being somewhat dark colored while that of Early Richmond is colorless.

Both varieties are profuse bearers, and Dyehouse is probably the earliest bearer of all fruit trees, young trees, two years old, quite frequently bearing in the nursery rows. Both varieties are valuable for localities in which the sweet cherries are not generally successful; and Dyehouse is valuable for any locality and in any collection, considering its excellence for pies, for canning, and, when fully ripe, for eating right from the tree. It has also the smallest pit of all cherries.

THE CANADIAN HORTICULTURIST.

Dyehouse, as many of our readers know, originated in Central Kentucky, an accidental seedling in the orchard of the person whose name it bears. This was years ago, when the people there had heard little or nothing about budding or grafting, and increased the stock of their favorite and never-failing cherry by sprouts dug up from the roots of the parent tree. And some prefer these sprouts still, though the reason of their preference is hardly clear. Finally, after thirty years of continuous bearing—every year with one exception, when a late frost destroyed the young fruit, then about the size of peas—Mr. Henry T.

Harris, a person who had experience with choice fruits, came across it and introduced it to the public.

Since that time—over twenty years ago—it has demonstrated its excellence in various parts of the country, North as well as South, East and West, even in Minnesota and Canada.

There is one peculiarity attending the propagation of the trees of Dyehouse; the buds frequently do not succeed, failing to become attached to the stock, and consequently dying. Why this is so, is difficult to say, but it affects only the nurseryman.

PLUM NOTES.

GRAFTING.—Plums should be grafted very early to obtain best results, whatever the stock they are set upon. Care should be used not to tear the bark, if the cleft style should be used, but incline the blade that does the splitting to the side of the stump that is to receive the scion. This will cut a smoother place to set the scion than would be made by not doing so, and the fit will be better. Plum scions should be cut very early. Fall is really the best time to cut scions of all kinds; for there is no possibility of damage from cold weather, or of the buds starting from the warmth of approaching spring.

BURBANK.—As a class, the Japanese plums are inferior in quality to the domestica types; and yet, the Burbank and some others are fully as good as the Lombard if, in fact, not better. The particular merits of the Japanese plums to my mind, are their earliness, great

productiveness, early bearing, beauty, long-keeping qualities. They supply varieties in summer before any of the valuable domestica types ripen their fruit. They are so exceedingly productive as a class that they tend to overbear, and it is probable that we shall find complaints of the trees being short-lived. The best quality of the plum is ordinarily not developed except by heroic thinning. Trees which bear so heavily as these Japanese plums should receive extra care in thinning, tillage and fertilizing.

PRUNING.—My method of pruning plums can be told in a few words: To cut back two-thirds all new wood; that is, all the new leading shoots are cut back at least two-thirds of the entire length. This is my rule, and I follow it as closely as circumstances will permit.

—AMERICAN GARDENING.

GROWING POTATOES—PREVENTING DISEASE.

(Continued from last month.)

The scab is a fungus growth on the skin of the potato making it unsightly for market and causing considerable waste in cleaning for the table.

To kill the scab we first wash the seed so that the fungi side reaches every part of the skin.

Make the solution with one ounce of corrosive sublimate dissolved in one gallon of hot water, added to seven gallons of water, or in this proportion for any quantity required. We use the sheep dipping tank, but two barrels, or an oil barrel sawn in two is handy.

Leave the potatoes in the solution ninety minutes, draw off the solution in the other barrel or any wooden vessel, or dip out the potatoes when they are ready to cut and plant and will not produce a scabby crop except they are handled in crates or bags that have had scabby potatoes in them, or planted on land that has produced a crop of scabby potatoes.

There has been a popular opinion that fresh stable manure caused the scab. We staked out a plot and applied fresh manure directly on the seed after dropped, but the crop from all parts of the field was smooth and clean including this plot.

This takes a little additional time and expense, but we have found it to pay us well from ready sales at top prices.

Blight.—Early in August, 1895, we noticed the under and older leaves on our potatoes showing brown patches on them which was then spreading rapidly.

Although too late to get best results we undertook to spray with Bordeaux mixture the middle and end of August, with only crude implements at our disposal, with the result of an increased

yield of 36 bushels to the acre from the sprayed over the unsprayed parts of the field.

1896 found us prepared to do first-class spraying at short notice, and again the blight commenced the last days of July, and we made three sprayings with Bordeaux the first, middle and end of August. At the time of the last spraying we found the unsprayed rows completely dead with the blight, and the sprayed rows were beautifully green yet and remained so up to the time of frost, late in September, and yielded $87\frac{1}{2}$ bushels to the acre more than the unsprayed.

The same variety (Empire State) was used for the test, all planted the same day under the same conditions, and care as far as possible except the spraying.

At the Cornell University Agricultural Experimental Station in 1897, the potato plots cultivated on the level yielded 325 bushels per acre against 288 bushels from plots hilled up, showing an increased yield in favor of the level cultivation of 37 bushels per acre with Carman No. 3.

At the same station the R. N. T. No. 2, unsprayed with five cultivations yielded 234 bushels.

Sprayed four times with five cultivations yielded 305 bushels.

Sprayed four times with seven cultivations yielded 347 bushels.

Showing an increased yield of 71 bushels per acre from spraying for blight, and an increased yield of 113 bushels per acre as the result of spraying and two extra cultivations.

Varieties.—The best varieties ever introduced have lost in vitality in a few years, which makes it necessary to orig-

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inate new varieties. This work is very interesting and might be taken up by our young people.

Care should be taken to gather seed balls from the best varieties. Wash out the seeds in the same way that tomato seeds are washed and dried. Plant in box in window, hotbed, or greenhouse early in spring and transplant in berry box or flower pots before the plants begin to spindle up, and transplant in open ground soon as danger of frost is over, giving same care as for field crop.

Seedlings the first year will be of different sizes, shapes and colors and perhaps quite different in type from the parent stock. Select only the fittest the second and third seasons, and in this way we may originate new varieties equal if not superior to any in cultivation.

Our first seedling was the Rot Proof (which has not proved to be free from rot in all sections but at home has never shown any development of the putrid rot caused by the late blight), which yielded in 1897 at Agassiz, B. C., 454.40 bushels, and an average at all the stations of 308.11; at home it yielded 309.15 as compared with 265.30 White Star, and 206 bushels of Beauty of Hebron per acre.

The yield and shape is quite satisfactory, but the dark red skin is against its appearance in the market.

A number of seedlings are being tested.

The Peerless, R. N. Y., Empire State, Vick's Perfection, Great Divide and others have been tried for market and give good yields, but customers will not buy them if they can get potatoes of better quality.

The Hebron, Elephant, Potatuck, Early Northern, Freeman and Pearl of Savoy are of good quality, but will soon need replacing with new blood.

