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Growing Nursery Stock in a Cold Climate*

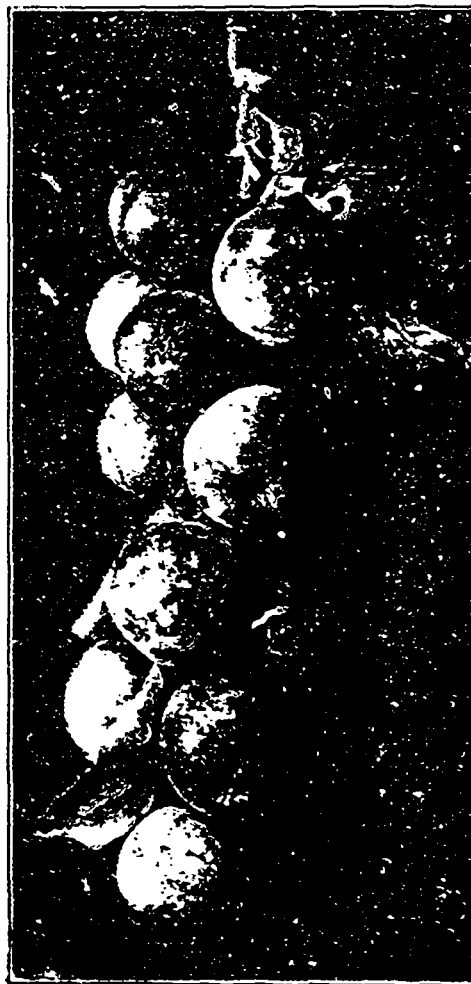
W. T. Macoun, Dominion Horticulturist, Ottawa, Ont.

THE question of nursery stock is one of much importance to the fruit grower. If he does not get the right kind of stock, no matter how closely he follows everything recommended, he will not have good success with his orchard.

It is sometimes unfortunately the case when a man orders trees, that the order is not filled by good stock and he is not able to get redress. There are several advantages, therefore, in ordering nursery stock from home nurseries. One advantage is that you can go and see the trees you are going to plant. If the trees are not satisfactory when you get them, you can return them and demand redress. This is a much more difficult process, when the man is a thousand miles away. If your trees prove to be diseased or are affected by insects it is also easier to get redress. These are some of the advantages of getting stock from a local nursery. On the other hand there are disadvantages.

The range of the native trees north to south has been determined by probably thousands of years of acclimatization. Our experiments at Ottawa for over twenty years show that native ornamental or forest trees from the south might fruit at Ottawa, but some years would be tender and kill back and not be vigorous and hardy. It has probably taken thousands of years to acclimatize those tender trees to their present northern limit. They might be hardy enough to produce seed, but the wood of individual trees keeps killing back. When we come to such apples as King and Baldwin, Rhode Island Greening, and some of the tender varieties, tender for certain parts of the province of New Brunswick, we find the same thing happening. These trees originated in a much milder climate than the province of New Brunswick. Their range has been determined largely by the relative degree of hardiness that is inherent in them, and it has been found by experience that if one introduces these trees and tries to grow them in northern nurseries, tries to grow Rhode Island Greening or King or Baldwin or any of these apples that require a long season's growth and are what we

call tender, they prove a failure, they kill back, the bark splits. We cannot grow these trees in northern nurseries profitably. A tree that is tender will not be made hardier by growing it in cold districts.



How is This for Apple-Bearing?

This short stalk contained twenty-one full grown apples when it was taken from the tree. Three were lost on the way to the studio. Grown in the orchard of Robert Bell, Sackville, N. B.

COMPARATIVE HARDINESS

You might ask: Will the average apple originated, say, in the province of New Brunswick be necessarily hardier than the apple which is originated, say, in the state of New York or Rhode Island? No, it might not be hardier if originated there. If I sow the seed of the Wealthy apple in the province of New Brunswick, the seedling of that

apple is not necessarily hardy. Some may be hardy and some may be tender, and it will require a great number of years before one will find out which seedlings are going to be hardy in New Brunswick. When one has a seedling, say, the Merrit, which originated in the province of New Brunswick, an apple tree that has been able to withstand the cold climate year after year, you cannot say that variety is hardy because it is able to withstand the cold climate. Seedlings from a hardy tree, however, are much more likely to be hardy than seedlings from a tender tree. We have found that in our experience.

Which, you may ask, is the better, Northern or United States grown stock, local grown New Brunswick stock or stock grown, say, in the province of Ontario? Which is the better stock for us to use? Are there great advantages in growing home-grown stock, or are there not such great advantages?

CLIMATIC DIFFERENCES

In the warmer parts of Canada and the United States they have a much longer growing season than you have here. The result is that they can plant nursery stock on much richer soil than you can and have the trees ripen thoroughly. If you plant nursery stock in Northern New Brunswick, for instance, on your richest soil, your trees will not be properly ripened and will be almost certain to winter kill.

There is danger in getting nursery stock, even from a southern district, in getting it not properly ripened because trees are dug which are not thoroughly ripened. For instance, it has been the practice I won't say it is the practice now—to dig trees in large nurseries while the leaves are still green and strip the leaves off so as to give the tree the appearance of being thoroughly ripened. You can easily see that if such trees are planted in another district they are liable to be too tender for the first winter. So that you see from my standpoint there is not sufficient evidence in regard to the quality of the trees from the southern nurseries and the northern nurseries to warrant the statement which has been made that northern stock is the best stock. For instance, I believe you can get hardy stock properly ripened in

*Extract from an address delivered before the New Brunswick Fruit Growers' Association, November, 1910.

southern nurseries and secure just as good results from them as from stock from the home nursery

DISADVANTAGES

Some of the disadvantages of growing nursery stock at home and in colder districts include the following: There is a temptation at home to grow nursery stock in rather rich soil in order to get a strong growth and a strong tree. If you plant your trees on a clay soil or a heavy soil there will come certain years when the fall is favorable to late growth when you will lose a large proportion of fine, hardy varieties such as McIntosh Red and Fameuse. So if one wants to have home-grown stock one must grow it on soil which is not too rich. If your soil is well drained and warm your stock should be thoroughly ripened before the winter sets in.

Another disadvantage of growing trees at home is that one loses one year very often in the growth of trees if one wants to get good stock, because no matter whether you grow your trees on light

soil or heavy soil, we have found in some winters in a cold climate the trees become what is known as "black hearted." This is due to the fact that the trees have made too late a growth, notwithstanding the greatest care. It may be also that trees have ripened their wood all right and a very severe winter follows while the trees are quite young, and the result is the pith and wood of the trees are damaged, but the cambium being alive the tree goes on growing next year, and unless one treats the tree the way I have described one is liable to have black-hearted trees. While black-heart may not be a very serious injury to a tree in its early history, just as soon as they begin to lose the branches disease will begin to work on the trees, and eventually the tree will decay and break down. After a very severe winter, we have found that black heart occurs in trees set out in the orchard three or four years. As a rule, I think I am safe in saying it occurs in the nursery. We want to avoid this black heart in trees.

Nova Scotia, a few months after I took up my duties there. No doubt every reader is familiar with the silvery foliage of some of our native willows and poplars. From a distance these trees may be easily recognized on account of the bluish white appearance of their foliage. If you bear in mind the appearance of this color when examining your orchards if you find that it is not due to any milky film of sprays, there exists the probability of the presence of this "Silver Leaf" disease. I again solicit samples of foliage, for we cannot be too careful in taking every possible step to prevent this disease from becoming a source of real danger to one of the country's most important industries.

NATURE OF THE DISEASE

The "Silver Leaf" is injurious to the life of the trees that have been enumerated. The trees may at first show only one limb affected, gradually another falls a victim, until the whole tree becomes involved. The disease works slowly, and it may take from three to five years before the disease has involved a whole tree. This depends naturally upon the size of the tree. During the first few years the affected branches bear some fruit, but bearing soon becomes a thing of the past and the tree dies limb after limb. It may be said that a tree once attacked nearly always dies. It is our experience that it bears little or no fruit previous. Protection practically amounts to immediate destruction of the trees which show this disease.

WARNING TO GROWERS

The "Silver Leaf" disease has been recorded and has been personally observed in the following provinces: Ontario (Ottawa only), Nova Scotia (several records), New Brunswick, British Columbia, and in the experimental orchards in Manitoba. No case has yet been received from Quebec, the Niagara district, or from any of the other provinces where fruit is grown. This must not be taken as an indication of its non-existence. I have reason to believe that the disease is very widely spread. The disease is very serious. Growers in this country are advised to examine their trees very carefully and give the disease no chance of establishing itself firmly all over the country. The fruit industry is in real danger. Without wishing to be an alarmist we cannot afford to neglect the lessons taught us by this disease in other countries, and every fruit grower should unite with the government in the efforts which are being made to arrest and control the spread of "Silver Leaf."

Stereum purpureum, the fungus which causes "Silver Leaf," is a wound parasite. The fungus is liable to gain entrance through any wound in the bark or root. It produces its fructification on

The Silver Leaf Disease of Fruit Trees

Dr. H. T. Gussow, Dominion Botanist, Ottawa

I desire to make an appeal to the fruit growers of Canada for cooperation in preventing the spreading of this alarming disease, the "Silver Leaf" of fruit trees. Already this disease has been located in several provinces.

As the name indicates, this disease may be recognized by a silvery or milky gloss on the upper surface of the leaves of apples, plums, peaches, cherries, currants and gooseberries. In Canada authentic cases have occurred only on apples and plums, but in Europe this disease has often been found in the other kinds of fruits. It is somewhat difficult to recognize the silvery appearance of the leaves, which, however, may become so pronounced as to completely whiten with a kind of bluish white tinge, the foliage of one or more limbs, or often the whole tree.

The use of sprays like Bordeaux or lime-sulphur results in the covering of the leaves with a bluish or yellowish white film. This may give the tree an appearance not unlike "silver leaf" but on wiping the leaves, this covering is of course easily removed, while in the real "Silver Leaf" the color will remain. Hence, it is important to distinguish carefully between these two facts. In order to be sure of the disease specimens will gladly be examined and reported upon by the Division of Botany, Central Experimental Farm, Ottawa.

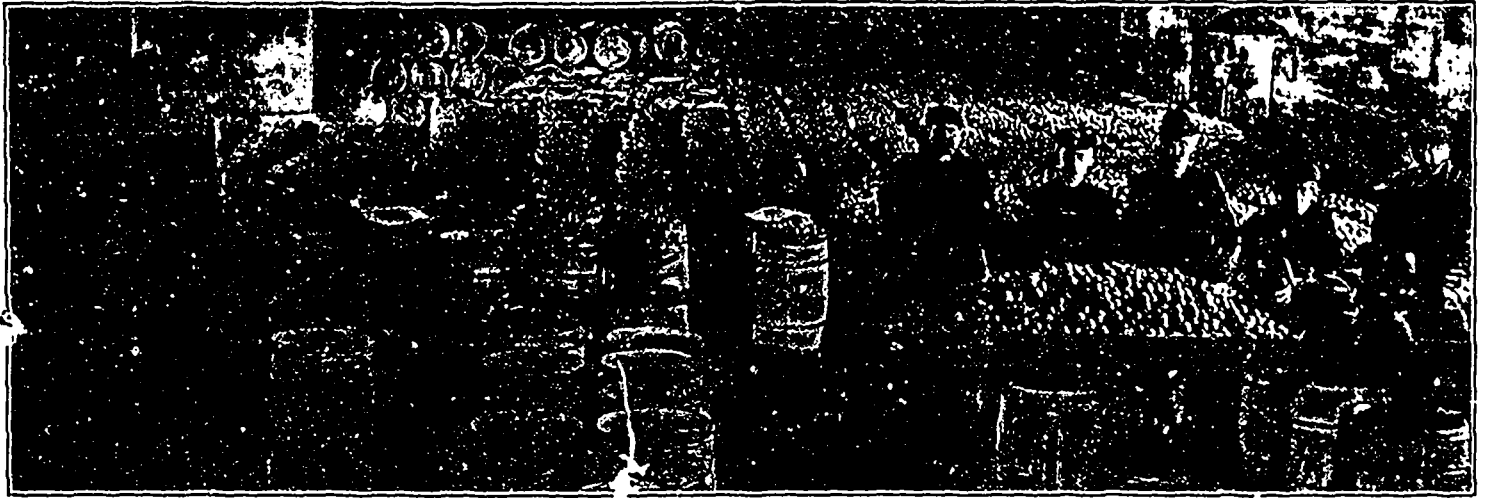
Growers should try to become familiar with the appearance of this disease which is by no means a new trouble in this country, but which has unfortunately es-

caped detection until the discovery of undoubted cases of "Silver Leaf" in



Silver Leaf Disease in Apples

The top branch shows the silvery appearance of leaves when compared with the healthy twig below. The twigs towards the right show the fructification of the causal fungus.



