A Garden of Flowers
For Every Home

The WINNIPEG FLOWER GARDEN 1950

Presented by

The Winnipeg Horticultural Society

FOREWORD

A. M. OSWALD, President

Your Directors take pleasure in presenting the 1950 edition of "Winnipeg Flower Garden".

The production of this book entails a great amount of work by our Year Book Committee. It is intended as an easily understood guide to those who enjoy gardening and take pride in beautifying their homes. It is hoped that every reader will find helpful information in the wide range of subjects contained herein.

We aim to obtain a substantial increase in our membership during the year and as an inducement are offering plant premiums to those who secure new members. We hope each of you will co-operate and induce several of your gardening friends to become members of our society.

Arrangements are being completed for the annual Flower and Vegetable Show. We are striving to make this show even a greater success and urge all members to plan several entries. Entry forms and price lists will be mailed to you about planting time.

I wish to express appreciation to our Advertisers, Donors and Contributors, who have made possible the publication of this book, and express gratitude for the very fine work of the Year Book Committee.

To all members and friends, the very best wishes for Health and Prosperity and a year of Happy Gardening.

INDEX

Winnipeg Horticultural Society

OFFICERS and DIRECTORS FOR 1950

President,
MR. A. M. OSWALD, Ste. 5 Lonsdale Apts.

MR. T. M. YAGER, 22 Lawndale Ave., Norwood.
First Vice-President,

Second Vice-President,
MR. WM. J. TANNER, 518 Henderson Highway.

Secretary-Treasurer,
MR. R. W. BROWN, 675 Valour Road, Winnipeg.

Directors

Mr. HECTOR MacDONALD	Kildonan Park, W. Kildonan
Mr. R. SKELDING	1097 Dominion St.
Mr. J. C. WILLIAMS	644 Garwood Ave.
Mr. R. H. HIKIDA	670 Spruce St.
Mr. R. J. EMERSON	928 Palmerston Ave.
Miss G. MATCHETT	247 Campbell St.
Mr. W. G. D. Robbins	146 Borebank St.
Mr. G. S. REYCRAFT	92 Queenston St.
Mr. E. F. Ball	Assiniboine Park
Mr. F. J. WEIR	153 Legislative Bldg.
Mr. J. N. FRYDAY	100 Claremont Ave.

Associate Directors

Mr. J. A. MacPHAIL	1000 Jessie Ave.
Mr. W. G. KOTCHAPAW	50 Guelph St.
Mr. THEO E. HOWARD	870 Palmerston Ave.
Mrs. T. J. FOXCROFT	198 Good St.
Mrs. Roy Munt	545 Basswood Place
Mrs. W. GYLES	825 McMillan Ave.
Prof. E. T. ANDERSEN	962 North Drive, Fort Garry
Mr. E. M. FINKLEMAN	1447 Wellington Crescent
Mr. C. E. LAW	26 Sherwood Place, St. Vital
Mr. R. C. PRAGNELL	60 Lennox Ave., St. Vital
Mr. J. H. NICHOL	211 Egerton Rd., St. Vital
Mr. A. E. Wall	55 Claremont Ave., Norwood

Advertising Manager, Mrs. T. J. FOXCROFT

Auditor: MR. J. A. MacPHAIL

LIFE MEMBERS

DR. H. M. SPEECHLY
PROF. F. W. BRODRICK
MR. JOHN WALKER
MR. R. W. BROWN

PAST PRESIDENTS

1931—Mr. Henry Downing*
1932—Mr. Williams Stubbs*
1933—Dr. R. W. Kenny
1934—Dr. Percy G. Bell
1935—Mr. John Walker
1936—Mr. R. R. Nichol*
1937—Mr. R. W. Brown
1938—Dr. W. J. Riley
1939—Mr. J. A. MacPhail
1940—Mr. Thos. O. Graham
1941—Mr. Thos. O. Graham
1942—Mr Theo. E. Howard
1943—Mrs. Roy Munt
1944—Dr. S. W. Edgecombe
1945—Mr. Eric Sochting
1946—Mr. J. C. Williams
1947—Mr. J. H. Nichol
1948—Mr. W. J. Tanner
1949—Mr. Q. C. Moffatt

*Deceased.

Winnipeg Horticultural Society

STATEMENT OF RECEIPTS and DISBURSEMENTS FOR THE YEAR ENDING OCTOBER 31st, 1949

MEMBERSHIP—515

RECEIPTS

Membership fees for 1949		$ 469.00
Membership fees for 1950		49.00
Government grant, membership		57.10
Government grant, exhibition		365.37
Municipal grant		100.00
Donations		407.00
Advertising		1,464.57
Sale of books		267.00
Subscriptions to Your Garden and Home		85.00
Manitoba Horticultural Association, Fruit Show (prize money for 1948)		27.50
Entry fees for flower show		55.10
Miscellaneous		6.49
		3,353.13
Balance on hand, Nov. 1st, 1948		718.17
		$4,071.30

DISBURSEMENTS

Flower Show:		
Prizes, Flower Show	$463.50	
Prizes, Peony Show	65.00	
Prize lists	48.60	
Entry tickets and ribbons	52.38	
Rent of rink	50.00	
Help at rink	20.00	
Other expenses	54.45	
		$ 753.93
Home Grounds Competitions:		
Prizes, Home Grounds	50.00	
Prizes, Vegetable Gardens	160.00	
Judging expenses	39.45	
Engraving and trophies	27.31	
		276.76
		1,527.20
Year Book		146.13
Printing		114.31
Postage		150.00
Honorarium, for 1948		150.00
Honorarium, for 1949		45.00
Tulip bulbs for premiums		86.00
Subscriptions for Your Home and Garden		42.00
Telephone		78.00
Annual meeting		18.50
Other meetings		10.64
Stationary		55.50
Miscellaneous		
		$3,453.97
Balance on hand, Nov. 1st, 1949		617.33
		$4,071.30

R. W. BROWN,
Secretary-Treasurer.

AUDITOR'S REPORT

To the President and Members, Winnipeg Horticultural Society:

I have compared the above statement with the books and vouchers, relating thereto, and certify that it is a correct record of the receipts and disbursements of the Winnipeg Horticultural Society for the year ending Oct. 31st, 1949.

Winnipeg, Nov. 15th, 1949.

J. A. MacPHAIL,
Auditor.

Winnipeg Horticultural Society

PRESIDENT'S REPORT FOR 1949

The Winnipeg Horticultural Society has just completed a very active and progressive year in 1949, membership increase over 1948 of 62 members brought the present membership to 515. One hundred and six new members joined during the year.

Eight general meetings of the society were held, the average attendance was one hundred and nine. A wide variety of horticultural subjects were presented by able speakers selected by the Program Committee. Ten directors' meetings were held with an average attendance at these meetings of 13 members. The committees established by the directors were very active during the year and gave many hours to organizing the various competitions.

Your president visited, with the judges, all gardens in the Rock Garden and Home Grounds' Competitions. He was impressed with the interest and enthusiasm of the members of the society. The deep satisfaction and pleasure that members derived from gardening is an inspiration to all.

The Peony Show, held in the T. Eaton Co. Assembly Hall, while not too satisfactory from a competitive standpoint, presented to the people of Winnipeg many beautiful varieties of peonies that can be grown and the event was well attended. The writer would recommend that it be continued in the form of display by securing the co-operation of the Parks Board, University, and Experimental Farms in presenting "Named Varieties."

Entries in the Flower, Vegetable and Fruit Show were many and of excellent quality. Keen competition was shown in all classes, particularly gladioli and table centres. More publicity should be given the event previous to the show to encourage public attendance on the first night when the flowers are at their best.

Receipts for the year totalled $3,353.13; expenditures $3,453.97, and the balance on hand as of November 1, 1949, $617.33.

The Year Book is creating widespread interest and is becoming more and more valuable to western gardeners.

May I express my thanks to the directors for their support throughout the year it has been my privilege to serve as president. I extend to the society my very best wishes for continued progress and service to the community.

Q. C. MOFFAT.

Your Horticultural Society

F. J. WEIR

Horticultural societies are fortunate. In no other organization is there the opportunity of improving the living conditions and surroundings of the average citizen. It is due largely to the good work and lively interest of horticultural groups, that we have such fine parks, boulevards, and other beauty spots throughout our cities, towns and villages. It is through the horticultural societies that many farmers have become interested in improving their farm-steads. It is through the horticultural society that many growers are kept up-to-date with the latest garden practices, and introduced to the newer varieties of vegetables, fruit and flowers. To many, interest in a horticultural society has meant the beginning of a fascinating hobby, whether it be hybridizing lilies, growing strawberries, or merely looking after a few house plants. Gardening in itself, really gets into one's blood. No person who has become genuinely interested in gardening of one form or another, ever loses his interest. As a rule, where an enthusiast makes a beginning he gradually develops an ever-widening interest in all branches of horticulture.

However, there is apparent, in the activities of most societies, and particularly since the last war, a form of apathy in all undertakings. Although people are still taking pride in improving their own individual places, there is something lacking in their attitude to community activities. In all probability, this is due to the fact that, during the war, living became greatly accelerated. Since the war, this fast pace of living has not slowed down because money has been circulating freely. If there is to be an easing-off in this complicated, competitive living, we should prepare ourselves for those times, and begin to think more on community lines.

In the past decade, most horticultural societies have not given the necessary attention towards the improvement of their local surroundings. There are many paths of achievement open to energetic societies—many ways by which societies can lead the way towards a better understanding of horticultural practices. Most organizations have members

who are authorities in some branch of horticultural science. Are these members, and their abilities, being utilized for the most good?

One difficulty which many societies have encountered is that of getting young folks interested in the activities of the society. It is to the young folks that we must look for future workers. Many organizations are still content to let two or three workers shoulder all responsibility, without taking the trouble to "break in" younger blood. There are many ways in which this can be done. A garden club in the United States managed to get the young folks working along with them by sponsoring an All-Junior Show. All committees and chairmen were youngsters, although adult guidance was given as unostentatiously as possible, where necessary. The result was a very successful show, with great interest shown by all the younger ones.

As the years pass, and our cultural methods become more intensified, we will have to give serious thought to conservation of our soil, and other natural resources. These will not last forever. If the young folks can be made to realize this while they are still young, they will be able to put into practice the correct methods for a continuous building-up of the soil. In addition, an horticultural society could sponsor a conservation program in co-operation with the local school teacher, giving attention to such details as soil-builders, protection of wild life, and conservation of native plants.

Another worthwhile project which an energetic society could undertake is the planting of school grounds and church grounds. It is a treat to see well-landscaped school grounds. School grounds which have been planted properly with suitable shelter belts for protection from winds and an occasional shrub to relieve the usual bareness, indicate a community of progressive individuals. Attractive school grounds are a good advertisement for selling farm property. Many church organizations would welcome co-operation with, and suggestions from, the members of a horticultural society in the planting of their church grounds. In some cases, the grounds around service stations are much more attractive than church grounds. Many church members, who take a delight in making the interior of the church attractive, are very lax when it comes to improving the exterior. Improvements in the grounds of both church and school are lasting, and in addition, present to many people ideas for improving their own grounds.

There are many such activities in which a horticultural society can interest itself. Improvements can always be made

to the entrances to towns. First impressions are always important. A few shrubs planted at the edge of town always show the visitor that the inhabitants are proud of their "home town." Boulevards can always be improved. Road intersection triangles, where suitably planted with perennials, shrubs or bulbs, add much to the enjoyment of travellers. There are still many vacant lots on busy streets, overgrown with weeds, or with run-down buildings. Such eye-sores on the landscape should be cleaned up, and suitable plantings made in their places. A vacant lot which has been cleaned up, and even planted in vegetables by a number of individuals, is a big improvement.

However, our propects should not be confined to summer activities alone. In many cases a winter programme can be enlivened by catering to particular interests in the horticultural field. There are always a number of members interested in flower arranging. Most cities and towns have florists who would be happy to give demonstrations in this art. This could be developed into a very interesting project, with members making Christmas decorations for tables, doorways and mantels. Another allied project would be to plant bulbs in novelty containers, and these to be either given to hospitals or sold to provide funds for other work. Dish-gardening is developing into a very popular hobby. Any object which can be "home-made" is appreciated much more than one which is bought, and is always much cheaper.

An easy way of making a little extra money is to have a "White Elephant" sale, with each member bringing an inexpensive vase or flower container to be auctioned off. A variation of this idea could be a "Stop and Swap" meeting, with each member bringing a small item to be exchanged for another one. A small fee could be paid to the society for the exchange. Other suggestions for articles to sell, or exchange, could be flats of started seedlings, and rooted cuttings of desirable plants.

A very educational programme can be built around the theme "What's New?" with different members prepared to give short talks on new introductions in Iris, Peonies, Roses, Dahlias, Phlox, Gladioli, or Chrysanthemums. Or the programme could be based on a particular flower theme, as Delphiniums, with several members giving short talks on Propagation, Culture, Varieties, Insect and Disease Pests.

With so many interesting new books, a "Book Night" could be developed into a very interesting occasion. One book

could be selected, with a half dozen members giving a few minutes' resume of the chapters. There are many books from which to choose, but the more familiar titles coming to mind are Louis Bromfield's "Pleasant Valley" and "Malabar Farm," and Faulkner's "Plowman's Folly".

Many public libraries are very co-operative in providing reference books in horticulture, but many boards do not know what books are wanted. It is advisable for a horticultural society to supply a list of recommended references for use of the library board. I know of one society which buys one book a year in horticulture, and donates it to the library. In this way more people could make use of the text than if it were held by the society or privately-owned.

To add further variety and interest to programmes, a topic could be given to each member early in the year on which material is to be collected. At meetings during the year several members would be selected to give short resumes of their findings. Other suggestions for complete programmes could be "What Plants Furnish to Man," "Common Garden Mistakes", and "Weeds". This last topic could be developed under such sections as "Edible Weeds", "Control", "Weeds As Garden Flowers", "Local Weeds", "Native Weeds", "Imported or Introduced Weeds", "Medicinal Value of Weeds", and "Poison Weeds".

There is an endless variety of topics which a lively, energetic group could develop. Let us not feel that we must hold at least one meeting a month, with occasional social evenings when suitable entertainment or moving pictures could be presented. By an all-round programme, a lively interest in general improvement in our community surroundings, and a desire to make our lives and the lives of others a little fuller, we can make the influence of our horticultural society felt throughout the country. Let each member say, as we start out the new year:

"If every member were just like me,
What kind of club would my club be?"

The Rose

A. R. VANSTONE

The Hybrid Tea Rose is still undoubtedly the most popular type of rose, and will, I think, continue so in the foreseeable future.

The oldest and most widely recognized use of the queenly rose is in a special bed containing the choice of your favorite varieties. In the carefully planned garden the height of the various varieties of bedding roses must be considered.

Each year rose lovers look forward to the introduction of new varieties, these, they hope, will add beauty and improve the already established bed of H.T's., H.P's., Polyanthas and Hybrid Rugosas and perhaps a few climbers.

