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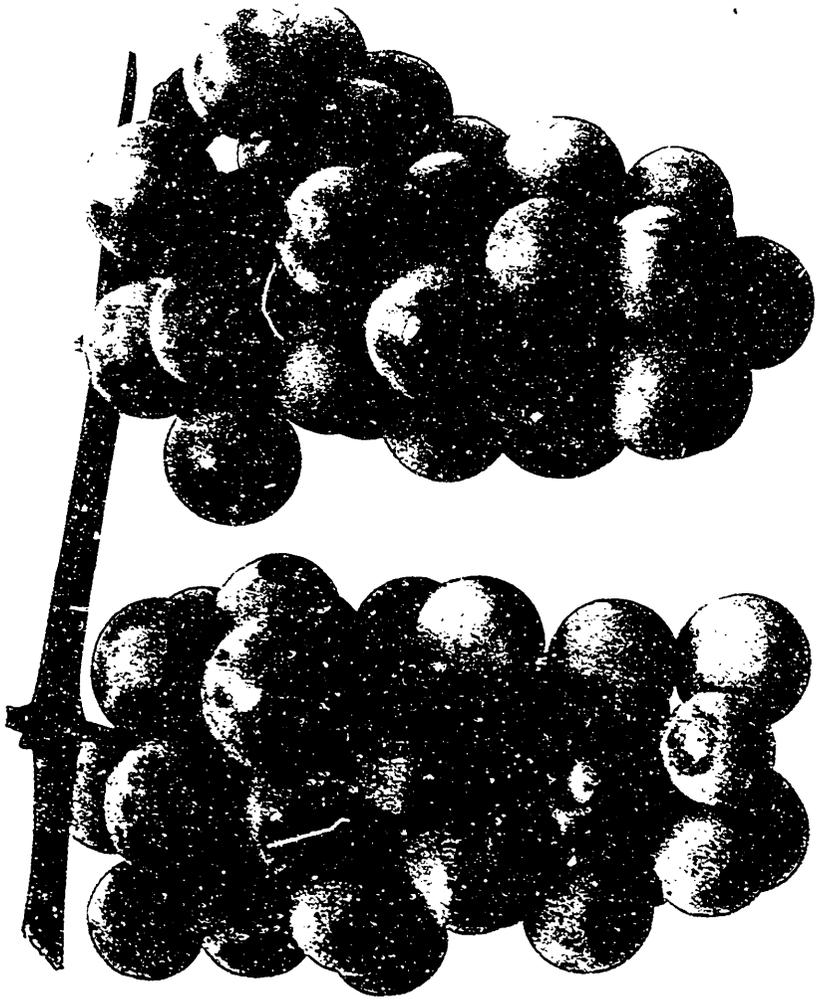


FIG. 2630. LINNÉY.

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LINDLEY

A FEW years ago the Lindley, or Roger's No. 9, was a favorite red grape with vinedressers, and it was planted quite freely in commercial vineyards. It was also a favorite for the dessert table, for its quality is excellent and its pretty and peculiar red color shows up its bunches finely in the dessert dish, along with Niagara and Concord, making a display of our emblematic colors, the red, white and blue.

In some instances vineyards of Lindley have yielded splendid crops, amounting in one case to an average of about thirty pounds to the vine; but it was not long before the variety began to fail in productiveness and become unprofitable. Perhaps this failure was due to the thrip, which is very troublesome on vines of the Lindley, for they weaken them by sucking the sap from the leaves. Anyway, whatever may be the reason, we find that of late years our Lindleys never give a good yield of fruit, and it is very difficult to select out bunches that are really perfect. We cannot, therefore, recommend the Lindley as a market variety, and, since it is scarcely the equal of the Delaware in quality, it cannot displace that excellent little grape for the dessert table.

Perhaps if we could succeed in destroying the thrip this grape might recover the place

it held when President Wilder, of the celebrated Massachusetts Horticultural Society, denominated it and Jefferson "the Muscats of America," and when in the Bushberg catalogue it was recommended as a "fine table grape, one of the best of the red hybrids."

It was on the encouragement given by such favorable statements that about ten years ago we planted a vineyard of Lindleys at Maplehurst, but every year they have been growing less satisfactory, until now we expect soon to be obliged to root them out, for they are only a breeding place of thrips, which swarm over to the other varieties.

Lindley is an excellent keeping grape, holding its rich flavor in ordinary storage, well on into the winter, and in a dry atmosphere it turns almost to a raisin.

There is a grape called Mary in our collection which very closely resembles Lindley, so closely indeed that experts are puzzled to decide whether it is really distinct or not. We notice, however, that it is a better grower, that the bunches are more compact, and, if anything, brighter in color. Perhaps it may prove better able to resist the vexatious thrip than the Lindley, and, if so, it will establish its distinct identity.

Editorial Notes and Comments

TOP BUDDING.

GRAFTING has usually been looked upon by the farmer and fruit grower as the only method by which the top of a tree might be changed to some other variety. The operation of budding, which is really grafting with a single bud instead of a scion with two or three buds may, however, be practised in almost every case with as much success as grafting. Grafting is best done early in the spring, at which time there is often such a rush of other work that it has to be put off and is then neglected. Budding is done during the summer, when it is usually more convenient to get time for doing it.

The practice of budding is particularly adapted to the top working of young trees when the main branches are not more than an inch or so in diameter, for the buds may be inserted on branches of this size, and the wound made when the branch is removed heals over readily. Detailed directions for budding may be found elsewhere in this number.

A WARNING TO FRUIT GROWERS.

THE Fruit Division of the Department of Agriculture, Ottawa, issued the following warning to fruit growers about the last of June: It is to be feared that the wet weather at present prevailing will lead a good many orchardists to neglect spraying. Last year the summer and autumn were wet, and many growers of fruit failed to give their orchards more than two or three sprayings. Cool moist weather is peculiarly favorable to the development of fungous growths, and it is only by seizing every opportunity and spraying whenever a day or two of dry weather comes along that sound clean fruit can be secured. Wet weather should be an incentive to greater diligence

in spraying, rather than an excuse for not spraying. Eternal vigilance is the price of safety in fruit growing, and it behooves every one who desires a full crop of first-class fruit to spray early and often.

ORCHARD CULTIVATION.

THERE is a danger that on account of the wet weather orchards will not receive their usual cultivation, which is urgently needed to destroy weeds, aerate the soil, and conserve soil moisture for future use. If the ground is not stirred it bakes, cracks open, and evaporation goes on rapidly. By stirring the soil through frequent cultivation, thus keeping a loose mulch on the surface, capillarity is broken up and moisture retained. As soon as it is possible, therefore, to get on the ground after a rain, the cultivator should be started in the orchard and kept going as steadily as time and weather will permit.

FRUIT PROSPECTS.

THE following is a summary of the crop report, as obtained by the Fruit Division of the Dominion Department of Agriculture: Early apples are reported a good crop in all sections. Winter apples will be only medium. The fruit has been singularly free from the ravages of insects and fungous diseases, though a few correspondents are noting the development of some scab since the wet weather has set in. The fruit division a few days ago issued a timely warning that spraying with the Bordeaux mixture would be doubly necessary as long as the wet weather continued.

Pears in Southern Ontario and Georgian Bay districts are a good crop. In Eastern Ontario they are a failure in many places.

Plums are a heavy crop in all the plum growing sections, but the rot is developing

with the wet weather, and will, if it continues, cause a serious depreciation.

Peaches are also a large crop. Mr. J. L. Hilborn, of Leamington, says: "Peaches of all varieties except those subject to curl leaf are heavily loaded. The Elberta, a variety much subject to curl, has suffered very little where it was sprayed early, but where spraying was done late or not at all many of the trees will probably die."

Small fruits are a heavy crop everywhere except in the eastern portion of the province, where the drought is responsible for the failure.

THE "KING" APPLE.

THE "King" is one of the favorite varieties in the market, but unfortunately it is so shy a bearer on its own roots that it is not at all profitable. It has, however, frequently been noted that by top-grafting it on any vigorous stock it becomes much more prolific.

The Fruit Division, Ottawa, invited correspondence upon this subject, and has received some valuable information. Mr. C. L. Stephens, of Orillia, has the King top-grafted on Duchess, and finds that its bearing qualities are quite satisfactory. Mr. Wm. Read, of Jarrat's Corners, has twelve King trees grafted on Duchess, and reports equally good results. Mr. Judson Harris, of Ingersoll, has an orchard of two and a half acres, the crop from which the past eight years has never brought him less than \$500. Many of these trees are Kings grafted on Russets. Mr. Robert Murray, of Avening, has a number of King trees on their own roots and others grafted on Tolman Sweets, and notes that the top grafted trees are the only ones that give him paying crops.

The experience of these growers and many others goes to show that it would be a very profitable piece of business to top-graft at least some of the early apples to be found all

over Ontario with Kings. The King is an apple that exactly fills the bill as a fancy market variety, as it is of excellent quality, color and size, and well known in the English market. If its only defect, want of productiveness, can be cured by the simple method of top-grafting, it should prove a boon to many people who have vigorous trees of undesirable varieties.

THE GIFT PACKAGE FOR GRAPES.

OUR readers, who have been hoping to see a market in Great Britain for Canadian grapes, may be interested in a view of the interior of a salesroom in Covent Garden, London, England. These old wicker baskets, which have been in use from time immemorial in that country, may look clumsy to us, but owing to their great strength they endure shipments for years, thus avoiding that most serious annual expenditure for baskets, which bids fair to keep the Canadian fruit grower poor. Once when fruit prices were high, the gift package came into use, and was looked upon as a saving of trouble; and so it was, but can we afford the luxury? Very often the money we fruit growers pay the basket maker exceeds our own share of the proceeds of our fruit crop. Indeed, the basket bill of many a fruit grower in the Niagara district reaches \$1,000 in a single season. Is it not time to call a halt and ask ourselves whether, after all, this old world conservative custom of using such fine strong baskets, as are shown in the illustration, is not worthy of introduction into Canada. Such baskets would last for generations, and are returned free by the carrying companies, so that when once a stock is secured the basket expense is over.

Of course in this we refer only to home markets; for it would be almost impracticable to have export packages returned, even if they were so made that they could be nested.



FIG. 2631. A. FRUIT SALESROOM IN COVENT GARDEN, LONDON.

The illustration is furnished by Mr. W. A. McKinnon, chief of our fruit department at Ottawa, who calls attention to the "packages in which grapes are sold with bloom undisturbed," and also to the packages of peaches and melons.

WESTERN MARKET FOR SUMMER FRUITS.

THAT a northwestern trade for Southern Ontario fruit will develop a hundred fold in the near future, owing to the rapid settlement of northern Ontario, Manitoba, and the Northwest, there is no manner of doubt. Southern Ontario will send to the latter points, not merely advance supplies of early fruits, but in a large measure will contribute the whole supply. The

northerly limit for many of the early and tenderer fruits, as well as for some later and hardier varieties, is found somewhere in old Ontario. The very low winter temperatures of the northern points enfeeble, if they do not kill, fruit trees, vines, and bushes, while the comparative shortness of the season that is free from frost adds to the difficulty of producing fruit on a large or profitable scale. Berries, grapes, peaches and apples are demanded in the west now in large quantities, and as settlement continues and wealth increases the market will widen more and more. The Ontario fruit grower will do well to look to the northwestern market.

Winnipeg should be a great shipping centre for Ontario fruits of all kinds. Strawberries are sold there by a commission firm at 18 cents a box. These berries come, we are informed, from Oregon. Berries from Ontario could be sold in Winnipeg with handsome profit at 10 cents a box. But before this can be done an opening must be made in the market against the active opposition of the aforementioned commission firm, a proper car must be found to carry the

berries thither, and the railway companies must be induced to build and to use this car.

What is true of berries is true of most other Ontario fruits; there should be an ever-increasing market in the west. Cooperation and patience in establishing the market, a little experimenting on cars for shipping, and a deal of suasion towards the railway companies, are necessary to the accomplishment of this important object.

FRUIT TRADE WITH THE WEST IN A CRITICAL CONDITION.

THE Fruit Division, Ottawa, gives out the following statement: Numerous requests have been received from Manitoba and the Northwest Territories for Ontario fruit of the best quality, put up in neat and attractive packages of the sort that western dealers prefer to handle. There are immense possibilities in this western trade for the Ontario fruit growers, but up-to-date methods of packing and shipping will have to be adopted at once, or the whole of this great and growing business will be captured by the Americans.

Fruit Inspector Philp, of Winnipeg, writes that matters have come to a critical stage, and that unless Ontario now makes a determined bid for the trade the market will be occupied almost exclusively by fruit from California, Oregon and British Columbia. In the case of apples, even Kansas and Missouri are likely to be strong competitors. According to Mr. Philp, the packages wanted in the Winnipeg market are the following: Early apples, the bushel box; pears, the half box, holding twenty pounds of wrapped fruit; peaches and plums, the crate holding four boxes, similar to those used by California shippers, and which are well known in all Canadian markets.

It is very important that Ontario shippers should realize the critical stage at which this trade has arrived, and that they should make a united effort to capture the western market, not only by perfecting the details of their own end of the business, but by taking up the matter of transportation with the express and railway companies in order to secure if possible a better and quicker service to Winnipeg. At present fruit is frequently forwarded by express from Toronto to Winnipeg via Smith's Falls, and even via Montreal, to connect with the through trains. The result is that the fruit is on the road from 18 to 24 hours longer than it would be if sent via North Bay, and consequently it does not arrive in Winnipeg in the best condition. If the carrying companies can be convinced that Ontario growers are prepared to maintain a steady shipment of fruit in modern packages, and not merely to send west the fruit that the east does not want, put up in all sorts of antiquated shapes, there is little doubt that adequate service will be provided at a rate which will compare favorably with that now enjoyed by Oregon and California shippers.