Spraying.—Our outfit consists of a spramotor No. 2 with eight feet of hose connecting the pump to the centre of a nine feet piece of gas pipe with four nozzles arranged in it three feet apart, with which we can spray four rows of potatoes fast as a horse will walk.

The barrel, pump and all are mounted on a cart made of two rake wheels 6 feet apart. When the horse is walking between two rows, the wheels are running between the next two on either side.

Two men with this rig will mix and apply a 50 gallon barrel of Bordeaux or Paris Green solution in 45 minutes, if the water is not more than 40 rods from the field to be sprayed.

At ten cents an hour the expense of applying a barrel is 15 cents.

One 50 gallon barrel is sufficient to spray an acre of potatoes once except that the vines are very heavy.

Four ounces of Paris green to the barrel of water is sufficient to destroy the young Colorado beetles; if they get nearly full fledged double this amount will be required—

Costing from 19 to 23 cents per barrel, including material and time of spraying.

For Bordeaux we use 6 pounds Copper Sulphate, 4 pounds fresh lime, costing 47 cents per barrel applied.

The Flea beetles are very troublesome some seasons, doing considerable damage to the young plants, enfeebling their growth and making them an easy prey to disease. Neither Paris green nor Bordeaux kills this pest but the latter seems to be very offensive to them and they hunt new feeding grounds.

Conclusions.—The early and late blights can be prevented by a timely use of Bordeaux mixture.

Every acre of potatoes we sprayed during 1896 and 7 gave us enough pro-

THE HOUSE FLY.

fit over unsprayed to pay for a first class outfit to spray with.

Spraying both years gave satisfactory yield of good quality.

Unsprayed rows were immature and

of poor quality, similar to those found in many parts of New York State, Ontario, Ireland and other countries.

ALF. BROWN.

Pitton.

THE HOUSE FLY.

THINK now is the time of year when the old saying, "an ounce of prevention is worth a pound of cure," is very applicable, for whilst one cannot entirely rid oneself of those worrying pest flies, one can do quite a lot to decrease their numbers. So a few words as to how, when and where they breed, and how they may be destroyed, will, I hope, be useful to many people to whom the incessant buzz and worrying bite of the fly helps to make summer heat unbearable. The house fly (*Musca Domestica*) belongs to the family (*Muscidæ*) in the order *Diptera*, and it is marvellous to find how numerous are their progeny, and how rapid their increase, amounting to 2,080,320 from one fly in one season. We naturally ask ourselves where and when do they breed. They breed chiefly in horse manure during the summer, also in refuse and ash heaps. Have you never noticed when turning over manure in the summer, the numerous small brown grains like grains of

rice, they are the pupæ. The eggs hatch after being laid, in 24 to 30 hours, becoming a perfect insect in from 7 to 9 days. It is ready now to lay eggs, which in turn hatch, and this is the source of so great a number. But now how to destroy them;—cast all refuse, manure and decaying matter far from the house and barn, or if that cannot be done, turn the manure over to allow the hens to scratch and devour the eggs, which they eat with rapidity. And I cannot be too emphatic in pressing upon every one to move the manure, for in it lies the greatest breeding ground of the house fly. Nature has given us certainly some help in afflicting the fly with a fungus disease called "*Sporendonema Muscæ*," (a spray pump isn't in it), spreading through the entire body, covering it with a powdery fluff, sapping its life until it finally succumbs, generally bursting from swelling.

NIGEL KEEP.

Grimsby.

HOW TO MEASURE CORN IN A CRIB, HAY IN A MOW, ETC.—This rule will apply to a crib of any size or kind. Two cubic feet of good, sound dry corn in the ear will make a bushel of shelled corn. To get, then, the quantity of shelled corn in a crib of corn in the ear, measure the length, breadth and height of the crib, inside of the rail; multiply the length by the breadth and the product by the height, then divide the pro-

duct by two, and you have the number of bushels of shelled corn in the crib.

To find the number of bushels of apples, potatoes, etc., in a bin, multiply the length, breadth and thickness together, and this product by 8, and point off one figure in the product for decimals.

To find the amount of hay in a mow, allow 512 cubic feet for a ton, and it will come out very generally correct.

SPRAYING PEACH TREES FOR PEACH CURL.

SELDOM if ever have we observed a more serious attack of peach curl, than that now (May 24) affecting the peach orchards of Southern Ontario. For several years past this fungus has been growing more and more trouble-

face; frequently the affected leaves drop from the tree, as well as the fruit. The trouble is progressive, when once in an orchard; because the mycelium or growing portion of the fungus; leaves through the winter in the interior of the leaf buds, and only waits for the develop-



FIG. 1364.—*Exoascus deformans*, The Peach leaf Curl, from Cornell Bulletin 73.

some, often causing the fruit to drop, and seriously affecting the health of the tree. The cause was long a mystery, but it has been recently proved to be one of the fungi called *Exoasceæ*, and this particular one *E. deformans*. It affects both the leaves and the young twigs, causing abnormal growth and development of the affected surface, and consequently a complexity of that sur-

ing leaf of the following spring to grow out with it, and produce spores for its rapid spread, on both the under and upper surfaces of the leaf.

A year ago we drew attention to the fungus, saying we hoped Bordeaux mixture would prove useful, but at that time we had no proof that it would; but this spring we have some decided evidence in that direction. Mr. W. M.

SPRAYING PEACH TREES FOR PEACH CURL.

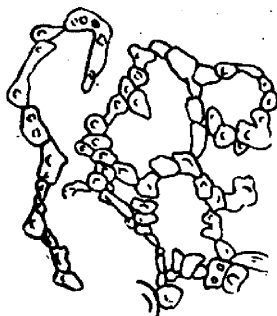


FIG. 1365.—Leaf Curl, filaments magnified.

Orr, provincial inspector of spraying, has been faithfully spraying his peach trees since the first opening of the leaf, with Bordeaux mixture.

On the 24th of May the writer visited the orchard for the purpose of noting the result, and found that while orchards on each side of his were affected to an alarming extent with curl leaf, Mr. Orr's were almost free. We further noticed that certain rows had been whitewashed by means of a spray pump in the winter season, the whole tree being thoroughly whitened. The object of

this was in part to test the effect in delaying the opening of the buds until danger of frosts was over; but it seemed to have a special effect also upon the fungus under consideration, for on those rows the foliage was still less affected.

EXPERIMENTAL SPRAYING of apple trees is being again pushed forward most vigorously by Mr. W. M. Orr, the Provincial Director. The province is divided into three divisions, the Central, Eastern and Western, and ten points in each are selected for the experimental work. The apple trees in each are selected in some orchard where a good assortment of varieties can be found, and these are treated with six different applications of the Bordeaux mixture. The results in some cases have been simply surprising, the trees being not only free from scab and codling moth, but also from canker worm, bud moth, tent-caterpillar and many other insects. No doubt Mr. Orr's next report will be of still greater interest than his last one.