Roses prefer a good garden loam or clay loam with a plentiful supply of organic matter incorporated. Soils of this nature retain moisture well and roses like plenty of moisture but resent wet feet. Provide for drainage if the rose bed is located where water does not drain readily. An improvement in both soil conditions and drainage can be gained by proper preparation of the beds. If soil is poor dig out the bed, say to a depth of three feet, and fill the bed with alternate layers of fertile, medium heavy soil and humus. If the soil is good preparation is easy, incorporate some humus such as rotten manure into the top 18 inches and plant. Roses can be grown in good soil with no more preparation than that necessary for garden vegetables.

The manner of planting the rose is the same as planting a shrub, but is pruned differently. First dig a hole wider than the spread of the root and the proper depth, fill the hole with water, then some dirt and puddle in the bush, be sure the roots are spread and bush sits level, then fill with dirt and stamp bed to level of mother earth. All grafted roses should be planted deep enough to bring the joint between the root stock and top at least three inches below the surface of the ground. Unless this is done the strong sturdy root is liable to send up a shoot which, if not cut off, will flourish and cause the upper or grafted part to die. Watch carefully for this growth and your bush will never revert.

During the summer the soil around the bush should be dug two or three times in the season, this gives ventilation and easier breathing. Save your grass cuttings and sprinkle when

fresh between the bushes, this tends to mulch and hold the moisture, after the grass is dry dig it in for fertilizer, and I am sure the bush or bushes will reward you. Do not be afraid to use your cultivator. Watch carefully for red spider, aphis and, above all, mildew. Dust the bush before the buds start to form, and several times during the season.

In the fall cut the bush back from six to ten inches, spring will do but you will not get results that fall trimming gives. Remember, the shorter the bush the larger and better the rose. If one wanted a taller bush blooms will be plentiful but smaller. Give bush an application of bone meal or vigoro in the fall, it really pays. In preparing for winter dig the ground around each bush, then put box around the bush, after the ground is frozen pack bush with dry grass cuttings to the full of the box. The idea of putting the box around the bush before freezing is to let the box freeze into the ground, this will keep the mice out after packing with grass.

When spring arrives, the snow all gone, be sure and unpack, but leave the box until danger of frost is over, or if one wishes remove the box on sunny days and replace at night, by doing this you have less chance of mildew and a good healthy bush will be your reward.

Wall Gardens

R. C. PRAGNELL

Many a home-owner has planned a terrace to reduce an ungainly high elevation when his foundation seemed to hoist his home too high to look well. When such terraces face west or south it has been found difficult to keep the grass green during the hot summer months; especially when the terrace was high. Some have overcome this by stone walls. Instead of having bare walls it is possible to have attractive wall gardens at the same time.

In a stone or brick wall built dry, that is without mortar or very little of it, it can be made attractive if many plants of the rock garden type are used, especially of the trailing varieties. It may be so built as to act as a backdrop to the rock garden, or as a surrounding to a sunken garden or lawn. It should be in a sunny location and is best when built against a retaining bank of soil so that it slopes slightly back from the base to the top. Flat stones of varied thickness can be used. Place the first layer or line a little below the ground level on a thick layer of good drainage material such as coarse gravel or rough cinders. As the wall is built up draw some soil over the stones and between them to the thickness or width of two inches or so. This is for the roots of the plants to be planted or seeds sown. Lay each line or layer of stone so that it tips slightly upwards and back. This helps to eliminate washing out the soil and helps to give the plants moisture. A large stone may be laid here and there, at right angles to the lines, to act as binders. Also the lines or layers need not be laid too precisely; but break some lines. This looks better than too straight. Tamp all stones firmly when placed in position.

The cheapest way to get plants growing in a dry wall is to seed them by mixing the seed with a little sifted soil and placing the mixture well into the cracks between the stones. This naturally takes longer to provide a show of bloom. A better way is to have some growing plants on hand and as the wall is built set them in position, taking care to see that the roots are spread out and well back into the soil and tamped firmly in. A fine spray of water will help establish them. Seeds may be sown, too, for the more plants growing will, of course, soon cover the wall with greenery and flowers. When the building is in progress watch to eliminate weeds and

especially "Quack Grass". This, as we know, is very hard to get rid of. Also Wild Toadflax is very hard to eradicate and will soon spoil either a wall garden or a rock garden.

A list of suitable plants for the wall garden is as follows:

Alyssun saxitile (Golddust)
Arabis alpina (Rock Cress)
Aubretia, in variety
Campanula, in variety
Cerastium (Snow in Summer)
Dianthus, in variety
Cheranthus (Siberian Wallflower)
Gypsophila repens (Chalk Plant)
Heuchera sanguinea (Coral Bells)
Myosotis palustris (Forget-Me-Not)
Leontopodium (Eidelweiss)
Linaria alpina (Purple flax)
Phlox subulata (Moss pinks)
Linum perenne (Perennial Flax)
Nepeta (Catmint)
Saponaria (Soapwort)
Sedums (Stonecrop)
Sempervivums (Hen and Chickens)

African Violet Culture

By JOAN COPELAND

Did you ever make plans for a coming event, thinking about it so much that you were certain what was going to happen? Then the great day arrives and everything is so entirely different that you feel almost lost!

This has just happened to my husband and me. We exhibited our 110 named varieties of African Violets at the Canadian National Exhibition and were cock-sure of what was going to take place.

Instead of mild interest, we were swamped! I didn't think either one of us stopped talking for 15 minutes, and certainly we didn't have more than two minutes respite any time. What sort of questions were thrown at us? Practically only one: "Why don't my violet bloom?" It seems easily 90% of the violets owned by our visitors bloom about once a year, and then only for a month or so! As our violets bloom just about all year round, two more surprised people you never did meet.

Come to think of it, though, most articles devote one measly little paragraph each to the subjects of feeding, watering and light, and then go to town on pests and diseases and how to combat them.

Hardly one question in a thousand had to do with ailing plants, for any cause. Worded differently each time, they all had the same tune: "Why don't they bloom?" Maybe the wrong type of advice is being handed out, telling folk how to combat troubles which never appear, just as most cooking experts tell you how to prepare fancy dishes, but rarely tell you how to make the left-overs equally attractive the next day. I've often wondered why these specialists didn't give more thought to this problem which looms so big to the average housewife. Maybe violet lovers are saying the same thing about those who write violet articles, "Why do they weary us with fancy problems; why don't they get down to earth and discuss everyday problems so we can make our violets blooms?"

African Violets should bloom from September to June and then slow up a bit during the hotter days, but not cease

altogether. To bring this about, attention must be paid to three points in their culture: watering, light and food. Let's tackle watering first.

Violets thrive on rain water, but will adapt themselves to chlorinated water if no other is available. It is a good idea to let the water stand overnight as this will allow some of the chlorine to escape. They like it lukewarm; they don't care whether it comes from the top or the bottom, but they don't like too much of it.

Soil should be kept moist and never allowed to dry out. It should never be so wet that if your finger is rubbed over the top of the soil it will come away with moisture on it. The color of the pot will help you, too. If the correct water balance is maintained it will lose its usual brilliant color and take on a deeper tone. Until you are able to judge, just by the color of the soil, whether it needs watering you may have to push your finger down into the soil a little to decide if it is really moist.

Next, the matter of top or bottom watering. Sure, most visitors were told to water from the bottom, but I'll let you into a little secret as to why we do this. I would never dare suggest that you, yourself, are guilty of this mistake, but haven't you some friend who waters her plants when she happens to see the watering can? She fills it up, and soaks every plant in the house. That person takes no thought of the heat of the sun, nor when she watered them last. This type of waterer will do less harm if she puts it in the saucer. So, just in case we were talking to one, we suggested the safest course.

Actually, water on the leaves is beneficial as it cleans them off and lets them breathe. It is sun on the moisture on the leaves which burns. Wet leaves, or leaves sweating in the heat, take about three hours to dry off. If you want healthy, fresh looking foliage, then water from the top at least three hours before the direct sunlight is going to reach them.

If your plants are in a window facing directly north or east, then water in the afternoon or early evening, but before the house temperature drops for the night; if the south or west window, then in the early morning. It's simple if you just stop to think.

Naturally you are not going to pour water directly into the crown, no matter when you water, or fill the top of the pot so completely that you flood the crown.

Next for light. Sunlight is beneficial to violets as it gives them lots of blooms and good color. But use common sense.

If you can sit comfortably where your plants are, so can they, but if you burn they will do the same. Sensible, isn't it?

This year's exceptional weather made us change our habit slightly, but usually you will only have to protect your plants in south or west exposures for a few hours each July and August afternoon. This can be done either by drawing the drapes or using a sheet of waxed paper.

In an exhibit building that rarely dropped below 80 degrees this subject naturally didn't crop up, but snow glare needs watching, too. If you have to squint when looking across the snow, your violets may be suffering, too, and need a little shade. Think of violet leaves as being like your skin and treat them accordingly, then you won't have burned or yellow leaves.

Now for the third subject—food. I've never heard of a new wife telling her husband that he could jolly well live for the rest of his life on the food he had previously been given, and that he could keep on smiling and be happy, or she would throw him out and get a new one! Yet that seems to be exactly what folk are saying to the plants they buy! I do hope the plants bought from us are being treated better. No plant, no matter how carefully fed in its youth, will blossom in its old age without food.

Violets are heavy feeders and as they have comparatively small root system will soon exhaust all goodness in the soil they are able to reach. What food must be given? Well, let's look at it sensibly. If you want to sacrifice roots and flowers for big leaves, then feed them something high in nitrogen. If you want strong roots and lots of big blooms of true color then give them a food of high phosphoric acid, balanced with potash.

Does my non-technical language displease you? I'm not trying to write a profound article to satisfy the professional. I am more anxious to help the average violet lover, and they want a spade called a spade, not some fancy name which has to be looked up in the dictionary.

Canadian soil, generally speaking, has a good quantity of nitrogen in it. The natural rotting of the vegetation in your soil, replaces what is used up. No one at the Canadian National Exhibition complained of lack of leaves. Look at the figures shown on every package, bottle or carton of plant food. Choose a formula with a small figure appearing first.

You will want lots of blooms, big ones, and of good color, so choose a fertilizer with a high figure for the second one—the phosphoric acid available. Strangely enough, violets will

take only as much phosphoric acid out of the soil as they are able to assimilate, so I have yet to find a fertilizer too high in this ingredient. This second figure should be double the first.

The third figure in the fertilizer formula represents available potash, necessary to strengthen root structure, and this figure should be about the same as that of nitrogen.

Now for the complex problem of which should be used—tablets, liquids or powders. Tablets are not good for violets. As mentioned before, this plant has a small root system, so a tablet placed at the side of the pot will take a long time to dissolve and reach the roots. The perfect formula then is one where the second figure is double the first and last, in low percentages. If your tablet is in that ratio, you can crush it into powder, just one extra step, that's all.

Now we have the tablets and powders in the same form, so can discuss them together. Dissolve the powder, being certain it possesses the magic formula. If it is completely dissolved and no residue or lumps remain at the bottom, then you have a perfectly balanced plant food ready for use.

The trouble is that many powders are not completely soluble. The phosphoric acid content, which is so vital to your plant, is one of the hardest parts to dissolve. In many cases, that film which remains at the bottom of your watering can is the part you are most anxious to feed to your plant. Why fertilize your septic tank? We use a fertilizer already in liquid form, so are not worried with this problem. Actually it boils down to this: Use a good formula, as already explained, and one completely soluble in water.

This is quite a harangue on food, but we found that less than one percent of those who asked questions had any idea of what violets require, and which fertilizers contained their requirements. The more you get to know about violets, the more you will feel sure that given good food, good light and sane watering, they will do well in anything from tin cans to solid china bowls, and in almost any soil mixture.

May I make a few definite statements which will contradict many popular opinions? No yellow violet exists. Those who know tell us there is no pigment in the violet which will ever allow it to produce a yellow. Flowers do not drop off

because of under-watering. With the exception of the doubles, which wither, all violet blossoms drop off as soon as their span of life is complete.

B-1 is not a fertilizer and will never take the place of it. It is an extremely good product, making the plant hungry, so that it wants to eat the food you supply, and thus become a healthier plant.

Egg-shell water is not the only plant food needed. As far as I can find out, the only thing released by egg shells into the water is calcium and that takes three weeks of soaking. After that long, the atmosphere would be far better sterilized than your plant. Violets like air, but cannot stand draughts. There is no reason why all living-room windows should be sealed just because you have a violet. Violets like moisture on their leaves. In winter time, particularly, a bath is good for them. Pass plants gently under a slowly running faucet. Use tepid water, and wash each leaf, then set out of the direct light for 24 hours.

Boiling water, or close to it, is not good for violets except under unusual circumstances. It should not be used except by those who know their violets inside and out. I've already likened violet leaves to our skin. Use horse sense. You would be pretty lively after a boiling bath, and am sure wouldn't ask to have the treatment repeated.

Violets are not hard to grow. They only need common sense treatment, nothing fancy.

Last, but not least—most violets sold have been grown under greenhouse conditions and plants grown this way should not be expected to bloom from purchase date on. Grown under close to home conditions, in specially constructed houses, they will bloom continuously from the time they have their first true blooming, and will not suffer from change to your home.

So have patience. Help that greenhouse plant over its resting period. When it comes into the second bloom, good light, sane watering and good food will make it a joy to behold for many years.

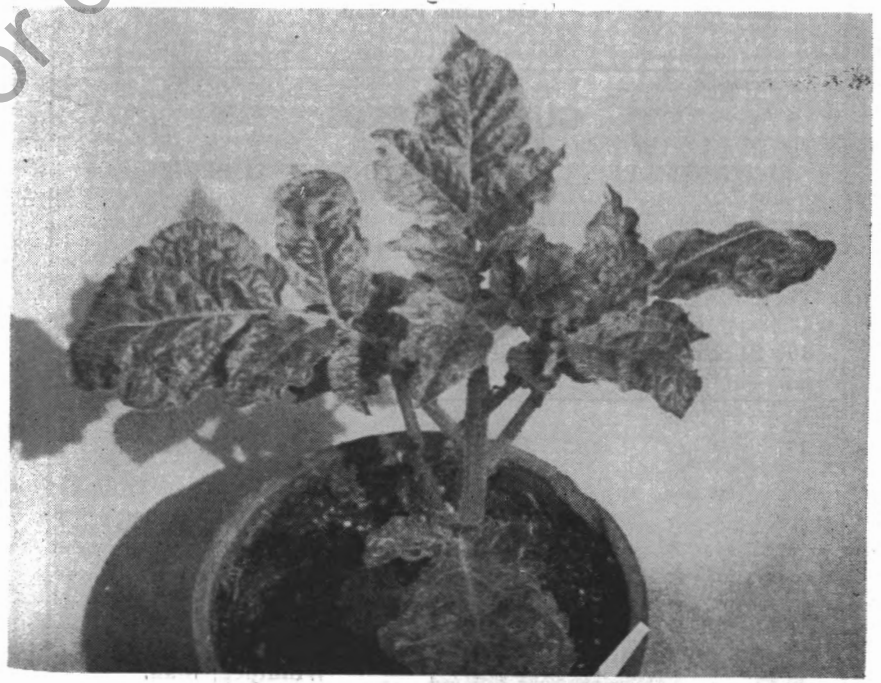
—Reprinted from the October issue of Your Garden and Home. Subscriptions to this Canadian garden and home magazine are available to the Winnipeg Horticultural Society members at the reduced rate of $1.00 a year. For further information contact the secretary.