FRUIT PACKAGES

THE box is fast coming into popular favor as a suitable package for shipping apples in, as well as pears, and many shippers say that the barrel will soon be a thing of the past. However, it will be some time yet before the barrel will be entirely superseded. There are several points in favor of the box, and it is, undoubtedly, by far the best package for early and tender fruit; there is less bulk of the fruit together, and it is, therefore, much easier to keep it at a cool, even temperature. It has plenty of ventilation; there is not so much pressure necessary to keep it tight; it is a handy package to handle; it is square in shape, and utilizes the space on cars or on vessels to better advantage. If to be shipped in cold storage, the fruit can be cooled down to the necessary point very quickly, but it takes a long time to get a barrel cooled to the center. In price, there is little difference between the box and the barrel. The raw material has risen in price, so that a good barrel will cost about 35 cents laid down; what is called the bushel box is laid down for about 12 cents, or 12½ cents. It takes three boxes to the barrel, so it will be seen that the difference in cost is very slight.

It is claimed that nothing but the very choicest fruit should be shipped in boxes, so that the fact of the fruit being in boxes would mean that it was of the very best quality, and that no second grade should be boxed. In British Columbia they use boxes almost entirely for shipping their fruit, and their second grade is shipped in boxes as well as the first, and where no barrels are used this must certainly be done, and it is hard to see how it can be avoided, or just why it should not be done, providing it is properly marked and branded as required by law.

There is as yet no standard fixed as to the size the box should be, and any and every kind and size is being used. Some use the bushel box, so called, holding about one-third of a barrel; others use what is called the 40-lb. box, holding about one-quarter of a barrel, and for extra fancy stuff, especially pears, which are wrapped in paper, a much smaller package, containing only about two or three dozen fruits. There is a difference of opinion among growers and shippers as to whether there should be a standard fixed, or whether everyone should continue to use the size that suited them best. In the St. Lawrence valley, in the neighborhood of Montreal, they are using what is called the Cochrane case, which is fitted with pasteboard squares like an egg case. These are used for choice specimens of Wealthy and Fameuse, and it has been highly profitable. The fruit must be of uniform size to fit the squares, and this matter of uniformity in size should be a cardinal point in packing fruit in all kinds of packages. It need not all be large, but the large specimens should be put together. A smaller size can be put up, in which the only difference will be in the size. In all other respects these should be as good as the first, clean and well colored; and these will often—in fact, in most cases—bring as much money in the British market as the larger ones; but good judgment must be used in the grading, as to uniformity, cleanliness and color.

The question of packages for fruit was discussed at the last annual meeting of the Ontario Fruit Growers' Association, at Walkerton, but there was such a diversity of opinion as to which was the best size of box to use, that no definite conclusion was arrived at.

However, the matter will come up again,

and if it is necessary to have a standard size for the barrel, and the size of the basket is fixed by statute, then we must have some definite standard for the box as well. They must be of different sizes like the baskets, so

as to have a small package for very choice fruit for export, but buyers will want to know when they buy a box of fruit what it should contain.—*Farmers' Advocate*.

OUR ASSOCIATION AND THE FALL FAIRS

IN his published address Mr. G. C. Creelman, the superintendent, made the following remarks touching on the way in which our work may help to make the fall fairs of our province a greater success than they have been hitherto:

I believe that the Fruit Growers' Association can materially assist the fairs. We are now making arrangements whereby there will be an active local Fruit Growers' Association in every part of the province. The Ontario Fruit Growers' Association has done splendid work up to this time, but now the time has arrived when they must extend their yearly meetings into a series of meetings, in which the individual farmers may take part. The local Fruit Growers' Association should be asked to consult with the Fair board, and to revise the prize list so far as fruit is concerned.

First: Then we can go a step further and secure the co-operation of the Fruit Experiment Stations. If these stations are any good at all, they must have demonstrated to a large extent at least what is best in the way of fruit for the localities in which they are located. These stations are receiving government money, and their object is to assist those interested in horticultural matters. Are you making enough use of them? Are

you asking the superintendent of the station to co-operate with your board? Take the information he has to give and make use of it. If he will not give it, I as secretary of the Fruit Growers' Association will undertake to see that he does give it. But I have no hesitation in saying that these men are anxious to help the farmers in their vicinity. Each secretary should write to the director of the Fruit Experiment Station for his district and ask him what varieties he would recommend for the prize list, or what varieties should be cut out.

Second: The local horticultural societies ought also to assist materially. Give them a place in your main building for the exhibition of hardy varieties of plants, shrubs and flowers. They ought to be asked to have their officers there at certain hours during the fair, to explain how these plants and flowers have been produced, the mode of growing them, etc. An opportunity should be given to ask how to grow this or that. To-day people are discouraged by seeing exhibits so far superior to their own plants and flowers, because they do not know how to produce them. Let us take the other associations into our confidence; they are only waiting to be asked.

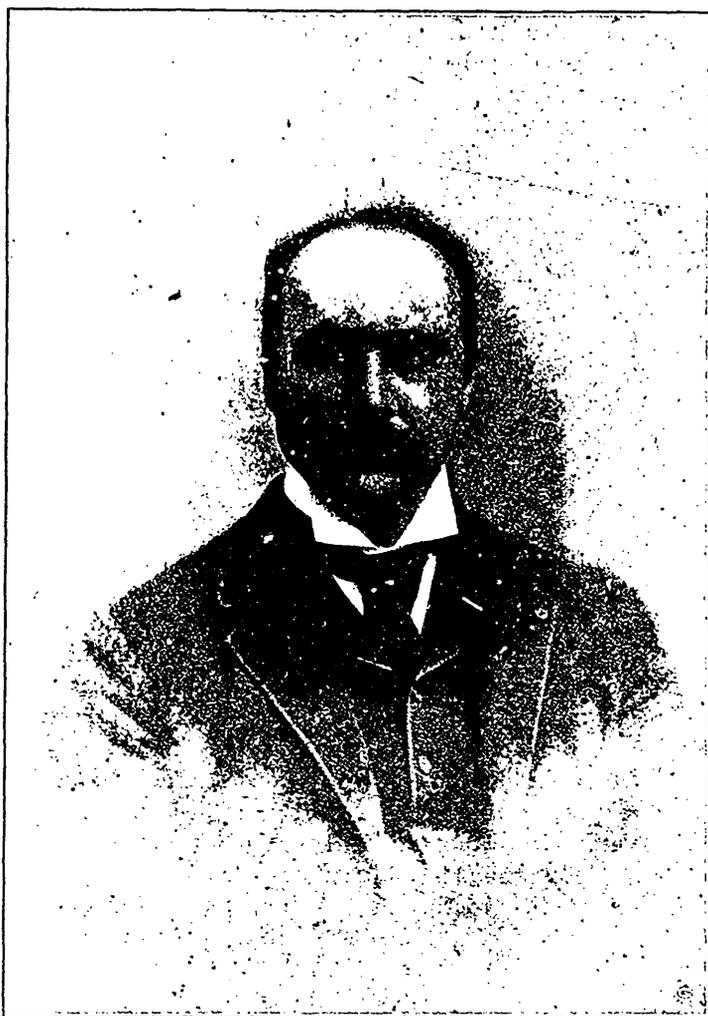


FIG. 2632. JAMES FLETCHER, F. R. S. C., L. I. D.

AMONG the most acceptable and most effective agricultural convention speakers is our friend, Dr. James Fletcher, of Ottawa, entomologist for the Dominion Experimental Farms. His name appears frequently on the programs for dairy conventions, live stock meetings, the Ontario Fruit Growers' Association, and the Ontario Entomological Society annual meetings. The school teachers' conventions also welcome him. Just now he is on his

annual official visit to Manitoba, the Northwest and British Columbia, and we take advantage of his absence to give our readers a sight of his genial face, and a note or two as to his work. Dr. Fletcher is not fond of keeping his personal affairs before the public, and so we will have to be content with but a brief note as to his career.

Dr. Fletcher was born in England, but has lived in Canada for so many years that his attachments to this country have become

thoroughly established. He has great faith in Canada, and is giving his whole energy and thought to assist the farmers of Canada in developing our unlimited resources. For some years after coming to Canada he was attached to the parliamentary library at Ottawa. At the same time he continued his studies of insects, and soon became one of the live working members of the Ontario Entomological Society. To Dr. Fletcher and to Dr. Bethune the society owes a great deal, for they have, year in and year out, kept up the interest and maintained the continuity of its existence.

When Sir John Carling established the system of Dominion farms in 1886, he selected an ex-president and active member of the Ontario Fruit Growers' Association as director, and he also appointed the most active member of the Ontario Entomological Society, Mr. James Fletcher, as Dominion Entomologist. A few years ago Queen's University, Kingston, conferred upon these two gentlemen the degree of Doctor of Laws. May they both live long to enjoy their honors.

Dr. Fletcher has been one of the active fel-

lows, and an efficient officer of the Royal Society of Canada, and has contributed several valuable studies to the proceedings of that body. He has not found time to collect his material into book form, but his papers and investigations may be found scattered through half a dozen series of reports for the past twenty years. While he is a first-class investigator, we consider his strongest point is his ability to interest an audience, and to arouse their enthusiasm in agricultural work. His instruction is clear, inspiring, and wholesome. He quickly gains the attention of his hearers, at the same time he knows enough not to weary his audience. His geniality beams out in his talk, and he gets the confidence and sympathy of the people to whom he is speaking. He is generous to others, not seeking to monopolize time, attention, or credit—he is just the kind of man that one likes to work with. Every one is pleased to see Dr. Fletcher's name on the program, or at the head of an article, and the fruit growers of Canada will be exceedingly pleased to see his portrait on these pages.

OUR BARTLETT PEARS IN ENGLAND.

The pear imports are heavier now than ever. More than half the quantity received is drawn from France, though California is now becoming a keen competitor of the continental pear growers. Fair quantities are drawn from Holland and Belgium, but the French and Californian are best in quality. As a pear-growing country Canada has no equal. We have, during the last five-and-twenty years, had much experience of imported pears, and we have no hesitation in saying that the finest William pears ever marketed from outside sources came from Canada. The French William has had a high reputation in Covent Garden market

for over twenty years. The California William is fine. But those sent us from Canada two years ago to report upon officially were of mammoth proportion, with a clear yellow skin, and a melting sugary and juicy flesh. In quantity they were worth from 3s. to 6s. a dozen fruits. Then again, from Australasia we have had some fine pears sent into London. The colonial pear trade should be made a large business, and when the growers set themselves to satisfy the market's need they will find our merchants only too anxious to get their fruit.—*S. Morgan in Birmingham Post.*

COLD STORAGE OF FRUITS

STORAGE OF PEARS AND APPLES.

BULLETIN 123 of the Ontario Agricultural College, by J. B. Reynolds and H. L. Hutt, treats of an experiment with cold storage of pears and apples, which will be of interest to many of our readers. We give below a summary of the bulletin, a complete copy of which may be obtained upon application to the college.

The two fruits made use of for this experiment were the Duchess pear and the Fameuse or Snow apple, and the conditions experimented upon affecting the keeping of the same were: (1) different temperatures; (2) different sizes of fruit, and (3) different styles of packing. The temperatures aimed at were 31 and 38 degrees. The fruit was all first class, but was graded into large and medium sizes. The styles of packing were as follows:

A. Fruit in an ordinary packing case, holding one-third of a barrel, without wrapping paper or filling.

B. In the case unwrapped, with excelsior at top and bottom.

C. In case wrapped in tissue paper, with excelsior top and bottom and between the layers.

D. Same as C, except oil paper was used instead of tissue paper.

E. Same as D, with heavy wrapping paper between box and the fruit, making the box airtight.

F. In barrel packed in the ordinary way (used on apples only).

From the results obtained the following conclusions are drawn:

1. *For long storage, the medium-sized grade gives better results than the largest sized grade of fruit.* This is evidently a matter of maturity; the larger fruits are on the whole riper than the smaller ones, if picked at the same time. It would there-

fore appear profitable with choice varieties to pick the larger fruits, if intended for shipping or storing, a week or two earlier than the medium-sized ones.

2. *The style of packing is a most important consideration.* The fruit wrapped with either tissue or oiled paper and packed between layers of excelsior gave by far the best results. The wrapping and filling has a two-fold effect of preventing bruises and preventing the spread of decay throughout the package. In the unwrapped fruit three or four decayed specimens were frequently found in a group, showing that decay had spread from one apple to adjoining ones.

3. *The lower temperature is the more favorable one for the long storage of fruit.* Further experimenting is necessary to ascertain the most suitable temperature for the various classes of fruits, but those under the test kept well at 31 degrees.

4. *Under even the most favorable conditions there is a limit beyond which it is unprofitable to hold fruit in storage.* Cold storage postpones, but cannot avert, maturity and decay. The limit for the Duchess pears was reached between Christmas and New Year's while the Snow apple kept well into March.

HANDLING OF FRUIT AFTER REMOVAL FROM COLD STORAGE.

It has been charged against cold storage that produce quickly deteriorates after being removed from cold storage conditions. That it usually does so, is quite natural. If the produce has been held for a considerable length of time in cold storage, the process of decay has been working, though very slowly. When the produce is removed from the low temperature into surroundings favorable to rapid decay, it is not to be ex-



pected that it will resist deterioration so well as if fresh.

Careful handling after removal from cold storage will lengthen the life of the fruit. In the apple experiment two basketfuls of sound apples were selected from the same lot after examination. At the time of selection, the apples having been examined in a warm room, they were quite wet, owing to deposition of moisture from the warm air of the room upon the cold apples. They were "wets," as they are termed in the old country markets. One basketful of these wets was allowed to remain in the basket as they were. The other basketful of these wets was removed from the basket and spread out thinly over the table. The former lot remained wet for some time, the latter dried off quickly. Next day they were removed to the cellar and left there in the same way as described. After ten days they were again examined, with the following results:

First lot (left in basket)—Sound, 70 per cent; discolored, 30 per cent. (12 per cent. rotten).

Second lot (spread out thinly)—Sound, 89 per cent; discolored, 11 per cent. (5 per cent. rotten).

The difference in these two lots was simply one of drying off quickly or remaining wet. It would have been better, of course, if they had not been allowed to become wet at all. To this end, the fruit should be warmed gradually, moisture not being allowed to form on its surface; or the warm air should be kept from contact with the fruit, by a covering or an air-tight package, until the fruit has attained the temperature of the surrounding air.

COLD STORAGE FROM THE FRUIT GROWER'S POINT OF VIEW.

The foregoing account shows that certain results may be reached by cold storage. It remains to be considered (1) whether or not

such storage can be made commercially profitable, and (2) if so, how storage facilities may be obtained by the grower.