THE SEASON AT ITHACA.

The season here, in common with most other parts of the Eastern United States and I suppose Western Canada, has been abnormal in many respects. At first—about the middle of March—it gave promise of unusual earliness. The peach buds swelled, here and there and apricot showed its blossoms, but the cold weather of April retarded vegetation wonderfully and was the means of saving the crop in many parts of the State from the damaging effects of some late April frosts. The prospects are at the present time most favorable for an abundant crop of all kinds of fruit. Peaches will be rather light in some places, but the crop generally bids fair to be above the average. Curl leaf has, however, made its appearance and may lessen the prospective yield. Dwarf pears and Japan plums have set very fully in the Experiment Station grounds. The blossoming period of fruits and ornamental shrubs was wonderfully prolonged by the cold weather of April. For instance, Forsythea began blossoming March 28th, was in full bloom on April 10th, and only lost its last flowers about a week ago; just now quinces are in full bloom and very striking with their beautiful white terminal tips.

A careful study is being made this year of the phenomena attending the pollination of orchard fruits. This field appears to grow wider the farther it is explored and important results are expected to follow the investigations of this season. Insects are abundant, tent caterpillar everywhere and aphides already beginning a vigorous campaign on the snowball. Apropos of this I may say that Mr. Slingerland is following his interesting bulletin on the codling moth with another equally interesting, describing insects injurious to the quince, I am glad to learn that it seems probable Mr. Slingerland will succeed the late Dr. Lintner, as State Entomologist. Such an appointment would certainly meet with the hearty approval of nurserymen and fruit growers. As an economic entomologist Mr. Slingerland stands in the first rank of workers in this branch.

I may say in closing this hasty note that the HORTICULTURIST is much appreciated by the members of the University Horticultural Club.

JOHN CRAIG.

Cornell University, May 23, '98.



Flower Garden and Lawn. K

THE DAHLIA AS A SHOW FLOWER.

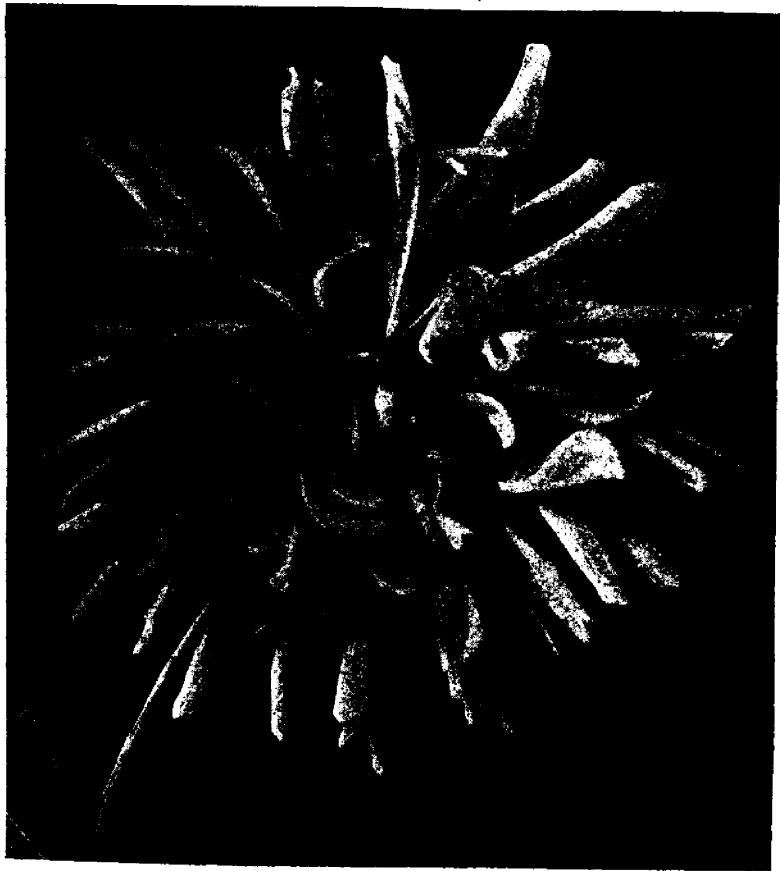


FIG. 1366.—A WHITE CACTUS DAHLIA.

MR. FRANK BRUNTON, of Boston, Mass, writes us an excellent paper on the above subject. We much regret that space will not permit of the whole appearing in this month's issue, and we

have therefore selected from that portion most adapted for the present month. The balance which gives the history of the dahlia, and a description of varieties, is reserved for a future number.

“The great improvement which has

THE DAHLIA AS A SHOW FLOWER.

taken place in the show and fancy dahlia in the last 25 years is in the outline, well shaped petal and perfect centre, the flowers of the present day requiring little or no dressing in comparison to the time it took 30 years since to prepare a stand of dahlias for exhibition.

Improvement in Habit.—The improvement in the flower has also had some effect on the habit, and the show varieties of the present day are not nearly so tall in habit as those grown 25 years since.

Potting.—I might say a few words as to the preparation of the plant to produce show flowers, although the subject has been described in another paper under the heading of cultivation. The plants intended to plant out to produce show flowers, should be potted from the small five inch pots (in the early part of May) into 4 inch, and placed in a cold frame until planted out early in June.

Nearly all the varieties make strong plants, and succeed well if grown from cutting, but a few varieties such as Bendigo, Mrs. Foster, Burgundy, Herbert Turner, etc., which are very double, or are apt to come with green centres, are better grown from pot roots, or old divided ground roots.

Planting.—The plants should be planted five feet apart; if in a border, arranging for the tallest flowerst at the back. After the ground has been squared out, dig holes about two feet square and the same depth into each hole put a spadeful of light potting shed or other soil mixed with a little manure—this is to give the plant a start—break up the soil taken out of the hole before returning it, and after the plant is planted lightly tread when replacing it. A light stick will hold the plant for a few days, and when planting is finished put a stout stake four to five feet high to each plant, and tie the stem of the plant to the

stake rather loosely to allow for the stem to swell in due course. As soon as the main stem throws out laterals, add four smaller stakes to secure the side branches, to keep them well tied so that plenty of light and air are admitted to the plants during growth.

Disbudding and Thinning.—There is no general rule to disbudding. Every variety has to be studied in this respect; to commence to disbud some coarse growing varieties, such as Champion Rollo, Royal Queen, etc., as soon as the buds appear would make the flowers coarse the whole season, whilst all varieties should be sparingly disbudded at first, by taking only one bud away, and then within three weeks of the exhibition the grower can choose the bud which is perfect, and will be likely to be in flower about the date of the exhibition, and remove all the other buds. Should the variety be a thin and small flower, then remove all the side shoots down from the bud to the stem; but should the variety be inclined to become coarse, only thin sparingly until a week or so before the show.