Nova Scotia this Year will probably have a Million Barrel Apple Crop, mostly High Grade

The interior of a Nova Scotia packing house at Middleton is here shown.

dead wood only, hence its true nature has not at once been recognized. The fructification appears as more or less depressed or horizontal brackets of a dull crimson color. Remove at once all trees that are wholly involved—do not allow the stump to remain in the ground. It is generally on the stump, in, or lying on the ground where the fructification of the fungus is produced. The whole wood of any "Silver Leaf" tree should be destroyed by fire. Take the trees out any time before fall.

In the fall the fructification appears more generally. Cut away and burn any

silver leaved branches, and watch the tree; if after cutting away a branch "Silver Leaf" re-appears in others, throw the tree out. When removing a tree the roots should be dug out also, then fill in the hole with stone lime mixed with soil and allow three months before planting another tree in its place. Local infections of single limbs may take place and the inoculation experiments have shown that such a limb may recover, but it is best to remove an infected limb as soon as noticed. The disease is liable to spread from limb to limb, so do not take any risks.

So far as Apple Scab is concerned, neither the fall nor the early spring application seem necessary for control, though they might help slightly. The important sprays for it are (first) the one just before the blossoms open, and (second) just after the blossoms have fallen, and in very moist districts or in wet or foggy weather a third one about two or three weeks later.

INSECT CONTROL

From the standpoint of the control of insects it is probable that fall spraying would give fairly good results though I do not see how it would be quite so effective as the early spring spray before the buds burst. The main insects controlled by this spray are of course oyster-shell and San Jose scales and Blister Mite. A number of other insects are partially controlled by it but not entirely. In my experience it is a very desirable matter in the control of scale insects that the spray should remain on the tree as long as possible in the spring so that it will be there when the young insects appear. In this way, it seems to destroy a large number of these delicate little creatures. This could not take place if the application had been made in autumn as it would be washed off. Some claim that fall spraying is more effective than spring spraying against scale insects, but they have not been able so far as I know to demonstrate this, and the very opposite seems to be the case. We should remember, too, that winter itself destroys over fifty per cent. of most of our hibernating insect enemies, so that they are weakened greatly by the time the spring application is made.

WESTERN CONDITIONS

Why then is fall spraying practised and advocated so strongly in the Pacific States and British Columbia? It is, so far as I can discover, chiefly to keep under control a very troublesome fungous disease known as Apple Anthracnose

Fall vs. Spring Spraying

L. Caesar, O.A.C., Guelph, Ont.

OUR eastern fruit growers sometimes ask why fall spraying of apple orchards, which is being largely practiced, I believe in British Columbia and the western states and to a small extent in some of the eastern states, has neither been recommended nor practised in Ontario. It is because we have found in Ontario that our present method of spraying, if thoroughly done, gives us almost perfect control both of insect pests and of diseases. Therefore it is not necessary for fruitgrowers to make an extra application in the autumn after the leaves are all or nearly all off. To do so would mean a good deal of inconvenience, and would greatly increase the cost and labor of spraying, thereby lowering the profits of apple growing and discouraging the growers. Our aim is to secure the best results in the easiest, most practical and economical way.

If the fall application could take the place of our first spring application just before the buds burst, any person who found it more convenient to spray in the fall than in the spring might do so. But we cannot see how it is possible to do

this, because the application is not made until the leaves have nearly all fallen, and by this time it is usually so cold that all growth, both of the trees and of the diseases that attack them has ceased; nature is, so to speak, dormant, or nearly so, and remains this way until the warm days of spring renew activity.

Fall spraying cannot destroy all the spores of disease, for many of them are enclosed in little protected pustules on the bark or leaves or fruit, and these often do not open until spring; moreover, in the spring the wind will bring spores for long distances, and these will lodge on our trees. By this time all the fall spray will have been washed off the trees, hence the early spring application will be just as necessary as ever to keep off our Ontario diseases. This is especially true of Black Rot Canker, which spreads in spring to a very large extent. To ward it off it is very important that before growth begins in the spring the bark of the trunk and main branches be thoroughly covered with lime-sulphur so that any wounds or winter injured areas may not afford lodging places where this fungus can germinate and establish itself.

which causes numerous destructive cankers on the smaller branches and twigs. The spores of this disease spread in the autumn and germinate during or shortly after the fall rains. Therefore to prevent their germination the plant pathologists recommend that the trees be sprayed about the time these rains are due, which seems to be early in October, and again as soon as the leaves fall or the crop is off. We have no Apple Anthracnose disease in Ontario. It is believed that the earlier of these applications helps to prevent fresh attacks of apple scab in autumn, but it is not claimed by such a reliable authority as Prof. Cordley, of Oregon, that this alone will control apple scab for the rest of the season. He practises the same spring and summer sprayings as we do.

Thus, the main reason for fall spraying in the west, does not exist in Ontario. We should, moreover, remember that the climate of the Pacific coast is much different from ours, and what may be necessary there may not be either necessary or desirable here. No harm, of course, could come from fall spraying in Ontario and anyone desiring to test it is running no risk. It certainly destroys many of the insects that a spring application would kill, and where an orchard is badly infested with Blister Mite or San Jose Scale or Oyster-shell Scale, it could be practised with much benefit until these were brought under control, but its proper place, in my opinion, is to supplement in this way and not to displace the early spring application. The proper mixture to use is lime-sulphur of the ordinary spring strength, without any arsenate of lead.

We should not forget that any system of spraying can be made more effective by proper pruning of trees and by careful cultivation of the orchard in the early part of the season, followed by a cover crop to prepare the wood for winter. These things help to make the trees themselves healthy, and allow a free circulation of air and plenty of sunlight, all of which are important in the control of insects and diseases. The destruction of fallen fruit by hauling it to the evaporator or in any other way, is one of the best things that can be practised if we want clean apples.

Locating Little Peach

A Niagara district fruit grower wrote recently to the United States Department of Agriculture at Washington to find if it is possible to determine the presence of little peach on trees planted out last year. In its reply the department states it is possible, though the identification would not be very positive. The difficulties in a positive identification come from the presence of other diseases, such as the black peach aphid, cel worms on the

roots, borers, sour soil, nitrogen starvation and other weaknesses. If none of these troubles are present, or, if upon examination one can make reasonably certain of their absence, then the little peach cases stand out pretty clear.

"We have," writes the pathologist, Mr. M. B. Waite, "used the buds from trees affected with little peach more than the one-year nursery trees which show the symptoms a little but not very decidedly. These were transplanted on to rich ground here at Washington, where they developed the symptoms, though in rather moderate degree, during the first year's growth in the orchard. The trees lived along for several years, becoming more and more marked. This is equally true of peach yellows. Of course to be absolutely positive one would perhaps have to wait for the fruit, as the leaf symptoms of little peach are somewhat similar to yellows, and not always easily distinguished from the symptoms caused by the other diseases named."

Apple Packing in British Columbia*

In British Columbia every man owns his own packing house. When the pickers are started in the morning one man goes down with a load of boxes, scattering them along the trees as he goes. On his return he picks up the filled ones, takes them to the storehouse and returns and comes back with another load of empty ones. By this means there is no waste time.

The apples are picked in galvanized iron buckets with canvas bottoms. The bottom is held together with a drawstring which is loosened and the apples come out the bottom of the bucket, thus preventing any bruising. Low truck wagons are used for drawing the apples to the storehouse. The apples are graded in three grades—culls, fancy, and choice.

No man is allowed to pack his own apples. The packer who is sent by the association is sole judge of what should go in the box. In this way the grower has nothing to say about the grading, and to this factor is very largely due the high reputation of British Columbia apples for their uniform grade.

The organization of the Hood River Apple Growers has increased the price of the apples to \$2.10 per box f.o.b. The price has not been less the last five or six years. The apples are sold f.o.b. station. The association formerly advertised for buyers, but now each grower estimates his yield and signs up his association for his entire crop. Last year 80,000 boxes were sold to one man. The stamp on the boxes guarantees the Hood River reputation, wherever the

*Extracts from an address given at the Guelph Agricultural College Short Course by Mr. A. B. Campbell.

apples are eaten. The association gives an absolute guarantee that every box or package is honestly packed.

The number of apples in the boxes vary according to the size of the apples from one hundred to one hundred and fifty. A car will hold six hundred and forty boxes. Everything that goes east is wrapped in paper. The spring in the box amounts to a half or three-quarters of an inch on both the top and bottom. Experience has shown that the best pack is where the stem comes immediately above the calyx of the apple below. In this case the paper forms a cushion between the apples.

Many eastern people obtain a wrong impression of the apple when they see the exhibition packed boxes. The growers estimate that an exhibition will cost them from fifty cents to seventy-five cents each, while the regular rate paid the packers for putting up the commercial boxes is seventy-five cents apiece. Mr. Campbell produced eight thousand boxes, of which seventy-five per cent. were fancy, the balance choice, with the exception of about seventy-five boxes.

DEFINITION OF GRADES

The grades are as follows: Fancy, seventy per cent, good color, free from blemishes, no fungus, good shape; choice, two fungus spots, or two stings, not open, are allowed, no limit in color. Mr. Campbell obtained by spraying three times an almost perfect crop of apples, as only one-tenth of one per cent. were graded as culls.

The trees were sprayed three times: Once in the fall, as soon as the apples were picked, with the Bordeaux mixture, 6-6-50. In the spring they were again sprayed with the same application, and then again with lime-sulphur and three pounds of lead arsenate to the barrel of the mixture.

PACKING

On British Columbia apple ranches, everything moves like clockwork. The apples are brought in to well lighted sheds and emptied out on a packing table, four feet wide by six feet long. Four packers are at each table and sort the different sizes out at the same time. By this means there is much less bruising than there is where a less number are working and where the different sizes are not all packed at the same time. The packers are held responsible for the work, and are paid thirty cents an hour and their board. The grower gets the entire produce of the apples, with the exception of ten cents a box, which is deducted to pay expenses.

In grapes I grow the Concord and Niagara, and spray twice with Bordeaux to prevent the rot.—L. Wolverton, Grimsby, Ont.

The Decorative Use of Palms and Ferns

A. V. Main, Almonte, Ont.

WHEN selecting house plants of an evergreen nature and of the most graceful and elegant form, palms and ferns stand out pre-eminently. However lavish a mansion may be in other adornments, plants of this evergreen habit are indispensable. On the other hand nothing is more disgusting than half-dead, sickly plants.

inch is ample. Palms occupying eight inch, nine inch, and ten inch pots are permanently settled down, as it were, and benefit from an annual top-dressing in the spring. To do this remove two inches of the surface soil and in its place pack in some fresh compost.

When in need of water the pot will give out a clear sound when rapped on

inside the jardiniere for the pot to rest on. This is applicable to all house plants. The surplus water thus is clear of the pot. It should be emptied out periodically. The correct idea is to get the water to pass through the pot quickly. This necessitates the use of drainage, charcoal, and judgment in watering.

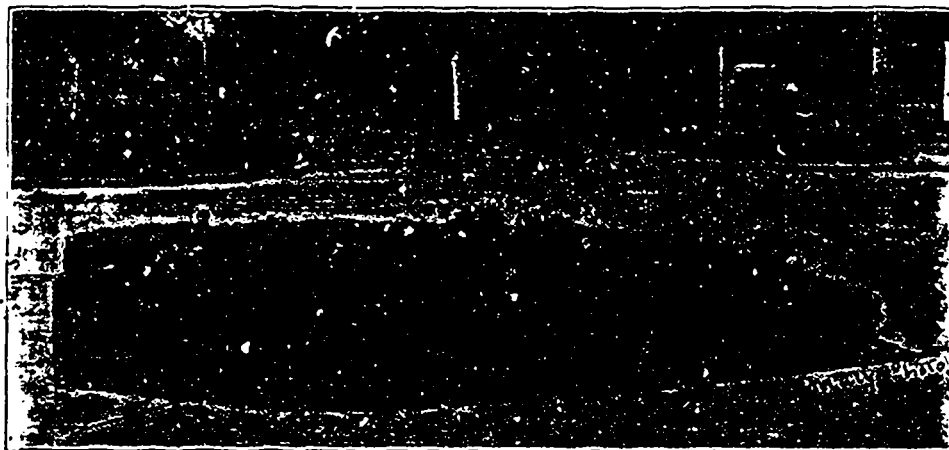
Bone meal or raw crushed bone in the soil is beneficial. It is a lasting manure, which it is wise to use with slow growing plants. Soluble manures are practically lost on palms. We find a weak solution of soft coal soot is the best stimulant for green leaves.