Potato Disease Problems

N. SHENDEREVICH

Some of the more important problems in growing potatoes in Manitoba include those due to fungus, bacterial or virus diseases. All these affect the potato plants and yields obtained. Some affect the storage and eating qualities of tubers. Of all the cultivated crops, the potato seems to be subject to most diseases. However, only the more important ones will be dealt with here.

Late Blight and Late Blight Tuber rot are caused by a fungus spread from plant to plant by wind and splashing rain. Predisposing conditions are a very warm temperature together with wet foliage due to fog, dew or rain. Leaf spots up to an inch or more across, of dark color with a pale green border and a white mold beneath, appear on the plants. Tuber lesions



Rugose mosaic showing mottling and rugose crinkling of the leaves.
Photo by H. R. Hikida.

are purple to reddish brown, penetrating irregularly into the flesh, often being replaced by a soft rot. The spread is very rapid and the damage usually quite extensive. **Control:** Where possible use resistant varieties such as Sebago or Kennebec. A number of others (Empire, Placid, Essex, etc.) have been introduced but their adaptability is not established yet. Other means of control are a spray or dust program where crop is worked over thoroughly at regular intervals of 7-10 days with fixed copper mixtures like Bordeaux, Trox etc. Fields affected with blight should not be dug till the vines are dead for at least 10 days.

Early Blight is brought about under similar conditions as Late Blight, but is usually somewhat earlier in the season. This disease is never very serious in Manitoba. Small dark brown spots with closely spaced parallel rings are produced on the leaves. Small shallow lesions are produced on tubers. **Control:** Same as for Late Blight.

Common Scab—produces tuber lesions of various sizes and shapes. It is more severe on alkaline soils or land where

Typical leaf roll shown on plant on right. Plant on left is healthy.
Photo by H. R. Hikida.

fresh manure has been used. The marketable value of potatoes is reduced. **Control:** Use of resistant varieties. Those available are Netted Gem and Menominee, the latter being late for our conditions. Two new varieties, Ontario and Cayuga, are scab resistant, and may prove themselves here. Other methods of control are acidifying the soil by applications of sulphur and ammonium sulphate fertilizer and avoiding the planting of scabby seed pieces.

Rhizoctonia—the fungus that causes this disease is carried on the tubers and also persists in the soil. The black scurf on the tubers looks like dirt but adheres more tenaciously. Infected plants are weak, dwarfed and produce aerial tubers. Infected tubers are russeted, cracked and have holes. **Control:** Use a clean seed stock or disinfect infected tubers with a mercurial solution. Solution is made up by dissolving four ounces of mercuric chloride in two quarts of warm water. Add cold water to make up 30 gallons. Immerse tubers for 30 minutes to two hours. Dry as quickly as possible. Solution is good for four immersions. **Is Poisonus to Humans and Animals.** Use of crop rotation with cereals and grasses, where possible, helps to control this disease.

Bacterial Ring Rot—This disease has become very serious in most parts of Manitoba. It is caused by bacteria which over-winters in diseased tubers and is spread by direct contamination from cutting knives and other equipment. Symptoms on the plant are evident only in the late growing season. Leafs on infected plants are slightly rolled and mottled and are of a pale green color. Later they more or less wilt. Decay of tubers starts in vascular ring, giving it a yellowship white appearance (later dark) and a crumbly nature. **Control:** Use of ring-rot-free seed stocks, which means certified or foundation seed. No ring rot is tolerated in these fields if they are to make certification. Because the disease is spread by cutting knives, losses can be reduced by planting whole tubers. Due to infectious nature of the disease all equipment should be cleaned and disinfected. Barrels, planters, diggers, containers, bags and knives should all be disinfected in a solution of two pounds of bluestone ($CuSO_4$) in ten gallons of water or one pint of 40% formaldehyde in 15 gallons of water. If certified seed is to be used, all old stock should be disposed of and the storage premises disinfected.

Virus diseases are not as readily understood as bacterial or fungus diseases. They may be transmitted in various ways but the chief offenders are insects like aphids, flea beetles and

leafhoppers. Thus virus disease may be controlled indirectly by control of these insects. Direct spraying for control of viruses is of no value.

Mild Mosaic—caused by the interaction of two different viruses (X and A). Produces a leaf mottling and crinkling, plants are dwarfed with a reduction in yield. Symtoms are best seen on dull, cool days. Resistant varieties are Chippewa, Irish Cobbler, Katahdin and Sebago.

Rugose Mosaic—caused by interaction of virsuses X and Y. The effects are more pronounced than in mild mosaic. There is a mottling, yellowing, rugose wrinkling, burning, streaking and dropping of leaves. Plants are severely dwarfed and some are killed.

Leaf Roll—causes a rolling, yellowing and a stiffness of leaflets starting from lower leaves if source of infection is from the tuber, and from upper leaves if source is from aphid transmission. Leaves are erect and plants are dwarfed. Net necrosis or internal browning is produced in the tubers of some varieties. Chippewa and Katahdin are resistant against net necrosis.

Purple Top—Produces a purpling, yellowing, rolling and stiffness of upper leaves. Foliage and roots die prematurely. Yield is greatly reduced. Some tubers from infected plants are wilted and spongy.

Four main virus diseases have been mentioned but there are numerous others. The practical means of control is by the use of certified, foundation or tested seed. A seed plot can be used where all infected plants are rogued out and discarded as soon as any symptoms appear. Aphids are the worst offenders in spreading virus disease, so that aphid control will indirectly control viruses. 5% D.D.T. has been found to be quite effective in controlling aphids. However, some better, newer insecticides will probably be on the market soon, e.g., parathion.

Weeds, whether in your potato patch or along its border are outstanding as secondary hosts for insects, especially aphids. The more important ones are wild radish, wild rutabaga, hemp nettle and lamb's quarters. Some woody plants serving as hosts for potato aphids are buckthorn, wild roses, wild plum and foxglove. Thus controlling these weeds and woody plants will indirectly control your virus situation.

Numerous other disorders arise in potato plants which could be classified as due to physiological causes. **Hollow**

Heart is caused by the uneven rate of tuber growth and large tuber size. It forms a cavity with brown lining in the tuber. The most susceptible varieties are Katahdin and Irish Cobbler. **Tipburn** is caused by the slow drying out of leaflets, producing a yellowing, dying and darkening of leaflets from tips and margins inward. Control can be brought about by conserving soil moisture and keeping down insects and diseases for they aggravate the situation. **In Hopper Burn** there is a tip and marginal burning of leaves due to toxin inserted into leaf tissue by the feeding of leafhoppers. A spray or dust programme with D.D.T. or Bordeaux to control leafhoppers will control hopper burn. **Tuber greening** is caused by sunlight or other light on parts of tubers. It has no effect on seed value but tastes bitter and may be poisonous. For control keep plants well hilled and avoid light in storage.

Man-made conditions can bring out various injuries like spray injury, disinfectant injury, fertilizer burning, bruising, etc. These can all be avoided by exercising the proper care.

As a summary in order to keep your disease problems down to a minimum, the following points should be kept in mind:

1. Where possible use adaptable resistant varieties.
2. At regular intervals (2 to 3 years) get fresh certified, foundation or tested seed, for old stocks get polluted with disease.
3. Seed may be disinfected in late winter or spring against Rhizoctonia, Common Scab, and for reduction of bacterial ring rot.
4. Disinfect storages and equipment when bringing in new certified seed.
5. Carry out regular spraying or dusting programme with insecticides and fungicides to control insects and disease.
6. Soil can be acidified to control scab.
7. Use proper care in cultural and handling practices of potatoes.

Browsing Around the Parks

T. W. HOLTOM

To appreciate the real beauty of the parks of Winnipeg, it is necessary to make periodical visits at all seasons of the year, to observe the scenic changes in the course of the year, and to fully realize nature in all its glories, and the wonders it has performed in such a short space of time at its disposal.

Winnipeg parks, of which there are so many, are a source of pleasure and pride to all the citizens of this progressive city, and it is said they are second to none, and the best on the North American continent. The landscape architecture from raw prairie, and bushland, have been wonders to perform.

In a small article such as this, it is somewhat futile to try to elaborate on the beauty of all the parks of this city, and the wonderful advantages for one and all to enjoy; such as the highly equipped playgrounds to be found in so many of our parks, run under the supervision of the recreation director and his specially trained supervisors. Inasmuch as it would require a book to be written to give all details, such as the expansion of parks and playgrounds within the last three or four decades, the landscaping of such, the arboricultural achievements, the botanical and common names of trees and shrubs. This would be an education to all lovers of nature.

I have heard it said that the trees and shrubs in our local parks are lacking in color, too much sameness. This is quite erroneous in the eyes of one who knows shrubs and trees. An admirable feature of Assiniboine Park is the fine adaption everywhere displayed, all trees and shrubs are planted with skilful ingenuity to show when at their best, at one season of the year, when the landscape and lawns are seen at their best, and perennial borders and flower beds so gorgeous with the marvellous display of blending colors. This may subdue all interest in trees and shrubs, however beautiful the trees may be with all their beautiful foliage.

On browsing around some of the parks this autumn, I thought back to the person who said our trees lacked variety in color. I don't think I ever saw a more brilliant display of blending and color at any other time of the year, beautiful

and breath-taking in its intensity. How trivial the display of the earlier months of the season, how favorably they compared with the summer's fairest flowers.

Assiniboine Park is somewhat unique as it has so many attractions that one could spend a whole day with great satisfaction visualizing what it has to offer. The conservatory, with all its year-round display of grandeur, which is a great credit to the head florist and his staff. The zoo, with all its native animals. The cricket grounds, the duck pond, the flower gardens, the immense lawn, and splendidly equipped picnic grounds.

Kildonan Park, at the extreme end of the city, is one of nature's wonders of the west, beautiful undulating green lawns, well kept driveways through magnificent scenery, riverside glades and walks through woodlands, and flower gardens at different locations in the park. A beautiful pavilion, with an environment unequalled, a well equipped picnic ground, and playground for children. This park bestowed upon us by nature, and with the help of human skill, is without a doubt the finest natural park in Western Canada. Visitors should not miss this worthwhile spot.

There are many parks in the city that are really worthy of mention. Some of them are not very well known, but should be visited by all lovers of beauty and nature.

McKittrick Park, located at Beresford and Cockburn, is one of our newer parks, has a shelter for children, a well equipped playground at one end, and a very decorative part at the east end, with an Italian flower garden and natural shrubbery.

Pembina Park, sometimes called Fisher Park, is at the end of Baltimore Road, it is a very attractive park with its sunken flower garden and avenue of trees, very much appreciated by the residents of that part of Fort Rouge.

Fort Rouge Park, on River Avenue, is noted for its shade and numerous trees, with terraced lawn sloping down to the Assiniboine River,. One of our oldest parks, and a good spot to relax when the thermometers are around the nineties.

Enderton Park, on Ruskin Row, is a very pretty park, well used by a great number of people, and is very adapted for small children.

Sargent Park, at Downing Street, has an extensive recreation centre for various kinds of sports. Has splendid bowling greens, tennis courts, football grounds, quarter-mile

race track, all kept up to perfection. In addition to this there is an outdoor swimming pool, which is extremely popular, and used by thousands of people during the hot summer months when all activities are in full swing. A visitor can derive a tremendous amount of pleasure in a day of sports, then a plunge in the outdoor pool, going home refreshed and feeling like a new person.

Notre Dame Park, at Victor Street, now mostly a playground, is a worthy place to visit. Hundreds and hundreds of children may be seen here, enjoying themselves to their hearts' content, in the wading pool and on the numerous swings. This is a scene that should not be missed.

Going on to the north end of the city we come to Machray Park, at Powers Street. Situated in the heart of a densely populated residential district is this lovely park, with a well equipped playground, including wading pool and shelter.

St. John's Park, on the corner of Main Street and St. John's Avenue, is a fairly extensive park and has many attractions. This park has many beautiful flower beds and large sweeping lawns and shady dells. An extension, running parallel with St. Cross Street, has a long terraced river bank with elm trees and shrubbery, intermingled, and a high walk whereby you perceive a wonderful panoramic view of the Red River. Take a walk through, any Sunday afternoon, and you may be amazed and wonder where so many people came from.

Across the river you find Elmwood Park, on the Henderson Highway. This is a very lovely park, most of its beauty is derived from it having so many immense trees, which are to this day as nature appointed them. The arboreal effect is wonderful, and the terraced embankment down to the river is an accomplishment which adds beauty to the park. The pergola is embraced on either side with lilac bushes and flower beds between. There is a fine playground attached at the east end of the park. A brouse around this lovely spot gives one a feeling they have seen something worth while.

King Edward Park is situated on Manhattan Avenue, in East Elmwood, near George V School. This park has the record of being the only one of its kind in the city. It possesses a very beautiful lily pond, in the natural shape of a lake. This pond is stocked with gold fish, water lilies, and wild poppies. It is surrounded by magnificent flower beds, perennial borders and backed by long rows of shrubbery and trees. Has a lovely large shaded lawn and winding walks. The playground at the far end of this park is well equipped, having a wading pool, shelter and swings. Visitors to this park will be amazed at its beauty.

Wild or Native Flowers in Our Garden

NANCIE GYLES

Wild flowers can be made a most interesting hobby. You never know what you might run into and what will happen when you transplant them.

We have done a lot of searching through the growth of Manitoba and have seen numerous plants we would like to transplant, but there is not much purpose in bringing home plants that will not continue to thrive. There are, however, a great many plants that lend themselves to transplanting and that is where the real interest takes hold of one, particularly if you are fortunate enough to own an old car, shovels, diggers and burlap bags or similar impedimenta, for when transplanting wild flowers it is advisable to bring along lots of the soil in which they are growing.

I shall not repeat myself in mentioning my favorite wild flowers I previously wrote about in the 1947 Flower Garden, such as several kinds of Ladyslippers, Blood Root, Mertensia, etc., but will mention a few for the early summer.

The Hepatica is a truly brave little flower. We have had them poke their little buds up through the snow. The blossom comes before the leaves, in pink, blue and white. The leaves are three-lobed and quite attractive all summer. They require a rather neutral soil rich in humus.

The Trillium belongs to the Lily family. The erect white one found in Ontario is lovely, much larger than the Manitoba one, which has the drooping flowers. We also have a dark wine red one with three very large broad leaves a few inches below the flower, which hangs on a slender stem. In the fall it has a very large red berry. They grow naturally in semi-shade and moist soil, rich in humus.

The wild Cleome, sometimes called Rocky Mountain Bee Plant, is quite pretty and attracts the bees. It is not as large or showy as the cultivated Cleome. It does best in sandy soil and is a terrific spreader.

We once found the Indian Pipe or Corpse Plant around Marchand but did not give it the right home, so lost it. It is

not pretty, just interesting. The Indian Pipe has no leaves or green color, usually all white. It is found in deep rich woods and may be a parasite.

The Spiderwort is very pretty. We have had it in pink, blue and white. Its beauty is fleeting, however, as the temperature rises towards noon the petals wilt and you have to wait until the next morning to see them again. They spread rapidly. Around Detroit Lakes we have found them growing along the beaches a piece back from the lake.

The Wild Blue Iris is quite effective around the pool and easy to transplant.