Watering.—This is most essential to show a dahlia, the plant should never be allowed to be dry at the root from the time of the planting, and I think I might here state that after the plants have been staked and tied out, the surface of the soil should be forked over, and the plants top dressed with a good dressing of stable manure; this will keep the roots moist, and encourage the roots to the surface to feed. Should the weather be hot and dry the plants should be sprinkled over head every night in addition to the watering at the roots which at first should not be excessive, but sufficient to keep them moist and growing. Heavy watering should be commenced three weeks before the exhibition, as the plants will be suffi-

THE CANADIAN HORTICULTURIST.

ciently large to take plenty of water, and should be continued until a week previous to the show, the last week lightly sprinkling round the plants to keep them fresh and moist, too much water a few days previous to the show has a tendency to cause the flowers to shoot their petals after being cut for the exhibition.

Protecting the Buds and Blooms.—To protect the bud from earwigs, caterpillars, green fly, thrips, etc., a muslin bag six inches by eight inches is best, and should be placed over the bud as soon as it shows color, the bag should be fastened with bast or raffia round the stem of the flower, and should be taken off every morning to see if any insect has by chance got into the bag, and the flower examined to see if it is growing properly, and as the flower progresses the bag should be lifted up every morning, so as not to check the growth of the flower.

Shading.—Shades are best made of a stout wire frame with a thick canvas covering, and should the weather prove very hot a few leaves of rhubarb should be laid on the shade over the full-grown flowers. Shading should be commenced a week previous to the exhibition. Some tipped or light edged flowers are much improved by a flower pot (24) placed over them on a table a week or ten days before the show, with a piece of glass over the hole in case of rain.

THE Sweet William, though an old-fashioned flower, is still one of the best free flowering plants, and when fully out it is a blaze of bloom. Some do not like it as a cut flower, but when associated with others of a more graceful nature they are useful. There are many dirty colors among them, especially among the mixed ones, and it is best to get each color separate. The best are

Exhibiting—The stands on which the flowers are exhibited are usually painted green, and are made of one uniform width, viz., 18 inches, and should be supported by legs 9 inches at the back and 3 in front, holes being made to receive the flowers 6 inches apart, and for a stand of 12 flowers 24 inches long.

Selecting Blooms for Exhibition.—In selecting blooms for exhibition, place deep circular flowers at the corners of the stand, and introduce as much diversity of colour as possible, and select quality before size, a large coarse flower often spoiling what would otherwise have been a good stand.

Qualities in a Good Flower.—The perfection in a show flower should be fair size, globular with good depth, the petals short and cupped smooth on the edge, the outline a perfect globe, the centre high but not above the face of the flower; the centre should be close, and the petals radiating from the centre should expand by degrees. Types of the most perfect flowers being Mrs. Gladstone, Bendigo, Joseph Green, and Sunbeam, etc.

Color.—The color of a self should be bright and clear, of one uniform shade from the centre to the back petals; if an edged flower, the marking should extend round the edge of each petal until it is lost out of sight.

the dark crimson, double white and the auricula-eyed. They should be sown now, and should be planted out in a prepared bed where no water will stand in winter. In early spring they should be planted where they are to flower. They are quite hardy with light protection. The best covering is one of evergreen branches.—Gardening.

PROPAGATION OF HOUSE PLANTS BY CUTTINGS.



FIG. 1367.—IMPORTANT AND PROPER CONDITION OF STEM FOR CUTTINGS.

GREENHOUSE plants are generally multiplied by what is known as soft cuttings of the stems. They are usually made from terminal shoots, although if cuttings lower down the stem can be obtained in the proper condition, they will readily root and make good plants.

The plants from which cuttings are taken should be strong and vigorous; if stunted by insects or by improper surroundings of heat, light, temperature or food, or weakened by excessive production of flowers, the result will be quite unsatisfactory, and it will be equally so if soft, watery growth, produced by a high temperature and excess of nitrogenous food is used. The use of cuttings



FIG. 1368.—SOFT CUTTING OF COLEUS.

from plants enfeebled by disease will be even more disastrous, as the plants produced will not only be susceptible to the attack of the same and other diseases, but they may

even have the germs of the disease within them when severed from the parent plant.

While a soft, watery growth is not desirable, cuttings cannot, as a rule, be induced to root readily after they become woody, and the usual test is to reject all cuttings that when bent do not snap off, rather than crush down without breaking, the latter behavior indicating that the

fibro-vascular bundles (woody fibers) have formed (Fig. 1367). Cuttings made from stems in that condition root slowly and sparingly, and the plants will be weaker than when made from those in the proper condition. For a few plants like the rose, a firmer condition of the wood is desirable.

Soft cuttings should have a bud at the top and from one to three inches of stem. Unless a cutting can be made three inches long and have its base in proper condition, it will be better to shorten it to one inch, and, if necessary, the length may be even less, its stem being principally of value to give a secure hold in the cutting bed. Cuttings of this kind should have at least one leaf, and sometimes from two to four are left. Those at the lower part of the stem should be removed, and the others shortened in (Fig. 1368). In this way the amount of evaporation will be checked and the cuttings can be placed nearer together. Cuttings should be so handled that they will not wilt. It is well to use a sharp knife, and to cut off the stem at nearly right angles. Neither however, is really necessary, and in

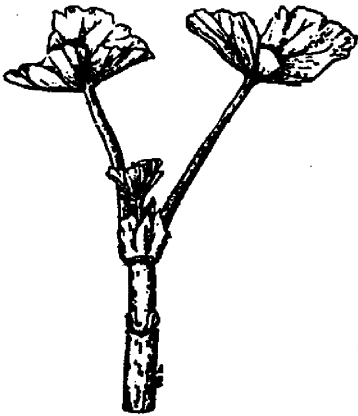


FIG. 1369.—GERANIUM CUTTING.

many cases the cuttings can be broken off without the use of a knife. If in the proper condition, most cuttings will root readily from any part of the stem, but with others that root with difficulty, and especially if they have become too hard, it will be well to have a bud near the base of the cuttings, as roots are most readily sent out from near the nodes.

There are, however, a few plants that, owing to some peculiarity of construction or growth, need different treatment, and among them are our common pelargoniums (geraniums) (Fig. 1369) and many of the cacti and other succulent plants. These are more or less succulent and if placed at once in a cutting bed are

likely to rot off. After being made, it is well to spread them out and allow them to wilt for from one day to one week and then place them in a rather dry cutting bed, or they may at once be potted off, using a soil containing at least one-half sand. If, after giving them one thorough watering, water is withheld until they begin to wilt, cuttings handled in this way will often show smaller losses than when grown in a cutting bed. Many plants do not strike readily unless in a moist, warm air and for such a hand glass or propagating case must be used.