WASH THE PLANTS

Dust settling on the leaves often results in a leaf turning yellow. A couple of such leaves will disfigure a well-balanced palm. At the least, the palm requires a monthly wash or sponge, and oftener if time permits. All sorts of dirt will accumulate on the leaves, which encourages the insects that feed on the plant to its disfigurement. A small piece of sulpho tobacco soap dissolved in tepid water or ordinary soap makes a good cleanser. Preventatives to insect life are better than fighting them after their unwelcome intrusion.

Be sure and wet all parts with the sponge on either side of the leaves, particularly the under side. Sprinkle or spray with clean water after the use of the soap wash. Nothing benefits this class of plants more than a wash and spray overhead, especially in hot, arid rooms. The large, graceful leaves of glossy green hue are suggestive of moisture.

Scale and red spider are the worst enemies of palms. They gradually eat the fibre and turn the leaf into splashes of yellow. Persistent cleaning with soap and water is the remedy, but remember that unhealthy conditions at the roots give place to attacks of insects.



Street Improvement by the Windsor Horticultural Society.

Excellent work is being done by the Windsor Horticultural Society in the line of civic improvement by the planting of flower beds at street corners. Three of these flower beds may here be seen.

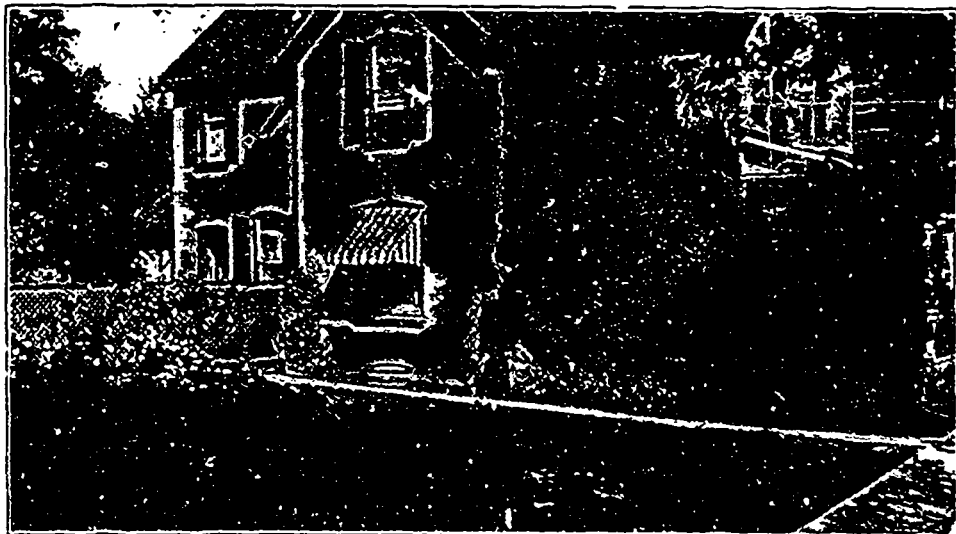
No special care is required to keep palms and ferns healthy and green, but like most other things a few points must be given attention. In their proper culture three factors are essential—suitable soil, judicious watering, and cleanliness.

Kentia Belmoreana is, possibly, the best house plant. Others are Kentia Forsteriana and the fan-leaved palm, Lantania Borbonica. Cocos Weddelliana has fine delicate foliage and is adaptable for a table plant, but it is rather difficult to grow. Palms dislike root disturbance, particularly when in their artificial homes. That warns us to have good drainage and soil, for a larger pot is rarely needed before two years. Reckless potting and fine soil collected from, well, any odd place is not good enough. An excellent soil may be made from two parts fibrous loam, one part of fibrous peat, with sand and charcoal to shine through it, and half a cup of bone meal fertilizer. Mix thoroughly and you have a good, lasting compost.

When potting, use clean pots. Put in several pieces of broken pots, slates, or tile, and then some fibrous pieces of soil. Next set in the plant, straight, first removing the loose soil from it. Any unruly roots can be cut. Have the brown base of the leaf stalk just clear of the soil. Pack it firmly around the plant, using a blunt stick for the purpose. Avoid large pots. When repotting, a change from a six inch to a seven inch or from a seven inch to an eight

the side. A vigorous plant in a warm position will want water about every second day. If the surface is fairly dry and the weight of the pot light, it is safe to give water. By attending to their daily wants you soon know when water is wanted.

One of the worst evils of palms is to have the plant sitting in a jardiniere or other ornamental dish. This water gets sour and in time is absorbed by the soil, much to the detriment of the plant. Use a small block of wood or small pot



A First Prize Lawn and Garden at Brantford.

The home of Mr. F. Simmons is here shown which won first prize for a workingman's lawn and garden in the competition held last year by the Brantford Horticultural Society.

Practical Plant Breeding

H. J. Moore, Queen Victoria Park, Niagara Falls, Ont.

IN writing this article, I feel that I am treading on dangerous ground, seeing that my profession is not that of plant breeder entirely, but that of horticulturist. However, I may be able to overcome the difficulty by approaching the matter from a practical standpoint and dealing only with that phase

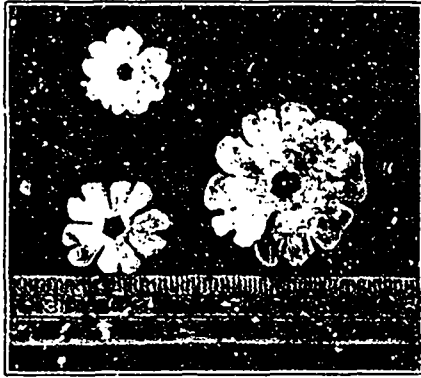


Fig. 1

connected with practical horticulture.

No matter whether we are interested in the subject for practical or scientific purposes we must approach it systematically. We must discriminate in order to get the best results from our labors, or much valuable time will be lost in beating around the bush. There is no reason whatever why every trained horticulturist should not become a practical plant-breeder, and the pleasure he would derive from associating himself more intimately with and understanding more fully the fundamental laws on which the science is based would amply repay him for the time spent in its pursuit. There is something indescribably fascinating about plant breeding, as one never knows what to expect; although, if we understand Mendel's Law of Inheritance and its relation to the particular group of plants with which we are working, we can predict pretty closely as to results.

The life of the man who is engaged in plant breeding is full of hope. This has a tendency to make him look more cheerfully upon the sterner duties which, as a horticulturist, fall to his lot. Even for the amateur, plant breeding has its charm, and there is no occupation more edifying, more instructive, or more worthy of man's best efforts than the production of something better than already exists, or the creation of something new, which will either aid in the beautifying of our home surroundings or be of some utility in the economy of life.

Although it is impossible to make two blades of grass grow where one grew hitherto, it is quite possible to produce a better blade of grass, a better ear of corn, or a sweeter-scented flower, which

will occupy only the same space as its less worthy progenitor. There is room for improvement not only in our fruits, but also in our flowers and vegetables.

There are essentials which are necessary in order to become a skilled breeder or improver of plants, the chief of which is an intelligent mind to grasp a knowledge of the subject to be dealt with. Before a doctor can diagnose the case of a patient he must have a thorough knowledge of human anatomy and physiology. He must know the various organs which constitute the body, and understand their functions. Thus it is with the hybridizer. He must know at least something about the other branch of biology, viz., botany, without which it is useless to attempt any discriminate work, because the operator, although having eyes, sees not; that is, he lacks the knowledge to intelligently carry out his desires.

REQUIREMENTS

A good course in First Stage Botany is the first requirement. When a person has studied the morphology, and physiology of plants, he or she understands at least what the various organs of the flower, the calyx, corolla, stamens and pistil, were intended for. Secondly, a course in Systematic Botany will be

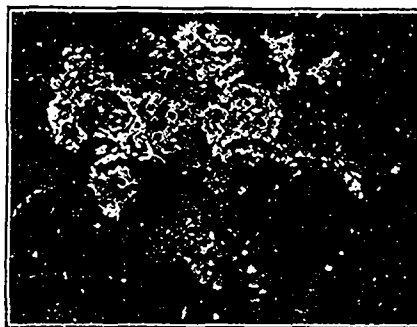


Fig. 2

found invaluable, because of the knowledge of the families or natural orders of plants that is obtained. Why is Systematic Botany necessary? Because it has been long known that plants of different natural orders will not hybridize, but plants of the same order may. Thus, when a person knows the characters of the plants which constitute an order, his chances of success in plant breeding will be greatly enhanced. It would be absolutely useless to attempt to hybridize a plant belonging to the natural order Ranunculaceae with another belonging to the order Compositae. Different species of an order may cross; species of different genera or the same order occasionally cross, but rarely; bi-generic hybrids are uncommon. From the above remarks the value of Systematic Botany will be readily understood.

Where is it possible to obtain these courses of instruction? At the agricultural and various other colleges of the country and at high schools. As some idea of the requirements of plants is of great value to the hybridizer, the practical horticulturist has the advantage over his less fortunate neighbor who has never had facilities for work in this direction. A knowledge of soils, temperature, humidity, and other environmental conditions is essential in order that we may bring any class of plants to full maturity by giving them conditions as nearly natural as possible; otherwise our chances of success will be limited to the extent of our knowledge in this respect.

CHOICE OF SUBJECTS

Now, suppose we are through with all preliminaries, the next step is the selection of suitable subjects for hybridizing. The operator must have some definite purpose; there is very little to be gained by indiscriminately pollinating everything which appears likely to hybridize. The inevitable result of lack of forethought is disappointment. Some special type of plant should be selected, such as the primula, the lily, or any plant with flowers easy to manipulate at first, as plants possessing flowers more intricate should be left severely alone until the simpler flowers are mastered.

It would be well at this stage to mention the instruments which are required for plant breeding. They are not numerous, but should be of good quality. A pair of forceps, a sharp scalpel, a good pocket lens, a camel's hair brush, and a quantity of alcohol, or other sterilizing medium, in a bottle, alone are required. The forceps, brush, and scalpel must be kept scrupulously clean, and immediately after use should be sterilized. It may be found necessary to cover all pollinated flowers, and for this purpose small paper sacks are used, the dimensions of which will depend upon the size of the flower operated upon.

POLLINATION

Not having space in this short article to give the details of pollination, I may say that it simply consists in transferring pollen from the anthers or male organs of one plant to the stigma or female organs of another. As flowers are in most cases perfect, that is, possessing male and female organs, it is sometimes necessary to pollinate a flower with its own pollen or with pollen from another flower of the same plant. The primrose is a good example. In the case of "monoecious" plants, which possess both staminate and pistillate flowers, the only course to pursue is to transfer the pollen from the staminate flower to the pistillate one, or, if the staminate and pistillate flowers re-



The Winning Garden in the St. Thomas Lawn and Garden Competition

The first prize garden of W. R. Rowbotham, of St. Thomas, Ont., is here shown. Mr. Rowbotham has developed it in only two years. A fuller description will be given later.

borne on different plants of the same species, the pollen must of necessity be transferred from the staminate flower of one "dioecious" plant to the pistillate flower of the other. After the act of pollination is performed the flowers are covered with the paper sacks, and the operation completed by affixing a small tag bearing essential data.

Nearly everyone knows the beautiful Primrose, *Primula obconica*, a plant commonly grown in a great many homes. I have chosen this plant as an illustration on account of that fact, to show the possibilities of practical plant breeding.

It is plainly evident from Figure 1 that great improvement has taken place. The small flower represents the original species; the medium one, that of an improved variety called *gigantea*; and the large flower that of a cross between *Primula obconica* and *Primula megalacifolia*. Although the flowers of the hybrid were not larger than those of the variety *gigantea* originally, this enormous size has been attained by selection through several generations, plants possessing the largest flowers having been selected for seed. Up to date each succeeding generation has given us larger flowers than its progenitor.

The plant is very floriferous, and the umbellato inflorescences, which are remarkably large and borne on long, rigid stems, measuring in some cases 18 inches, are most desirable as cut flowers. In this respect a new feature is introduced. Figure 2 speaks plainer than words.

(To be continued)

Plants should have a rest, and that is accomplished by withholding water, lowering the temperature in which they grow and not giving them any stimulant.—E. F. Collins, Toronto.

around the plants and then covering them with an inverted sugar or flour barrel is a good method of covering tender roses. This method is, however, very unsightly on a lawn.

CLIMBING ROSES

Climbing roses should be taken down from the trellis they are trained on, and the canes laid down as close to the ground as possible without breaking them. About the end of October is a good time to lay them down. Strawy manure, or straw, may be used for a covering for climbing roses. This should not be put on until quite late in November, for the reasons before mentioned. The covering should be about two or three inches in depth. Dry leaves may be used first with a light covering of strawy manure over them to keep them in place. There is some objection to leaves on account of harboring mice. Corr stalks should never be used for the same reason.