CONSIDERED COMMERCIALY. In considering the commercial side of the question, we must remember that the plan of storage recommended above as securing best results involves two items of additional expenditure: first, the extra cost of packing; and secondly, the cost of storage. The extra cost of packing, Mr. A. W. Peart, Burlington, Ont., who has packed a good deal of fruit in this way, estimates as follows:

"Extra labor in wrapping, four cents per box.

"Wrapping paper and excelsior, seven to eight cents per box.

"Total extra cost, seven to eight cents per box.

"As against this, however, it must be borne in mind that four boxes of bare pears will make about five boxes of wrapped ones."

There is also to be added on the credit side the saving of fruit from bruising and decay by the superior method of packing; and this, for the fruit grower who looks to the future, means, besides the actual saving of fruit, the possibility of establishing a reputation for furnishing an article of first-class quality.

As to the cost of storage, the wisdom or unwisdom of incurring the expense will depend entirely upon the state of the market when the fruit is harvested, the probable difference between present rates and rates a month or three or six months hence, or the difference between local prices and prices in the foreign markets (for storage implies storage in transit as well as in the warehouse). In fact, this being a commercial question, is solved as all commercial questions are, by taking the risk, and depending upon increase in prices to repay cost of holding and shipping. As to the probability of profit from such a venture we quote the fol-

lowing from the United States Year Book for 1900: "Most storage establishments store apples in carload lots at about forty cents per barrel for the season ending May 1st, and it is rarely the case that sound fruit does not advance more than that in price by March 1st, while a rise of \$1 or even \$1.50 per barrel is not infrequent."

COLD STORAGE CONSIDERED MECHANICALLY. As to the question of securing cold storage accommodation, there is, first of all, the *cellar*, available to all. For late fall and winter storage a well-ventilated cellar will serve the purpose of the family in preserving apples and late pears. In this statement there is, of course, nothing new; but it is necessary to repeat at this juncture that there are three reasons for the spoiling of fruit in cellars: First, the fruit, all or part of it, may be of poor quality when stored. Then the handling, packing, or manner of storing the fruit may be careless. Finally, the storage room may be badly ventilated and uneven in temperature. The cellar should be well ventilated, with the window or windows open as much as possible, so long as the temperature does not drop below freezing. If the windows are left open, the temperature of the cellar will require careful watching, and a thermometer suspended about the middle of the room is advisable. A proper average temperature for a mixture of fruit and vegetables is 36 degrees F., and the temperature of the cellar should be kept at that point as steadily as possible. Of course, with early fruits that are stored during the warm weather of September and October this temperature cannot be reached, nor yet in the spring with late-keeping fruits. The cellar, however, even at these times, will likely be cooler and steadier in temperature than any place above ground, not artificially cooled; and therefore, it is better to make the most of it. Fruit that is intended for long keeping should be packed and stored immediately

after picking, and not left in heaps in the orchard or the shed.

A *small ice-storage* is another means for preserving fruit. This is superior to the cellar in warm weather, and, therefore, generally more suitable for this purpose. For private purposes, an ice-storage may be built for \$250 and upward, according to the size and style of insulation. It includes a refrigerator, or storage room, and an ice house attached, where the ice is stored in the winter and does its duty without being rehandled. The refrigerator is cooled after the most approved fashion by the circulation of air between that chamber and the ice house.

While this kind of storage is generally satisfactory if properly constructed, it has limitations inseparable from refrigerators cooled by ice. The principal of these limitations is that of temperature. It is difficult to keep the temperature down to the lowest desirable limit in summer, and in winter there is danger of freezing. Especially is this the case while the ice is being put in, and afterwards.

The third method is the large co-operative storage, owned and operated by a company of fruit growers, situated at a railway depot and in the midst of a fruit growing district. This kind of storage accommodation has many advantages. The fruit stored here can be marketed promptly and without long hauls. A large company can afford to build a well-equipped plant, well insulated, and well provided with the best arrangements for refrigeration, and to employ a capable manager to look after the fruit and see that the temperature and humidity of the various rooms are of the proper degree. While a fairly satisfactory plant on a large scale can be refrigerated by the use of ice, the large plants of the future will be cooled by machinery. There is an account of such a plant in the April number of the Canadian Horticulturist for 1902.

A fourth means of storage is the large warehouse, where space may be rented. There are a few of these in Ontario now, there will be more when the demand increases. The rates at these are moderate, so moderate that it can rarely happen that the fruit grower will not have a good margin of profit after deducting the cost of storage from the advance in the price of fruit during the storage season. A price list at hand from a large cold storage warehouse gives storage rates as follows:

Barrel, 10 cents per month, 25 cents per season ending May 1st. Bushel box, 5 cents per month, 15 cents per season. Box containing one-quarter barrel, 4 cents per month, 12 cents per season.

SUMMARY.

1. Apples and pears keep best when wrapped singly in paper, and packed in a shallow box not larger than a bushel. They ship best when, in addition, they are packed in layers with excelsior between.

2. Apples keep better at a temperature of 31 degrees than at a higher temperature. The experiment does not show what is the best temperature for pears.

3. Cold storage cannot make bad fruit good; neither can it keep bad fruit from becoming worse. Only good specimens will keep for any length of time in cold storage, or will pay for storage.

4. For long storage, it pays to select the best fruit and to pack it in the best manner known. The extra labor and the cost of

material are more than repaid in the greater quantity and better quality of fruit left at the end of the storage period.

5. With apples and pears at least, and, it seems likely, for most kinds of fruit, the fruit should be picked and stored in advance of dead ripeness. The maturing process goes on more slowly in cold storage than on the tree or bush.

6. With the two kinds of fruit tried, apples and pears, the medium sizes of fruit keep longer than the largest, all being perfect specimens and picked at the same time. It would, therefore, be an advantage, especially with pears and peaches, to pick the larger specimens first, and leave the smaller to mature later.

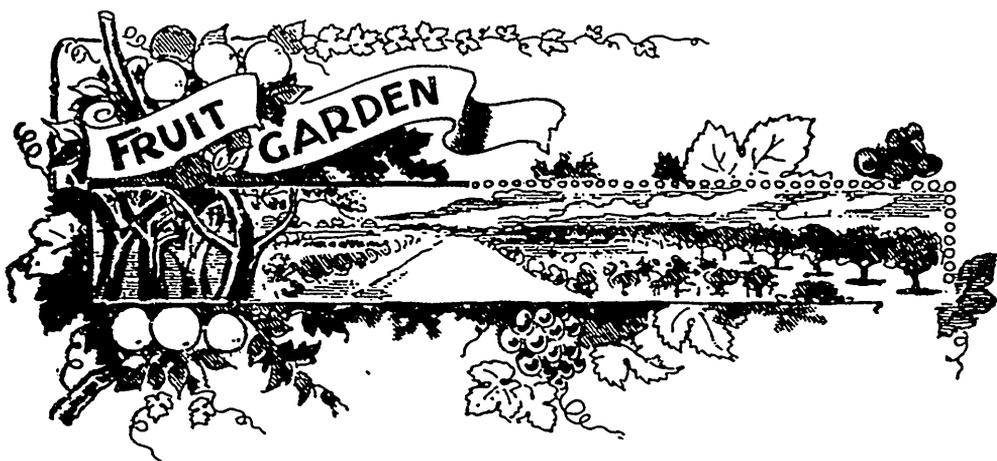
7. Fruit, on being removed from cold storage, should be allowed to warm gradually, and moisture should not be allowed to deposit upon it. But if the wetting cannot be prevented, then the fruit should be spread out and dried as quickly as possible.

8. With all kinds of fruit there is a time limit beyond which it is unprofitable to hold the fruit in cold storage, or anywhere else. That limit, for sound fruit, is dead ripeness. Duchess pears can be kept profitably until late in December; Fameuse, or Snow apples, until March or April. The time limit has to be determined for each kind of fruit.

9. In addition to proper conditions in the storage room, the most important points in the storage of fruit are the *selection* of sound fruit, *grading* into uniform sizes, one variety only in a case, and careful *packing*.

PEAR TREES do not often reach great size, but they do achieve greatness sometimes by the fruit they produce. Under modern systems of cultivation this is not so remarkable; but it is recorded in a quaint volume of Scottish lore, published in the early part of the nineteenth century, that at Melrose a

single pear tree for fifty years yielded the interest of the money paid for the garden and a house in it; while in 1793 two trees there yielded 60,000 pears. Such an enormous crop would be difficult to surpass now, notwithstanding the immense improvements that have been effected in fruit culture.



THE SELECTION OF BUDS FOR BUDDING.

AT a recent meeting of the American Nurserymen's Association, Prof. L. H. Bailey took as the subject of his address, "The Whole Question of Varieties," and at the close of his remarks a question was asked which should be carefully considered by every propagator of trees at this season of the year.

The question was put by Mr. George A. Sweet as follows:

As I understand Prof. Bailey, his suggestion is that the practical nurseryman must select his buds from a known bearing tree of value, and thereby get a valuable strain of that variety. Now, the point that occurs to me is this: We will say that we go to Mr. Hale, who is a great peach man, and say that we want some buds from the best Crawford peach that he has on his place, and we get a package of buds and bud them. Now, next year, is it assumed by Prof. Bailey that we must send to Mr. Hale again and get our stock of buds from that particular tree, or are we at liberty to use the buds that come from the growth of that tree, assuming that parent tree to have been the most valuable Crawford to be grown? If he takes that position, of course it would

simplify the question of bud selections; but if he accepts the latter proposition, where is the limit to come? Are they going to deteriorate in the second or fourth generation, or are they all going to propagate true to name, as the original? That is practically what our nurserymen are now doing. I should like to know if, with that limitation, it would be possible to cut sufficient buds from one tree to carry on the business?

Prof. Bailey—I am glad to have that question brought up, because it is exceedingly important, and because on that hinges the feasibility of the whole scheme. I am free to say that I cannot answer Mr. Sweet's question. There are four or five questions involved which have been up a number of times before societies; one comes before a meeting of this sort with more or less theoretical ideas of things which are going to come in the future. I do not expect any nurseryman ever can live up to these ideals in the beginning, but we are going to work along that line, reaching them as nearly as possible. Now, to come down to the great question of Mr. Sweet's, I am so much interested in this matter myself that on my own place I have planted a small orchard of

Northern Spies. I have grafted part of these this year with scions from a King apple tree; I have grafted the other with scions from nursery trees which ten years ago were taken from that same apple tree, for the purpose of finding out whether in the ten intervening years there has been deterioration. I believe, as a matter of theory, that it is the best for the nurserymen every year to go back to his bearing tree, but I do not think you can do it; it is only in rare cases and in special varieties that you can do that, and just how long these nursery trees can be propagated without deteriorating I do not know and no man knows. I believe one reason why the Crawford peach is running out is because we are propagating from so many different strains of it; but whether by reason of a strain having been introduced that chanced

to deteriorate in the nursery row, I cannot say. My own opinion is that we ought to try to renew back from the original tree as often as we can, and, when the opportunity arises, once in five years, or once in ten; and I believe the oftener we can renew, the safer we are, without saying that we are not safe if we do not renew. I know, however, that there is such a thing as individuality in a tree, and I am perfectly sure that a great deal of individuality passes over. At present we are thinning out the cattle in the dairy herd by means of the Babcock test; we are finding that many cows never paid for their board, and are thinning out these cows all the time. I wish we could apply a Babcock test to our orchards by means of which we could eliminate those trees that do not pay their board, or at least that we never should propagate from those types of trees.

BUDDING FRUIT TREES

IN Ontario budding is usually performed in the months of July, August and September, the later date being for young trees which have a long season of growth; such as peach trees in their first year from the seed. The essential conditions are, (1) that the bark can be raised easily, and (2) that the growth of the season is so nearly completed that the new layer of wood inside the bark has acquired some consistency, and has ceased to be thin and watery. It is this new wood which, in its ripening process, is to grow the bud fast to the young tree: therefore, the importance of its being in the right condition. This may be known by the young tree beginning to form its terminal buds, in completing the season's growth.

The buds to be put in are obtained from shoots of the current year's growth, and

they are usually more perfect if grown in full sunshine. As soon as cut, the leaves are to be removed—all but about a third of an inch of the footstalk, which is left to hold the bud by when putting it in place—and three inches or so of the immature point of the shoot is rejected, as are also two or three of the lower and imperfect buds. A prepared "stick of buds" (as it is termed) is shown at *a* in Fig. 2633. Several of these "bud sticks" may be prepared at one time, if desired, but they must be kept in a damp cloth until used, and on no account allowed to become wilted. Scions for grafting, being fully ripened wood, will not be seriously hurt by a slight wilting, but this would ruin buds. When properly managed, by being wrapped in damp moss (sphagnum) and enclosed in waterproof paper, these "bud

sticks" may be sent a thousand miles by mail or express. This is a great convenience in the way of obtaining promising new fruits for trial.

The knife specially made for budding is most suitable, but one who has had some experience will succeed with other knives—a first rate "Barlow" has done good work. It should have a thin blade, a very keen edge and a half-rounding point. And it should be used for no other purpose than budding. An ordinary knife must be at hand also, to be used in any trimming of the young tree that may be required.

The budding may be done in the branches of a large tree if desired; but in the case of a young peach tree (or a young tree of any



FIG. 2633.

kind) it is best done within two or three inches of the ground. A smooth place in the tree, or branch—the "stock," as it is called—is selected to receive the bud; and if any leaves or young shoots are in the way they are to be removed; and the dirt is to be wiped off with a rag, so that nothing will interfere. An upright incision, about an inch in length, is made with the rounded point of the budding knife, just through the bark, holding the knife in the fingers about as a lead pencil is held; then a short cross incision is made at the upper end of the first one, as at *b* in Fig. 2633.

Now comes the raising of the bark, which is a very particular operation, for it must be done without touching the soft layer of new wood under the bark. If the soft, new wood is touched a wound is made, and while this wound is healing the bud which is put in perishes, instead of growing fast to the stock. The raising of the bark must be done gently, beginning at the upper end of the incision. This is done with the thin piece of bone at the end of the handle of the knife, pressing on the cut edges of the incision and lifting slightly on both sides and the whole length of the incision. In the absence of the regular budding knife, a thin, smooth piece of wood may take the place of the piece of ivory, but the expert budder requires neither, as he uses the rounding point of the budding knife—and saves time. Fig. 2633 at *c* shows the incision made and the bark raised, ready for the bud.