A method of rooting cuttings that gives excellent results, when bottom heat cannot be secured, is placing them in earthenware pans of sand two or three inches deep which are kept constantly saturated with water. The other treatment, such as the making and setting of the cutting, watering and ventilating, is exactly the same as for the cutting bed. Some of our common plants like the oleander root even better if placed in clear water than when in a cutting bed, or the saucer with its mud.

Any kind of glazed earthenware vessel, of a suitable size and depth, may be used, but if it is unglazed the water will need to be much more frequently added. —L. R. TAFT, in American Agriculturist.

COREOPSIS lanceolata and *C. grandiflora* are still (July) giving us plenty of their lovely yellow flowers. For cutting this is one of the finest June flowering perennials we have, and how free they do flower! They don't last a great while, but then they give us a few flowers in the early fall months, which makes up for it. They are easily raised from seed, but they don't seem to be very hardy the first year, as we lost last

winter the most of ours that were raised from seed the summer before, while the old plants in the garden came out all right.—Gardening.

SAID the golden-rod as it looked through the fence into a cornfield: "Dear me, what big ears you have!" The corn was too shocked to say anything in reply.

EPYPHYLLUM GÆRTNERI.



FIG. 1370—

SIR,—By this mail I am sending you a photo. of a Cactus in bloom. You may remember this as one of the plants I showed at the meeting of the Ontario Fruit Growers' Association in Waterloo, last December, as a specimen of a grafted Cactus. When photographed, there were thirty-five flowers open, some of these have been open daily for three

weeks, thus proving that Cactus flowers are not all ephemeral.

This plant, *Epiphyllum Rusellianum Gærtneri*, is one of the most handsome and free-flowering of all the Epyphyllums, and those who have not seen or cultivated this most beautiful hybrid, have a grand treat in store. The flowers are not like the other varieties of the "Crab Cactus," resembling more a flower of *Phyllocactus*, and differing also in color, which is brilliant scarlet. They are profuse winter bloomers, easy to grow, and when grafted on the *Pereskia* or *Cereus*, soon make fine specimens, and a grand display can be had from November to May, at a very small cost.

Cuttings strike readily at any time of the year, in a warm house, after having lain in the sun for a few days, so that the cut is calloused; insert in a clean pot of sandy soil and give a slight syringing with tepid water occasionally. Grafted plants are more graceful and produce flowers in greater profusion.

JAMES LOCKIE.

Waterloo.

AZALEA.

THE plants of *Azalea Indica* which make such a show during winter and spring are, for the most part, grown in Europe, especially Holland and Belgium. They are grown in nursery beds, dug up, and shipped here in the fall. When these semi-dormant plants are received, the florists here pot them at once in a compost consisting of two-thirds loam and one-third leaf-mold. They must be potted very firmly, the soil being rammed down at the side of

the pot with a flat stick. As they have a very hard ball of roots, and are extremely dry when received, it is well to stand the plant in a tub of water for a few minutes before potting it; otherwise the ball is so much harder and drier than the soil added when potting, that subsequent waterings run right through the soil, without really reaching the roots. There is no doubt that neglect of this precaution is often the cause of trouble with Azaleas. When first

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potted, or when taken in in the fall, Azaleas should be started in a cool greenhouse temperature, ranging from 40 to 45 degrees at night. As the season advances, a higher temperature may be given, if it is desired to hurry blooming; but they make the best growth in a temperature of 45 to 55 at night, and the flowers last longer than when warmer. When they are making buds, remove the little weak leaf-shoots that may appear around the flowers; you do not want them to make a lot of new growth until the flowering is over. Water liberally, yet do not allow the soil to become sodden. In an over-hot, dry place they are likely to suffer from thrips, and greenfly is another enemy; fumigation with tobacco may be used for both insects. Hard syringing directed to the under side of the leaves will also dislodge thrips. Fumigation should not be used when the

plants are in full bloom, as the smoke is likely to injure the flowers. As the flowers fall, the seed-vessels should be plucked off, and the plants continued in the same temperature while they make growth. They may be syringed freely during this. When settled warm weather begins, say in June, the Azaleas may be set outside to ripen their wood, remaining out until there is a hint of frost in the fall. A slightly shaded place facing the north, where they will be free from drip, will suit them. It is a good plan to stand the pots on boards, so that there is less risk of worms entering them, and bank up to the rim of the pot with coal ashes or tan bark, so that the soil does not dry out so rapidly. The plants must be watered and syringed while in this position, and by the time they are brought in, their wood is well ripened, and upon this depends the extent of their bloom.—R. N. Y.

RUDBECKIA, "GOLDEN GLOW."

AS a lover of the beautiful in the flowery kingdom I want to pay an humble tribute to a recent garden debutante, Rudbeckia "Golden Glow." In the spring of 1896 I set out three plants that were about twelve inches high. In the month of August they had grown to a height of six feet, had branched out beautifully, and they were laden with their amber-like blooms for about a month. They survived last winter with slight protection, and this summer each plant grew into a magnificent bush, laden with exquisite fluffy yellow blooms, that were ready to challenge the beauty

and grace of the proudest chrysanthemum.

Its period of bloom lasts for more than a month, and when at its height it looks like a majestic bouquet of golden chrysanthemums. The flowers are so large, and in so great profusion, that there is scarcely any part of the plant visible except the slender, willow-like leaves. The huge bouquets that are daily plucked from its wealth of bloom will last a week in a vase supplied with fresh water each day. I would advise all lovers of the beautiful to try a plant this spring.—Vick's Magazine.

WINDOW-BOXES FOR FLOWERS.

IN the city, where it is impossible to have a garden, there may still be quite a substitute for it in the form of a window-box, and this substitute may be enjoyed by the occupants of upper stories as well as by those living on the ground floor. A window-box that will grow plants quite as well as the elaborate and expensive boxes used by wealthy people, will cost very little. The box should be as long as the window is wide, or a little longer, and about a foot

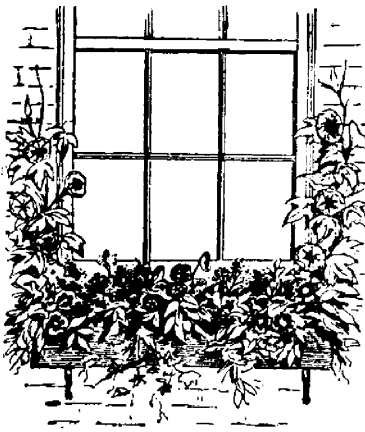


FIG. 1371.—A PRETTY WINDOW.

wide and a foot deep. Fasten it level with the window sill, or just below it. For support use iron brackets, which can be screwed to the wall just below the box, or by braces of wood running from the outside of the bottom of the box to the wall, set at such an angle that ample support will be provided. A few nails can be put through the box into the sill or side of the house, to give additional security and firmness. Any boy ten years old can put the box in place, if you furnish him with a saw, a hammer and some nails to work with. Packing boxes of about the right size and shape can be bought at many of the dry-goods stores for a small sum.