Green pine or spruce boughs make a good covering for roses. A light covering of soil can also be made use of. The latter sometimes causes damage to the canes from the weight, and if the season should be mild and wet, soil often induces mildew, and keeps the canes too green and soft by the exclusion of air, and the retention of too much moisture. Some material that will afford a slight protection, admit air, and help to hold the snow around the plants is the best material for protecting climbing roses in winter.

Planting Roses

W. G. McKendrick, Toronto, Ont.

November in Toronto, is the best month to plant or transplant roses, as the wood is well ripened and the roots take hold and start off quicker than if planted in April, when most of my planting has been done. If you cannot plant in November, April or even May will give splendid results and lots of flowers if two year old roses are purchased. If budded roses are planted, place the joint from one to two inches below the surface and



Sweet Peas, Seven Feet High, Grown by Arthur Walker, Cobourg, Ont.

compact the soil firmly with the foot.

When planting roses cut off any injured parts of roots and cut back the tops to from three to seven inches above ground. The second year prune in the spring as soon as the buds begin to show. If you want good roses cut them ruthlessly down to within a few inches of the ground and just above an outside bud, as inside buds will spoil the symmetry of the plant and not let the sun and air into the centre of the plant. The weaker the plant the harder it should be pruned.

Climbing roses need little pruning, except to cut off the dead wood. After a main root of these climbers has

bloomed for say two seasons, it is advisable to cut it off close to the main root immediately after it has bloomed, so that a new shoot or two will be grown to take its place with fresh flowering wood to give the next season's flowers. Each variety should have a good, permanent label of wood painted white and the name legibly written with an indelible pencil and wired with good copper wire, and it will last for years. An ordinary wood label with ordinary wire will become weather-worn in one season, and the wire will rust off during the winter, and unless you have a plan of your rose bed you are at a loss to know what your roses are the next spring.

Growing Bulbs in Fibre

John Gall, Weston

A large number of flower lovers are practically unable to procure suitable soil for the planting of bulbs in pots, a few articles regarding the new method, known as "culture in prepared fibre," may be of considerable interest to dwellers in towns and others. This method, if carefully managed, gives excellent results, and as there is nothing difficult about it, every one may give it a trial. Any kind of bowl or dish will suit, providing it is not less than three or four inches deep. In mostly all seed stores may be purchased vessels made specially for this method of culture, and the prepared fibre may be got at the same place.

PREPARING THE FIBRE

It is often found that the fibre has got into rather a lumpy state, so it should be pulled or rubbed with the hands so as to get it into a nicely usable form. After the mass has been thus prepared, take a fine-rosed watering pan and sprinkle lightly with water; then mix with the hands, and if necessary add a little more water. What is to be aimed at is to get the fibre just nicely moist, but not soaking wet. This is of the very greatest importance, so if by any chance the material is made too wet spread it out for a day or so to dry somewhat.

PLANTING THE BULBS

Having got the fibre in proper shape, fill the bowls or other dishes to about an inch and a half from the tops, and then gently press the bulbs into this, but on no account make the material hard by unduly pressing it with the fingers. Fill in a little more of the fibre, so as just to cover the tops of the bulbs, leaving of course, a little space for watering. A few smart taps on the table will settle the material nicely around the bulbs without the necessity of pressing much with the fingers. If the potting material is in a nicely moist state, as described above, then no water should be given.

The bowls should be placed in a per-

fectly dark but rather airy place. Those having a garden could set the bulbs outside and cover them over with sand, and when so treated no further attention will be necessary for about six weeks in the case of tulips, hyacinths and crocuses, and twelve weeks in the case of daffodils. If kept indoors the dishes must be examined about once a week, so as to ascertain the condition of the potting material. If it appears to be getting dry give a little water, but do not soak it. If at any time it should chance that too much water has been given, tilt the dish gently, holding one hand over the mouth to prevent the bulbs from falling out, and so allow all the surplus moisture to escape.

If these few simple details be followed success is almost certain. The chief point to bear in mind is to keep the fibre just nicely moist from the time of potting until the flowers fade.

SUITABLE BULBS

While the bulk of bulbs will succeed partially, there are a few that give very best results if fair treatment is meted out. The following may be relied on and should be used by the beginner until he sees how he succeeds:

Hyacinths—White Roman, Schotel, L'Innocence, Jacques, and any of the miniature varieties fancied.

Tulips—Vermilion, Prince of Austria, Yellow Prince and Brilliant.

Daffodils—Sir Watkin, Empress, Queen of Spain, Emperor and Henry Irving.

Crocuses—Sir Walter Scott, May and John Bright.

Early potting gives best results, and I would advise that all be got in not later than the third week in November.

Roses are particularly impatient of stagnant water about their roots, and no manner of treatment will ensure success till the ground is thoroughly drained.

Sweet Pea Culture

W. T. Macoun, C. E. F., Ottawa.

The Sweet Pea is the most popular annual grown at Ottawa. Its popularity is well merited for it possesses most of the qualities which are desirable in a flower—grace of form, delicacy and variety of coloring, long stem for cutting, and a profusion of bloom from early summer until late autumn.

The soil should be prepared for sweet peas in the autumn to obtain the best results. Soils dug in the spring with the seed sown immediately, in many cases remain loose when there is not much rain during the spring months, and they dry out much easier than they would if they were more compact. My advice would be to prepare the soil for sweet peas in the autumn, thoroughly spading a trench about two feet wide and a foot deep, and working through it some well rotted manure. This soil will become thoroughly pulverized by the frost of winter and by planting time in spring will settle down sufficiently to make a fairly compact, though by no means hard, bed.

Of almost equal importance to a cool soil is abundance of sunlight. Sweet peas do not do well in shade, and just in proportion to the amount of sunlight the plants receive so will be the success, all other things being equal.

The sweet pea requires moisture and coolness in order to develop a good root system and a good root system means good plants and good flowers. Therefore, where it is possible a site for sweet peas should be chosen where the soil is naturally cool. A natural cool soil is usually one where there is a constant supply of moisture during the summer months. No amount of surface watering can make up for the lack of a cool soil, although good results are obtained by artificial watering even in dry, warm soils. While the soil should be cool and retentive of moisture it should be well drained as sweet peas like most garden flowers will not thrive in water-soaked ground.

Sweet peas do not require as rich soil as is generally supposed. The sweet pea belongs to the family of plants known as the leguminosæ, which are noted for the vigorous growth they make on land which is what is known as light soil. Clover, beans and garden peas are all of this nature. They obtain much of their nitrogen from the air, hence highly nitrogenous soils are not necessary for sweet peas.

No gardener can dispense with the useful hoe in his endeavor to keep down the weeds and to loosen the surface of the soil, especially when heavy rains pass the ground.—H. M. Speechly, Pilot Mound, Man.



Exhibit of Ottawa Branch of the Ontario Vegetable Growers' Association at Central Canada Exhibition, Ottawa

Screening Cabbage Seed Beds

EXPERIMENTS have been conducted for four years by the Geneva, New York, Experiment Station, in the use of cheese cloth for the protection of cabbage seed-beds against insect injuries. The results of the experiments are set out in Bulletin 334. The bulletin says in part:

The experience of farmers during the past four years, has shown conclusively that the use of tight frames, covered with cheesecloth, will entirely prevent injury by the cabbage-maggot. The use of certain grades of cheesecloth will help to prevent injury by the flea-beetle. Plants raised under cloth grow faster during most seasons and attain the size desired for transplanting about ten days or two weeks sooner than plants grown in open beds. The extra cost of screening plants in these trial seed-beds by ten different growers, ranged from six to twenty cents per thousand plants. These figures are based on very conservative estimates of the number of plants produced, with full allowance for the various items of expense. In the opinion of many of the growers who have used screens for several years, the extra cost of the cheesecloth is more than met by the saving in seed.

The plants grown under screens have good roots so that they start quickly when transplanted, while plants grown in the open are liable to suffer a varying amount of root injury, even in years when there is only a mild infestation of maggots. In addition some cabbage growers prefer to screen their beds because they may obtain sets earlier than can be grown in open beds. Usually

the cabbages that are set early are the first harvested, and it happens frequently that the first sales in the fall bring a better price than the regular crop.

The screened plants are more tender than those not screened, but experience has shown that by removing the cover a week or ten days before transplanting the seedlings become sufficiently hardened so that there is very little difference in the growth of the sets in the field.

SCREENING SUGGESTIONS

The seed-bed should be located on a fertile, well-drained soil, where there can be no accumulation of water or washing under the frame by rains. It is also desirable to locate the bed on land known to be free from weeds, and injurious insects such as wire worms and white grubs. The ground should certainly be free from the disease known as club-root. The soil should be thoroughly cultivated so that it is in good physical condition at seeding time. It is customary to apply liberal amounts of high-grade commercial fertilizer. The seed should be drilled rather thickly, in rows six or eight inches apart.

When the early varieties of cabbage are to be grown, the seed should be planted during the first part of May, or even earlier, whereas such varieties as Danish should be planted about May 15. Before the seed is drilled, the corners of the bed should be staked, so that the frame can be built and the cheesecloth applied before the plants come up. This is important as the cloth prevents the soil from baking and conserves the moisture; also if the screening is delayed until after the plants come up, the plants

are subject to injury by the flea-beetle. Six-inch boards will serve for the frame, though some growers use eight and ten-inch boards with satisfaction.

The cloth should not sag and rest on the plants. This may be prevented by stretching several lengths of wire from end to end of the bed. The wires should not be more than four or five feet apart. The wire can be supported on stakes to which it is held by staples. It is preferable that galvanized wire and staples be used as rusty wire wears holes in the cloth at the point of contact. All openings under the frame, due to unevenness in the soil, should be filled by banking the earth against the boards. To harden the plants so that they will not wilt beyond recovery when set in the field, the cheesecloth should be removed a week or ten days before transplanting.

It is well to examine the soil about the plants at intervals of several days after they have been uncovered to ascertain if eggs are being deposited. If the eggs are numerous the plants should be transplanted as soon as possible, the earth being shaken from the roots, which will dislodge most of the eggs or young maggots. When the plants have reached a desirable size they should be transplanted, as they are liable to grow too long and spindling.

Keeping Tomatoes for Seed

What is the method of keeping tomatoes for seed and also the best way of preserving the seeds during the winter?—R. C., Montreal West, Que.

To keep tomato seed all that is necessary is to have it perfectly dry to start with and keep it in a dry place and not within reach of mice. To secure the seed, select typical, well-ripened specimens and crush them up by placing the mass in a dish to undergo fermentation. This will take from two to three days, depending upon the temperature and the ripeness of the seed. The riper the seed and the higher the temperature the quicker the fermentation. This process is necessary in order to easily separate pulp from seed. It is well to stir the mass two or three times during fermentation. After this the seed may be thoroughly washed through a sieve, and after all of the pulp mass is removed they are thoroughly dried in the sun.—Prof. W. S. Blair, Macdonald College, Que.

A good roothouse can be made by digging a cellar four feet deep and constructing over it a house well roofed with cedar. Around the sides, bank with earth about two and a half feet deep, using sods as the first tier, next to the wood. Keep the house dark, but ventilate every twelve feet.—Jas. Guthrie, Dixie, Ont.

The Canadian Horticulturist

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OFFICIAL ORGAN OF THE ONTARIO, QUEBEC, NEW
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FRUIT GROWERS' ASSOCIATIONS

H. BRONSON COWAN, Managing Director

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6. Advertising Rates quoted on application. Copy received up to the 15th. Address all advertising correspondence and copy to our Advertising Manager, Peterboro, Ont.

7. Articles and Illustrations for publication will be thankfully received by the editor.

CIRCULATION STATEMENT

The following is a sworn statement of the net paid circulation of The Canadian Horticulturist for the year ending with December, 1910. The figures given are exclusive of samples and spoiled copies. Most months, including the sample copies, from 11,000 to 12,000 copies of The Canadian Horticulturist are mailed to people known to be interested in the growing of fruits, flowers or vegetables:

January, 1910	8,925
February, 1910	8,967
March, 1910	9,178
April, 1910	9,410
May, 1910	9,505
June, 1910	9,723
July, 1910	9,300
August, 1910	8,832
September, 1910	8,776
October, 1910	8,794
November, 1910	8,747
December, 1910	8,662
	108,805

Average each issue in 1907	6,637
" " " " 1908	5,635
" " " " 1909	5,378
" " " " 1910	9,267

Sworn detailed statements will be mailed upon application.