A bud is now to be cut from the prepared scion, which is held in the left hand with the lower end extending outward. The knife is made to enter about half an inch below one of the buds and is drawn toward the operator, nearly horizontally so as to make a thin slice of the wood along with the bud, and coming out about three-fourths of an inch above the bud. Fig *d* represents the bud ready for insertion. (The piece of footstalk of leaf is not quite long enough for convenience in holding). Some take out the thin slice of wood, but this is unnecessary, and some times injurious.

The bud is taken hold of by the footstalk left for the purpose, and inserted under the raised bark, beginning at the upper end of the incision and pushing it down gently to the lower end. In case a portion of the bud extends above the cross incision, it is to be cut off so as to make a good fit, according to *e* in Fig. 2633.

Tying is done at once, in order to exclude air and moisture and assist the healing process which is to unite the incision, using

both ends of the material, wrapping moderately tight, continuing upward and covering all the incision but leaving out the bud and the piece of footstalk, and finishing with a knot at the upper end.

The tying begins at the lower end of the bud with the stock. Any soft material answers for tying: woolen yarn, narrow strips of calico or muslin, etc. When much budding is to be done, prepared basswood bark is used, or raffia, which is to be had in the seed stores. The latter is prepared from the leaves of a kind of the palm tree found on the island of Madagascar.

The short piece of leafstalk will remain green, and in a week or ten days will drop off on being touched. If it dries up and sticks fast after the ten days have passed, the bud has failed. But if the bark can still be lifted the tree may be budded again, selecting a new place on the stem.

The tying may remain from two to three

weeks, but will need occasional looking after, so that it may be prevented from cutting into the tree, which it is apt to do if the tree is growing rapidly. In that case, it may be untied in a week or so, and tied again but less tightly.

After the final untying, nothing more needs to be done until the next spring. About the time the sap begins to move, the top of the young tree (or branch) is to be cut off about three inches above the bud. The sprouts from the stock will then start, even more readily than the bud, but they must be rubbed off from time to time, so as to throw the sap and the force of the growth to the bud; and in July or August, the stub—the three inches of wood left above the bud in spring—is to be cut off with a sloping cut on the side opposite the bud. This wound will soon heal over and the work will be perfected.—*Exchange.*

THE ASH HEAP AND HEN MANURE.

THE horticulturist should make an economical disposition of two things that are generally regarded as household nuisances—the ash heap and the droppings of the poultry house. There is nothing that will lighten and loosen a stiff soil so quickly as coal ash siftings. Mr. Allen, the celebrated bulb culturist, of Long Island, thinks there is nothing so good in its mechanical effects and he uses large quantities on his lily beds. Take your ashes every morning as they come from the stoves and before they get wet, sift them through a coal sifter, the coarse part you use on your walks about the premises; the fine, dust-like portion you carry to the henhouse and scatter it over the droppings. It will absorb the gases that arise, keep the floor dry and the air pure—

a sort of dry earth system. Every few weeks when the weather permits, the contents of the hen house are wheeled out and spread as a top dressing over the beds of perennials. Will it do any good? Yes, four-fold.

Firstly, it has charitably aided that ash heap to lose its existence; secondly, your hens shall feel better and your labors shall be rewarded with more eggs; thirdly, it does the soil of that flower bed good by loosening it, and fourthly, it does the plants good by feeding them. Why, next June the pæonias will fairly clap their hands with joy. Did you ever dream that a four-fold blessing lay concealed in your ash heap?—*Pa. Horticultural Society Report.*

SYSTEM OF GROWING STRAWBERRIES

NEARLY every one who grows strawberries for home use or for market has his own ideas as to how the plants should be set out and cared for. If perfectly satisfactory results are obtained by the system already in use, it is well to be conservative about adopting new methods of culture; but few are ever perfectly satisfied, and any suggestions whereby desired results can be attained more nearly may be worth considering.

There are four general methods of growing strawberries—the hill system, the hedge row, the matted row, and the modified matted row. In the hill system the plants are set out in check rows about $2\frac{1}{2}$ ft. by 2 ft. apart, and no runners are allowed to form. This continual clipping back concentrates the vital forces in the original plant, and instead of expending the greater part of its energy in reproducing new plants, it goes to developing fruit crowns of great strength and vigor. Everything that will aid in this development should be supplied in liberal quantities. Plant food and moisture are two of the most essential requisites. Aim to grow plants with such a multitude of crowns that a bushel basket will not cover them. This system is of special value when one desires to grow extra large fancy berries of high color and quality. It is more generally used by amateurs than by commercial growers; still, this is no reason why it should not be commercially successful for a fancy trade. For the home garden there is no better method, as the best berries are none too good for the family. It is quite important to make a wise selection of varieties, for not all stool up equally well. Marshal, Parker, Earle and Brandywine are excellent for this purpose in locations where they succeed.

The hedge row system naturally follows, for it is really a modified hill system. The plants are set out in rows about 3 ft. apart and 18 to 24 in. in the rows. The first runners should be allowed to root, placing them so that they form a continuous row with the plants originally set. They should not be nearer than 4 to 6 in. for best development. After a row has once been formed, keep all runners cut off by a wheel disk attached to the hand or horse cultivator frame. Nearly all that has been said in regard to the development of the fruit crowns in the hill system applies here, the crowns developing amazingly when once the tendency of runners to vines is checked. The hedge row system has the advantages of the hill system without entailing so much labor and expense. It allows one to cultivate right up to the plants, thus saving moisture and doing away with a certain amount of hand work. When the fruit is ripening, it is exposed to the sunlight, and size, flavor, firmness and color are obtained. Sample, Clyde, Haverland and Glen Mary are standard varieties that do exceptionally well grown in this way. When the merits of this system of culture become more generally known, the writer is convinced that the up-to-date commercial strawberry grower will adopt it, to the exclusion of others.

The matted-row system consists in setting the plants in rows $3\frac{1}{2}$ or 4 ft. apart, 2 to $2\frac{1}{2}$ ft. in the row, keeping off all runners for several weeks until the plants become established, then allowing the runners to form until a space 18 in. to 2 ft. wide is covered. On strong soil and with abundance of moisture, large yields of medium grade berries can be obtained. This method is very generally practiced, probably because it requires the least care. Its disadvant-

ages are many. After the matted row is formed, cultivation practically ceases, except in a very narrow strip, the plant-producing tendency is developed to the detriment of the fruiting strength, and vigorous crowns are few. The plants stand so thickly that in cloudy, wet weather the fruit is apt to decay, to lack flavor and color, and run small after the first pickings.

The modified matted row differs from the foregoing in the fact that after the plants have run so as to form a medium wide row, the rest of the runners are clipped off as

soon as formed, and also the weak plants—the row thinned out so that the remainder have a better chance to develop. It is a great improvement over the matted row, and fine berries can be grown.

The strawberry plant is a wonderful little organism, and it is only by carefully studying its behavior under different conditions and modes of culture that we are able to learn how to develop its various functions to suit our individual needs.—*G. A. Drew in Country Gentleman.*

THE TWIG-BLIGHT OF THE APPLE, PEAR AND QUINCE

BY

PROF. WM. LOCHHEAD,

O. A. C., GUELPH.

IT is probable that the year 1903 will be known among horticulturists as the year of the twig-blight, if we are to judge at the time of writing (July 10), from reports from the whole of the southern section from Niagara to Windsor. The disease seems to be widespread, and is producing alarm in the sections which are infested.

Although much has been written about this disease, yet the story of the blight is always an interesting one, and is not as well known among fruit growers as it should be. In spite of all that has been done and written, we do not know of any sure, easy method of controlling the disease. It is true that the cause of the trouble, and the mode of infection have been determined, but it is also true that there is no easy practicable remedy. It can be kept under control by cutting out the affected parts and burning them, but a continuance of this practice renders the trees unsightly, and practically useless in a few years.

The Cause: The cause of the trouble is a bacterium or microbe, which enters the

plant through the blossom and tips of growing shoots. It is very frequently observed that some of the flower clusters turn black, as if they had been frost-bitten. The young fruits are also killed, and the disease spreads rapidly to the twigs and limbs. In a limb which has been killed by the blight certain characteristics make their appearance:

1. The leaves die in about two weeks after the limb or twig is killed:

2. They remain attached to the stem, and the tree appears as if it had been scorched with lightning or a hot fire:

3. The inner bark and cambium layer of the limbs are destroyed:

4. The bark becomes almost black or dark brown:

5. At the close of the season of growth there is a distinct line of separation between the diseased and healthy wood, but during the growing season there is but a gradual change in color observed in passing from the healthy to the dead wood.

The greatest amount of damage is done within a few weeks of the first appearance

of the blight, and usually the disease ceases to spread with the close of the season. In such cases the bacteria are virtually all dead before winter sets in, for they cannot withstand drying out of the twigs. In some cases, however, the disease lingers on into the winter, and actually survives the winter. According to Mr. M. B. Waite, of Washington, whenever infections occur in late summer and autumn there is a likelihood that the bacteria will winter over.

Spring Infection: In the spring when the sap gorges the tissues of the twigs and limbs, the dormant bacteria revive and begin to invade new areas. The warmth and moisture combined favor the rapid development of the disease, and upon the exudation of the gummy substance from the bark of the diseased twigs many bees, wasps and flies feed. The flowers visited by these insects are inoculated, and soon show symptoms of the blight. Even after the blossoming period the bacteria may be carried to the tips of growing shoots and find entrance thereto.

Condition of Trees Infected: Unfortunately for the fruit grower, the trees that are making the most rapid growth are usually the most easily infected and injured. One grower reports that the pear orchard which was badly infested with the *Psylla* this and last spring has almost entirely escaped the blight, but that the orchard which escaped the *Psylla* is blighted very severely.

Name and Appearance of the Bacterium: The scientific name of the twig-blight is *bacillus amylovorus*, discovered by Prof. Burrill, of Illinois, in 1879. The bacteria are very minute, being about one twenty-thousandths of an inch in diameter. They are oval, rather than round, and are colorless.

Reasons for Supposing These Bacteria are the Cause of the Blight: 1. These bacteria can be taken from a diseased twig

grown in pure cultures, and when pear, apple or quince twigs are inoculated with the bacteria from the cultures the disease or blight is produced. 2. In such inoculated twigs the bacteria are again found in abundance; and 3. The same kind of bacteria are found in blighted trees.

Some of the Theories as to the Origin of Blight: 1. The action of the hot rays of the sun during very humid weather derange the machinery of the plant; 2. The action of a small bark beetle, *Xyleborus pyri*, often called the blight beetle, which causes the portion of the twig attached to die; 3. The freezing of the immature wood in autumn and winter produces a poison which the currents of sap distribute, causing the death of the parts; 4. A fungus was supposed to bring about the blight, but this fungus has never been discovered; 5. The action of lightning and atmospheric electricity scorches the twigs; 6. A bacterium enters the plant and kills the tissues. This last theory is the one generally accepted at the present time.

Treatment: Since it is believed that only the bacteria of the late infected portions winter over, it is evident that if these late infections were cut out and burned there would be but a small chance for infection the following spring. But we cannot tell these late-infected parts from the others; so, to be sure, we would cut out all the blighted parts of the tree. In years like this this cutting would be a formidable task, especially at a time when the fruit grower is already overworked. This work may be done any time when the tree is dormant, but the best time is the fall before the leaves fall, for then it is quite an easy matter to distinguish blighted from healthy limbs.

If it were practicable it would be wise to cut out blighted twigs whenever they show themselves, for the disease tends to intensify from year to year.

SPRAYING POTATOES

NOW IS THE TIME TO PREVENT BLIGHT AND ROT.

BY

W. T. MACOUN, C. E. F., OTTAWA.

NOTWITHSTANDING the fact that year after year the potato crop in Canada is very much lessened by blight and rot, and that this blight can be prevented to a large extent by spraying, comparatively few farmers spray their potatoes to prevent this disease. It has been known for about eighteen years that Bordeaux mixture will prevent the blight, and it has been frequently demonstrated by experimenters and by other growers of potatoes that the crop is much increased by spraying. In order, however, to get potato growers to spray it is necessary to keep constantly demonstrating the value of it. The results of the tests made at the Central Experimental Farm, Ottawa, in 1902 and 1903 should be sufficient to induce everyone who lives in a disease-infected district to spray.

In 1901 eight varieties were tested. The average increase in yield per acre of the eight varieties, where sprayed, was 94 bushels. In one variety, however, there was an increase of 171 bushels, and in another 155 bushels per acre.

In 1902 eleven varieties were tested. The average increase in yield of marketable potatoes, where sprayed, was 120 bushels per acre, the yield per acre of marketable potatoes from the sprayed being 310 bushels 12 lbs. per acre, and from the unsprayed 189 bushels 54 lbs. The cost of the bluestone, which is the principal expense, was \$7.98 per acre, or 114 lbs. at 7 cents per lb. In spraying large areas the cost would be less. At 40 cents a bushel, an increase of 120 bushels per acre would mean \$48, or after deducting the cost of the bluestone, about \$40.00.

The object of spraying is to destroy the spores of the disease on the foliage. If the mixture is not there when the spores are

there the disease will usually spread very rapidly and soon the tops are destroyed. The foliage should be kept covered with the mixture from the middle of July, when the spores may be expected to appear, until the end of the season, and from four to five sprayings will be found necessary. In 1902 the vines were kept growing 18 days longer by spraying. The vines were sprayed on July 10th, July 22nd, July 30th and August 13th, and probably even better results would have been obtained if another spraying had been made.

Formula for spraying to prevent potato blight and rot:

Copper sulphate (bluestone), 6 lbs.

Unslaked lime, 4 lbs.

Water, 40 gallons.

Dissolve the copper sulphate with hot water or by suspending for several hours in a coarse bag in a wooden or earthen vessel containing four or five or more gallons of water. Slake the lime in another vessel. If the lime when slaked is lumpy or granular it should be strained through coarse sacking or a fine sieve. Dilute the sulphate of copper solution to about 20 gallons, and the lime mixture to about 10 gallons, and then pour the latter into the former, then dilute to forty gallons and stir the mixture thoroughly.