When in place, fill it with the best soil you can get—the richer the better; but if you cannot get such soil, use whatever is at hand and depend on soap-suds and the like for food for the plants. The best annuals for use in window-boxes are: For flowers—petunias, phlox, calliopsis, sweet alyssum and nasturtiums; for fragrance—mignonette; for training up and about the window—morning glories. Among other good plants, not annuals, geraniums, both double and single, are excellent; also verbenas, heliotropes, and roses of the ever-blooming class. If I wanted a window-box that would be as near perfection as possible in the beauty and fragrance of its bloom, I would have a *Perle les Jardins* rose—rich yellow and very sweet; a few dark purple and a few pale yellow, white, and sky-blue pansies, a heliotrope, some mignonette to droop over the sides of the box, a rose geranium, and morning glories at the ends to train up over the window. You would not be likely to get as many flowers from such a selection as you would from annuals, like those named above, but what flowers you did get would be so choice, so exquisite in color, sweetness, and form, that you would find them more satisfactory if you are at all fastidious in this direction. From such a window-box one can cut a dainty button-hole bouquet every day during the season, if it is carefully cared for; and what could be lovelier than a yellow rose-bud and a purple pansy, with a geranium leaf, or a cluster of pale yellow, white and blue pansies, unless it is a *Perle* rose, just opened wide enough to give you a glimpse of its golden heart, with a cluster of lavender heliotrope?—American Agriculturist.



The Canadian Horticulturist

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

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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.

Notes and Comments.

FRUIT GROWERS in P.E.I. are organizing a provincial Society, and are asking for Government patronage.

THE TABULATED RESULTS of Mr. Orr's work, which appeared on page 156, should be credited to W. H. Heard, London, who prepared it for his catalogue of spramotor pumps.

THE HAMILTON HORTICULTURAL SOCIETY held a monthly meeting on Monday evening, May 2nd. An address was given before the Society on "The Garden and Lawn," by the Secretary of the Ontario F. G. A.

SAN JOSE SCALE.—Articles appear from time to time, copied from American papers, which lead one to suppose that too much alarm has been aroused, and that the insect is not so terrible a

pest after all. One has only to visit orchards that are affected, and that are dying with the Scale, such as we have seen, to be convinced that the danger is a real one.

RASPBERRIES have in many instances been rooted out this season because unprofitable. Indeed, last year the writer counted a cash loss of \$25 on two acres of Cuthbert raspberries, and many other fruits gave similar results; but we have not dug out either the raspberries or the other fruits, believing that low prices will not always prevail, and that it is unwise to be fickle in fruit cultivation. We shall be false prophets if better results do not meet the fruit grower in 1898.

THE WAR between the United States and Spain may possibly serve to increase

NOTES AND COMMENTS.

the prices of Canadian fruit products. The import of the banana will, no doubt, be lessened by it, and this fruit, so cheap and so popular, has done more than anything else toward lowering the price of our native fruits. This, coupled with the unfortunate frosts above referred to, may cause a sharp advance this season in the values of our native fruits.

FROST BITTEN FRUITS.—According to the California Fruit Grower, a storm of frost and snow, about the middle of April, has swept not only through California, but also northward and eastward from Northern Texas, virtually ruining the fruit crop in Arkansas, Missouri, Tennessee, Kentucky, Indiana, Illinois, Ohio, North Carolina, Virginia, Maryland, Delaware, New Jersey and Connecticut. Peaches have suffered most, but cherries, pears and even apples have suffered more or less. Fruit on the Pacific Coast has suffered more than almost ever before, peaches and apples being the principal sufferers, while nearly all classes of fruit will be reduced one-half.

THE COLD STORAGE FOR FRUIT at Grimsby has just been completely remodeled, under the direction of Mr. MacFarlane, cold storage inspector, for the Department. The accommodation has been doubled, and instead of cooling the store rooms by means of direct currents of air from the ice room as last year, the air will be cooled by means of a double row of large galvanized iron cylinders, each about a foot in diameter, which rest in a trough below, and are to be kept full of ice and salt, shovelled in from the smashing floor above. This building is now, in our opinion, a model refrigerator building for fruit storage, and will no doubt be the kind erected by fruit

growers in all the fruit districts, where tender fruits are grown for export. We have the fullest confidence in this building, and invite inspection of it by any growers interested. It is situated at the G. T. R. depot, at Grimsby.

MR. R. TROTTER, a prominent fruit grower at Owen Sound, died Tuesday, 10th May, at Owen Sound. He was a prime mover in the formation of the local Horticultural Society of that place.

THE VIRGINIA CREEPER has for two years been subject to the thrip which has become so numerous, and so annoying when one passes by, that we are questioning the wisdom of continuing the use of this old and useful climber for the porch of a house. We will faithfully spray it with kerosene emulsion, and, if successful in destroying it, we will report later on.

ALYSSUM SAXATILE and *A. S. Compacta* are just now (May 15) in full bloom in our garden at Maplehurst. Everyone is familiar with the common Sweet Alyssum, but this is far more showy, with its corymbs of bright yellow flowers, not much larger than those of the Forget-me-not, which are in bloom at the same time. This species was introduced from eastern Europe in 1710, and *Compacta* is a new and valuable variety.

THE PLANTS AND TREES sent out by the Association to its members this spring have given unusually good satisfaction, and numerous have been the complimentary letters received from Secretaries of Societies and others, concerning them.

Never before has so large a list been sent out, amounting in all to 3729 pack-

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ages in all. The *Crimson Rambler* rose was most called for, and 1585 large two year old plants were sent out. The Wickson plum was large enough for orchard planting, and was called for next in order, the number sent out being 1255. Besides these there were 434 Peonies, 288 packages raspberry plants, and 167 Victoria Black Currants. We hope the special effort made by the executive to please will lead to increased membership in all our Societies, for it has not been done without considerable extra expense. The greater the membership the more wide will be our influence; and the more money we have to spend the more generous we can be to each member.

THE INSPECTORS of orchards are doing faithful work in the Niagara District under the charge of Mr. G. E. Fisher, of Burlington. Cases of infested orchards have been discovered near the United States border, and are being destroyed root and branch.

At the suggestion of the Provincial Minister of Agriculture it is proposed to make each of our fruit experimenters a referee to decide cases of San Jose scale in his district, thus co-operating as far as possible in the work of detecting its existence in any orchard in the province.