OUR PROTECTIVE POLICY

We want the readers of The Canadian Horticulturist to feel that they can deal with our advertisers with our assurance of the advertisers' reliability. We try to admit to our columns only the most reliable advertisers. Should any subscriber, therefore, have good cause to be dissatisfied with the treatment he receives from any of our advertisers we will look into the matter and investigate the circumstances fully. Should we find reason, even in the slightest degree, we will discontinue immediately the publication of their advertisements in The Horticulturist. Should the circumstances warrant, we will expose them through the columns of the paper. Thus we will not only protect our readers, but our reputable advertisers as well. All that is necessary to enable you to the benefit of this Protective Policy is that you include in all your letters to advertisers the words, "I saw your ad. in The Canadian Horticulturist." Complaints should be made to us as soon as possible after reason for dissatisfaction has been found.

Communications should be addressed,

THE CANADIAN HORTICULTURIST,

PETERBORO, ONTARIO.

EDITORIAL

OUR NEW MINISTER

The appointment of Martin Burrell, M.P., of Grand Forks, B.C., as Dominion Minister of Agriculture, should mean much to the fruit interests of the Dominion. The former Minister of Agriculture, Honorable Sydney Fisher, represented a dairy constituency and a dairy province. Under his administration the dairy industry was promoted in many ways. The fruit industry was materially helped also, especially by the passing of the Fruit Marks Act, but many felt that possibly it did not receive the attention in some other ways that it might have been given.

Our new minister of agriculture represents a constituency and a province in which the fruit interests are the chief agricultural factor. While we may expect that all branches of agriculture will receive their full share of attention at his hands, we may rest assured that the fruit interests of the Dominion will be given every consideration under his administration. At one time Honorable Mr. Burrell was favorable to the fruit division being separated from the dairy division and placed under the management of an independent commissioner. This possibly may be done. We may expect also that conferences of fruit growers from the different provinces will be held more frequently hereafter than they have been in the past. Should these be held regularly, even only every three years, they would be a great benefit to the fruit interests. The holding of national fruit shows may also be encouraged. There is much that may be done for the fruit interests, and Hon. Martin Burrell may be depended upon to give them every consideration.

LOOK OUT FOR FRAUDS

This is a season of the year when we should be on the lookout for fraudulent nursery agents. Almost every year some new method of gulling some at least of the public seems to be devised by sharpers who represent themselves as agents for known and unknown nursery concerns. These agents frequently come to Canada after having worked their game successfully in the United States. Only last week the Ohio Experiment Station found it necessary to issue a warning against agents who were selling one year seedling nursery stock.

The public should be on its guard against men who pretend to have some new and wonderful variety of vegetable or fruit, and should insist on being shown reports by experiment stations showing that the stock has been tested and proved to be worthy. Our reliable nursery firms make it a point to equip their agents with credentials which may be seen upon request. There is no reason why any person, other than those unduly anxious to get rich quick, should be gulled by these frauds.

PREMIUM LISTS

Each year many of the horticultural societies in Ontario distribute lists of premiums among their members. The preparation of these lists involves much labor and thought on the part of the officers of the societies. Some societies which are fortunate enough to have experts and enthusiasts among their officers, who are willing to devote considerable time to this work, issue much better lists than are distributed by other

societies. The different societies would be greatly helped each year did they have the privilege of seeing the lists issued by other societies. How would it do for the secretary of the Ontario Horticultural Association to collect a number of these lists and publish them in connection with the annual report of the association.

The horticultural societies of Ontario will be holding their annual meetings in November. Many of them will appoint delegates to attend the annual convention of the Horticultural Association that will be held in Toronto this month. Were any considerable number of the societies to make a recommendation to this effect we feel sure that their recommendation would be acted upon. Here is an opportunity for the taking of action that should prove helpful to all our societies.

STARTING A LIBRARY

Last month we suggested that the Ontario Horticultural Association might well undertake the offering of prizes for the best essays by members of horticultural societies on the growing of flowers as was done this year through the private efforts of Mr. Hermann Simmers, of Toronto, and Mr. R. B. Whyte, of Ottawa. In the event of this proposal being acted upon, we would like to suggest further that the competition should be made an annual event.

Prizes could be offered one year for the best essays on the growing of roses. The prize-winning essays could then be published in the annual report of the Horticultural Association. The next year prizes could be offered for the best essays on the growing of some other variety of flowers, such as sweet peas, bulbs, geraniums or any one of many others. By publishing the prize-winning essays each year in the report of the association, these reports would become very valuable, and members of the horticultural societies would be encouraged to preserve them. In the course of a few years the reports would become valuable as a reference library that would contain full directions in regard to the best methods of culture of practically all the leading varieties of flowers. The expense connected with such a competition each year would be light. We trust that the association will decide to act upon this suggestion and to improve upon it in such ways as its officers may suggest.

TIME TO PROTEST

A vigorous protest should be lodged in connection with the management of the horticultural building of the Canadian National Exhibition, Toronto. This building was erected at the request of the fruit, flower, and vegetable growers. When it was completed it was understood that it would be used solely for their purposes. At first this was done. During the past couple of years, however, the management of the exhibition has located the provincial exhibits in this building with the result that this year the vegetable and much of the fruit exhibits had to be displayed in tents outside where thousands of people who visited the horticultural building did not see them.

Some years ago a dairy building was erected to accommodate the dairy exhibits. Year by year, however, the exhibitors of dairy appliances and dairy products have been forced to show their exhibits in other buildings, while space in the dairy building proper has been given over to the sale of ice-cream and to other concessions not entitled to such consideration. The dairy building in consequence has lost much of its value to those interested in the dairy industry. Unless our fruit, flower and vege-

table growers take concerted and vigorous action immediately they are likely to lose the use of the horticultural building for the purpose for which it was intended. They should refuse to be put off with promises, and insist on being granted their full rights in connection with next year's exhibition.

PUBLISHER'S DESK

OUR ISSUES FOR 1912

Last month we told our readers that we were planning a series of articles on the growing of fruit, flowers and vegetables for each issue of *The Canadian Horticulturist* during 1912. Our plans in regard to these issues are now practically completed. Leading growers in all parts of Canada have promised to contribute the special articles for which we have asked, and thus we are assured, that the various issues of *The Canadian Horticulturist* next year will be incomparably the best we have ever published.

During the year we will publish three special issues. These will include the February number, which will be devoted to spraying, both in the orchard and garden. The April number will be our first garden annual, and the September issue our second special packing number. Space does not permit of our giving an outline in this issue of all the special articles which will be published in the various departments of all twelve issues next year. Suffice it to say that timely articles on fruit growing will

Why Do They Pay It?

A single full-page advertisement in some of the leading magazines costs anywhere from \$1,000 to \$7,000, and more. A one-inch advertisement in these magazines costs as high as \$140 for a single issue.

Numerous firms in Canada and the United States spend annually from \$100,000 to several times that amount for the sole purpose of telling people about their goods, through different forms of advertising.

A concern must have a lot of confidence in the goods they sell when they will spend such sums of money to let people know about them. Well they know that people will not continue to buy their goods if these goods do not give satisfaction. Can you imagine shrewd business men continuing to spend large sums of money to advertise their goods if they did not KNOW that these goods were the very best they could produce, and that they were giving satisfaction to customers.

When an advertiser CONTINUES to use good-sized advertising space to promote the sale of his goods, it is the best possible guarantee we can have that his goods are reliable. The loss to the individual purchaser is not to be compared to the loss to the advertiser, if his goods do not please his customers.

Advertisers in *The Canadian Horticulturist* are paying their money for the privilege of telling you about their goods, or the service they have to offer you. They believe in their goods. We believe in them, too, else these advertisements would not be appearing in *The Canadian Horticulturist*.



Honorable Martin Burrell
Dominion Minister of Agriculture

Canada's now Dominion Minister of Agriculture is a practical fruit-grower. Born in 1858 at Farington, Berks, England, he came to Canada in 1883. A horticulturist in vocation, he tried farming in the Niagara Peninsula, and did considerable work as a farmers institute lecturer, but later the productive areas of southern British Columbia attracted him. In 1899 he became associated with the fruit industry around Grand Forks, B. C., where he conducted a large fruit ranch that has been looked upon as being a model. An illustration of this orchard appeared in our April issue, and an article by Mr. Burrell, describing it, in our August number. He also established a nursery, and is a member of the British Columbia Board of Horticulture, and has frequently acted as a judge at fruit fairs, including Vancouver's big apple show.

be published from the pens of fruit growers in all the leading fruit provinces and from government authorities, practically all of whom have national reputations.

In the floral department there will be a series of twelve articles, one appearing in each issue, describing leading gardens in various cities and towns. The first of these articles will appear in our January issue. It will describe the garden of Lady Grey at Ottawa, now the garden of the Duchess of Connaught. It will be written by Mr. W. T. Macoun, of the Central Experimental Farm, Ottawa, who helped Lady Grey to plan and arrange it. Gardens owned and conducted by amateurs will be described in later issues by such well-known contributors, among others, as Miss M. E. Blacklock, of Toronto, and Mr. Buck, of the Central Experimental Farm, Ottawa.

In each issue throughout the year will appear a page of timely suggestions for amateur flower growers. This material will be furnished during the first six months of the year by Mr. E. I. Mopsted, of Ottawa, a past president of the Ottawa Horticultural Society, during the following three months by Mr. H. E. Gould, of Sussex, New Brunswick, one of the best known writers on floral subjects in Canada, and during the last three months of the year by Mr. J. McPherson Ross, of Toronto, whose ability as a writer is well-known to readers of *The Canadian Horticulturist*.

In addition to the foregoing articles, special articles of a timely nature by such well-known contributors as Mr. Wm. Hunt, of the Ontario Agricultural College, Mrs. A. I. Jack, Chateauvau Basin, Que.; John Cavors, Oakville; E. F. Collins, Toronto,

and by a number of successful amateur flower growers will appear from month to month. Among these special articles will be some devoted to the fighting of insect pests, the use of fertilizers and timely planting tables.

Special articles have been arranged also for the vegetable department for each issue of the year. These will deal with the use of fertilizers, methods of cultivation, the growing of special crops, spraying and fumigating for insects and other timely and valuable subjects.

This year some fifty horticultural societies in Ontario subscribed for *The Canadian Horticulturist* for all their members. We can assure these societies and any others which may decide to follow their example, that if they decide to subscribe for *The Canadian Horticulturist* again next year they will give their members unusual value for their money. In spite of these and other improvements, we are planning for 1912, the subscription price of *The Canadian Horticulturist* will remain as at present only sixty cents a year, or two years for one dollar, with special rates for horticultural societies and fruit growers associations.

SOCIETY NOTES

We invite the officers of Horticultural Societies to send in short, pithy reports of work that would interest members of other Horticultural Societies.

Horticultural Convention

Each year the annual convention of the Ontario Horticultural Association grows in interest and importance. This year's promises to be no exception. It will be held in the City Hall, Toronto, Thursday and Friday, November 16 and 17. At the opening session Thursday afternoon will be given the address of the president, R. B. Whyte, Ottawa; the report of the treasurer, H. B. Cowan, Peterboro, and the report of the superintendent of horticultural societies, J. Lockie Wilson, Toronto. Addresses will be given also on "Sweet Peas, Varieties and Cultivation," by T. D. Dockray, Toronto, and on "The School Garden," by Harvey Gayman of Jordan Harbor.

Thursday evening addresses will be given by Hon. J. S. Duff, Minister of Agriculture, and by Mrs. Dunnington-Grubb of London, Eng., on "The Modern Home and the Garden City Movement." This address will be illustrated with limelight views. There will be an address also on "The Care and Arrangement of Lawns," by J. A. Thorne of New York.

The Friday morning session will be devoted to the nomination of officers, the presentation of reports and to addresses on "Spiraeas," by W. T. Macoun, Ottawa, and on "The Broadview Boys' Institute and Its Field of Work," by the superintendent, C. J. Atkinson, Toronto. The concluding session Friday afternoon will be devoted to the election of officers and address by C. C. James, C.M.G., Deputy Minister of Agriculture, Toronto. An address on "Currants and Gooseberries" will be given by R. B. Whyte, and one on "Gladiolus," by John Cavors, Oakville. There will be single fare rates to the convention from all points in Ontario. A large attendance, especially on the part of members of horticultural societies, is expected.