Stock solutions of copper sulphate and lime at the rate of 1 lb. to 1 gallon of water may be prepared and kept in separate covered barrels throughout the spraying season and diluted and mixed when needed.

While the potato beetles are active, 8 oz. of Paris green should be added to each 40 gals. of the Bordeaux mixture. The mixture should be applied by means of a spray pump with a good nozzle in order to get a fine spray, which is necessary to get best results.

A NEW GOOSEBERRY FRUIT WORM

BY

PROF. WM. LOCHHEAD,

O. A. C., GUELPH.

THERE is evidently a new pest working on the green gooseberries, the life-history of which I am not familiar with. This pest is working havoc in the plantations of Mr. Stanley Spillet, of Nantyr, and has caused most of his gooseberries to fall prematurely to the ground. My attention was first called to the work of this insect on the return of Prof. Hutt from an official visit to the Nantyr Experimental Station a few weeks ago, when a small box of infested gooseberries was handed to me with instructions to determine the cause of the falling of the fruit, and their premature reddening. Beyond these particulars there was nothing else that attracted attention, or indicated that anything was wrong.

Four or five days after the box was received the fruit began to soften at the core, and an examination showed the presence of a small caterpillar in every fruit. It had eaten away some of the pulpy tissue near the core, and the fruit had collapsed, and incipient decay had set in.

The caterpillar at this date (July 13) is between one-third and one-half an inch in length; is white, with a slight tinge of green; it tapers slightly towards both ends; its head and cervical shield are dark brown; each segment of the body has several (eight) little elevations, from the centre of each a hair arises; it has three pairs of true legs and five pairs of pro-legs, hence it is probably the larva of a moth.

The caterpillar occasionally comes to the surface, as exit holes are sometimes visible, and if a caterpillar is taken from one berry and placed on another it will soon make its way inside. As a rule, I think it prefers to

eat somewhat close to the skin of the fruit, rather than near the core.

The accompanying letter from Mr. Spillet shows how the pest is affecting his plantation. He very naturally would like to know if any other grower is suffering from a similar cause.

It is impossible to give the name of the pest at this stage of its life-history. It is probable that arsenical poisons will have to be used early in the season, just after blossoming, to control the pest, for once within the fruit it cannot be controlled. It is probable also that fall cultivation may be a means of destroying the hibernating stage, although this cannot be definitely ascertained until we know the full history of the insect.

Editor Canadian Horticulturist:

For four years the fruit of all the thin skinned American varieties of gooseberries has been dropping from the bushes just as they are fully grown. This falling has grown worse every year, till now almost every berry is down. At first I attributed this falling to drought and over loading, and resorted to close pruning and mulching to prevent it, but no change in results. E. D. Smith, M.P., of Winona, has had a similar experience. For the last two years I have had strong suspicion that this falling, which has now become serious (at first enough was left upon the bushes for a nice crop), is caused by the presence of a maggot in the berry, as every berry, after lying on the ground for a few days, has a dark spot appear upon the surface of the skin which gradually enlarges until the whole pulp becomes red, but not ripe. Again, the thick

skinned foreign varieties are never so effected.

A lady here informs me that she picked up a tin pailfull of these fallen berries, for they look all right when they first fall. She set the pail upon a table, where it remained all night. Next morning she was surprised to find the pail literally covered with small worms or maggots.

Upon his last official visit Prof. Hutt, of the O. A. C., took away a pint of those fallen berries to investigate, and following his instructions I have a pint put up in a glass jar with thin muslin tied over to see if any grubs make their appearance.

This year I have kept my bushes sprayed continually with flour of sulphur in the hope

that the offensive smell would prevent the fly from depositing eggs, but with only failure as a result.

Pearl, Downing, Champion and Red Jacket have not a dozen berries each left upon the bushes.

The first thing is to detect and know the fly that deposits this egg, for I have no longer any doubt of this being the cause.

It seems a great pity that just as we have got such a perfect variety as Josselyn that such a pest should appear upon the scene. I should like to know if others have their gooseberries effected in this way. Last year we lost about 25 per cent. of the crop, but this season 100 per cent.

Nantyr. STANLEY SPILLETT.

THE PRESERVATION OF FRUITS FOR EXHIBITION PURPOSES.

BY

PROF. H. L. HUTT, O. A. C., GUELPH.

MOST of the large exhibitions, as well as the smaller township and county fairs, are held at a time when nearly all of the small fruits are out of season. Consequently we seldom if ever see a good display of these valuable small fruits on exhibition. That they can be preserved in good condition for such a purpose was fully demonstrated by the display of strawberries, raspberries, currants, gooseberries, etc., made by the Ontario Agricultural College at the Pan-American Exposition at Buffalo.

We have at the college also a collection of fruits in antiseptic fluids, some of which were put up four years ago for the Paris Exposition, and others that have been in the jars seven or eight years and are still in good condition.

In the collection put up for Paris and

Buffalo neat glass jars of various sizes, with large mouth and glass stoppers were used, but for less pretentious exhibitions the ordinary glass fruit jars should answer the purpose well.

For the benefit of those interested in exhibiting fruits at the fall fairs, as well as for the many inquirers we have from time to time wanting to know how these fruits are kept, we give below brief directions for preserving fruits in this way.

The fruit should be carefully selected, and if possible shown on the branch just as it grew. This prevents it floating to the top, as it would if the jar were not full of fruit. Strawberries are best shown by picking them with long stems and tying the berries about a central twig so that each berry stands out separately. Care must be taken to avoid all bruising, and the fruit should be

arranged in the jar to show it to the best advantage. Usually most of the leaves on fruit clusters have to be removed. When the fruit has been placed in the jar the preservative fluid should be poured on so as to entirely cover all the fruit and fill the jar. The tops should be screwed on tightly, making it air tight. Neat gum labels may be used to show the variety. The printing should be large and legible, and the labels as small as possible to avoid covering any more fruit than necessary. To avoid bleaching as much as possible it is best to wrap the jars in paper and store them in a cool dark cellar till they are wanted for exhibition.

The fluids mentioned below are those recommended by Dr. Saunders, of Ottawa, for the preparation of the display at the Paris exhibition:

FLUID NO. 1.

Formalin (Formaldehyde). 1 pound (16 oz.): water, 44 pounds; alcohol, 5 pints. Allow the mixture to stand, and should there be any sediment, pour off the clear liquid and filter the remainder through filtering paper. This 2 per cent. solution of formalin or formaldehyde has been found very useful for preserving strawberries so as to give them a natural appearance.

FLUID NO. 2.

A solution of boric acid in the proportion of 2 per cent. Dissolve 1 pound of boric (Boracic) acid in 45 gallons of water, agitate until dissolved, then add 5 pints of alcohol. If the fluid is not clear, allow it to stand and settle, when the clear upper portion may be poured off, and the remainder filtered.

FLUID NO. 3.

A solution of zinc chloride in the proportion of 3 per cent. Dissolve one-half pound of zinc chloride in 15 pounds of water, agitate until dissolved, then add one and two-third pints of alcohol. Allow the mixture to stand until settled, then pour off the clear fluid and filter the remainder.

FLUID NO. 4.

Sulphurous acid, 1 pint; water, 8 pints; alcohol, 1 pint. Allow the mixture to stand, and should there be any sediment, pour off the clear liquid and filter the remainder.

List of fruits, with names of preservatives to be used in each case. Where two fluids are named, either may be used, but the first is preferred:

Strawberries—Solution No. 1, formalin.

Raspberries, red—No. 2, boric acid; No. 1, formalin.

Raspberries, white—No. 4, sulphurous acid; No. 3, zinc chloride.

Raspberries, black—No. 2, boric acid.

Blackberries—No. 2, boric acid; No. 1, formalin.

Cherries, red or black—No. 1, formalin; No. 2, boric acid.

Cherries, white—No. 4, sulphurous acid; No. 3, zinc chloride.

Currants, red—No. 1, formalin; No. 2,

Currants, white—No. 4, sulphurous acid; boric acid.

No. 3, zinc chloride.

Currants, black—No. 2, boric acid.

Gooseberries—No. 1, formalin; No. 2, boric acid.

Apples, green and russet—No. 3, zinc chloride.

Apples, more or less red—No. 2, boric acid.

Apples, white or yellow—No. 4, sulphurous acid.

Pears, russet—No. 3, zinc chloride.

Pears, green or yellow—No. 4, sulphurous acid.

Plums, dark colored varieties—No. 1 formalin; No. 2, boric acid.

Plums, green or yellow—No. 4, sulphurous acid.

Peaches, apricots, nectarines or quinces—No. 4, sulphurous acid; No. 3, zinc chloride.

Grapes, red or black—No. 1, formalin; No. 2, boric acid.

Grapes, green or yellow—No. 4, sulphurous acid.

NOTES FROM THE NORTH

BY

CHAS. YOUNG,

RICHARD'S LANDING, ST. JOSEPH'S ISLAND.

PERHAPS a few observations on how our fruit trees have come through the winter and the condition they are in at this date in the far away north may be interesting to you. Early in December, 1902, we had a sharp frost before the snow, which usually falls in sufficient depth to prevent the frost getting into the ground, consequently many half hardy plants, roses and shrubs, more especially those which have a tendency to keep on growing into the winter were badly frozen. None of mine have been killed outright, but when the dead wood was cut off this spring they were a sorry looking lot. By the way, tell your readers of the Canadian Horticulturist in New Ontario that the Rambler roses are not sufficiently hardy here. I am sorry to say don't plant them, but they don't ripen up their wood before winter, and covering them will not save them. Perhaps more of these roses have been sold in this district than all the other shrubs put together. Sold upon the recommendation of travelling tree agents that they were hardy as a poplar. It is a case of throwing away money the same as in former years, when we would not plant anything in the apple line except a Spy, King, or Baldwin, not one of which, as far as I know is alive to-day. The reason for this I will leave to some one with more horticultural knowledge than myself.

The winter, as a whole, was fairly mild, although we had a drop to 30 below zero, but there was plenty of snow on the ground at that time. Spring opened up early, or rather the snow went away sooner than usual, with warm, bright sunny days and hard frosty nights, ideal weather for mak-

ing sugar and inducing sun scald, but bad for fruit buds, the consequence is that most plums and cherries were destroyed in the bud. I found that the English Morello buds were less effected than even the Ostheim, which is supposed to be very hardy. Of the sweet cherry fruit buds which were strung along the branches, only a few opened, and then had not strength enough in them to form fruit. Pears came through fairly well, and apples uninjured. Of the small fruits, strawberries promise an immense crop, and there is plenty of moisture in the ground to develop it. Of the eight or ten varieties of raspberries, Cuthbert has as usual proved the most tender. Grown alongside of Brinkle's orange, both were frozen to the snow line, but the latter makes so much better growth in the spring and is so much finer in quality that for home use it is to be preferred to the former. Of the reds, Loudon is to be preferred to all others I have tried. Currants and gooseberries are a good crop. This would mean with you an extraordinary crop.

The crop prospects I might sum up thus: Fall apples, very good: winter apples, good; pears, fair (this would be poor with you); sweet cherries, none; sour cherries, good; plums, a few (native plums seem no better than European or Japan); raspberries, very good (tons of wild fruit will go to waste in the woods and along the roadsides); currants and gooseberries, very good; strawberries, very good (I expect 1 quart to the plant).

No insect pests have troubled us so far this year.

Civic Improvement

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

CANADIAN PARKS ALONG THE NIAGARA RIVER

NOT only all patriotic Canadians, but lovers of nature the world over, are more or less interested in the preservation of the natural beauties of Niagara. The policy of the Niagara Falls Park Commissioners, as outlined by Mr. J. W. Langmuir before the recent convention of the American Park and Out-door Art Association, shows that the commissioners are aiming at making the Niagara frontier a beauty spot that Canadians may be proud of. Mr. Langmuir's address was intended in some measure as a reply to those who have criticized what they called vandalism on the part of the Canadian commissioners for allowing the various power companies to cut up the Queen Victoria Park. In the course of his address he referred to the financial difficulties which the commission had had to face and the happy solution of these by the concessions to the power companies and others, which in a short time will provide an annual revenue of about a quarter of a million dollars. This the commission proposes to expend in developing the beauty of the river front, in preserving the natural conditions in a locality so historic, and making it the resting place of tired millions who come to see it.

In concluding his address Mr. Langmuir said:

Will you permit me to venture to take an outlook into the future, the near future. I hope, and picture in your mind's eye the completion of all the plans and projects of the Park Commissioners on the Canadian side of the river. It is doubtless known to some of you, at least, that the river bank from Lake Erie to Lake Ontario is vested in the commission. This reserve, now in the process of being made the full width of 66 feet at all points, will be completed. The bank of the river protected from erosion by the construction of an electric railway on the shore line from Lake Erie to the park, a well-constructed and well-kept road, ornamented with shade trees along the entire bank of the river, forming an avenue to Queen Victoria Park. Within the park the works of construction in connection with the power plants completed, with only two artistically designed power buildings in sight, the river bank along the upper roads, the Dufferin islands, and the entire grounds above the Falls restored and beautified to correspond with the finished portion of the park overlooking the cataract. The unsightly buildings overlooking the Falls, in one of which we are now sitting, torn down, and a fine, artistic structure for shelter and refectory purposes erected, and the whole of the grounds, roads and walks in the park

brought up to the highest standard of æsthetic taste. Then, passing from the park surrounding the Falls to the lower gorge of the river, with its magnificent grandeur from the base of the cataract until its majestic banks and rushing waters merge into the quiet scenery of the lower river, we come to the Niagara Glen, immediately north of the whirlpool, comprising 100 acres of territory, unique in its unrivalled and primitive wildness, which by the construction of roads, walks and means of access will have become one of the most fascinating resorts in the gorge, as well as a very paradise for botanists. The Queenston Heights Park, with its grand panoramic

views, will be completed and restored, from the historic monument on the summit to the shores of the river below, with the whole river gorge, from the Falls to Queenston, improved and restored and its magnificent views and vistas opened up. In fine, the whole shore of the Niagara river, from Lake Erie to Lake Ontario, will be restored and converted into one continued series of avenues and parks for the recreation and enjoyment of the millions of overworked and tired humanity, where they can come for a time from the turmoil and toil to this Mecca of peace and quietness, to commune with the majesty of nature and the eternal.