THE PROSPECTS FOR an extraordinary fruit crop never exceeded those of the present season. The pear orchards are literally white with bloom, the peaches are a beautiful pink, the cherry and apple promise equal to any year in the history of Canadian fruit growing. The reports so far received, seem to indicate that this condition is universal throughout the province. That pests will also abound, we doubt not; already the aphid is present on the cherry, and the

rose, and the webworm is on the apple and pear. The scab may possibly not appear, if June is a dry month, but as Prof. Bailey remarks, we should spray as an insurance policy on the fruit, and it will be money well spent.

EXPORT OF FRUIT.—The great question facing us fruit growers this year, especially in view of the possibility of an enormous crop of fruit of all kinds, is the export trade. Can we succeed in placing our fruit products in the great markets of the world in good condition. Last year we had both failure and success, but not enough success to warrant private enterprise to any great extent. This year no effort is to be spared on the part of the Minister of Agriculture for the Dominion, and of the growers interested, to make this important undertaking a complete success, and of all this the CANADIAN HORTICULTURIST will give its readers the fullest information.

THE PRICE OF NURSERY STOCK has not advanced, notwithstanding the exclusion of United States stock, and nobody seems seriously inconvenienced by the San José Scale Act. American nurserymen who had made sales in Canada, have simply bought their stock wholesale from Canadian nurserymen, and packed their orders this side the line; while the surplus was so great in Canada, that fine trees have been almost given away. Fancy, beautiful pear trees, three years of age, wholesaling at from 7 to 10 cents each and peach trees at 5 cents, when a few years ago they could not be bought for less than three times these prices.

Strange that when peach and pear trees are so cheap, our fruit growers do not seize the opportunity of planting

NOTES AND COMMENTS.

largely. Discouraged by the low prices of one or two seasons, they have given up these fruits, and encouraged by the high price of apples in 1897, all want to plant apple orchards. Mr. W. E. Wellington says that the Fonhill Nurseries sent out over 300,000 apple trees this spring! Next year, should apples be cheap, no doubt our fruit growers will again begin digging out their apple orchards. Why this unrest? There is rise and depression in all lines, and the wise man keeps straight on in his chosen lines, whether he is on the crest of the wave, or in its hollow.

THE WESTERN HORTICULTURAL SOCIETY of Manitoba has recently been organized, and the President, the Rev. Prof. Baird, of Winnipeg, has forwarded us a copy of the following resolution, passed at a meeting held on the 15th of March.

It was moved by Mr. H. C. Whellams, seconded by Mr. G. H. Greig, and agreed unanimously that, while the Western Horticultural Society cannot agree to affiliate with the Fruit Growers' Association of Ontario, on account of the differences of climatic condition which renders such an intimate degree of co-operation impossible, yet this Society thanks the Ontario Association for the friendly wishes which are expressed in its proposal, and asks that it be allowed to co-

operate with the Ontario Association in any free and harmonious way which may be found to be mutually desirable or beneficial.

It is a great pleasure to us to find so firmly established and influential an Association as yours taking so friendly an interest in our small affairs, and you may rest assured that we will do anything that lies in our power for the promotion of the interests of horticulture throughout Canada at large, and for the promotion of good will and friendly intercourse between your Society and ours.

CALIFORNIA'S FRUIT PRODUCTS are enormous. It is estimated that her export of cured fruits alone, during the past season amounted to 150,000,000 lbs., which would require 600,000,000 lbs. of fresh fruits. California has shipped in addition about 230,000,000 lbs. Mr. Glen writes, "California's fruit crop is immense, and yet the industry is in its infancy. The market is extending as rapidly as the crop is increasing, because a regular supply of prime fruit creates a demand. Mind and capital are united in California fruit production. Careful selection and packing is the rule when shipments are made. The average results are satisfactory. Ontario fruit growers have no greater difficulties to contend with than those of California, and they are nearer to the world's best markets.

CRIMSON RAMBLER is the greatest rose that has been introduced in modern times. It may not be hardy everywhere, though I have not heard of any place where it is not so. It is distinct in growth and in manner of blooming. The third year after planting it will make canes from eight to fifteen feet in length, and at the base will be nearly as thick as a broom handle. It blooms in clusters composed of large numbers of

double flowers about the size of a double cherry blossom. It blooms only once a year, it is true, but it is a grand sight for three weeks or a month after it commences to flower. The flowers are a bright cheerful shade of crimson, and it has a very telling effect in the landscape, no matter whether the garden wherein it is planted is small or in the more pretentious pleasure grounds of the wealthy. —American Florist.

✧ Question Drawer. ✧

We shall be glad to answer all questions relative to Horticulture, Floriculture, and Forestry, in these columns, but cannot undertake to send answers to such questions by mail.

Red Spider on Datura.

1011.—Please tell me through HORTICULTURIST, what to do for a small insect that infests the Datura Brugmansia. It is a very small insect of a greenish yellow color, and is on the under side of the leaves which turns yellow and falls off. You will find a leaf enclosed.

F. J. FRAMPTON.

Reply by Dr. Fletcher, Central Experimental Farm, Ottawa.

Mr. Frampton's *Brugmansia* is attacked by the ordinary Red Spider. The best remedy for this is to fertilize the plant well if he has it growing in a pot, repot if necessary and stimulate with a little nitrate of soda (in the proportion of one ounce in three gallons of water) once a week for the three weeks or one of the specially prepared fertilizers for house plants such as Albert's Horticultural Manure, Bouker's Plant Food, etc. There are many of these put up in convenient tins and all of them use-

ful and very similar in composition. This will strengthen the plant very much and help it to overcome the injury which has been done to the leaves. To check the increase of the insects the plants, if not too large, should be inverted and thoroughly washed in a basin of soapsuds, made preferably with whale oil soap, but, if this is not convenient any ordinary soap will do. While still wet, the plant should be dusted, particularly beneath the leaves, with powdered sulphur. Spraying plants with finely powdered sulphur in water is an excellent remedy for the Red Spider. Upon large plants, shrubs or trees out of doors, spraying with kerosene emulsion is the best remedy for Red Spider. The remedy frequently recommended of spraying with pure water so as to keep the air damp, I have found of very little use, even in a greenhouse.

HOUSEKEEPER.—“It's queer that the potatoes you bring should be so much bigger on the top of the basket than they are at the bottom. Grower.—“P'taters, ma'am, is growin' so fast now that by the time I git a basketful dug the last ones is ever so much bigger than the fust ones.”—Credit Lost.

HERE is a stereotyped jokelet seeking recognition: “Hello,” said the chestnut to the robin, “what are you?” “I am a little bird,” said the robin, “and what are you?” “I'm a little burred, too,” said the chestnut.