Claytonia or Spring Beauty plants are dwarf, not more than a foot high, and delight in damp, rich soil and partial shade. We have found them down the Dawson Road, usually near a tree trunk or rotten log. They have two fresh green leaves and a cluster of dainty flowers. The ones we have found are a pale yellow, I believe there are pink ones, but we have never found them. In the fall they have a seed like a bead.

There are many kinds of Violets, white, mauve, purple and yellow. We found quite large, long stemmed purple ones on a rocky beach at Grand Beach. The leaves were quite small and fairly close to the ground. We have found very nice, quite large purple violets in the ditches along the gravel ridge beyond Marquette. We once found a very miniature white one in the woods, and also had the Birdsfoot Violet with deeply cut leaves. It grows in open woods.

Tomatoes

H. ROBERT HIKIDA

Tomatoes, as a fresh summer vegetable, are a favorite for everyone. This vegetable is relatively easy to grow and with a suitable, early variety, a heavy yield of high quality fruits may be obtained. Various problems in growing this vegetable may be encountered but with a better understanding of the culture of this crop these difficulties may be overcome.

The tomato is native of tropical America. Here the fruits were called **tomati** by the natives. The tomato was then carried over to Europe where it was grown largely as an ornamental plant. In southern Europe the tomato was considered as an excellent vegetable but in northern Europe it was considered poisonous and grown only as a novelty until about 1850. The tomato was introduced to the United States during the early 1800's and has been in great favor since.

The tomato is a warm-season plant and therefore will not tolerate any frost. The time required from seeding to the ripe fruit stage is 80 to 120 days, depending upon the variety. Since there are only 100 frost-free days in this area, plants must be started indoors and the young transplants set out after the last danger of frost. Only healthy, vigorous growing, strong-stemmed transplants should be used. The first week in June has been considered a safe date to transplant these tender plants.

Tomato plants thrive best in a well drained, fairly light, sandy loam. They prefer a soil that is close to neutral—that is neither too acid nor too alkaline. With lighter soils, an earlier crop may be harvested. The heavy soils encountered by many of the home gardeners may be lightened by the use of horticultural peat or leaf mold.

Tomato plants may be classified into two types—the determinate or the self-pruning, and the indeterminate or the staking types.

The stems of the determinate plants generally terminate with flower clusters. Shoots or branches develop at the axils of the leaves, giving the plant a bushy appearance. Plants in

this group are not staked. The determinate varieties include Farthest North, Redskin, Early Chatham, Bounty, Victor, Firesteel and Bison.

Plants in the indeterminate class are able to continue their growth indefinitely. Blossom clusters are produced at every third internode. Plants in this group may be staked and pruned. In pruning, the shoots appearing at the axils of the leaves are removed and the single main stem is tied to the supporting stakes. Some of the varieties in this group are Earliana, Abel, Stokesdale, Bonny Best, Marglobe and Beefsteak.

Three common problems encountered by the home gardener in growing tomatoes are blossom drop, blossom end rot and bacterial canker. Blossom drop may be caused by a high nitrogen supply to the plants or by a very hot, dry atmospheric condition. Blossom end rot is a physiological disease and is of rather widespread occurrence. Blossom end rot may appear on either green or ripe fruit and it shows up as a brownish patch in the earlier stage and as a black rot in the later stage. The disease develops at the blossom end of the fruit. This disease is associated with a condition where the plant is unable to take up sufficient moisture to feed the developing fruits. A careful watering program will help in reducing the loss due to blossom end rot.

Bacterial canker shows up as a wilting and dying of the leaves. On the fruits the disease appears as a white spot about an eighth of an inch in diameter. A number of these spots disfigure the normally clean surface of the fruits and make them unattractive. Control of this disease may be had by the use of disease-free seed or transplants. Once the organisms have made an inroad into the plot there is no known control.

Purple Cauliflower is a vegetable that is quite new on the local market. This vegetable looks somewhat like the ordinary cauliflower except for the dark purple color. In size and general appearance it looks very much like a cauliflower. The quality of this purple cauliflower is exceptionally good. When cooked, the purple color disappears and leaves a bright green product which is very tender and mild. It takes less time to cook and the quality is better than the regular cauliflower.

Rodent Damage and Control

CLAUDE E. L. H. LAW

When mentioning rodents that prove destructive in our gardens we do not have in mind the beaver, muskrat, porcupine, woodchuck or badger. The common rat, deermouse, squirrel, chipmunk are destructive but not so much in the garden or among plants. The pocket-gophers damage golf courses, parks, and field crops, but outside of the country towns do not go far afield to seek shelter and food in the city. Squirrels and chipmunks are fond of seeds and so prove troublesome to nurserymen and seedmen. We are more directly interested in the rodents that prove so destructive in our gardens and shrubbery and trees in the city.

The short-tailed field mouse, the bush rabbit, the jack rabbit, and the cotton-tail rabbit have been found to be the most destructive. Of these the bush rabbit (Varying hare) is the most damaging, with the field mouse, jack rabbit and cotton-tail following closely after.

In rural parts, with present widely adopted system of harvesting grain neglecting weedy portions of the fields, leaving wide headlands and wide sweeping corners is attractive to these creatures laying in store for winter, and so tends to their increase. Later they seek shelter in brush heaps, under buildings, or where bushes arch over under the burden of snow, there to nibble the bark of some tree or shrub. In this way they girdle some of our choicest trees or shrubs. Rabbits can hop about on the crusted snow and nibble off the twigs and branches protruding through the snow. Our choicest trees may thus be seriously damaged or die the following season.

Field mice are found in all prairie areas, especially where there are trees, shrubs, berry bushes, flowers, and long grass. In summer they feed on the carrots, beets, lettuce, petunias, geraniums and other plants. But their greatest destruction is in the winter, when they make runways in the lawns, feed on choice perennials or girdle trees and shrubs. Timely watchfulness is the price we pay to keep them under control.

The Nebraska cotton-tail rabbit is not a hare but a true rabbit. It does not change color with the seasons. It breeds prolifically, finds food and shelter in cities, towns and villages, making their lairs in brush piles, under buildings, abandoned

burrows of other animals, or new lairs of their own making. Bush rabbits (Varying hare) dwell among trees and bushes and so are troublesome to gardens and plantations bordering on wooded areas. The jack rabbit (Prairie hare) keeps to the more open areas, but will invade the gardens at night to satisfy his hunger. Extermination is seldom accomplished, but methods of control can reduce the numbers so that the damage done is not noticeable.

CONTROL

1. See that no holes exist under garages, sheds or other buildings in the late summer; clear away brush and trim shrubs so that no shelter can be afforded when snow weighs the branches down. While not mowing the lawns too closely in the fall, still do not leave long grass for the mice to make tunnel runways in.

2. By fencing the garden area with chicken wire, rabbits may be kept out. However, an occasional inspection is wise to see if the fence has been drifted over anywhere, and if so remove the snow away from the fence, leaving a trench. Box traps and snares in the runways outside the fences can capture would-be intruders.

3. Woven wire tree guards are effective if the snow is not deep enough to drift over them.

4. Trapping and snares may be used when other means fail or are not feasible. They may injure or destroy innocent animals before the desired culprits are ensnared. Rabbit wire loops suspended from a branch over and in a runway can do harm, too. This less humane method requires frequent inspection. Steel traps are as effective but also just as inhumane.

5. Poisoning, while effective, may prove destructive of friendly birds that are eager for scraps of food lying around. Carrots and apples cut into cubes and dusted with white arsenic is effective when placed toward evening in field mice trails. But there again is the chance that the victim is not the one desired. Likewise poisoned grain, while effective on rabbits, may prove fatal to game birds and livestock.

6. Hunting and shooting can be a bit of sport, and its practice may keep the skill, but is safe only away from urban areas. Any one who has travelled much through bush areas at night has seen how rabbits become bewildered with the bright headlights and misjudge their speed to be run down

on the highway. Those who have dogs may train them to patrol the driveways and paths and so destroy many an unwarry rabbit.

7. Repellents. It would be comforting to the fruit grower if he could apply some spray to his fruit trees, shrubs, etc., that on the one hand would not be injurious to the plants or to humans, would not attract innocent wild life, but would make the troublesome rodent move on without girdling or pruning his fruit trees. Research has consumed much time testing and trying many substances. Some of these have been found to retard spring development, others have proven injurious to the bark, and only a few have given encouragement in their reactions on vegetation and satisfaction as a repellent. Cost is also an important item in any repellent. A rosin-alcohol formula, made by dissolving one pound of rosin in one pint of denaturized alcohol, furnishes a coating when applied with a brush, or as a spray to the bark of tree or shrubs will ward off the rodent. This is not toxic to plants, is cheap, and lasts a long time.

Fortunately the destructive rodents are not continually destructive in large numbers. They follow cycles of scarcity and abundance. So the horticulturist needs to study the trend and act accordingly.

Rock Garden Notes

R. C. PRAGNELL

It has been suggested that the rock garden is an unnecessary elaboration, and that rock and alpine plants can as easily be grown in a flower border, but a well designed and constructed rock garden is a much better place to grow and show off the plants in a more or less natural setting.

The fascination of rock gardening is great. It can be carried out on a smaller scale than almost any other type of gardening. In quite a small rock garden, a large variety of choice and lovely plants may be grown and their cultivation be as interesting as any branch of horticulture.

The first essential is the careful selection of the site of the rock garden. It should be in an open and sunny location, facing full morning sun, preferably away from heavy shade, roots and the drip of overhanging trees. A few low shrubs are not harmful to any extent, and when placed so as to filter the hot afternoon sun helps to prolong the blooming of most plants. Mounds of earth in the centre of the lawn is not advisable, but a corner of the home grounds is preferable, or along a terrace bank is a well suited location if a not more natural setting, such as a ravine or small hill, occurs on the grounds. This, of course, is a good site if open and sunny. Whether in a formal or informal garden, the little landscape does not have a detracting appearance, and will, if properly built and cared for, provide a focal point of much interest.

Having chosen the site, dig the soil thoroughly, saving the good top-soil and discarding any heavy clay. Some coarse gravel and broken stone or brick should be laid in the bottom for drainage. Fill back the good top-soil and obtain enough loam to form the planting medium, incorporate with this leaf-mold and fine sand, a sprinkle of bone meal does not harm. But avoid harsh chemical fertilizers. These have a tendency to burn tender plants.

The next consideration is what stone to use. Real good stone is not easy to secure. Do not makeshift by using broken concrete, clinkers, or granite boulders. Rather use weathered limestone or sandstone, of flat and irregular shape, of good size from a half to two hundredweight or so, rocks as large as

four or five hundredweight or more may be used if a large rock garden is contemplated.

When the ground has been prepared and shaped to the desired plan, and stone is on hand, commence the actual building. A very good plan is to place a few good size rocks at or near the top or high portion, incorporating two or three so as to form a headland or a cliff, leaving crevices and pockets and terraces, large and small, suited to various types of rock plants such as saxafrages, Dianthus alpinus. Dianthus arvernensis, sempervivums and many others.

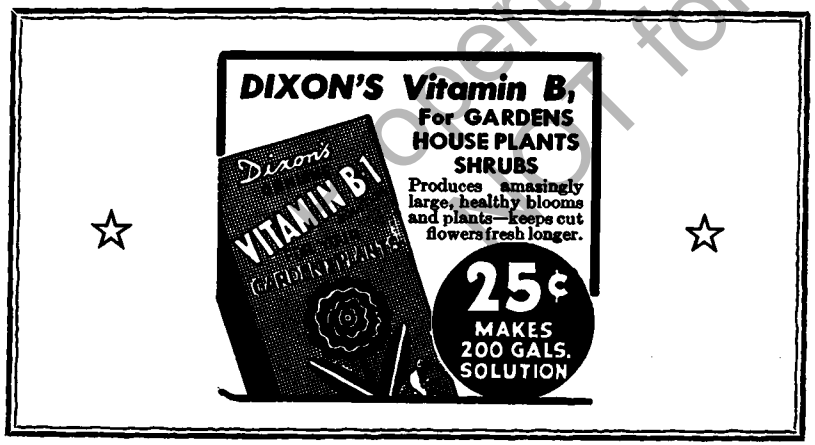
Having placed the main point of the garden, work up now from the bottom, avoiding a monotonous arrangement of the rocks. Instead, build them in so as to look as much like a natural outcropping as possible. Form crevices and pockets and open spaces for the more rampant growing plants taking care not to use all the best rocks at the beginning or last stages or the last stages will be weaker than needs be. As the rocks are built into the soil, it is important to imbed them firmly, so that the lower edge is an inch or two below the soil, and the rock tilted slightly inward to allow the natural moisture to percolate to the roots of the plants. Tamp the soil firmly around the rocks so as to thoroughly set them, and also to eliminate air pockets. A few flat rocks may be arranged to form stepping-tones, which are very convenient when planting or tending the plants. After the rock garden is completed, the whole structure should be allowed to settle, otherwise plants may suffer through being planted in too loose soil. A sprinkle of water, once or twice, will greatly help in settling, if one is anxious to get on with the planting. The introduction of water into the rock garden adds considerably to the pictoral effect! Even a small pool, in which one or two aquatic plants may be grown, will enhance the beauty of the whole. Concrete is best for construction of the pool, or a large wooden tub can be used, though it will not last long as it would be imbedded in the soil.

Rock garden plants should be carefully chosen, and for best and lasting results, perennial with a few biennials may be used, too. Annuals are pretty if of low growth, but once the garden is established should be avoided for they have the tendency of crowding out the smaller and rarer alpines, the real rock gardens plants, which should comprise the main planting.

Take care and time when doing the planting. This type of gardening should not be done in a haphazard fashion. There is more to it than planting an annual border. Rock garden plants are many and their likes and dislikes are varied,

as to soil, location, etc., and so all the more interesting for that. Many plants have an intricate root system, requiring a deep and cool run. Spread these out well into deep pockets between rocks and fill in with some good soil, and then firmly tamp, leaving no air-pockets. Others again, like Androsace and some Saxafrages, are more shallow-rooted and do not like a lot of moisture around the stems or collar. In some cases some stone chips scattered around them is beneficial. Sedums in variety are not so particular as to soil or location, and usually grow easily. Uusually the rock gardener, as he progresses in knowledge of the alpines, weeds out the poorer class of sedums and discards them for choicier plants.

For winter protection or more esentially early spring, for this is really when most damage occurs, when the days



are longer and the many clear days are bright and sunny, the plants begin to stir to life. Then the night frosts are usually severe and freeze the sap just beginning to flow and the young growth and early buds are killed. Some spruce boughs, cut from the Christmas tree when the festive season is past, or marsh hay is good cover. These can be loosened up after the snow has gone to let in sun and air. It is enough to retard too early growth.

In addition to alpine plants, some suitable bulbs may well be used. To name a few are Tulipa Kaufmannia, Scillas, Alliums, Fritillaria meleagris and pudica, Grape Hyacinth, and dwarf lilies. Evergreens, too, of dwarf nature such as Juniperus horizontalis, Mugho pine, Euonymous radicans, Daphne cneorum and mezereum, placed beside or between some of the larger stones are quite effective, if the garden is of good size.

There are a host of alpine and rock garden plants, not all hardy to our prairie climate. Selecting by a beginner is quite bewildering, so a list of some of the easiest to grow and obtain is offered.