Nomenclature Committee

A meeting of the Nomenclature Committee of the Ontario Horticultural Association (Continued on page v)

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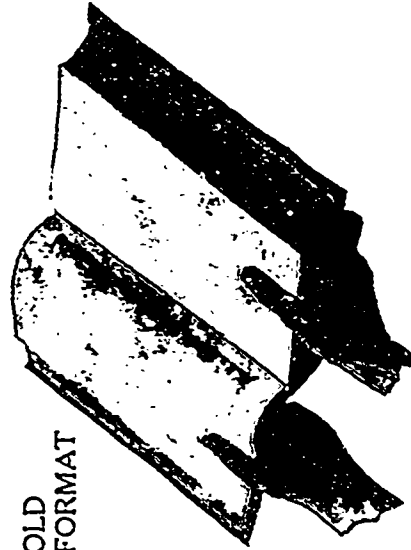
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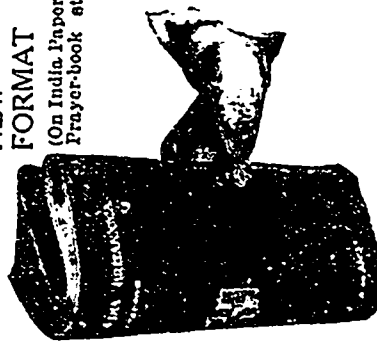
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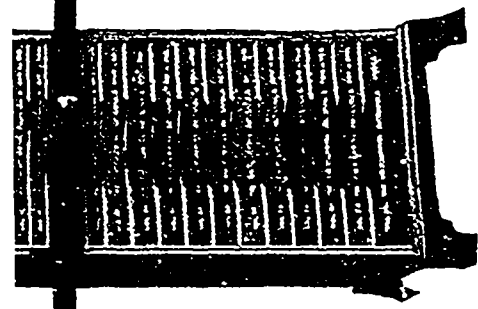
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which average 1,400 words to the page. Volume 20 consists of an index, containing 100,000 references, and a complete list of the names of all persons mentioned in the work. The 1,000 contributors include men of Learning (scientists, economists), 2. Men of Action (soldiers, sailors, men of affairs, jurists, administrators, surgeons, architects, artists, inventors, archaeologists, explorers, engineers, sportsmen, manufacturers, financiers), 3. Practical experts, men of special knowledge, who are professionally engaged in the advancement of industrial undertakings for the welfare of mankind. The sum of £230,000 (\$1,150,000) was paid to contributors and editors, as well as for maps, illustrations, typesetting, plates, etc., before a single copy was offered for sale.

THE Encyclopaedia Britannica, the only work which has summarized and elucidated universal knowledge in successive editions during 140 years in a manner commensurate with the expansion and international primacy of the two branches of the English-speaking race, has come, by virtue of its acknowledged excellence to be recognized as an institution, as one of the most prized heritages of scholars and readers, wherever the language is spoken.

THREE NOTABLE NEW FEATURES

The issue of the new edition (the eleventh since 1768-71), while it is a notable literary event in itself, is signalized by three unprecedented features:

1. THE UNIVERSITY OF CAMBRIDGE The new edition bears the imprimatur of the University of Cambridge instead of being issued by a private firm of publishers as hitherto. The added endorsement of the authority of the 1,500 eminent specialists, representing all civilized countries, who contributed to the book, served to confirm its status with a swiftness and a certainty not possible otherwise.

2. THE INDIA PAPER FORMAT

The work appears in a revolutionary format, which renders the Encyclopaedia Britannica for the first time a convenient book to hold and, therefore, agreeable to read. Printed on India paper (tough, light and thin, but at the same time opaque), the volumes measure but one inch in thickness instead of two and three-quarter inches as heretofore, though containing identically the same matter and produced from identically the same plates as the familiar impression on ordinary paper.

3. THE LOW PRICE

The third new feature is the low price. The last completely new edition (the Ninth, 1876-1889) had been sold at \$7.50 a volume, cloth bound, and at \$10.00 a volume in Half Russia. The 11th Edition, on the other hand, is sold at prices averaging, in the several bindings, about forty per cent less. A single volume of the New 11th Edition contains some 1,000 pages, and over 1,500,000 words, yet is sold at only \$4.50 a volume in cheapest form. In assuming control of the Encyclopaedia Britannica the Syndics of The Cambridge University Press regarded its sale at a low price as an inherent characteristic of the undertaking.

They believe that in respect to cheapness no publication can be compared with the 11th edition of the Encyclopaedia Britannica at the present price.

Notes on the Old Country Markets

W. A. MacKinnon, Canadian Trade Commission, England

IN no other market of the world is the question of packing and packages so important as in England, where purchasers of all classes of goods are accustomed to see them put up attractively as well as substantially. This is particularly the case with fruit, whether it be the package used in transit or that in which it is displayed for sale, and it is on this side that competent observers declare Canadians to be behind some of their competitors.

A few words, therefore, on the various packages seen on the British market may not be amiss, even though it would not be desirable in every case for Canadians to copy the methods of the Old Country or of other competitors.

SMALL FRUITS

Taking first small fruit, such as strawberries, raspberries and currants, the popular package used in the home market is what is known as the "chip," an oblong basket commonly measuring twelve inches by six and one-half inches and holding about six pounds of fruit, provided with a handle of wood or metal. These are, in fact, very similar to Canadian ten-pound grape baskets, but slightly wider, shallower and shorter. Strawberries are picked direct into these baskets, and are sometimes shipped away without any covering. At the most a piece of thin pink or white paper is placed over the fruit, the edges turned down and tied with string running round the outside of the basket.

The old method consisted of packing and shipping the fruit on wooden trays, holding twelve pounds each, which trays were returnable by the railways. The "chip" is considered in every way superior to the

tray, whether for berries or for currants.

French shippers send to this market large quantities of strawberries packed in small wooden boats, which consist simply of a flat bottom with sides and ends sloping outwards, barge-like. These are filled with fruit and then tied together in pairs, each forming, as it were, a cover for the other. The "boat" holds from three to four pounds of fruit, and owing to its solidity and the ease with which the double package can be tossed from hand to hand in transshipment (there being no vacant space to allow play for the fruit) this style of package seems quite popular, and was strongly supported at a recent meeting of fruit growers, convened to consider the question of improvements.

PLUMS

English plums are usually sent to market in round and rather shallow wicker baskets. They are called "half-sieves" or "half-bushels," and hold about twenty-four pounds of plums. They usually have the name of the dealer printed on the outside, and are called "returnables," as they have to be sent back to the dealer, having cost him about one shilling each. This kind of package is also very popular for gooseberries, best pears and cherries.

Choice plums have been shipped somewhat extensively from South Africa here, with success. They have been packed in shallow wooden cases about three inches deep, well protected with wood wool at top and bottom of case, each fruit being wrapped in paper.

The package considered most suitable for peaches is the shallow wooden case about four inches deep. The bottom should be

covered with a thick pad of fine wood-wool, on which the peaches are placed, each wrapped in paper, and separated from another by little pads of the packing material. Another layer of wood-wool should cover all.

Holland has been sending peaches to this market, and on the whole the experiment was proved successful. They also adopted the single layer package now so popular, but used a different kind of packing. Instead of wood-wool, cotton-wool was utilized. The boxes were first of all lined with this material; then each peach was wrapped in it, and wads of the same placed between as a protection against bruising. This packing material, however, is considered here to be much too "heating," and the wood-wool is declared to be superior in every way.

PEARS

Home-grown pears are packed in the same way as plums in round, shallow wicker baskets—and it is said that it will be difficult to improve on this kind of package.

French pears come to England packed in two-layer wooden cases, commonly made of slat-wood, holding about twelve pounds of fruit. The pears are placed on a bed of wood-wool and covered with another layer. More pears are placed on top of this, and a further pad of wood-wool covers all. These pears carry very well, but some receivers would prefer that each fruit should be wrapped in paper.

As is very well known to Canadian exporters, quite the most familiar package for apples in these markets is the barrel, which occurs in three types—the flat-topped Canadian barrel, the Nova Scotia spruce barrel with half-round hoops, and the United States barrel, which is simi-

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lar to that used in Ontario but like the Nova Scotia barrel, slightly smaller. Of this package little need be said beyond the fact that for the great bulk of the ordinary crop of every year it is perhaps the best that can be devised. The use of eight hoops instead of the ordinary six is well worth the extra cost, both as producing a firmer and more rigid barrel and as providing most effective insurance against collapse of the package through the breaking of a single hoop.

BRITISH-MADE PACKAGES

By way of contrast, the home-made packages found in this market may be mentioned. They vary greatly in size, shape and material, but for the most part are of the hamper type, being closely woven, square-cornered wicker baskets, unprovided as a rule with covers. These hampers are lined with straw or other soft material, and the fruit appears to be poured in without any attempt at arrangement or packing, though indeed it is sometimes the case that the best fruit is reserved for the last. "topping off" the package most effectively.

In such packages as these some of the best home-grown fruit is offered for the markets. Even Ireland, which is beginning to produce some excellent varieties and to make good profits, does not seem to have seriously considered the desirability of adopting a package which will show the fruit at its best. There is no possible doubt that English and Irish apples would bring a much higher price if growers took the same trouble to grade and pack them as they do with smaller fruits.

THE FORTY-POUND BOX

At the other extreme from the careless style and methods of English packers, is the product of those who have adopted variations of the standard forty-pound box as known in Canada. Many of Canada's

keenest competitors use this package to the exclusion of all others. Beginning near home are the shippers of the Oregon Newtown Pippin, looked upon by many as the finest dessert apple that can be purchased in this country. These are never sent in anything but the box, neatly packed in rows and tiers, the number of the latter being indicated on the outside of the package. California Newtowns, inferior to those from Oregon and bringing shillings less per box in the market, are also carefully put up, each fruit being wrapped in paper, and the box exactly filled with specimens of a nearly uniform size. Australia has a somewhat similar package though frequently of rougher and harder wood, making not so good an appearance, and South Africa has followed suit to such good purpose, that many consider the South African packing to be the best in the world.

As pointed out in a recent report by the Acting Trade Commissioner for Manchester, the trade in boxed apples is visibly and vastly increasing every year, and yet Canada has almost no part in this increase. Whatever may be said for the fact that importers here are accustomed to and therefore prefer Canadian apples in barrels, it is obvious that the same fact holds good for United States fruit in general, yet this has proved no obstacle to the Oregon and California packers who find ready market for their goods, though never put up in barrels. It may be said at once that the difference lies in the fact that the latter ship nothing but choice fruit, and therein does indeed lie the secret, though it cannot be truthfully asserted that Californian consignments contain no inferior lots. Still, in the main, it is true that the British storekeeper or consumer likes to find in a box only carefully selected first quality fruit.

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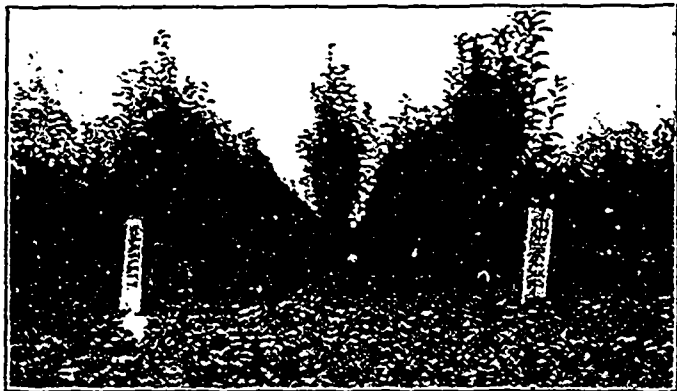
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would deny for a moment that Canada has annually an immense quantity of strictly first-class fruit to export. When it is urged that she should take advantage of the increasing demand for boxed apples and secure her rightful share of this trade, it is always and only intended that she should adopt the small package for finest varieties only and for carefully selected specimens of these varieties.

It is only fair to state that British Columbia has set an example which the rest of Canada would do well to follow. The boxes of British Columbia fruit are beautifully packed, and as the fruit itself is always most carefully selected, these boxes have established a reputation second to none in Great Britain. The only complaint ever heard is that so few of them are put up.

There may be many reasons why British Columbia is not able to export larger quantities of choice fruit packed in boxes, one of which is the lucrative market offered in the nearby Provinces of Alberta and Saskatchewan, but such reasons do not apply as obstacles to Eastern Canadian shippers adopting the methods of the West. Obviously it will be quite easy to lose money through lack of care in selection or in packing the fruit, but there is every reason to suppose that any who undertake the matter seriously and ship to this country forty-pound boxes neat and attractive looking on the outside and containing nothing but choice fruit, will undoubtedly reap a rich reward.

REVIEW OF APPLE SEASON

The following extracts from the first apple report of Messrs. Woodall & Co., for the season 1911-12, deal with the receipts of last season and the prospects for that which is beginning:

The receipts last season at Liverpool, which lasted to the end of April, have been, including boxes calculated at three to the barrel, 638,373 barrels, as against 870,168 barrels during 1909-10, the total arrivals into the United Kingdom being 1,642,202 barrels. The past season must be considered satisfactory to shippers, as there was a high range of prices, and towards the close some record sales were made for barrels.