BRAMPTON'S NEW PARK.

THE modern idea that parks and pleasure grounds are a necessity in the upbuilding of a respectable town or city is fast gaining ground.

We are glad to be able to record the fact that the town of Brampton, which has long been famous for having one of the largest set of greenhouses on the continent, is now

the possessor of one of the finest park properties to be found in any town of its size in the Dominion. This it owes to the generosity of Mr. W. J. Gage, the well known publisher of Toronto, who, on Dominion day donated to the town for park purposes a valuable property adjoining the county buildings costing \$20,000.

WOMEN'S CLUBS.

THE ladies of our Horticultural Societies might profitably form themselves into a club for the discussion of questions of Domestic Science or Home Sanitation. The following subjects for such clubs are suggested by Home and Flowers:

1. What can a woman do for improved sanitation?
2. Discuss the water supply of the neighborhood.
3. Discuss impurities of the soil about a dwelling and danger therefrom.
4. Consider the best location for sleeping rooms.
5. Is there any public or neighborhood

nuisance which threatens the health of the neighborhood? Is there any preventive to be had?

6. Discuss the best means of ventilating the rooms in a home.

7. Are the children exposed to any danger from disease in the surroundings at school? Appoint, if necessary, a committee to investigate this. Can individual drinking cups be supplied in the school? Are the floors of the schoolroom kept free from dust? Do the children sit in draughts? Are the outbuildings in a sanitary condition?

8. Is the care necessary for exquisite cleanliness conducive to the happiest homes?



FIG. 2634. A BEAUTIFUL STREET IN DAYTON, OHIO.

COMMERCIAL BODIES AND CIVIC IMPROVEMENT.

BY

E. L. SHUEY,

IN "THE HOW OF IMPROVEMENT WORK."

THE day is past when improvement of home surroundings is wholly a matter of private choice: when only an occasional "sweet will" decides whether weeds or flowers shall grow over the premises and sidewalks, and whether the principal ornaments of the rear yard shall be tin cans.

Neatly kept yards, well trimmed sidewalks and clean streets are now regarded as high evidence of the city's prosperity as much as large factories, and are one of its best means of attracting desirable citizens. The city must advertise as well as the business man to-day if it would attract capital, good men and women and law-abiding citizens.

Efforts are made by many cities to draw factories and business enterprises to settle within their limits. The advantages of railroad and steamboat communication, the nearness of markets or of raw material, the excellence of labor—all are arguments frequently used with manufacturers and investors to prove a city's opportunities. But in recent days it has been recognized that another element must be named: attractiveness of the home life, the beauty and healthfulness of the city, the excellence of its schools. All these are now seen to be essential to the growing town. In view of this, the improvement and beautifying of the city streets, parks, boulevards, and even of its yards and houses, become matters not

simply of individual preference but of public concern. The investment in attractiveness is no longer municipal extravagance, but prudent expenditure, hence the organization of improvement associations, usually composed of people of a neighborhood, or in smaller cities of an entire community, has come to be a recognized method of encouraging an *esprit de corps* which is essential to the best growth. Such societies have as their purpose not only the beautifying of external conditions but also general improvement and instruction. The Neighborhood Improvement Association is not, it is true, a recent form of organization, but its exten-



FIG. 2635. A CORNER IN GROUNDS OF WESTINGHOUSE AIR BRAKE CO., PITTSBURG, PA.

sion and importance are more fully recognized at this time.

The improvement association seeks the general good and asks assistance from every class of kindred social, educational and civic organizations. In the list of the possible helpers are the commercial and municipal bodies of many cities. While these are formed voluntarily or by law for the promotion of business enterprises or for legislation for the city's government and the moral, physical and financial safety of the corporation, yet the application of these functions is wide and varied. Local and municipal

bodies—city, town and village councils, etc.—have it within their power very materially to assist these organizations by encouraging and passing well planned ordinances for securing the general purpose for which they are formed so far as they pertain to common interests.

It is within the power of these civic bodies

(1) To see that the streets and alleys are kept neat and attractive;

(2) To provide for the collection of garbage, refuse, etc.

Both of these are important, not only for the sake of appearance, but more especially for the sake of the general health of the community. With good laws, well enforced, backed by the interest of active improvement associations, a town may be revolutionised in a short time. Without the active assistance of well organized, interested citizens, it is difficult to enforce even the good laws. An improvement association is an excellent director of public opinion and educator of personal interests.

(3) To make reasonable but exact rules for good sidewalks, roadways, planting of trees, etc.

(4) To provide for parks.

(5) In short, to put into the form of ordinances and to provide for their enforcement, proper laws for municipal care of public health and improvement, and to enlist members of improvement associations or similar organizations in their best development.

It is important that the work be in harmony, remembering that members of other societies often are willing to give freely of their time and effort to encourage this feature.

In almost every city, the boards of trade, the commercial clubs and similar organizations are the representative bodies for business purposes. Their object is the proper advertising of the city's interests. No better means can be used to accomplish this

purpose than that suggested by the encouragement of the organization of improvement associations within the limits of the city. This is as legitimate a purpose as any scheme for public welfare can be. It is therefore suggested that members of this organization ought

(1) To become familiar with the plans for home and neighborhood beautifying of other cities through a committee on improvements.

(2) To encourage the organization of improvement societies in the city, having one for each neighborhood if the city be large enough. It is necessary that some one take the initiative and give the movement the benefit of well organized beginnings. It is important, too, that there be a body easily reached, to which definite information may go till the improvement society has found its place. What more natural than that representative organizations of the city's interests should foster a definite movement of this kind?

(3) To assist by influence, counsel and funds in practical organization of improvement societies among property holders. A society of this kind will do better if given sufficient means from the beginning to follow up its work of encouragement, prizes for good work, examination into conditions, dissemination of information, and the score or more of directions into which it may extend its efforts.

(4) To bring proper pressure to bear upon factory owners to assist in the beautifying of their neighborhoods, thus emphasizing the attractiveness to the sturdy laboring classes of the city itself. It may be difficult to attain this directly, either by law or by effort of commercial organizations, but neighborhood organizations—which interest employer and employe—will often attain it. There is no longer any reason for the existence in most cities of the ugly, unsightly and disgraceful appearance of



FIG. 2636. WASTE PAPER RECEPTACLE.

Devised by one of the Members of the Springfield, Ohio, League. The advantages are a cover with spring hinge, and the ease with which the can can be lifted from the pole and replaced. The back of the can is shorter than the front which makes it fall over if not hung in place.

many factories and their neighborhoods. Unite the people of the neighborhood for a common purpose, interest the factory owner at least to the extent of cleaning and beautifying his own premises, and the results are soon attained.

5. Encourage the union of local societies with other societies through the league, for mutual information and assistance. Nothing will bring better return than this work and contributions for club funds for the purpose. The difficulty in the past has been the isolation of the organizations and the waste of energy through lack of knowledge of what others attempted. It is the aim of the National League, with the encouragement of commercial organizations and local societies, to unite their efforts and to disseminate information.

With such a union of effort of all local bodies organized for the city's good, there must come some excellent results—and the city's good name greatly magnified. Numerous are the illustrations of its excellent advantages, proving that the reasons here given are not theory but practice.

In this present age great interest is mani-

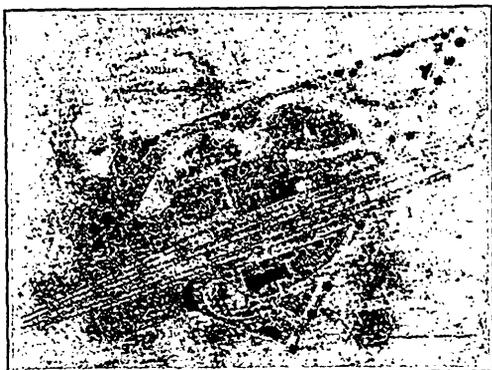


FIG. 2637. MILLIS, MASS., RAILWAY STATION GROUNDS.

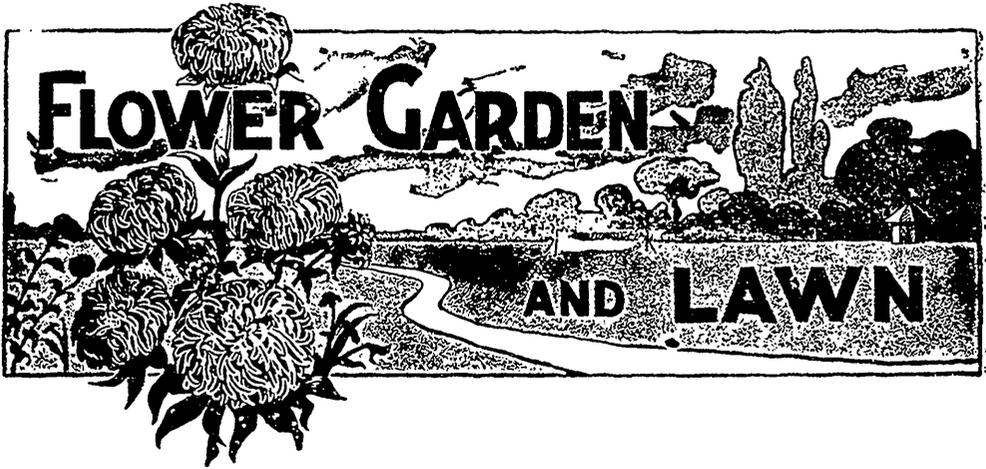
festated in railway stations and the grounds about them. The more cultivated tastes of the traveling public demand beauty of surroundings. Whether that beauty be simple or ornate depends upon the situation. The public at large does not care to enter a train from a marble palace in the city and be dumped on a dark, ill-smelling platform at

its home station, the station itself looking like an immigrant depot. Railway companies are awakening to a sense of their responsibilities in this regard, and a few well planned stations and grounds may be found in the United States. The Millis, Mass., railway station and the grounds about it were designed by Mr. Edward P. Adams, landscape architect, of Boston, Mass. The drives are graceful, and so arranged that a blockade of vehicles cannot occur. Shelter is provided for horses. A novel but excellent feature is the library and reading room on the second floor, for passengers and employes. This, and the pretty little parks about the station proper and about the freight ase across the tracks, makes waiting for a train a thing to be born with equanimity. Instead of an eyesore to this village of less than a thousand inhabitants, the station is its pride.

A RELIABLE ROSE.

ONE of the most beautiful and reliable roses in cultivation is the Mrs. John Laing. My experience with this meritorious variety in the nursery has been very pleasant and satisfactory in every way. I had it planted in nursery rows with other valuable sorts and was surprised and delighted to see it bloom so strong and continuously. The roses are large and very full, of a grand, clear bright pink color. The fragrance is delightful, and this, with other attractive features, makes it a general favorite with those who see it. The plants are

strong, vigorous, and begin to bloom early and continue to bloom until very cool weather. Last year my bushes were full of buds and others just opening, October 16. During several very cold nights, frosting and freezing water slightly, the roses were not affected. To keep for very late flowers I place a few paper bags over the buds at night and tie them on to prevent being blown off. The Mrs. Laing has great beauty and exquisite fragrance, combined with hardihood and a propensity to continuous blooming.—*Farm and Home*.



FLORAL NOTES FOR AUGUST

BY

WM. HUNT,

O. A. C., GUELPH.

FREESIAS.—Bulbs of these sweet-scented little Cape flowers should be potted now so as to be sure of a few sprays of their deliciously perfumed blossoms during the Christmas holidays. Plant about five bulbs in a four or five inch pot in fairly light rich loamy soil. The bulbs should be planted so that the pointed tips are just under the surface of the soil. A few pieces of broken pot, gravel, or coal cinders may be placed in the bottom of the pot before filling in the soil, so as to secure good drainage. Give the soil a good watering after the bulbs are potted, but do not give them any more water until the soil shows signs of dryness. Stand the pots outside in a partially shaded position where they do not get the full heat of the sun's rays during the hottest part of the day. As soon as the grass-like foliage begins to appear above the soil, water may be given them more frequently. Take the pots indoors early in September before the frost touches them. There is nothing more ac-

ceptable in a window of plants than a pot of freesias when in bloom, and the bulbs are so inexpensive and easy of culture that no plant lover should be without a pot or two in the window or greenhouse. The bulbs also under proper treatment renew and even increase in numbers from year to year, a fact that makes them of even more value than many of the winter and spring flowering bulbs.

EASTER LILIES.—These showy sweet-scented favorites, that are in such demand through the winter, and more especially for Eastertide decorations, have not of recent years been such an unqualified success as they were fifteen or twenty years ago, when *Lilium Harrisii* could frequently be seen six or seven feet in height and bearing eight or ten of their beautiful white blossoms, but recently plants three or four feet in height with even three or four perfect blooms are oftentimes difficult to obtain. The lily disease is responsible for this change, and there seems to be no certain remedy for the dis-

ease at the present time. If any of our readers, however, desire to try a bulb or two of either *Lilium Harrisii* (Bermuda lily) or *Lilium longiflorum*—which is considered by many growers to be less liable to disease than *L. Harrisii*—they should be secured as early as possible to have them in flower at Easter in the window. A seven inch pot for the largest size bulb will be necessary, whilst a six inch pot will do for a second size bulb. The method of potting, soil, and future treatment as recommended for the Freesias will suit the lilies mentioned.

WINDOW BOXES AND HANGING BASKETS.—These will require plenty of water, as the plants will by this time have a mass of roots to absorb the moisture, as well as a large amount of growth to support. The soil in them will also have become very much exhausted. An application of liquid manure, made from fresh cow manure prepared as described in July number of *Horticulturist*, will be found a good stimulant that will help to carry the growth and beauty of the plants through until late autumn.

PANSIES.—If early blossoms of these pretty bewitching flowers are wanted early next spring, the seed should be sown now. Sow the seed in a shallow box, about two inches deep and of required size. Place the box in a partially shaded place until the plants have attained their fourth leaf, when they should be transplanted into a cold frame, where they can be given the protection of a sash, or of even a few boards during severe weather. A box about ten inches deep and minus the bottom boards, placed over a good rich spot of soil in the garden will answer very well to winter a dozen or two of pansy plants in.