		COLOR	HEIGHT
Achillea tomentosa	Millfoil or Yarrow	Yellow	6″
Achillea ageratifolia	Millfoil or Yarrow	White	6″
Alyssum saxitile	Gold-dust	Yellow	9″
Aethionema	Persian Candytuft	Pink	8″
Anemone pulsatilla	Windflower	Purple	6″
Arabis albida	Rock Cress	White & Pink	6″
Aster alpinus	Mauve Daisy	Mauve	8″
Arenaria Belearica	Sandwort	White	2″
Aubretia	Purple Rock Cress	Purple and Shades	4″
Campanula in Variety	Bellflowers	Blue and White	4″ to 8″
Dodecatheon media	Shooting Star	Cerise	9″
Draba aizoon	Witlow Grass	Yellow	3″
Dianthus in variety	Pinks	White and Pink	3″ to 9″
Erigonon auranticus	Fleabane	Mauve	3″
Festuca glauca	A Grass	Blue Stems	5″
Gypsophila repens	Chalk Plant	Pink	Trailing
Geranium sanguinea	Cranesbill	Pink	6″ to 9″
Iris pumila		Blue, White and Yellow	6″
Phlox amoena & subulata	Moss pinks	Various	6″
Primula cortusoides	Primrose	Mauve	6″ to 8″
Primula polyantha	Primrose	Yellow	4″
Platycodon mariesii	Balloon flower	Blue	8″
Saponaria ocymoides	Soapwort	Pink	6″
Saxifraga aizoon		White	4″
Saxifraga macnabiana		White	6″
Sedums in variety	Stonecrop	Various	4″ to 6″
Sempervivums in variety	Hen and Chickens	Various	rosettes
Thymus in variety		Mauve - White	creeping
Veronica repens	Speedwell	Blue	creeping
Viola cornuta	Heartsease	Bicolor	4″
Viola Missouriensis	Violet	Pale Mauve	3″
Viola pedata	Bird's foot Violet	Blue	4″

Care of Tea Roses in Manitoba

By STUART CRIDDLE

A few years ago it was generally thought that to attempt wintering hybrid tea roses outside in Manitoba was a waste of time and money, or at least that is what I imagined after having experienced many failures. While this was quite correct then, as these roses are far too delicate to stand our rather severe winter weather without proper protection or cover, nevertheless when this is provided at the correct time the finest varieties will not only survive the winter but will come through in almost perfect condition and will provide a wealth of blossom from the middle of June until late fall, equal in color, size and perfume to any roses grown in North America, in fact their color is often richer here than when the same roses are grown under less perfect skies.

Mr. Harry Vane, of Treesbank, with his eighty or more varieties of the best roses procurable and his 25 years' experience in growing them, has without doubt, the finest rose garden in Manitoba. In this garden are to be seen such outstanding roses as Peace, Crimson Glory, Nocturne, Mirandy, Ena Harkness, McGredys Sunset, Sunset Glory, Mandalay Diamond Jubilee, Mrs. H. M. Eddie, Saturina, Best Regards, Greer Garson, and many others equally as good or nearly so.

In preparing rose bushes for wintering it is most important to keep the ground about them moist for some weeks before they are covered for winter, which should be done late in October or as near freeze-up as possible as the canes **must be well hardened** before this is done. Mr. Vane made board frames 18 inches square by 14 inches in height. These are put around the bushes and well filled with sawdust or moss—preferably moss. The canes are now cut off level with the top of the frame and the whole covered with chaff and fine straw.

The bushes are uncovered as soon as the frost has gone out of the ground. They are then pruned to within a few inches of the surface or to the second or third bud. Whenever there is danger of hard frosts or severe weather the bushes

must be well covered with burlap or some other material which will give them good protection as the new growth is very tender and easily damaged.

For those who have only a limited amount of room in their garden I would advise their procuring one or more bushes of the following varieties: Mrs. H. M. Eddie, white; Peace, golden yellow, edged cerise; Mandalay, yellow; McGredy's Sunset, orange; Nocturne, bright red; Crimson Glory, deep red; Forty-niner, petals red above, yellow below. We can recommend all of these very highly. However, the best thing for you to do is to send for as many catalogues as possible and make your choice from them.

Mr. Vane and I get most of our stock from H. M. Eddie and Sons, who have given us unusual satisfaction.

Please Patronize Our Advertisers

Hardy Chrysanthemums

H. F. HARP

Whether you know these plants as "Early Flowering Chrysanthemums", "Azalea 'Mums", "Winona 'Mums",, "Border 'Mums", "Cushion 'Mums", or perhaps under another name, they refer to one and the same class of plants. They are mostly varieties of Chrysanthemum hortorum which, in turn, is a horticultural variety of C. indicum and C. morifolium ancestry.

Modern varieties have other species in their make-up. It is known that C. articum, C. rubellum, C. zawndski, and possibly others have been used in the work of hybridization carried on by several universities in the United States and by growers in Eastern Canada, also by Dr. F. L. Skinner, at Dropmore, Man.

It had better be understood at the outset that these so-called hardy 'mums are not hardy in the sense that peonies or delphiniums are. Many varieties listed by nurserymen in the milder parts of Canada are totally unsuitable for prairie gardens, as killing frosts usually overtake them before they have bloomed.

When grown on heavy soil and in exposed positions the winter survival of these plants is most uncertain, but plants may be wintered over in a well lighted basement. Winter hardiness is really a secondary consideration. A plant failing to bloom before frost puts an end to growth, is not more useful by being able to stand the winter.

By making a careful selection of varieties a colorful display can be had in most seasons.

At the Dominion Experimental Station, Morden, a number of varieties are on test each year. Many prove too late in flowering to be of full value as border plants in prairie gardens. However, a number have given satisfaction in most seasons and still others have flowered well only in exceptionally favorable years.

Twenty varieties are listed here in two groups. The first group contains the earliest and most reliable of all varieties tested so far at Morden. The second group are on the border-

line of earliness and are worthy of trial in the Winnipeg area where climatic conditions seem to slightly advance the flowering date.

Mr. R. W. Oliver, of the Central Experimental Farm, Ottawa, writing in "Farm News" says: "Hardy 'mums must be in full bloom by September 15 at Ottawa otherwise they are liable to be cut down by frost." In prairie gardens they had better be in bloom by September 1st in order to give satisfactory returns for time and money involved.

CULTURE

Ordinary garden soils that produce satisfactory vegetable crops will grow these plants and no special preparation is needed beyond a dressing of barnyard manure, which is dug deeply into the soil in October. Bone meal at the rate of four ounces per square yard may be raked into the surface of the bed in spring. This will augment the supply of phosphate that often is not available in sufficient quantities for the plant's needs.

Plants received in spring from nurserymen should be immediately examined and given a soaking of water if needed. Set the plants very firmly in the soil, spacing them about 18 inches apart. Dwarf growing kinds such as Pigmy Pink may be placed somewhat closer. If soil conditions are at all dry at planting time, a good soaking of water must be given.

SEASONAL CARE

The care of chrysanthemum plants throughout the summer involves regular cultivation and hoeing to keep down weeds, conserve moisture, and to encourage healthy growth. In periods of dry weather soakings of water should be given by making a shallow depression around each plant and filling to the brim with water. After allowing the water to seep away the soil is replaced and the whole area given a light cultivation. In very hot weather a spraying of water from a garden hose, at sundown, will be of especial benefit.

After a severe frost has destroyed the blooms, a covering of leaves is put around each plant and a few evergreen boughs placed over the bed to provide winter protection. As a safety measure it is a good practice to lift a plant of each variety and carry them over in boxes or flower pots kept on a shelf near a basement window.

If the basement temperature can be maintained at 45 degrees, or close to it, satisfactory storage is possible. Atten-

tion to watering must be regular and careful. Very little water will be needed during the dark days of winter. Plants that are allowed to remain for lengthy periods in cold, wet soil will rot the crown.

Mildew is frequently a cause of trouble aggravated by excess moisture and a stagnant atmosphere. A dusting of Flowers of Sulphur applied when plants are removed to their basement quarters, and ventilating weather conditions permit, will keep mildew in check.

As the days lengthen there will be renewed activity of growth. Shoots that have lengthened to six inches or so may be pinched back to half their length. After the middle of April the boxes may be set outdoors in favorable weather. Protection from night frosts must be given by a covering of bags or by returning the plants indoors.

After hardening the plants thoroughly they may be set out in their permanent summer quarters about the third week of May. Each old plant is divided into several pieces, having at least one strong shoot. Culture is the same as already outlined for purchased plants.

INSECT PESTS

The most bothersome pest attacking chrysanthemums is the Tarnished Plant Bug. The adult insect is brown in color, about a quarter of an inch long, and usually makes its appearance on chrysanthemums in early July. Plants attacked will be stunted and flower buds distorted.

Control is difficult and no completely satisfactory measures are known. Stomach poisons are not effective as these insects have sucking mouth parts that pierce the tender new growths and flower buds. Best results to date have been obtained by using two teaspoonfuls of 50% wettable D.D.T. in one gallon of soft water. Spray thoroughly from July till flower buds show color, at ten-day intervals. Hand picking of the insects on cool days, or in the early morning, is practical. Too much emphasis cannot be placed on the importance of destroying all garden rubbish in the fall, otherwise it provides over-winter quarters for these pests.

Aphids or Plant Lice: These are easily controlled by a solution of Black Leaf 40. Nicotine Sulphate, one teaspoonful to one gallon of soapy water. Best applied in the evening when evaporation is lower.

Spider Mites: In very hot, dry seasons these are usually present. Water sprayed on by means of a garden hose, at regu-

lar intervals, will dislodge them and keep the plants reasonably free of injury.

Recommend List of Varieties

Earliest and Best—

Glacier—White, 2 feet.
Goldilocks—Yellow, 1½ feet.
Butterboy—Deep yellow, 2 feet.
Sunburnt—Bright yellow, 2 feet.
Maroon and Gold—Bronze, 1½ feet.
Harmony—Bronze, 1½ feet.
Pigmy Pink—Pink, 9 inches.
Dropmore Rose—Rose pink, 1½ feet.
Violet—Red purple, 2 feet.
Clara Curtiss—Single, pink, 2 feet.

Second List—These are slightly later but worth a trial:

Snowbird—2 feet, white shading, pale pink.
Achievement—1 foot, bronze and apricot shades.
Margaret Crawford—2½ feet, bronze.
Purple Star—2 feet, purple.
Chippewa—2 feet, purple.
September Cloud—2 feet, yellow.
Spitfire—1½ feet, bronze.
Dorothy Howard—2 feet, white.
Deanna Durbin—2½ feet, white, shading pink.
Redwood—1 foot, red bronze.

It is noteworthy that the variety Clara Curtiss has survived several winters in an open border, with only snow protection. It has Chrysanthemum rubellum in its make-up. A hybrid raised by Dr. Skinner (Deanna Durbin) has also behaved similarly and increases in size each year. Gardeners can look forward with confidence to earlier flowering, hardy chrysanthemums being developed in Manitoba for use throughout the prairie regions.

Evergreens on the City Lot

F. B. STEVENSON

As one drives through the residential sections of our city he can scarcely fail to note the increased prominence given to evergreens in the landscaping of home grounds during the last decade or two. Due to lack of space on the majority of city lots, the owners cannot spare sufficient space to plant many of them, but what a difference even one good one makes! The country dweller makes a twofold use of his evergreens; he plants them first of all for their beauty, and secondly, because his yard is usually large, he uses them as a shelter for his house and grounds.

Before planting evergreens on a city lot a number of important factors ought to be considered. Chief among these are (1), the amount of space that can be spared; (2), the location of the tree or trees to be planted; (3), the variety to be selected; (4), the proper time to plant; (5), the source from which the planting material is to be obtained; (6), the size of the trees to be used.

First of all let us consider our location problem. The all-too-common idea is to plant an evergreen directly in front of the living-room window. This is a poor location and is particularly bad if the window faces the street. Admittedly the tree will look well while it is small enough to see over or around, but, if properly cared for, in less than ten years we have an all-too-effective screen which will not permit us to see the street nor will it allow the passers-by to view our home as it should be seen. He may not be even able to spot the number and so miss our home because of the obstruction. The modern conception of the purpose of taller trees is to provide a frame for our picture, not a screen to hide it. Therefore, for the smaller lot at least, our evergreen planting ought to be confined to the corners and sides of the lot.

On lots under 35 feet in width it is almost impossible to use more than one evergreen without giving our planting a crowded appearance. In order to grow and develop properly, evergreens ought not to be spaced closer than eight or ten feet, twelve is even better. As most evergreens require plenty of sunlight it is not wise to place them where they will be

shaded most of the day. It is necessary also to ensure that overlapping branches from broadleaf trees will not interfere with their growth, especially the tip of the main leader.

A good deal might be written about different varieties which can be grown in our area but space does not permit me to discuss any except the hardiest and best. Perhaps the most widely used at present is the Colorado Blue Spruce. This splendid tree has given a good account of itself over a long period of time as one may see specimens over 40 feet in height growing in our parks and residential sections. Their only drawback is their tendency to sunscald in March. This is most serious in younger trees and occurs most frequently with specimens which have been planted on southern exposures. The hot spring sun begins to transpire sap from the needles while the roots are still frozen and cannot immediately replace the lost moisture. This causes the affected needles to redden and drop off and our tree loses much of its beauty for a time. Fortunately, sunscald does not occur every year and we can avoid damage to smaller trees by wrapping them with burlap when the danger season arrives. A thorough soaking with water before freeze-up is also a good insurance against damage through sunscald.

The Black Hills variety of White Spruce comes high on the list of evergreens for ornamental work. They are very hardy, compact, symmetrical, fast-growing trees and a favorite wherever they are grown. Odd good specimens of our Native White Spruce can occasionally be found but, as a whole, they cannot compare with the Black Hills type. It is possible to grow several other varieties of spruce in Manitoba—Englemann, Norway, and Black, for instance, but none of these have proven satisfactory with us.

In the Pine class I shall mention only three varieties. Many more can be grown but for various reasons they cannot be recommended. Scotch and Red Pine have both grown well here and both make good ornamentals. They look quite similar in appearance to the uninitiated eye but the Red Pine has longer and heavier needles and, in general, has a better form. Unfortunately they are hard to secure as few nurseries carry them in stock. The third member of the Pine family is the Mugho, a dwarf variety not native to this continent. These trees assume a bushy, compact form and rarely grow to more than five feet in height. In consequence, they are widely used in foundation planting. If possible they should not be planted in locations with a direct south or south-west exposure as they are not absolutely hardy and have a tendency to sunscald.

Only two varieties of Fir have proven hardy at our nursery thus far. These are the Native Balsam and the

Siberian Fir. Because it is a thinly foliaged tree and is short-lived under prairie conditions the Balsam is not to be highly recommended. The Siberian Fir is another story, however. This is one of the really fine trees in our estimation and has everything to look for in a good ornamental; density of foliage, symmetry, hardiness and color. Only a few nurseries are stocking them at present but once they become more widely known they will be a very popular tree.

Several varieties of Cedars and Junipers can be grown in this area but for the most part these beautiful trees are not sufficiently hardy to withstand our rigorous winters. The native White Cedar, of course, is perfectly hardy and makes a good ornamental. They grow quite slowly and will do well in locations too shady for most evergreens. As they lend themselves quite favorably to trimming they do very well in hedges.