The increased quantity of box apples, mostly California and Oregon, was again a noticeable feature, being approximately 360,000 boxes, as against 170,000 boxes in the season of 1909-10. The quality was generally satisfactory, the condition, with the exceptions of a few occasional cars, were good. There was an active demand throughout, and results should meet the approval of shippers.

The prospects for the coming season may be considered about an average. The early marketing of English apples may perhaps cause a lower opening range of prices, but their quality does not compete when American and Canadian begin to arrive, and this season they will be probably less attractive than usual.

Extensive Operations

On several occasions this season we have drawn attention to the extensive operations being conducted in Ontario and to some extent in Quebec by the Agency Land & Securities Company Ltd., and the National Land, Fruit & Packing Company, Ltd. These companies have leased and purchased several thousand acres of fruit land and have been managing them in a manner that has attracted wide attention. They have had at work constantly throughout the spraying season forty power spray outfits and have applied thousands of gallons of spray material. They had at work during the pruning season over one hun-

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Hyalcinths, Roman, White	5c	.48
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Tulips, Single Early, White, Red, Yellow, Pink	20c	\$1.00
Tulips, Double Early, White, Red, Yellow, Pink	25c	1.25
Tulips, Darwin Late, White, Red, Yellow, Pink	40c	—
Tulips, Parrot Mixed	20c	—
Daffodils { Large single, Yellow	40c	—
{ Small Single, Yellow	15c	1.00
{ Large Double, Yellow	30c	—
Narcissus { Giant Paper Whites	15c	1.50
Chinese Sacred Lilies ..	10c each	\$1.10 per doz.
Anemones, Grape Hyacinths, Freesias, Crocus (Yellow, White, Purple, Scilla Siberia. Any of the above, 10c per doz.		

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dred and fifty men. The value of this work may be more fully realized when it is stated that in this way one hundred and fifty thousand formerly neglected apple trees have had their first season of attention.

The assistance that work of such magnitude will give to those who want to improve their own orchards, and to others who are operating properly, is inestimable, and this is but a start for this company, which intends to lease as many more trees during the coming winter. In fact they state that were it not for the unreasonable attitude of the owners of neglected orchards they would have been renovating this year two or three times as many trees.

This type of man (the owner of a neglected orchard) does not readily lease at a rate which is profitable to the operator, and the would-be operator is compelled to stand by and see the neglect continue its ravages knowing that next year he must offer even less and knowing full well that the owner will take less if he only waits long enough.

On the other hand, many, of course, have been stimulated to improve their own orchards and thereby withdraw their property from the list of leasing orchards, but they are few in proportion, and so the company expects to very materially increase its acreage next year.

In operating the company works through district superintendents, who have charge of a definite list of orchards in one locality and under whom are working foremen and their gangs. This year the company has selected the best men available and further improved them by instruction. Next winter it is planned to have those men take a course in special instruction on the renovation of old apple orchards, so that for next year's work this company will have a corps of instructed and trained men who, when turned out to operate on 300,000 trees, will make a wonderful increase in the total apple production of Ontario. One of its officials states that this company, in addition to making a monetary success of its undertaking, will be the greatest single factor up to date in the improvement of the apple industry of Ontario.

\$5,000 Prize for Sweet Peas

The prize of \$5,000 offered by the London Daily Mail for the best bunch of sweet peas, shown at the Festival of the Empire, Crystal Palace, London, Eng., was won by Mrs. D. D. Fraser of the Manse, Sprouston, Kelso, Roxburghshire; the second prize of \$500 went to Mr. H. W. Richards of Ryde, Isle of Wight, while the third prize of \$250 fell to Rev. David Denholm Fraser, the husband of the winner of the first prize. The blooms in the winning bunch were carmine, pink, and maroon, and they won because they were the best grown, best in size, color and condition, and because there were four blooms on each stem. Of the 38,000 bunches received 10,000 were on view at the Festival of Empire. The awards were made by ten judges. In the first prize bunch the award went for length of stem and size of bloom.

The winning bunch comprised a group of eleven stalks—one beneath the maximum number allowed, and the blooms ranged from pale pink, through shades of rose, down to the darkest purple. Another interesting collection was that of artificial sweet peas, done in various materials, frilled paper, silk, muslin, and so forth, all marvellous imitations of the real flowers.

The Canadian Horticulturist is a No. 1 O.K. magazine and is growing better all the time.—Dr. W. F. Hool, North Coast, Que.

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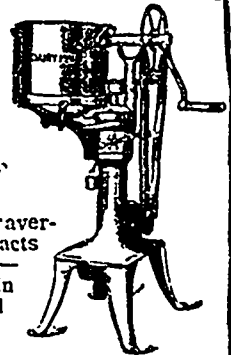
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These are the only separators with dust-proof and milk-proof gears, which are easily accessible. The frame is entirely protected from wear by phosphor bronze bushings. These separators have large shafts, bushings, and bearings; the flexible top-bearing is the strongest and most effective found in any separator.

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17

Ottawa Vegetable Growers

The Ottawa branch of the Ontario Vegetable Growers' Association has carried out an interesting programme during the present season. In June they held their regular monthly meeting in the gardens of Mr. Conrad McConnell, and the president, I. A. Farquharson, on the Avlmer road, during the strawberry season. Both gardens presented interesting subject matter for discussion. The feature of Mr. McConnell's garden was his extra choice plot of strawberries and a large field of promising tomatoes. The feature of Mr. Farquharson's garden was his large field of early cabbage, and a promising plot of Herbert raspberries, which later yielded him at the average of \$25.00 a row of about one hundred feet.


The July meeting was held at the Experimental Farm and the Ottawa Nurseries, the Herbert raspberry being the feature at both places. At the Experimental Farm the visitors were shown several seedling apple trees, that promise to be valuable for commercial planting.

In August the gardens of Jas. Cox and J. McMullen on the Montreal road were visited. Melons and high-class apples were a strong feature at both places.

The September meeting took place in the gardens of W. Trick, Ottawa South, and W. Hull, Herb Baillie and H. P. Carstesen, all of Billings Bridge. Excellent onion crops were seen in all four of these gardens; the tomatoes were fair, but some large cauliflower fields, like all others in the district, were poor, the dry, hot summer having ruined all the cauliflower in the district.

The Ottawa branch received a grant of twenty dollars from each of the three townships of Nepean, Gloucester and South Hull, and fifty dollars from the city of Ottawa. This money has been granted in prizes for exhibits at the Central Canada and Avlmer, Que., shows and for field crop competitions in onions, cauliflower and tomatoes. Mr. T. G. Bunting, assistant horticulturist at the Central Experimental Farm, acted as judge of the field crops and made awards as follows: Block of five hundred or more tomatoes—First prize, C. McConnell; second, W. Hull. Block of one thousand or more cauliflower—First, W. McCurrie; second, H. P. Carstesen. Block of five hundred square feet of onions—First, Herb Baillie; second, W. Trick. The judge recommended that a third prize of two dollars be given H. P. Carstesen for onions, as his field was very creditable, but hardly good enough to win against the two above named. The first prize in each case was six dollars, and the second prize four dollars. The association made a special demonstration exhibit at the Central Canada Exhibition, consisting of specimens of practically everything grown by the local gardeners. This exhibit was later given the city hospitals.


Cooperative buying of supplies, and the excellent and instructive meetings held have been a great incentive to new membership, and the branch has nearly doubled its membership this season. Addresses were delivered at the June meeting by Alex. McNeill, Chief of the Fruit Division of the Department of Agriculture at Ottawa; at the July meeting by Rev. A. H. Scott of Perth, vice president of the Ontario Horticultural Association, and by R. B. Whyte, president of that association. The August meeting was addressed by Mr. G. F. Marsh of the Ottawa Valley Journal, and the September meeting by R. B. Whyte, W. Graham of Graham Bros., seedsmen, and Mr. Buck of the Experimental Farm.—W. J. Kerr, Sec'y, Woodroffe, Ont.



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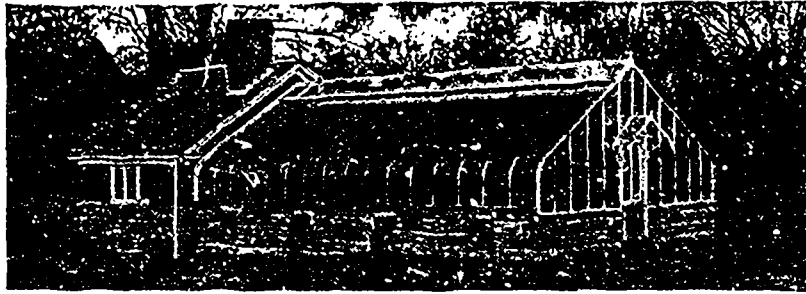
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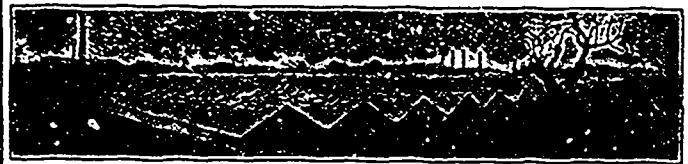
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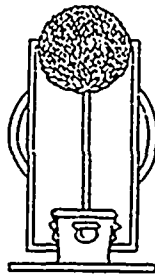
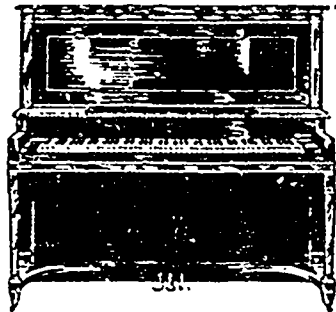
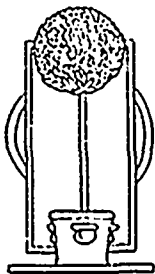
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PROVINCIAL NOTES

Eastern Annapolis Valley

Eunice Buchanan

The apple crop in most orchards far exceeded the early estimates of the growers and everywhere barrels are scarce. From twenty-five cents they gradually rose to forty cents and forty-five cents, and even then were hard to secure. Hundreds of barrels of apples are being emptied into bins to await the barrels. In the orchard dropped fruits are piled in heaps; the warehouses have not enough room, neither is there room in farm buildings, consequently the barrels are headed up and rolled on to planks under the trees. Barrel makers now charge eight cents for making.

By the beginning of October all the Gravensteins were shipped. From reports of the first boats they did not carry very well and one man received fifty cents each for one hundred and twenty barrels; others have had nine shillings for No. 2's and twelve shillings and sixpence for No. 1's. Ben Davis are being exported to Denmark, cider apples are going to Quebec. This year, owing to the excellence of the fruit, the sorting and grading is done rapidly. On the whole, good prices are expected.

The potato crop is short. One man planted twelve bushels of seed and dug eighty-seven bushels. The tubers are unusually large, there being very few small ones, and only a few big ones in a hill. The price began at fifty cents a bushel.

The evaporator at Berwick, which was burned, is now rebuilt and again at work. The vinegar factory has all its tanks full. Some orchardists finished picking the fruit by October eleventh, others a week later, but the scarcity of barrels has hindered the majority.

Montreal

E. H. Wartman, Dominion Fruit Inspector

We had a wonderful fall to the eighteenth day of October on account of frosts from frost. I could have picked a nice bouquet of tender flowers from my garden on that date not injured in the least by frost.

I am more and more impressed as years go by inspecting fruits that the proper condition of fruit packing is to be perfectly dry. Apples packed wet in barrels do not dry out for a long time, and when opened they have a dull color and in many cases a mouldy appearance. Barrels that get a drenching rain never look so well again and when piled in cars in that condition when unloaded many a head comes out which is re-cooped with the loss of apples, that makes a slack barrel. A six-hoop barrel especially will flatten on the bottom of the car and never regain its normal shape.

McIntosh & Fameuse apples coming to the city from the Province of Quebec are particularly fine, high colored and spotless. They command a high price, in some cases as high as \$5 a barrel.

In the ten years of my stay here I never saw grapes bring so high an average price. New York State Keiffer pears are shipped by Montreal to Glasgow in barrels in car lots. Their condition is good and sound, but the fruit is ungraded. The barrel for pears seems to me a good way to give away a large parcel for little money. If properly handled in boxes they bring good money in Ireland.

I am glad to see so beautifully packed apples and pears going forward to Eng-

land that will surely bring good money back. There is not enough supervision here yet over the handling of box fruits. I think placards with the words, "Box Fruits," must be laid down carefully in every instance. These placards in French and English placed in steamship sheds would be a great benefit to the fruit trade.