PELARGONIUMS.—Plants of these spring

flowering favorites should be cut back some time in August. Prune them back to within an inch or so of the two-year-old wood. Give them very little water, keeping the soil barely moist until growth commences. As soon as the new growth is about a quarter of an inch in length, they should be repotted. Shake all the soil from the roots and repot them into soil to which nearly one half of fine sharp sand has been added. Give them a size smaller pot than they have been growing in, and do not over water them until growth has well started. When the growth is about two or three inches in length, repot them into pots two sizes larger, using a rich loamy compost and some pieces of broken pot for drainage. The new growth can have the tops pinched off once or twice during the winter if it is inclined to grow spindled. Pelargoniums, or Lady Washington geraniums as they are sometimes called, are very liable to attacks of aphids or green fly when in the window. A strong solution of tobacco water, or fumigating the plants with tobacco smoke, will destroy these pests to window plants. Keep the plants outside until early in September until danger from frost is probable. The shelter of even a sash and frame for a few weeks in early autumn is often preferable for many other plants besides pelargoniums, as oftentimes we have several weeks of beautiful warm weather after the middle of September, when many plants that are to winter in the window or greenhouse will do much better out in a cold frame or somewhere where they can be protected from slight frosts if necessary. But care must be taken to watch the thermometer closely for sudden changes in temperature, or possibly the plants may be exposed for just one night too many and be nipped by the frost.



FIG. 2638.

TUBEROUS ROOTED BEGONIAS

BY

WM. HUNT,

O. A. C., GUELPH.

AMONG the almost innumerable varieties and types of flowering begonias now grown, there is none more deserving of attention or more beautiful for summer decorative purposes than the tuberous rooted varieties. Whether grown as pot plants entirely, or started early in the season in pots and then transferred to the flower bed or border later on; or if even the dry tubers are put at once into the open ground at the proper season, they will, with only average attention and care, and a fairly suitable position given

them to grow in, give a grand display of their beautiful and showy wax-like blossoms, both single and double, and in such a variety of shade and color that well repays the flower grower for the comparatively little skill and care required in their culture.

And yet how very few amateur plant growers there are who are thoroughly successful with them. Some can, however, grow them to perfection, as is evidenced by the splendid specimens that are seen at almost every floral exhibit that I have had the pleasure of judging; specimens that had

been grown entirely in a window, or in a sheltered position out of doors, or perhaps in a cold frame.

The collection of Tuberous Begonias at the O. A. C. was possibly the one feature that attracted the most attention and excited the most admiration amongst the forty or fifty thousand excursionists who visited the college greenhouses during the recent June excursions. The fact of the intense interest shown, and the many questions asked as to the culture of these begonias, has led me to write the following brief notes regarding their care and treatment. The accompanying cut (Fig. 2638), from a rather poor photograph of a group of these plants at the O. A. C., will give some idea of the floriferous habit and the beautiful foliage of the tuberous begonia.

SELECTING TUBERS.—Select good, firm, sound tubers; pulpy or soft tubers seldom produce good healthy plants, even if they grow at all. The best time to procure tubers is when they are dormant and just before they start into growth. Late in March or early in April is about the best time to secure them, as that is the time they start their growth as a rule, after having been kept dormant and dry all the winter.

STARTING TUBERS.—Start the tubers in April in small pots. A pot about three times larger in diameter than the tuber will be about the size. Use plenty of small broken pieces of pot or fine gravel stones for drainage in the bottom of the pot, one-third full will not be too much. Use a mixture of soil composed of one-third part of fine sharp sand and two-thirds of light, rich loamy potting soil. If soil of a heavier nature is used, use fully one-half sand, well mixed with the same quantity of soil. When potted, the top of the tuber should be about on a level with the surface of the soil. Give sufficient water to thoroughly moisten all the soil in the pot, and do not give any more water until the soil shows signs of dryness,

but do not on any account allow the soil to become dust dry. Keep the soil barely moist until growth has well commenced, when water can be given a little more freely. Stand the pot in a warm place in the window or greenhouse, but in such a position that the sun does not strike directly on it, especially during the hottest part of the day, as the sun will scorch the leaves, more particularly if they are damp from recent watering.

In about three or four weeks from the time of starting the tubers they will probably show a little growth. As soon as the growth has attained to about three inches in height, the tubers will most likely have grown a sufficient supply of roots to allow of the plant being repotted. This can be ascertained by carefully knocking the plant out of the pot to examine the roots. If a good supply of roots has been grown, the plant should be potted on into a pot about two or three sizes larger. A well established and nicely rooted plant will require a pot fully three sizes larger than the one it was started in.

REPOTTING.—In repotting use a little less drainage; an inch of drainage will usually be sufficient. Good loamy soil, fairly well enriched with dry cow manure and about one-sixth part of fine sand mixed with soil will make a good soil for these begonias to grow and flower in. Press the soil fairly firm around the roots of the plant, being careful not to break the ball of earth around the roots or damage them when repotting. Water the plant thoroughly once after repotting, and do not give water again until the soil shows signs of dryness. When growth has freely commenced the plant can be watered more frequently, but too frequent and too heavy waterings before growth has well commenced, and allowing the sun to strike directly on the foliage, especially after watering, are oftentimes the cause of failure in the culture of begonias.

AFTER TREATMENT.—A temperature of 60 to 65 degrees and a partially shaded position, well sheltered from strong draughts and high winds suits these begonias, whether they are grown in the window or out of doors. Sweeping winds are even more harmful than the sun when the plants have become hardened, but partial shade in the hottest part of the day is very beneficial if good blooms and clear, clean foliage is desired. A cold frame covered with a sash thinly shaded with a coat of whitewash and the frame placed so that it slopes and faces towards the north will suit tuberous begonias very well during the hot summer months. The sash can be removed during the hottest part of the day to advantage, more especially if the plants are shaded slightly from the direct rays of the sun. Plenty of ventilation by tilting the sash should be given both night and day, as these begonias dislike a too close humid atmosphere to grow in. Partial shade, careful watering, plenty of air, shelter from winds, and a fairly rich light loamy soil are the main essentials necessary for the successful culture of the tuberous begonia.

DRYING OFF AND RESTING TUBERS.—Towards fall, when the flowers and foliage begin to look shabby and rusty, less water should be given the plants. When the foliage has become nearly yellow and the flower stems begin to decay, no more water should be given them, but they should be removed to a dry warm shed and kept quite dry and free from frost. A dry temperature of about 45 or 50 degrees suits the tuberous begonia splendidly when dormant in the

winter, but at no time should either the growth or the tuber be exposed to a temperature below 40 degrees.

Where a number of these begonias are grown it is customary to shake the tubers out of the soil and pack them in sand, charcoal, etc., but I have had the best results by allowing the tubers to dry off in the soil they have grown in, and by placing them away in the pots in a dry cool temperature 15 or 20 degrees above freezing point, and keeping the soil perfectly dry during winter until the following spring, when they are shaken out of the pots and treated as I have described.

I have omitted any mention of the starting of these begonias from seed, as I consider their culture from seed is not only a delicate operation to be successfully carried out without the aid of a green house or at least a sash and frame, and as the tubers can be purchased very cheaply when dormant and give quick results, it is scarcely worth while waiting for the more tedious and uncertain results attained when the plants are raised from seed, as it would take at least two seasons before seedling plants could be had in flower if the seed was started in pots in the window.

Tuberous rooted begonias are decidedly an amateur's flower, and are much easier grown than many varieties of window plants if given only fair treatment in their culture. Too much water, when the tubers are first started, and improper drainage is too often the cause of failure in the culture of the tuberous begonia.

THE HOME GROUNDS

A FRIEND, who has spent some money and much time on his home grounds, is not satisfied with the result, as the effect is not what he supposed it would be. He supposed that a lawn primarily meant an expanse of grass surrounded and partially covered with trees and shrubs. We say, "we will walk on the lawn," and the thought of soft, velvety, close-shorn grass is immediately present. William Robinson, the noted English landscape gardener, speaks of it as a garden, while to give the true idea of it to people on this side of the ocean we must call it the home grounds. A good lawn includes trees, flowers, shrubs, rocks in some localities, etc., and the value and effect of a lawn consist in the arrangement of these things. Mr. Robinson advocates, in the garden, the treatment of the "garden" in a manner which will harmoniously unite it with the landscape beyond, thus making a beautiful whole of the near and distant surroundings of the house. The house must be architecturally in harmony with the locality, and then the grounds, before and behind the house, if there be room, must correspond with the architecture of the buildings, and with the topographical and other points of the landscape to be seen from that point. If everything is in harmony, according to nature's work there, the lawn effects will be satisfactory to the artist and to the unskilled as well. The front doorstep is a good point ground. And if there be any landscape before which to study the lawn, and its back behind the buildings it must be studied from the back stoop, if there be one.

VIEWED FROM THE FRONT DOOR.

The planting of the lawn, therefore, must be planned from the view at the front door. In general terms, it may be stated that, as a

rule, the front lawn must be an area of grass, bordered by trees, shrubs, and sometimes flowers. The friend mentioned planted his trees and shrubs mathematically distant from each other, and in regular lines. The trees have grown to a good size, and now all distant points are shut out from view, and the turf of the lawn has become spotted and uneven in color. He forgot when he planted his choice trees that they would some time grow to large size, some of them at least, and so now he is "cabined, cribbed, confined" in a shady grove, with no outward look. The ground was made fertile and deeply worked, and the plants were well and carefully set, where himself and his hired man decided they would best be placed. The future prosperity of the trees was well provided for, but no account was made for ultimate size. Any good landscape gardener would probably have suggested to him that with care such trees would grow tall and wide, and that they should have been so planted that the beautiful distant views should never be completely hidden. The popular notion that a lawn is a place for us to treasure beautiful trees, flowers and shrubs, is entirely misleading, being too narrow, so that in attempting to get and preserve beautiful things we deform our grounds, whether they be large or small. We are apt to plant too much, and to spoil beautiful pictures which would be far more attractive than the possession of rare plants, often too crowded to preserve their natural beauty and real value. Open outlooks are frequently lost through the ambition to have a fine specimen of some rare tree or shrub.

TO BROADEN THE OUTLOOK.

As far as practicable, the lawn should be so planted that it may seem as wide as possible to be made. Planting the borders in clumps with peninsulas of grass running

into and apparently behind them makes the lawn look as if it extends outward indefinitely, adding materially to the broad effect where the area is decidedly limited. These points of turf can be put where there is a line of view to a beautiful distant landscape, and so be made doubly useful. A New Hampshire man whose lawn was large and set full of trees and shrubs, found that his house was too much shaded for good health. So he employed an intelligent Boston landscape gardener to advise him what best to do to keep a good lawn and also plenty of sunshine. Most of the trees around the outside were left, some needing a little pruning; the trees in the central portions were dug out, and the shrubs were dug out and planted in masses in the corners, leaving an open area of grass which looked larger than the original lawn, and giving unobstructed views of neighboring hills and mountains in three directions, and yet when the grounds were viewed from a neighboring hill they appeared to be as shady as they were before any improvements had been made. A berberry hedge along the street in front was left, so that the effect of an enclosed English "garden" was retained, while the apparent size of the grounds was doubled, as viewed from the street. A lawn mentioned by Jacob Riis in his "Making of an American," as "decorated" by cast-iron flogs, has recently had half its trees cut out, and yet those left are so scattered about the lawn that it impresses the observer with a sense of confinement, or crowding, while a neighbor's lawn, not two-thirds the size, is so planted that it appears much the larger of the two. Just beyond is a lawn cut in two by a row of hydrangeas and golden elders, so that from the street the house appears to be set in a small lawn back from the front, more retired and cut off from view, than the New Hampshire one not so large, with its berberry hedge in front. The general effect is spoiled, as far as landscape

beauty is concerned. Such instances are too common, and from them one may learn how not to do it.

TREES SHOULD BE IN HARMONY WITH SURROUNDINGS.

It makes little difference as to what trees and plants are used, provided they are so placed that they are in harmony with the surrounding conditions. But it is generally better, in order to secure satisfactory results in the long run, to use trees and shrubs native to the locality. The white spruce of Northern New York is quite sure to live to a much greater age, and to retain its symmetry, than the Norway spruce, which is generally used because it grows faster, costless to propagate, so is cheaper at the outset. In 30 to 50 years the Norway spruce will begin to fail, while the native sort will scarcely have attained maturity of growth, and then it will retain its beauty another half century or more. In arranging the trees the largest (when full grown) are to form the background of the plantation, being careful not to plant so as to hide fine distant views in the future. Then, as far as color is concerned, the darkest foliage should be farthest from the viewpoint.

FLOWER BEDS.

The flower beds, if any, should generally be placed against the foundation walls of the house, or along the borders of the shrubbery. A small lawn will look large and wide if no shrubs or flower beds are cut into the expanse of turf, because the eye has no scale of measurement, while if two or three flower beds or mounds of cannas or bulbous flowering plants are set in the middle of the lawn, the ordinary eye easily estimates the distance between the beds and the border of the lawn, and so it looks limited. The more the beds or shrubs are multiplied, the smaller seems the lawn to the inexperienced eye. In all cases, whether at the first plant-

ing, or in making changes, the matter should be studied up from the front door steps, or from the most common point of view for the family, and the work must be so done that there shall be an unbroken expanse of green in the middle, with the trees and shrubs and flower borders around the outside, thus getting the biggest handsome picture possible under the circumstances. We do not want a haphazard, inartistic dotting about of plants on our lawns, nor a Parisian rug, nor a set piece of mathematical patchwork. Neither, on the other hand, do we want a tangled wildwood. We want a solid background of dark green, with a scattered mass of lighter green flowering branches and the shrubbery nearer the eye as a stand or set in our favorite place at the

house. If the neighboring lawns or fields are naturally or designedly beautiful, the boundary lines of the home grounds can be set sparsely with strips of grass between, so as to make the lawn seem to extend far away. But if the adjoining areas are unsightly or neglected, then the boundary should be set so thickly as to hide the nearby property, except where there is a fine distant scene, and then low shrubs can be made to hide the near undesirable spots. In all cases the arrangement should be as unartificial as possible, unless the buildings are large and architecturally ornate, when an artificial planting arrangement is proper and often desirable.—*D. A. A. Nichols, in Weekly Illustrated Buffalo Express.*

RUDBECKIA, GOLDEN GLOW.