There has always been a good deal of controversy over the proper time to plant evergreens. Theoretically it is possible to plant them at any time of the year and make them grow, but experience has shown that there are two periods in the year when the job can be done most successfully. The first is in early spring, as soon as the frost is out sufficiently and the soil is dry enough to work well. Spring planting must be done before the new buds open or these will wilt down and a year's growth will be lost. When moisture and temperature conditions are right, fall planting may be done any time between September 1 and freeze-up, but perhaps the best time is between September 15 and October 15.

The source from which our evergreens are secured is an important factor. For several good reasons it is always a good plan to buy from a reputable nurseryman. One can be assured of getting good, healthy trees, correctly classed as to size, variety, and quality. Altogether too much harm has been done to evergreen business by peddlers selling wild trees dug up in the woods. In most cases no protection is used to keep the roots moist and the trees are dead long before they are planted. It is wise to buy our nursery stock from a nursery located where climatic conditions are similar to our own so as to ensure that our trees are hardy. Difference in soils may be a factor in some cases, but we find no difficulty in transplanting from sand to heavy clay and vice-versa.

Generally speaking, it is better to buy small trees rather than larger ones. The initial cost is smaller and the risk in moving is not as great. In ornamental work it is better to

move evergreens with a ball of earth clinging to the roots. Trees under two feet in height can be quite easily moved without this earth, but the shock to the tree is greater and the risk of drying out and dying is greater. We have moved spruce trees, both White and Colorado Blue, up to fourteen feet in height and made them grow, but unless an immediate effect is required it is much better to buy smaller trees, say from one to six feet tall, and watch them grow. They will become large enough all too soon.

Because of their year-round beauty, evergreens occupy top position in our winter landscape. What a cheery note they add to what would otherwise be a bare and lifeless panorama! During the Christmas season especially, when they are festooned with strings of colored lights, they impart a sense of cosiness and warmth not possible to duplicate in any other way. Winnipeg's geographical position gives it a long, cold winter but we can at least give it a much more livable appearance by making it the "Evergreen City of the North."

Some Uncommon Early Flowering Plants

F. L. SKINNER, M.B.E., LL.D.

Gallianthemum angustifolium, which is closely related to the buttercups, has finely cut bluish green leaves that start into growth as soon as the snow is gone, even without flowers this is a neat and attractive plant, growing about six inches in height. By the middle of May these mounds of bluish fern-like leaves are studded with broad petalled white buttercups, from one to one and a half inches across. Any good garden soil seems to suit it, and it prefers a sunny spot where it will not be crowded by taller growing plants. It may be grown from seed (slow to germinate) and good size plants lend themselves readily to division either in early spring or early autumn.

Corydalis nobilis is one of the tallest of May flowering perennials. Its growth is rapid and by mid-May it will be a lush looking plant at least eighteen inches high with spikes of yellow flowers, each with a dark colored tip to it. Being a native of Siberia it is absolutely hardy and quite easy to grow in any good garden soil.

Crocus alatavicus comes from the mountains between Turkestan and Mongolia and is probably the only crocus that can be said to be absolutely hardy in Manitoba. The snow is scarcely off the ground when the flower buds of this crocus appear above ground and a few bright, warm, sunny days will cause the white flowers to open wide. Though not as large as the Dutch crocus these white flowers are quite beautiful and a clump of them in a sheltered nook in the rock garden will give flowers that are earlier than even the "Prairie Crocus" (Anemone patens).

Draba repens forms mats, two or three inches high and a foot across, of soft shoots clad with narrow, oblong leaves and in May, when in bloom, the whole plant becomes a mass of yellow. Though the individual flowers are small, about a third of an inch across, the foot wide mats of yellow are very showy.

Dracocephalum altaicum is one of the best of the Dragon-heads, the large deep blue flowers are borne in oblong heads

on six to nine inch stems towards the latter part of May. The rich blue flowers of this Dracocephalum are of a shade that is not very common among perennials at this season. Any friable loam suits it well and it is quite hardy.

Fritillaria pallidiflora comes from Siberia and grows from twelve to fifteen inches high. In May it has a clustered head of six or eight broad shouldered, pale yellow bells almost two inches across. This is quite easy to grow and extremely hardy.

Fritillaria pudica is common west of the Rocky Mountains, but on the east side of the mountains it occurs in Canada only in the southwestern corner of Alberta. Bulbs from this district have been quite hardy in Manitoba. By about the middle of May this gives us flowers that are very much like snowdrops in form but of a rich golden yellow in color. In the corner of Alberta where they grow wild, they are commonly called Yellow Bells. Their flowering period can be almost doubled by planting some in a shady spot and others in a sunny, sheltered place. Should a severe frost occur while they are in bloom, they merely fold up like an umbrella and await the return of better weather.

Muscari polyanthum is a little larger than the common Grape Hyacinth and the six-inch spikes of daintly blue flowers are good companions for the Siberian Squills. It has proved quite hardy at Dropmore and can be increased readily either from seed or by division of the bulbs. It flowers in May just a little later than the Squills.

Saxifraga crassifolia, from Siberia, is an accommodating perennial that does well either in full sun or in shade. The large evergreen leaves, sometimes six to eight inches across, are quite ornamental as soon as the snow has gone and about mid-May it sends up a tall sixteen to eighteen-inch spike terminating in a four to six-inch cluster of large, clear pink flowers. The flower spike is carried over winter in the bud stage and starts into growth so early that it is advisable to plant it where it will be sheltered from cold winds to ensure that the flowers will not be injured by spring frosts. It can be propagated by division. In England this plant is sometimes used as an edging for large perennial borders or even as an edging for shrubbery borders; the large leaves making it ornamental throughout the year.

Tulipa tarda, from the Altai Mountains of Turkestan, is one of the earliest tulips with us and as hardy as any of our native flowers. It is quite dwarf, only about six inches tall, and the flowers that open out almost flat are white with a deep yellow centre; as many as six flowers may be borne by one bulb and they remain in bloom quite a while. This tulip

starts to flower about the middle of May and increases rapidly by division. It will naturalize quite readily in a sunny spot.

Tulipa Kolpakowskiana, from Eastern Turkestan, is also quite at home in Manitoba gardens. It is a little later in flowering than Tulipa tarda, usually coming into flower in the latter part of May. The flowers are quite bright, clear yellow to golden yellow color, and are held upright on twelve to fifteen-inch stems, globe-shaped, with the tips of the segments spreading outwards. At Dropmore, hybrids of this tulip have been raised with flowers from four to five inches across, the original importations had flowers about half that size. This is a very bright colored tulip that will readily naturalize. Tulips are native of open, sunny places and this should be taken into consideration when naturalizing them.

Viola altaica is extremely floriferous in May and hybrids of this early flowering hardy pansy with the violas of commerce have produced a race of hardy pansies which start flowering in early spring and continue to bloom throughout the summer. From their Altai Mountain parents most of them have inherited, to a certain extent, the spoon-shaped leaves and creeping underground stems that enable them to withstand severe climatic conditions. They are best grown in an open, sunny spot.

Allergy

DR. I. F. FALARDEAU

Allergy is considered a "malady of civilization." In the United States of America alone fully 60,000,000 people have exhibited or will have exhibited some minor or major symptoms of allergy. Fully 10 per cent of the patients who enter the offices of physicians need allergic care.

Allergy is defined as the "capacity of the human body or one of its structures to react in an abnormal way to a normal or an altered protein-like substance." The effects are very diversified; thus bronchial asthma, hay fever, skin diseases, migrane and gastro-intestinal upsets may represent allergic reactions. Not only are the manifestations of allergy "protein", but the inciting factors ranging from "pollen to dog's hair, and cockroach powder to cosmetics" are indeed endless.

We are more interested in the effects produced on sensitive individuals of the pollen of certain plants. Surely there is no more distressing ailment.

Fortunate indeed is the person who can look at a rose and smell its fragrance without causing an attack of hay fever or even asthma. Hypersensitive individuals will react specifically with characteristically unusual symptoms to the administration of, or to the contact with a substance which when given in similar amounts to the majority of all other individuals proves harmless or innocuous.

Existence of a hereditary pre-disposition in both hay fever and asthma has long been suspected. The earliest studies showed that 7% of normal, non-allergic individuals gave a family history of allergy. The incidence of a positive family history of allergy in patients suffering chiefly from asthma and hay fever has been found to vary between 49% in adults and 58% in children. Subsequent investigation has indicated the probability that heredity not only pre-disposes an individual to the development of an allergy, but it may even determine the allergic condition which he is to develop.

So much for the history of allergy. Fortunately science marches on. Each decade finds new medicines to combat new and old diseases. In the "20's" it was the discovery of insulin bringing relief to thousands of diabetics. Then came the "sulfa" drugs with their marvellous results, and soon after

the wonder drug "penicillin" and now it is "anti-histamines."

For years certain people have known that they would suffer from an attack of asthma at certain times of the year. This was unexplained, but a fact. Now science has come to their help with the explanation that the immediate symptoms of anaphylaxis were to a large extent the same as those produced by "histamine" or H substance. While anaphylaxis and allergy are not identical there is much similarity and we know that histamine or a similar substance is responsible for producing allergic manifestations.

The development of the anti-histamine drugs has relieved large numbers of so-called hay fever sufferers but has not been so successful with asthma patients. Now they are being used for the common cold with shocking results.

The flowers most commonly causing hay fever or asthma attacks are as follows:

Alfalfa	Daffodil	Mock Orange
Aster	Dahlia	Mock Syringa
Balsam	Daisy	Nasturtium
Castor Bean	Gladiolus	Poppy
Clovers—Red, sweet, white		Peony
Coreopsis	Golden Rod	Rose
Corn	Lilac	Sunflower
Cosmos	Lily	Sweet Pea

Difficulties Encountered in Beautifying Home Grounds

J. H. NICHOL

In discussing our home grounds, a short description of the layout is in order. Our home is situated on the bank of the Seine River, and is a low rambling type of bungalow, painted yellow with a light grey roof. The lot has 93 foot frontage and a depth of 180 feet. The house is set fairly well back from the street and towards the south side of the lot. Behind the house there is about 50 feet to the upper bank of the river.

We moved into the house in late October, 1948, but were unable to do any work on the grounds at that time, except to try to line up some plans for our spring work.

Our difficulties were similar to those encountered in any new home grounds, except that our house was an older house to be remodelled and extended to make a rambling bungalow. An additional lot had been procured. During the rebuilding, nothing was done to the grounds so that they had become overrun with quack grass, Canada thistle, and various weeds. Also there were mounds of excavated earth and depressions here and there.

Our first job was to develop some kind of long term plan, which was a good project for the winter evenings. This was changed many times but gave us something to work on.

There are four large trees well placed in the front yard. There are no sidewalks on our street, so we plan on running the lawn right out to the road. A driveway had to be built to the garage and this is curved north to make an easier approach from the street. There was a considerable quantity of cement sidewalks from the old house. These were broken up to make a flagstone walk.

A lilac hedge had been started along the south lot line. This will be completed to the sidewalk allowance. A picket fence was built from the garage to the north boundary.

At the side of the house we plan on running an herbaceous (perennial and annual) border, from the picket fence to the

river bank. At the back of the house there are several large oak trees nicely placed on the upper level. On the river bank there is a large open space to the south side of the lot, which will be developed into two terraces for a vegetable garden. The north lower part of the river bank is heavily wooded. This will be thinned out to provide a picnic area in the shade of the trees.

Our undertaking for the first year was to try and lay out the front yard, and get as much of the ground in shape as possible. A raised flagstone patio had been started as an approach to the front door. This had to be cemented between the stones. A rock wall was extended from this to the far end of the house and earth filled in behind. This bed was planted with red salvia and blue trailing lobelia, which made a nice contrast against the house.

A fence was built around the back yard for our young son. Our big job was getting the back yard in shape. The weeds had to be cut down and all the rubble left from the building, cleaned up and burned. Then the ground was roughly levelled. What to do with the back yard was a real problem, as we wanted to clean up the weeds and still have a garden all in one year. To accomplish this we rented a rototiller and broke up the quack grass sod and weeds into a plot about 40 by 60 feet, and also about a quarter of the front yard. This did a wonderful job of loosening up the soil and made the next job so much easier to cope with. To get rid of the quack grass roots and the weeds we went over the back yard again, digging it by hand and picked out the roots. This was a very tedious job but well worth the effort. By the end of the season, with generous cultivation, there were very few signs of quack grass and thistles left.

As the garden was dug we planted our gladioli bulbs, vegetable garden seeds, and flower plants, and also a good selection of perennial flower seeds. We secured a number of small shrubs, and these were planted in rows in the garden where we could give them better attention. We will move these in the spring to their permanent locations.

Part of the front lawn was in fair condition and this was left. A plot of grass was sown late in June, which was well established by fall. Half of the boulevard allowance was in very poor condition. So this was planted to potatoes and will be seeded in grass next spring.

In the back yard we plan to have a curved flower bed from the kitchen steps to about the centre of the lot at the river

bank. The south side of this will be planted in small fruits and kitchen garden.

On the first terrace of the river bank we plan to build a summer house and barbecue with a small grass and flagstone patio. This will leave a space of about 20 by 50 feet for a vegetable garden. There will be a space of about 20 by 30 feet on the lower level which will likely flood, but this will not prevent this being used for a vegetable garden.

This is our long term plan which we hope to accomplish in another couple of years. We are thoroughly enjoying the developing of the project. In conclusion I would like to sum up a few pointers for anyone starting to landscape new home grounds:

1. Draw up a long term plan of what you want to strive for, and do not work here and there without something definite in view.

2. Do not be afraid to plant a vegetable garden on new or dirty ground, as with a little extra work you will be well rewarded for your effort.

3. Do not undertake to develop too much all at once, but spread it over a few years unless, however, you can afford to have someone do the work for you.

4. Do not plant shrubs too close to the house or too close to one another. They will be small when planted, but think of their size in another five years. The spaces can be well filled by seeding some annual flowers that you are fond of for a couple of years.

Popular Bedding Plants for Manitoba

By H. MACDONALD and E. T. ANDERSEN

GROUP I

Annual flowers which can be grown from seed, sown in early spring in the location which they are to bloom. Approximate mature height of plants is indicated:

CALENDULA, Scotch Marigold. Shades of yellow and orange. 18 inches.

COREOPSIS or CALLIOPSIS. Yellow, brown, and crimson. Very showy. 8 to 24 inches.

COSMOS. Early flowering varieties best for seeding in open ground. Excellent cut flowers; late bloom. 40 inches.

IBERIS. Candytuft. White, pink, crimson, purple. Difficult to transplant. Grow in open; early and mid-summer bloom. 12 inches.

CENTAUREA CYANUS, Corn Flower. Sweet scented. 24 inches.

DELPHINIUM, Annual Larkspur. Various colors, white, red to dark purple; late summer bloom. 30 inches.

KOCHIA, Burning Bush. Foliage plant. Red foliage in September. 30 inches.

MATTHIOLA, Night Scented Stock. Very fragrant; not showy. 10 inches.

RESEDA, Mignonette. Sweet perfume. 18 inches.

TROPAEOLUM, better known as NASTURTIUM. Dwarf and climbing forms.

IPOEMEA, Morning Glory. Showy climbing plant; late summer and fall bloom.

LATHYRUS, Sweet Peas. Cool growing conditions and ample moisture is required.