* Open Letters. *

The Best Sugar Industry.

SIR,—The time is not far distant when the consumption of sugar in the United States and Canada will reach 5,000,000 net tons. The per capita consumption in the United States in 1897 was 85 pounds. By 1925 the population of these two great English speaking communities will be not less than 130,000,000. If the per capita consumption is 85 pounds the total amount consumed will be 5,575,000 tons, at an average price of 3 cents per pound or \$60 per ton the value will be \$334,500,000. At the present time we do not produce in the two countries 10 per cent. of the sugar consumed. We can produce all of it from beets alone. The market already exists. It is but to be developed, the demand ever increasing, is as permanent as human existence upon this earth.

Shall we continue to import 90 per cent of our supply. Is it wise for any intelligent community to be dependent upon foreigners for a prime necessary of human life, when ordinary skill can produce it at home at a large profit. A sane child will answer this question in the negative with a big no. Sugar (refined granulated) has been made at Rome very successfully from beets and will be made this coming fall. The soil and climate of Ontario, south of Toronto, Guelph and Goderich is far better adapted for the production of the Sugar beet than in the vicinity of Rome. Frosts continue later in the spring and come earlier in the fall at Rome, than in the section of Canada named above. Twelve and one-half tons of beets per acre is an average crop on a large scale. They are worth net at factory in cash \$4 per ton or \$50 per acre. An acre of beets should produce 3,000 pounds of sugar. The product at that price gives the beet grower and the sugar refiner a good profit, and the consumer, cheap, pure, refined sugar. If the raw sugar is produced in Germany, Java, Cuba or Brazil, the consumer in America must pay freight, and charge upon it to the point of consumption in addition to cost of production. If it is produced in the State or country in which he resides, cost of transportation is small. Ontario has the land, the capital and the skill to produce sugar from beets, and a home market at present for not less than 350,000,000 pounds which now costs the consumer not less than \$20,000,000 annually.

Our fruit canning and preserving industry is in its *infancy*. Cheap sugar will promote development.

In your climate sugar is a good fuel for the production of heat in the human animal. It can be produced at a fair profit at 3 cents per pound in Ontario.

Land upon which beets have been grown is

in prime condition for other farm crops. The Government of Ontario should promote this great and valuable industry.

The average value of one acre of beets well cultivated, is as much as the average value of four acres of wheat or barley.

I have given the question much study the past six years, and may, if your readers desire it, write further upon the subject.

FRANCIS WAYLAND GLEN.

Brooklyn, May 14, 1898.

New Fruits Wanted.

SIR,—For the past thirty years those who undertake to originate new varieties of fruits have been trying to produce a first-class strawberry that would ripen very early because very early fruit commanded a high price. The refrigerator car has made it impossible for growers of strawberries in this vicinity to secure an extra price for very early berries. We begin to receive them from Florida and Louisiana March 1st, and then later from Georgia and Tennessee, and later still from Virginia and Maryland, and by June 1st when they come in from New Jersey and Long Island the price is low. It is surprising how many strawberries can be sold in this market at 25 cents a quart retail. We have in greater New York, Jersey City and Newark, say, 8,000 grocery-men who sell green fruits. If they sell only 12½ quarts each per day this total sale is 100,000 quarts at \$25,000. In addition is the retail fruit dealers, hotels and eating houses who buy direct from the wholesale dealers and beside there are thousands of men who hawk them through the residential streets from house to house. From five to ten such dealers call at our house every day with all kinds of vegetables. After the local growers sent in the greater part of their crop the prices go up from day to day until prime berries command large prices. The weather is very hot and the appetite for acid fruits is very strong. At 15 cents per quart this sale of prime strawberries in July in this market would be enormous. A good late strawberry, the later the better, would be a money-getter. They can be sent here in refrigerator cars from Ontario, Quebec, New Brunswick and Nova Scotia cheaper and in less time than from Georgia or Virginia. Twenty car-loads per day containing 10,000 quarts each would not glut this market in July.

The man who first originates a prime late strawberry that will bear transportation will reap a liberal reward.

FRANCIS WAYLAND GLEN.

* Our Book Table. *

GARDEN MAKING, by Prof. L. H. Bailey, The MacMillan Co., N. Y., 415 pages. Price, \$1.00.

It is a satisfaction to the average reader to find that the contents of a book are correctly indicated by its title. Writers frequently in straining after a striking title lose sight of the subject matter of the volume it represents—for it must not be supposed that the title of the book is fixed anterior to its construction. "Garden Making" is filled with suggestions for the utilizing of home grounds. The various ways in which home grounds may be utilized are fully outlined and clearly described, and how much there is in the manner in which an operation or a method is described. The volume is divided into six sections as follows: I. General Advice. II. The Plan of the Place. III. Planting the Ornamental Grounds. IV. The Fruit Plantation. V. The Vegetable Garden. VI. Seasonable Reminders. One of the most interesting chapters is that on the planting of ornamental grounds. Here the suggestions are particularly attractive, nature like effects, instead of studied and symmetrical figures, the idea that common plants may be used with rich effect, that sometimes a healthy burdock is as useful as a high priced exotic; these thoughts, with specific instructions for the preparation and maintainance of the lawn, make the chapter peculiarly interesting and valuable. Prof. Bailey has been assisted by Profs. Waugh, of Vermont, and Taft, of Michigan, who contribute respectively a chapter on vegetables and on fruit plantations, both of which are valuable. This volume is one that contains a large

amount of useful information, and is, apart from its interesting and readable style, a book that will be appreciated by the gardener and fruit grower.—J. C., Ithaca, N. Y.

THE HORTICULTURAL REPORT of the Western N. Y. Society is to hand, and fully keeps up its excellent reputation. Probably no other reports contains so much up-to-date information on fruit culture. The Secretary is Mr. John Hall, 409 Wilder Building, Rochester, N. Y.

MR. F. BRUNTON, landscape gardener, who advertised in our pages last season, has removed to 136 Boylston St., Boston, Mass. He has received several orders with cash, from our readers, which he writes he will return. Two of the letters did not give the address of the senders. He has opened out business in Boston, as importer and grower of plant seed, and bulb specialties, a business in which he is an expert.

THE PRUNING BOOK, a monograph of the pruning and training of plants, as applied to American conditions, by Prof. L. H. Bailey, of Cornell University, McMillan Co., New York, 1898. Price \$1.50.

This excellent book deals in the most intelligent manner with the Philosophy of Pruning, the Fruit Bud, the Healing of Wounds, the Principles of Pruning, Root Pruning, some Scientific Modes of Training, Grape Training, etc.

MR. F. BRUNTON, of 136 Boylston Street, Boston, has opened a Hardy Plant Club and Exchange, in connection with his business.