British Columbia

Our provincial government has adopted a policy of plugging power sprayers at various points in the province for demonstration purposes. One has been installed recently at Creston for the Kootenay district, and another has been ordered for Grand Forks. The government has two of these power sprayers in the Okanagan, two on the Lower Fraser; one at Salmon Arm, and one on Vancouver island. Three more are to be obtained in addition to the one ordered for Grand Forks. They will be placed in the Okanagan and on Vancouver island. The experts in charge of these machines will teach the growers what sprays to use and how and when they should be used. No charge will be made but the growers will be expected to supply the spraying material and a man to hold the spraying rods.

The government this year will continue the same policy as was followed last year in regard to the continuation of the packing schools. They have been productive of great benefit in many districts.

The Grand Trunk Pacific Railway have procured samples of apples grown in the Kitsumkalum Valley, ninety miles east of Prince Rupert. These apples are of different varieties, beautiful in their coloring, and the flavor is said to be equal to the best brands grown in Ontario, and entirely unlike the inferior flavored fruit grown under irrigation in the more southerly regions and in practically all of the Pacific Coast states. The specimens came from the orchard of Mr. D. Stewart, who has about fifteen acres under cultivation. They represent the first grown on the operated line of the Grand Trunk Pacific. In the valleys of the Kitsumkalum, Lakelse and Copper rivers with other areas along the Skeena River, there should be approximately 300,000 acres of ideal fruit lands placed under cultivation in comparatively few years, and much of this land can be procured by pre-emption in 160-acre lots, the only charge being one dollar per acre, in addition to the residence requirements of the law. It is predicted that this territory will become the centre of a new and greater fruit district in British Columbia.

At Prince Rupert this summer strawberries grown along the Skeena River and in the valleys of the Kitsumkalum, Lakelse and Copper rivers came into market for the first time in considerable quantities, and the fruit was reported to be superior in quality and extremely high colored.

"The Australian market is ready to-day to take 100,000 boxes of British Columbia

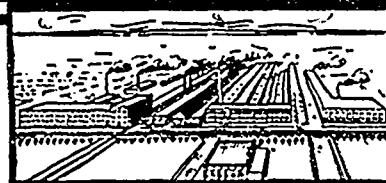
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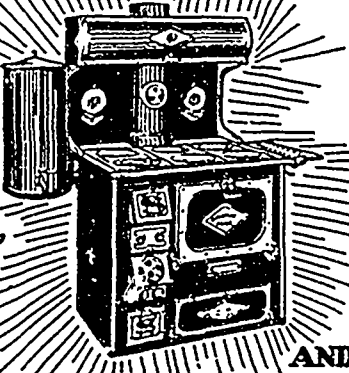
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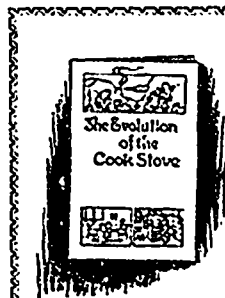
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Besides costing much less than other ranges in its class, the "DOMINION PRIDE" is much more satisfactory. It is made of tough, strong, malleable iron and the best blue polished steel—materials which will not warp, crack or break.

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apples, with the one proviso that they are free of disease," said Fruit Pests Inspector Thomas Cunningham recently. "That they are I can guarantee," continued Mr. Cunningham, "and it will not be very long before this province will be able to meet the requirements of the great Australian markets, because the production is increasing very rapidly. Recently I signed certificates of inspection of twelve shipments of apples in the Okanagan which were consigned to Australia."

Nova Scotia

Mr. Ray, Canadian Trade Commissioner at Birmingham, England, writing on September 21, said that during that week a consignment of 200 barrels of apples from Nova Scotia, shipped two or three weeks before contracted time, had been declined on account of their inability to compete with the home product. The imports of apples during the month of August were valued approximately at \$270,000, being \$96,000 less than the corresponding month of 1910. Nova Scotia Gravensteins were then commanding, No. 1, \$2.67 to \$3.40; No. 2, \$2 to \$3.50 per barrel, respectively.

The total shipment of apples from Halifax up to October 16 for the present season has been 352,000 barrels, compared with 205,000 barrels for the entire season last year. During the present week there will be at least another 50,000 barrels shipped.

One of the finest and best packed consignments of apples that has ever been sent out of the province was shipped recently by the Hillcrest Orchards at Kentville. It comprised 218 boxes. Half-tone reproductions of scenes in the orchards were placed in each box for advertising purposes. Up to October 12th this company had harvested between 8,000 and 9,000 barrels, including about 2,000 barrels of Gravensteins, which is probably the largest crop harvested this year in Eastern Canada. On that date picking in the orchards was not completed.

Notes from Niagara District

Linus Woolverton, Grimsby

Autumn work is beginning earlier than usual. Many of our fruit growers have already begun plowing their fruit orchards, having finished their fruit harvest by the middle of October. The drouth in early summer hastened the ripening of all our fruits, so that even winter apples were ready by the end of September.

Apples have graded number two and number three, instead of number one and number two. Had it not been for the hail storm the crop would have been chiefly number one, thanks to lime sulphur and arsenate of lead. The effect is noticeable in my orchard, trees bearing enormous loads on the sprayed half and no fruit to speak of on the other. I think the apple scab weakens the little stem of the blossom and causes it to fall, and when sprayed it becomes healthy and holds for fruiting.

I like having my whole orchard fall plowed for two reasons first, the improving effect of the frost on the exposed soil, and second, the advantage of having it done before beginning the pruning, otherwise one must clear up so much rubbish in early spring before beginning to plow, or to plant trees. Of course here we do not need winter protection for trees; and if we did, the mulch of plowed ground would be protection enough.

This whole district is being devoted to fruit. A trolley ride from Hamilton to Beatusville is an eye opener to strangers.

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A Collection of Six Desirable HOUSE PLANTS

Send us \$2.50 and we will forward by express, to your express office, this very choice collection of House Plants. We select these as the most desirable plants for you to buy, chosen from our large assortment; they are full grown plants, now in their flowering pots, healthy, thrifty and beautiful. Our regular selling price of these plants is \$3.60. To make a large number of sales we give this lot, an exceptional bargain, for \$2.50

- 1 Choice House Fern. Ostrich Plume.
- 1 Choice House Fern. Bostonensis.
- 1 Splendid Kentia Palm.
- 1 Large Asparagus Fern.
- 1 Xmas Cherry (in fruit).
- 1 Fimo Cyclamen.

Cultural directions for these plants will be found in our Catalog, which we mail free with this order.

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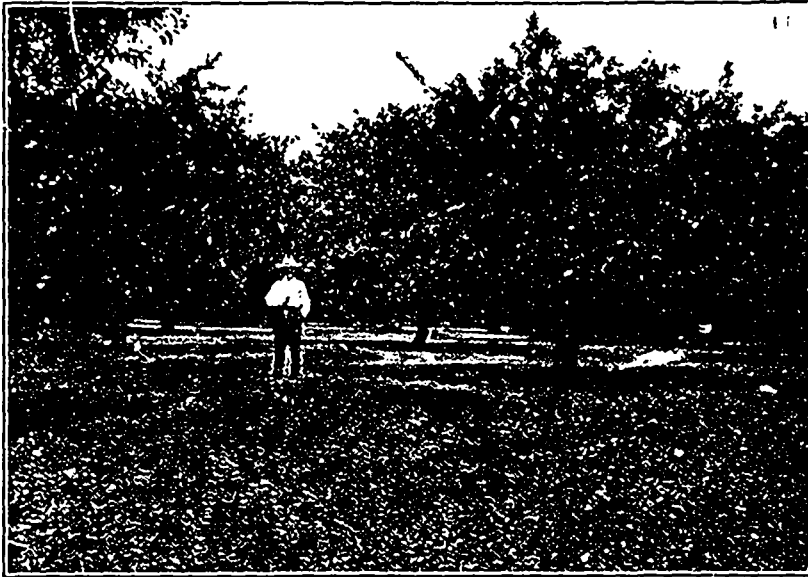
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148 Van Horne St., Toronto



This Food-Tonic Quickly Restores Strength



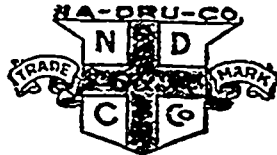
After a serious illness, ordinary food should be supplemented by a strengthening tonic. For this purpose

NA-DRU-CO Tasteless Cod Liver Oil Compound

is recommended very highly. In its preparation the disagreeable flavor of the natural Cod Liver Oil is entirely removed, while its well known nourishing and tissue-building qualities are retained. Then we add Hypophosphites to build up the nerves, Extract of Wild Cherry (for the Lungs and Bronchial Tubes), and Extract of Malt (a food itself) which aids in the assimilation of other foods.

Children in particular enjoy the pleasant flavor of Na-Dru-Co Tasteless Cod Liver Oil Compound, and quickly regain health and strength when Nature is aided by this natural food-tonic. Your Druggist has it in 50c. and \$1.00 Bottles.

National Drug and Chemical Co.
of Canada, Limited.



FOR EVERY AILMENT THERE'S A
NA-DRU-CO SPECIFIC BEARING THIS
TRADE MARK. SEE THAT YOU GET IT.

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Some History about *Typewriters*



Modern and Ancient

CHAPTER I

A Typewriter is not worth much without an efficient Operator.

IT is a conservative estimate that 90% of typists in this country are trained on the Underwood.

AND the machine an operator learns is the machine she is going to have. The day is past when a typist can use several makes of machines equally well. Scientific operation made it impracticable.

IT is a matter of considerable difficulty to get a competent operator for any typewriter except an Underwood.

Through our Employment Service we insure Underwood users against any difficulty of this kind.

United Typewriter Co.
Limited
TORONTO

A BARGAIN

The Canadian Apple Growers' Guide \$2.00
The Canadian Horticulturist. One Year .60
BOTH FOR \$2.00 \$2.60

TAKE ADVANTAGE OF THIS OFFER WHEN RENEWING YOUR SUBSCRIPTION

Books and Bulletins

During the past few weeks The Canadian Horticulturist has received a number of books and bulletins, a number of which are of more than ordinary interest and value. Three books from Doubleday Page and Co., publishers, of Garden City, N.Y., include the following: "Vines and how to Grow them," by Wm. C. McCollum. This volume deals with all kinds of climbing and trailing plants for garden effect, including not only hardy annual and permanent woody vines but many of the beautiful exotics. It is well illustrated. "Garden Planning," by W. S. Rogers, is especially designed to help the maker of small gardens. The author writes from actual experience in helping amateurs on city lots and on the average suburban plot. There are many other sketches and plans. "Chrysanthemums and how to Grow them," by I. L. Powell, is a complete manual of instruction on the growing of chrysanthemums. It pays special attention to the opportunity of the amateur who has only an outdoor garden. Several excellent illustrations add to the value of the volume. The foregoing books contain from two hundred to four hundred pages each, and may be purchased for \$1.10, with postage 10c extra.

"Cooperation among fruit growers" is the title of bulletin No. 27, issued by the Agricultural Experiment Station, Columbia, Missouri. It gives the constitution, by-laws and rules of a number of the most successful cooperative associations on the Continent, and explains the reasons for their success.

The Ohio Agricultural Experiment Station at Wooster has issued bulletin No. 228, dealing with "Two recent important cabbage diseases of Ohio." One of these is the wilt or the yellows of cabbage and the other black-leg or foot rot. The bulletin is well illustrated and handles both subjects at length.

Commercial fertilizers are dealt with in bulletin No. 101, issued by Purdue University, Lafayette, Indiana. It gives the full text of the law governing the sale of fertilizers in Indiana, and tables showing the results of inspections of samples.

"Commercial Apple Orcharding in Ohio" is described in circular No. 112 of the Ohio State at Wooster. The results of experiments in spraying are given.

The value of birds in the destruction of injurious insects is shown in Farmer's Bulletin No. 456, entitled "Our Grosbeaks and their Value to Agriculture," issued by the United States Department of Agriculture, Washington.

INJURIOUS INSECTS

One of the best bulletins of its class we have seen for some time is bulletin No. 110, issued by the Agricultural Experiment Station, Centre County, Pennsylvania, entitled "The Control of Insects and Diseases affecting Horticultural Crops." It gives concise descriptions of methods for controlling the principal insect enemies and fungous diseases of fruits and vegetables.

"How to combat the Melon Ape," is dealt with in press bulletin No. 34 of the Experiment Station, Lincoln, Neb.

"Cut Worms, Army Worms and Grasshoppers" are described in bulletin No. 124 of the Division of Entomology of the Experiment Station University Farm, St. Paul, Minnesota.

"The Apple Maggot or Railroad Worm" is the title of circular No. 14 of the Experiment Station, Durham, New Hampshire.

"Winter Vetch as a Cover Crop in Michigan Orchards" is dealt with in circular No. 13 of the Agricultural College, East Lansing, Mich.