PORTULACA, Trailing or Mat Plant. Brilliant colors. Likes sunshine and good drainage.

GROUP II

For best results the following annuals should be grown from seed indoors. Unless otherwise indicated sow around the first of April:

ANTIRRHINUM. Snapdragons. Sow third week in March. Popular as cut flowers. Many types. 6 to 36 inches.

ALYSSUM. Well known edging plant. Sweet scented. 6 inches.

CALLISTEPHUS, better known as ASTERS. Wilt-resistant strains preferable. 24 to 36 inches. Late summer and fall bloom.

IMPATIENS, Balsam. Showy. 24 inches.

LOBELIA. Blue edging plants, also a trailing form for window boxes. Require ample water in dry weather. 6 inches.

TAGETES, better known as MARIGOLDS. Several types, popular and easy to grow, continuous bloom. 12 to 36 inches.

NICOTIANA, or NICOTINA. Will grow in partial shade, flowers open in late afternoon, scented. Sow in mid-April. 30 inches.

PETUNIA. Popular bedding plants. Many types, single and double, free blooming. Dislikes excessive moisture. Continuous bloom. 6 to 24 inches.

PHLOX DRUMMONDII, Annual Phlox. Lovely colors and color combinations. 6 to 18 inches.

SALVIA. The scarlet form is most popular, early varieties should be grown. A blue variety is useful. Continuous bloom. Sow in mid-March. 18 inches.

LYTHRUM. Named varieties give a long season of bloom. 42 inches.

PHALARIS ARUNDINACEA, Ribbon Grass. Foliage plant. Likes moisture. 36 inches.

CAMPANULA GLOMERATA, Clustered Bellflower. Possibly the hardiest bellflower. 18 inches.

DELPHINIUM HYBRIDS. Need more care than other species listed. Should be staked. Pacific strains are good. 60 inches.

DELPHINIUM GRANDIFLORUM, Chinese Larkspur. Lovely shades of blue. 30 inches.

HEMEROCALLIS, Day Lilies. Many species and varieties, flowering from June to August. 24 to 50 inches.

GROUP III—LATE SUMMER AND FALL BLOOM

GYPSOPHILA PANICULATA, Baby's Breath. The double white forms are preferable. 30 inches.

LIMONIUM LATIFOLIUM, Statice or Sea Lavender. Excellent filler in bouquet work. Blooms later than Gypsophila. 30 inches.

HELIOPSIS SCABRA, False Sunflower. Garden varieties showy. Long season of bloom. 48 inches.

LILIUM TIGRINUM, Tiger Lily. An old favorite. 48 inches.

PHLOX PANICULATA. White Pyramid and Ada Blackjack are the most reliable varieties of Perennial Phlox. 24 inches.

SAPONARIA OFFICINALIS, Bouncing Bet. The double form is most attractive. 36 inches.

ASTER NOVAE-ANGLIAE, New England Aster. Of the many Michaelmas Daisies this is the most satisfactory for Manitoba. Prefers moisture. Improved varieties are best. 48 inches.

ACONITUM, Monkshood. Aconitum Napellus and Aconitum Napellus bicolor are the best forms. Likes moisture. Showy blue colors; poisonous root. 42 inches.

VIOLA or PANSIES. Do best in cool, moist conditions. Early and late, not good in mid-summer. Seed early, mid-March. 6 inches.

ZINNIA. One of the most satisfactory annuals. Easy to grow and free blooming. Many types and sizes, continuous bloom. 6 to 48 inches.

GROUP III

Tender perennials grown from roots or cuttings. Summer bloom and continuous till frost:

GLADIOLUS. Plant about first of May. Treat corms for thrips before planting. Excellent for cut flowers.

DAHLIA. Plant around 10th of May in open ground, or start indoors and plant outside in June. 24 to 60 inches.

GERANIUM. Grown from slips or cuttings of previous season's plants. Plant outside in June. 18 inches.

BEGONIA. For partial shade. Tuberous rooted started indoors in March. Fibrous rooted from seed or cuttings. 12 to 18 inches.

CANNAS. Start indoors and plant outside after damage of frost is past. 36 to 60 inches.

Dependable Perennials for Manitoba

By H. MACDONALD and E. T. ANDERSEN

Selected for hardiness and, except where noted, for drought resistance. Listed in order of blooming from spring to fall. Average height when in bloom is indicated.

GROUP I—SPRING TO EARLY SUMMER BLOOM

SCILLA SIBIRICA. Blue and white Squills. Bulbs. 6 inches.

TULIPA, Tulips. Darwin types probably best, most other types satisfactory.

PAPAVER NUDICAULE, Iceland Poppy. Valuable as cut flowers. 18 inches.

PHLOX SUBULATA, Moss Pink. Various colors. Edging plant. 6 inches.

ABABIS ALBIDA, Rock Cress. White. Edging plant. 6 inches.

DICENTRA SPECTABILIS, Bleeding Heart. Will grow in partial shade. 30 inches.

CHRYSANTHEMUM COCCINEUM. Pyrethrum is the popular name. Excellent cut flower. 18 inches.

CONVALLARIA MAJALIS, Lily of the Valley. Suitable for shady places. 6 inches.

BERGENIA CORDIFOLIA, better known as Saxifraga cordifolia. Large ornamental leaves. 18 inches.

GROUP II—MID-SUMMER BLOOM

PAEONIA, Peony. Many varieties. Festiva Maxima (white), Felix Crousse (red), and Sarah Bernhardt (pink), and other varieties are popular.

ACHILLEA PTARMICA. The double form called "The Pearl" is commonly planted. 18 inches.

ALLIUM SCHOENOPRASUM, Chives. A neat edging plant and useful for salads. 12 inches.

HESPERIS MATRONALIS, Sweet Rocket. Easily established biennial, mauve, pink and white. 36 inches.

IRIS. Tall bearded varieties have a wide selection of color combinations to choose from. 24 to 36 inches.

IRIS SIBIRICA, Siberian Iris. Several forms. Does best in moist soil. 24 to 36 inches.

PAPAVER ORIENTALE, Oriental Poppy. Brilliant reds, pink and white. Transplant after flowering. 24 to 30 inches.

LILIUM DAURICUM. Candlestick lilies, are very hardy and showy, orange and red shades. 19 to 36 inches.

LILIUM MAXWILL. Originated in Manitoba. A handsome orange lily. About 60 inches.

A Magnifying Glass Reveals Wonders In Our Gardens

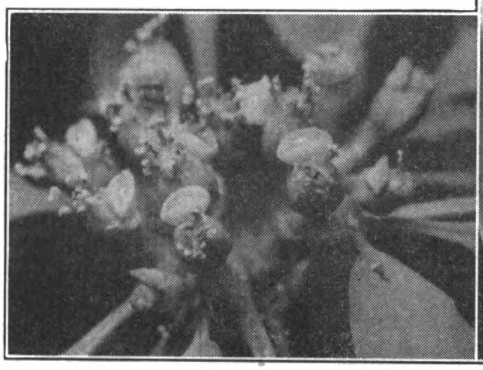
PAUL HADLEY

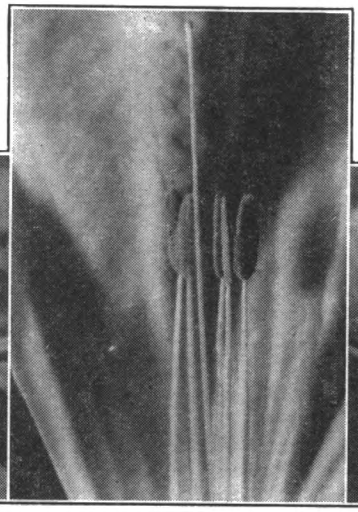
Beautiful though the flowers that bloom in our gardens appear to our eyes, if by some magic we were to be suddenly reduced in size to that of bees or butterflies, we would see these familiar objects in a much different aspect. Instead of seeing them as small, delicate affairs, we would see these blossoms as huge objects many times our size, in some cases large enough to serve as shelters for ourselves and our families. But we would see many other beautiful and strange things, too, that we now overlook due to their relatively small size.

Not only the flowers of the ornamental plants that we use to decorate our lawns, but the flowers of many of our garden vegetables would also reveal to us strange, new worlds —beautiful worlds—filled with color and with strange, exotic forms.

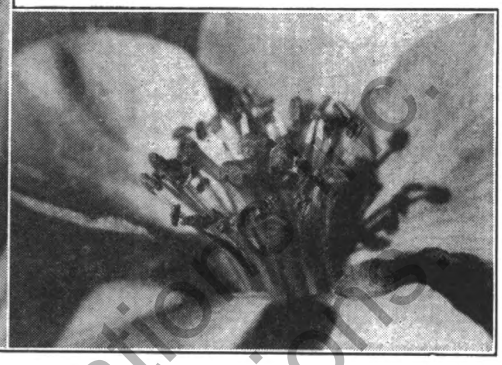
Entering the hearts of these flowers, we would find ourselves surrounded by the many parts of the flowers that we now call the stamens, anthers, pistils, stigmas, or other names common in botany. Some of them, such as the stamens of the lily, would be huge towering pillars that would reach far above our heads, and topped with strange mushroom-like growths (anthers). A poppy would show us a huge ring consisting of several hundred stamens, each tipped with a pollen-filled anther, each of which would shower us with the golden powder when we would brush against it. If it were the bloom of a hibiscus, we would find a golden "tree" in its centre, the collective stamens and stigma grown together to make one bizarre structure. In the vegetable garden, if we were to visit the huge golden cornucopias that bloom upon the vines of the pumpkin or a squash, we would find there were two kinds of flowers, one, which botanists call "staminate", having a central pillar or stamen resembling a golden "barber-pole", covered with pollen grains. The other, or "pistillate", would have an irregular shaped mushroom-like stigma in the centre. This is the bloom which produces the squash or pumpkin,

Below: This fantastic array of jewels lie in the heart of the Poinsettia. The glistening circular cups overflow with honey.



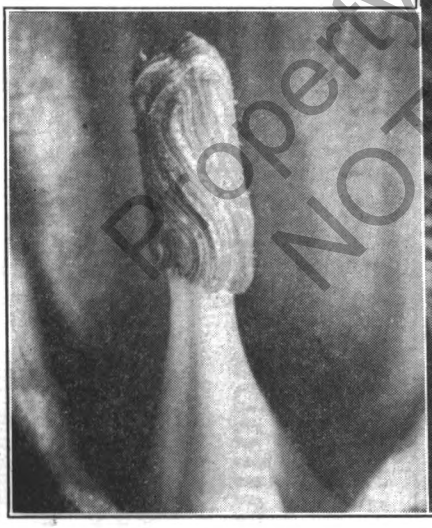


Below: This crown of gold is the ring of stamens surrounding the stigma of the Japonica or Flowering Quince.

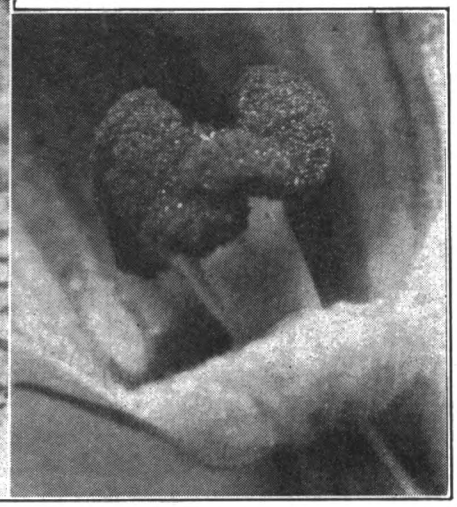


Above (centre): If you were able to enter the flower of an Angel's Trumpet, as insects do, this is what you would see.

The staminate flower of the pumpkin laden with the golden pollen dust which carries on the life cycle.



The pistillate blosom of the pumpkin. A tiny pumpkin is found below the bud as soon as it is fertilized.



This is not a strange caterpillar, but the beard of an iris bloom. Each of the three falls of a German Iris has this beard, hence some call them Bearded Iris.

which can be seen already formed on the stem outside the flower.

Upon examining the stamen and pistil arrangements carefully, one will find that all the members of the same plant family have some peculiarity in common that makes them easily recognizable. One would, for instance, never think of the clovers as belonging to the same family as huge locust trees; or the potato, the tomato, and the wild nightshades as belonging to the same family, but an examination of their flowers would show us that they are very close relatives.

Yes, the wonder-worlds of the flowers would prove very fascinating to us, if we were to see them through the eyes of the insects who visit the blossoms. But this difference in size might not be the only strange difference we would see. Scientists think that possibly insects' eyes are capable of seeing the ultra-violet rays in the sun's light to which our eyes are not sensitive, and this would make most of the flowers glow with strange new colors which they do not ordinarily reveal to our eyes. In experiments, by flooding flowers with ultra-violet light, we have found them to glow with color entirely different than that they present when in ordinary sunlight.

A powerful magnifying glass, or a miscroscope, is a handy and interesting thing to take to the flower garden. A study of the ways of the flowers is a fascinating hobby. It is a hobby which has proved so interesting that many of the world's great men have adopted it as a lifetime work, and many are the wonderful things they have done as a result of these studies in improving and changing the flowers and fruits of wild plants into the marvellous ones we now see in our gardens.

—Reprinted by permission from The Country Guide, October, 1949.

2,4-D on the Home Grounds

By J. S. SKAPTASON

The introduction of 2,4-D has been a tremendous forward step in weed control practice throughout the world. Weed control officials have been conscious of the tremendous loss, both in money and energy, which weeds cause. The development of selective herbicides, which began around 1940, has given much publicity and tremendous impetus to weed control. Results from these selective herbicides are so dramatic that there is almost an air of glamour now attached to weed control. There should be a certain amount of glamour and romance attached to the study of weeds, because many weeds were introduced in an almost story book fashion. One particular species of weed is alleged to have been introduced with grain that was smuggled into the country by immigrants from Eastern Europe. Broad-leaved Plantain was named "White Man's Foot" by the American Indians since it followed so closely the advance of civilization, springing wherever white men put their feet.

The old back-breaking method of pulling weeds by hand from lawns and gardens certainly contains little glamour for most householders. Before the advent of 2,4-D householders had nothing to look forward to, except hard work in controlling their weeds and, if the seed of a plant-like Broad-Leaved Plantain got into the soil, they can expect some of the seeds which remain in the ground, even for 40 years, to germinate and grow to healthy weeds.

2,4-D is an extremely powerful chemical. When dealing with certain plants, e.g., one drop can kill all of the mustard plants in an area of 150 square feet. It is quite easy to have 1,000 plants per square foot. Therefore, one drop can kill 150,000 plants. Tomato plants and bean plants can be killed more easily than mustard. If the distribution was perfect, it might not be impossible to kill a million bean plants with one drop of 2,4-D. By definition, a weed is an undesirable plant. Someone defined a weed as "A plant whose virtues have not been discovered." Once a plant has developed virtues and/or uses, and becomes a desirable plant, we must protect it from harm.

Fortunately, 2,4-D is not toxic to humans. It is pleasant to work with. Hence, the necessary precautions to protect

sensitive plants are in no way difficult. By using certain forms of 2,4-D it is possible to come within an inch of these highly susceptible plants and not cause them any harm. If the right application methods are used, it would be possible to kill weeds growing in the rows of sensitive crops but these methods are not practical in nature. 2,4-D has absolutely no place in the average back yard garden but it is indispensable in the care of lawns and turfed areas throughout the grounds.