IN the year 1898 I photographed a group of Golden Glow, Rudbeckia, and the picture is here reproduced. This species has now been widely disseminated, forming one of a trio of most excellent recent introductions, *Hydrangea paniculata grandiflora* and *Clematis paniculata* being the other two. It is a singular fact that they all bloom late in the season, when most needed, and are all of the easiest culture. Each requires an ample supply of moisture for the best results, and are perfectly hardy. Luckily they combine three divisions of plant life, the shrub, the perennial and the vine. Japan furnishes two of them and the western prairies the third, the *Rudbeckia laciniata* fl. pl.

We are all familiar with the black-eyed Susan, the *Rudbeckia hirta* of the botanists. *R. laciniata* is a near relative, and in its typical form somewhat resembles it, except that the disk flowers, those minute blooms covering the cone, are a dull greenish color, instead of yellow, and the whole flower larger.



FIG 2640. GOLDEN GLOW.

In the doubling up of the Golden Glow, these disk flowers have changed into ray flowers. The black-eyed Susan will thrive in dry soil, but the other being indigenous to the borders of swamps and low meadows, requires a fair amount of moisture. The origin of this double form is yet unsolved. About 1894 John Lewis Childs found it in his grounds among some unknown plants sent him by some of his customers. From it he increased the stock that has, in the main, reached the gardens of the United States and Europe.

While I bought three plants in the spring of 1896 from Mr. Childs, I had three given me in the fall of 1895 by Mr. Jensen, the superintendent of Humboldt Park, Chicago, who called it a double *R. laevigata*. Childs gave it the name Golden Glow, and I bought from him in order to compare it with those received from Mr. Jensen. They proved identical. Mr. Jensen had seen, in the fall of 1895, a large clump of it in the garden of a German in Chicago who had received it a year or so before from a relative, and traded some geraniums for a few roots. This traces it back to 1893 or 1894. At this later date it was blooming both in Mr. Childs' place and in Chicago.

A writer in an English paper about a year ago claimed that it was introduced to English gardens nearly twenty years ago under the name *R. laevigata*. Mr. Falconer in an editorial note in *Gardening* dispels this illusion in a clear and forcible manner. The mere fact that a plant so attractive in all its parts, so hardy in constitution, so readily grown and rapidly increased, was unknown in this country until within the past few years, even in the largest collec-

tions and among the most intelligent professionals and amateurs, is evidence enough that it was not known in English gardens twenty years ago.

The group illustrated is composed of three plants obtained from Mr. Childs which were placed in their present position in the spring of 1896. Some young plants from the outside of the group have been taken away. The group is supported and protected from damage by the winds by an iron hoop four feet in diameter placed about four feet from the ground and fastened to four strong stakes set among the plants. This is put in place when the plants are some five feet high. The hoop—which is of round iron—is slipped over nearly all the plants. Enough of the outer row of stalks are left outside the hoop to hide it and the stakes; these are then distributed evenly along the hoop and tied loosely, allowing each stock three or four inches play. When a heavy rain, accompanied by winds, comes they are apt to become top heavy and may break. In such cases I run temporarily a heavy but soft string around the whole group, well up towards the top, and draw it in quite closely—thus bunching it as one would a sheaf of wheat. This is removed when the storm is over and the blooms dried off. In this way one stalk supports the other and damage is seldom done. It is such a striking ornamental group upon the lawn that it pays to devote some extra care to it. The drip from a lawn hose connection is carried under this group by tiles, thus affording it an extra amount of moisture. Where plants are not given enough water the blooms are much smaller.—*Gardening*.

BUDDING ROSES

ONE of the easiest and best ways to propagate roses is by budding. I have the *Hermosa*, and desiring to make more plants of the same kind, thought I would try budding it on the wild rose; having one near by, I inserted two buds of the *Hermosa* about the middle of July, and in about three weeks they measured ten inches in height, and had buds almost ready to expand: since then I have given them but little care and attention, but they still continue to bloom, and are in good condition for winter. Although I had never heard of any one budding the rose, my experiment proved a grand success.

The process of budding is the same as that of the peach, pear, apple, etc., which has been explained through the columns of this paper before, but for the benefit of new subscribers, or those who perhaps did not observe closely the process, I will give an explanation with illustrations.

Select a bud from the rose you wish to propagate, and cut about one-fourth of an inch above and below the bud, taking out an elliptical piece with a little wood beneath it, as shown in Fig. b.

For the stock, take any hardy or wild rose, cut a T-shaped incision through the bark near the roots (Fig. a), carefully raise the ends or bark of the incision and insert the bud; then wrap firmly above and below the bud with a strip of cloth about one-fourth of an inch in width, commencing at the bottom and passing above the bud, returning again and tying just below, covering all but the bud, as shown in Fig. c.

In about ten days after budding, if done in spring or early summer, unwrap it, and if the operation has been successful, which it is most sure to be if properly done, cut the old stock off about two inches above the bud; and when it has made a new shoot, tie

it to this stump to make it grow straight.

If budding is done in August or later, re-wrap in about ten days, and let the bud and stock alone until spring, then cut off the stock above the bud, and encourage growth. The bud will not start till the following spring, though its union with the stock can readily be distinguished by its plump and fresh appearance.

Buds of different roses, red, white, crim-

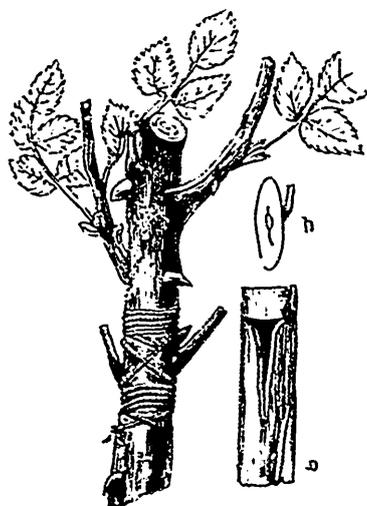


FIG. 2641.

son, etc., may be inserted in a single stock, thereby producing a rose tree of many colors.

It is not necessary to bud on the wild rose only, but if you have some other single rose you wish to improve, insert a bud or buds of some nice variety, and I think you will be pleased with the result.

Every lady reader should try this mode of propagating, for it is very simple, and easily done, and you can have a rose ready for bloom in the same length of time it would require a cutting to form roots.—*Farm and Fireside.*



The Canadian Horticulturist

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

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WELCOME HOME.

It has not yet been announced in the Horticulturist that the Editor has been absent for the past three months enjoying a honeymoon in Europe. We are pleased to state that after an enjoyable tour of the Old World, Mr. Woolverton is expected to return early next month, when he will resume his accustomed charge of our journal. It is not too late, on behalf of all the readers of the Horticulturist to wish its home-coming editor many years of personal prosperity and happiness, as well as added years of usefulness as its popular and efficient editor.

THE SPRUCE GALL LOUSE.

SIR.—Your attention has no doubt been directed to the fact that many spruce trees, widely used throughout the province for ornamental purposes, are dying. In some cases the limbs begin to die

next the trunk and extending gradually out to the tip, and in other cases the outer portion of a limb will die first and then the trouble will gradually work inward till the limb is quite dead clear to the trunk. Certain limbs are attacked while many others remain quite green and healthy looking, but gradually limb after limb is attacked until the whole tree is destroyed. Is this caused by some insect pest, or what is its cause—and what is the remedy? I shall be very greatly obliged if you will favor me with any information which will enable me to save some fine, well grown trees on my front lawn, which are being attacked in the way I have described.

Oshawa.

L. K. M.

Answered by Prof. Wm. Lochhead, O. A. C., Guelph.

It is difficult to state definitely the exact cause of the dying of the spruce trees from the description, but I venture to suggest that the cause is the Spruce gall-louse. Mr. M. does not state a characteristic of the work of the gall-louse, namely the gall-like growth on the terminal twigs. The

insect, according to my observations, works on the outside, and not near the trunk. The terminal twigs will often curl from the effects of the unequal growth. In my experience also the limbs do not readily die for some time as far in as the trunk. With regard to treatment of the gall-louse, the infested twigs may be cut and burned about the first week in May, when there is a woolly secretion on the twigs containing many eggs. About ten days later a soap solution may be applied if the cutting has been neglected. These remedies can be used when the number of trees affected is small, and the size also small. When the trees are both numerous and large much can be done by spraying, but nature will often come to our assistance by sending along parasites, which will do more to keep the lice in subjection than all the sprays. We should be pleased to get samples of the dead twigs from Mr. M., for it may be that the gall-louse is not the cause of the trouble in his case.

WOOD ASHES FOR STRAWBERRIES.

SIR.—After clearing up my old strawberry plot would it be advisable to sprinkle unleached wood ashes over it?

G. S. W.

Hawkesbury, Ont.

Answered by Prof. H. L. Hutt, O. A. C., Guelph.

You can seldom go astray in applying plenty of unleached wood ashes upon a strawberry plantation, or in fact upon any of the small fruits. The ashes furnish a large amount of potash and a lesser amount of phosphoric acid. The extent to which the soil requires these can only be determined by making experiments, but usually sandy soils are more or less deficient in potash, and it is upon such soils that ashes give the best results.

THE COTTONY MAPLE SCALE.

SIR.—I send you a sample of something that is rapidly covering our maples. I, among others,

would be pleased to learn the name and history of the pest.
J. M. M.
Waterloo.

Answered by Prof. Wm. Lochhead, O. A. C., Guelph.

For some years this pest has not been destructive, but this season it seems to have gathered force, and is proving quite serious in some sections. Alarming reports come from Woodstock, and Waterloo is becoming anxious as to the effect this pest will have upon the maples.

This insect is quite conspicuous in early June on infested trees with its cottony secretion. This waxy substance is secreted by the female at the time the eggs are being deposited, and forms a protective covering for the eggs. At one end will be noticed the oval, brown scale, the remnant of the mother insect, for the insect belongs to the family of scale insects (Coccidæ), to which also belongs the terrible San Jose scale, about which much has been said, done, and written during the last few years.

The eggs laid by a single scale are very numerous, and begin to hatch about the end of June or the beginning of July. At this time swarms of minute lice may be seen crawling on the infested twigs. They soon fix themselves to the bark by inserting their beaks, and begin to suck the sap of the tree. In a short time the young begin to form scales of their own by secreting a waxy substance through certain pores on their body. In September they become adult. The males die before winter, but the females migrate from the leaves to the twigs, where they remain all winter. In spring the females grow rapidly, and the eggs are laid, as already described, in the cottony sack in June.

With regard to remedies, it may be said that whenever a few of the cottony sacs appear the best plan is to cut off and burn the infested twigs, for by doing so the thousands of eggs will be destroyed.

However, when, by reason of numbers, this operation becomes impracticable, resort must be had to spraying solutions. Kerosene emulsion and whale oil soap solutions are perhaps the most effective. The standard kerosene emulsion should be diluted with ten parts of water if used alone. Some authorities recommend the use of the mixture—the standard emulsion is diluted with one pound of fish oil dissolved in ten gallons of water.

The best time to apply the mixture is about the first or second week in July, when the young lice emerge from the eggs. They are then easily killed. Winter or fall treatment is also valuable. The same substance may be used, but the solutions should be stronger than those used in summer.

In some cities where the cottony scale made its appearance good results were se-

cured by applying a strong stream of water against the cottony sacs when they contained the eggs, and before these hatched.

By reason of the abundance of parasites this pest is seldom troublesome more than two seasons.

PROPAGATING CLEMATIS.

SIR,—I have a thrifty Clematis Jackmanii. Can I propagate it by layering, and when would be the best time?
G. S. W.

Hawkesbury, Ont.

Answered by Prof. H. L. Hutt, O. A. C., Guelph.

The Clematis can be readily propagated by layering the young shoots any time now after the wood has become somewhat mature. The new vines should be covered with a couple of inches of rich earth and should be kept moist until the roots have formed.

Our Book Table.

PROCEEDINGS OF THE NEW JERSEY HORTICULTURAL SOCIETY FOR 1903.—A verbatim report of 265 pages of the 28th annual session of that society held in January of this year. This report contains much valuable information, given in the form of questions and answers, and the promptness with which it is published makes it of additional value to those interested.

THE 25TH ANNUAL REPORT OF THE ONTARIO AGRICULTURAL COLLEGE AND EXPERIMENTAL FARM FOR 1902.—This report is made up of seventeen parts, written by the heads of the various departments, and contains valuable information on a wide range of subjects. Probably that of most interest to our readers will be found in the Report of the Biologist and Horticulturist. A copy of this report can be obtained by applying to the Department of Agriculture, Toronto.

THE WOODLOT, A HANDBOOK FOR THE OWNERS OF WOODLANDS IN SOUTHERN NEW ENGLAND. (Bulletin No. 42, Bureau of Forestry, U. S. Department of Agriculture.) This is another of those valuable publications on forestry which the U. S. Department of Agriculture sends free to those interested in the care of private woodlands. The purpose of the bulletin is to show how second growth woods should be treated in order to yield larger returns in the long run than is possible under other methods. Thirty full page diagrams

are given, showing examples of typical cuttings in thinning timber.

THE NINTH ANNUAL REPORT OF THE FRUIT EXPERIMENT STATIONS OF ONTARIO.—To those interested in fruit growing in Ontario this is one of the most valuable reports published. It contains reports from fourteen fruit experiment stations, in as many different parts of the province, on all classes of fruits grown in the country. Careful notes are given on varieties new and old, and many of the newer ones are shown in beautiful photographic illustrations. This report can be obtained free upon application to the Department of Agriculture, Toronto.

LECTURES ON FORESTRY, BY B. E. FERNOW, LL.D.—This is a little booklet of 86 large pages, containing the ten lectures on forestry delivered by Dr. Fernow at the Kingston School of Mining last winter. The lectures are excellent, and cover in a general way the whole subject of forestry. It is also well illustrated and is well worth the price at which it is offered, 25c. The writer of the introduction, however, makes a mistake in trying to give Queen's University the credit for thus being the first to make a beginning in Forestry education in Canada. He probably was not aware that forestry has been regularly taught at the Ontario Agricultural College for the past twenty years.