To describe the way 2,4-D is used, let us suppose that we are faced with a weed problem in our grounds and that we want to find the easiest and cheapest way to dispose of them and in their place create the best possible turfed areas. Let us assume that we have the usual weed population, in which the Broad-Leaved Plantain and Dandelions are the chief offenders. An axiom in weed control in turf is "discourage the weeds, but encourage the grass". Once the weeds have been eradicated and a solid turf formed, the proper care of the turf by the standard practices of proper watering, regular mowing and fertilizing will make it very difficult for the weeds to get re-established. If there is enough grass growing, there will not be room for weeds.

The first problem is to get the weeds under control. If the predominant weeds are of the broad-leaved type, rather than grass-like, 2,4-D should do the job. In buying 2,4-D, as with any other commodity, deal with a reliable merchant. The merchant will have a selection of 2,4-D products. Again, choose the one marketed by an established, reputable firm. Having selected the merchant and manufacturer to your satisfaction, the problem becomes a little more complicated in that you must choose the form of 2,4-D best suited to your needs.

2,4-D acid itself is a white crystalline substance, which will not dissolve in water. It floats on water like wood chips. To make it usable it must be transformed into a new chemical form which will dissolve in water. One way this can be done is by reacting the 2,4-D acid with an alcohol which results in an **Ester of 2,4-D.** The Esters of 2,4-D are the most effective. The weeds respond more quickly and even if rain falls a matter of minutes after the application, the results will not be impaired. It would be quite in order to water a lawn treated with an Ester an hour or so after the application, although best results may be obtained by waiting as much as six hours. The Esters have one disadvantage which, under certain circumstances, is actually an advantage. In hot weather they give off 2,4-D fumes. Because 2,4-D is so powerful, the least

amount of vapor from the 2,4-D can affect extremely sensitive plants. This same characteristic is an advantage when dealing with resistant types of weeds.

The second type of 2,4-D is made by reacting the 2,4-D acid with an Amine, which results in the Amine Salt of 2,4-D. These 2,4-D compounds are generally not as effective as the Esters. Because they are less effective, they are less hazardous to sensitive plants. However, danger still exists in their use if a gust of wind were to carry some of the vapor from the spray to sensitive plants. They are more readily affected by rainfall if it comes within a short time after application.

Usually the smallest container you can buy will contain enough 2,4-D for the average sized lawn. For the control of the usual lawn weeds, the recommended rates of application vary from one-half to one and one-half pounds of 2,4-D acid per acre. It is, of course, possible to convert this recommendation into one that will fit your particular lawn but all this work is not necessary. If you have selected a material made by a reputable firm, the label will indicate the number of square feet that the material will cover. All of the recommendations are reviewed under the Federal Pest Control Act and are, therefore, reliable.

Having selected and bought the most suitable 2,4-D compound in the right quantity, the next step is to apply the material to the weeds. The type of equipment to be used is not too important from the point of view of application, but it is definitely important to remember what sprayers have been used for 2,4-D. All traces of 2,4-D can be removed from the sprayers but only with a certain amount of difficulty. Many inexpensive "gadgets" are available on the market for applying 2,4-D. The purchase of one of these may be justified by the consideration that a sprayer should be used for 2,4-D only, thereby eliminating all possible chance of injuring garden plants and flowers by using a contaminated sprayer.

When the 2,4-D liquid is added to the water one of two things should happen. If it is an Ester, the liquid should take on a milky appearance because an oil in water emulsion has been formed. If an Amine is used, this milky appearance will not be in evidence. This is a way of making sure that you have the formulation you wanted.

Time of application should be considered. Best results are usually obtained when the weeds are growing vigorously. Periods of extreme heat should be avoided because this will tend to cause vapor of 2,4-D to rise and be carried to sus-

ceptible plants. Periods of extreme cold should be avoided because the plants are growing very slowly. Under cold conditions only Esters are at their best advantage.

Most grasses are almost resistant to 2,4-D. However, Bent Grass is probably an exception. It may be advisable to refrain from the use of 2,4-D on Bent Grass unless the dosage is reduced to a quarter of that recommended. This may not result in a complete kill of weeds, although the susceptible ones will be destroyed. Even the resistant grasses can receive a severe burn from the chemical if an overdose is applied to one spot. Follow an orderly pattern in applying the spray mixture and keep moving to avoid injury to one spot by an overdose.

If there are certain prize plants in the vicinity of the area you wish to spray, it may be wise to cover them with a newspaper or cotton or burlap bag during the time of application. There is no reprieve for plants that have been sprayed with 2,4-D. The damage from a mishap can often be avoided by taking these precautionary measures before application.

Under good growing conditions within 24 to 48 hours the first sign of hormone effect should be visible. Under the best growing conditions leaves can often be seen to become more erect and often turn at a peculiar angle in a matter of three to five hours after application. As soon as the weeds are dead they should be replaced by grass. It is recommended that sprayed areas be given a sprinkling of grass seed and possibly an application of fertilizer for best results. The grass should not be cut for three to five days after application. It may be advisable not to cut the lawn just before application.

It might be thought that there are more don'ts than do's in the instructions above. That is as it should be because you only want to do one thing . . . that is kill your weeds. There are many things you don't want to do, such as injure your grass or kill your favorite ornamental plants. 2,4-D is extremely effective. It is very easy to use and it can save many, many hours of back-breaking labor. All that is required along with the 2,4-D is a little common sense.

There are many other uses for 2,4-D. There are indications that it can be used for weed control in and around certain horticultural plants. These are specific uses and before they are attempted, the advice of a competent authority should be obtained.

HOUSE PLANTS

Common Name	Botanical Name	Type	Flower Color	Winter Light	Day Temperature	Humidity	Gas Resistance	Soil	Propagation	Watering	Respiration	Summer Care	Miscellaneous
African Violet		flowering	blue	full sun	medium	high	medium	rich loam	division or leaf cutting	medium	none	shade	
Asparagus Fern	Asparagus plumosa Asparagus sprengeri	foliage		partial shade	medium	medium	low	rich loam	seed or division	heavy	no special	indoor shade	Fertilize frequently. Pinch back to keep bushy.
Azalea	Rhododendron varieties	flowering	red, white, orange	partial shade	low	high		rich, acid loam	buy plants	medium	no special	indoor shade	Use acid peat in soil and plenty of sand.
Begonia fibrous		flowering	various	full sun	low	high	medium	rich loam	stem cuttings	medium	no special	indoor shade	
Boston Fern	Nephrolepis exaltata bostoniensis	foliage		shade	high	high	low	rich loam	division	medium	no special	indoor shade	
Cacti (various)		odd forms		full	medium to high	medium to low		sandy loam	buy them	very light	no special	outdoor sun	Very tolerant to dry warm house. Keep soil dry.
Calla Lily	Tantedeschia aethiopica varieties	flowering	white yellow	full	medium	high	low	rich loam	bulbs in Sept.	medium to heavy	summer	in cellar	Reduce water gradually in summer. Re-pot in Fall.
Christmas Cactus		flowering	red	full		low	medium	sandy loam	stem cuttings	light	none	partial shade	
Cineraria	Cineraria cruenta	flowering	various	full	low	medium to high		rich loam	buy in bloom	very heavy when mature	grown as annual		Watch soil carefully. Never let it get dry.
Coleus		foliage		full	medium	medium	low	rich loam	stem cuttings	medium	none	indoor partial shade	
Crown of Thorns		foliage		full	medium	medium	low	sandy loam	stem cuttings	light	none	full sun	
Cyclamen		flowering	red and white	full	low	high	low	rich loam	seed	medium	none	partial shade	
English Ivy	Hedera helix	foliage		north window	medium	low	low	rich loam	stem cuttings	medium	no special	partial shade	
Ice Plant	Mesembry-anthemum roseum	flowering	pink	full sun	medium to high	medium to low		sandy loam	stem cuttings	light	no special	outdoor sun	Provide good drainage. Keep always fairly dry.
Flowering Maple	Abutilon hybridum	flowering	various	full sun	low to medium	high	low	rich loam	stem cuttings	medium	summer	outdoor sun	Keep growing but dry in summer. Re-pot in Fall.
Fuchsia	Fuchsia hybrida	flowering	various	sun	low to medium	very high	medium	rich loam	stem cuttings	medium to heavy	summer for winter bloom	outdoor partial shade	Sensitive to dry atmosphere and temperature changes.
Geraniums	Pelargonium	flowering	various	sun	medium	medium	low	rich loam	stem cuttings	medium	no special	outdoor sun	
Hydrangea	Hydrangea hortensis	flowering	red pink blue	full sun	low	high	low	rich loam with acid peat	stem cuttings	medium heavy when mature	Oct. Nov. Dec.		Cut back after bloom, withhold water in Fall. Place in cellar after frost. Keep dry until January.
Impatiens	Impatiens sultana	flowering	pink red white	full sun	low	medium		rich loam	stem cuttings and seed	heavy	no special	indoor partial shade	Propagate year around as geraniums.
Japannese Rubber Plants	Ficus Japonicus	foliage		shade	high	low	low	rich loam	leaf and stem cuttings	light	none	shade	
Jerusalem Cherry	Salonum pseudo-capsicum	flowering berried	red berries	full sun	low	high	low	rich loam	buy plants at Christmas	medium to heavy	treat as annual	outdoor sun	Very sensitive to warm, dry atmosphere and gas fumes.

Sex Life of the Gladiolus

R. SKELDING

Gladiolus sex organs grow high in flowers.
Flowers reproduction is artfully contrived.

The strange and beautiful forms are the sex organs of the flowers, each elaborately evolved and constructed for the fertilizing of the seed by which most plants reproduce. Some of the prettiest and most perfect of the sex organs of the flowers belongs to the gladioli, each of whose blossoms bear three male and one female organ. This female organ of the gladiolus grows the tallest in the cluster. It is called the pistil, and each of its three tips is called a stigma. Below the stigmas are the male sex organs, called the anthers, which become covered with grains of dust-like pollen. These pollen grains contain the flower's male sperm. A bee is attracted by the bright color of the petals of the gladiolus, and comes to get the nectar which is deep inside the flower below the sex organs. As it enters the flower it brushes against the stigmas and dusts on them the pollen it has collected from other flowers which it had previously been visiting. Pushing deeper into the flower the bee falls or rubs against the shorter male organs, the anthers, and rubs more pollen grains onto its body to be carried and deposited on the stigmas of other gladiolus flowers. The pollen left on the stigmas develops a long thread-like tube that fertilizes the egg nucleii at the base of the pistil. Seed develops then.

Though sex organs in some other flowers look more elaborate, those of the gladiolus are better designed than most. The male sex organ is the pollen producing anther. From the three short anthers of the three short stamens the bee picks up the pollen for the next flower visited. The stigmas have many cells to catch the dusty pollen from the bee. The seed pod or ovary of the gladiolus is full of unfertilized seeds until the pollen tubes reach them and fertilize them. After fertilization has thus taken place the flower petals wilt, become dry and brittle The seeds develop to normal size, ripen, and the ovary case bursts allowing the seeds to drop to the ground and start new gladiolus corms.

Gladioli are deservedly popular because of their wide variety of color and uses, their simple culture and their general adaptability. Gladiolus will grow anywhere and with little preparation in almost any kind of soil that is

well drained and in a sunny location. The preference of the plant seems to be for a sandy loam, well pulverized, mellow and deeply cultivated. Clay soil should have sand added to make it friable and drain well. Lighter soils are improved by additional amounts of decayed vegetable matter. Cultivating the soil to a depth of 18 inches cannot be too highly recommended. Well decayed manure may be used if the soil is dug in the fall (a very good practice) and allowed to lie rough all winter, but manure should not be in soil about to be planted. Dig the manure as deep as possible so that the roots may go deep into the soil in search of moisture and cool temperature. The gladiolus corms are planted three or four inches deep. Its roots will go considerably deeper if the soil is mellow. There is a black sedge humus sold commercially which is ideal for use if the soil is made up at planting time. Peat moss may be used but keep it away from the corm. Planting may be commenced in the Spring as soon as the ground is in condition to work. The approved distance for planting is six inches apart. Good corms pay. Large old corms which are usually flat and slightly hollowed on the bottom are not as good as smaller high-crowned younger corms. Depth of planting depends upon the size of the corm and condition of the soil. Small corms should be planted as shallow as two inches in heavy soil, and large ones as deep as four inches in light soil. Deep planting means less watering and less staking, giving more support to the plant.

For wireworms in the soil sprinkle the planting soil with a weak solution of Postassium permanganate and fumigate with sulphur at planting time. Burn any rotten or decayed corms to prevent spread of disease.

First cultivation after planting may be fairly deep, three inches. As plants advance cultivation should be done with a rake. Merely keep the top soil loosened, and keep weeds from starting, and to form a dust mulch. If done often (once a week) the rake is sufficient and will save the labour of breaking up the ground after it has packed. Keep the ground fairly level, hilling is a doubtful practice. Never water lightly. If watering becomes necessary, soak the ground to six inches deep. Cutting the spike as soon as the first flower opens allows the plant to develop a healthy new corm.

Fine bloom comes from fertilization. Dress the plant with equal parts of steamed bone and blood meal. One level teaspoonful to each plant when they are six to eight inches high, and give liquid manure just as the plants are ready to bloom. The best time to lift the corms is when the tips of the leaves begin to turn brown. Store them in bunches for about eight

weeks in open slatted trays in a cool cellar. Never remove stalks as long as any green is shown. If they must be stored in a furnace-heated cellar, they may be placed in dry sand or dry peat moss. Avoid dampness.

Cormbels or bulblets may be planted in shallow trenches in mellow soil either in the open or in boxes inside in the early spring. They will grow into large flowering bulbs in about two seasons. Store for the winter in very slightly moistened peat moss.

There is nothing that goes farther towards making a home out of a house than flowers, both in the garden and about the rooms. There is no flower that will go farther in beautifying the garden than gladioli. Their sharp, vivid coloring, together with variety of form and color have made them one of the most popular flowers of our day. They are easy to grow, require a minimum of attention, and will thrive well in almost any kind of soil. The ideal way to plant for continuous bloom is by planting a number of corms each week or ten days, as soon as you can get on the ground up to the middle of June. They will bloom in your garden from July until frost. As cut flowers they are far superior to any summer bloomer for lasting qualities. Plant them in beds or borders or in clumps with other flowers. Whatever way you choose to plant them they will pay fine dividends.

"The little brown bulbs went to sleep in the ground;
In their little nighties, they slept very sound
And winter, he raged and roared overhead
But never a bulb turned over in bed.
But when Spring came tiptoeing over the lea
Her finger on lip, just as still as could be,
The little brown bulbs at the very first tread
All split up their nighties, and jumped out of bed."

Flower Boxes

M. C. JILLETT and T. McKEOWN

Some people may prefer to call them Window Boxes, but no matter by what name they are called, they are a beauty to behold. Whether the home be a humble cottage or an elegant mansion, the addition of a flower box or two enhances its appearance and gives it a welcoming look.

Although the preparation of a Flower Box requires some careful study, when once it is established it is more easily handled than a flower bed. When people realize this fact we shall have many more boxes adorning the homes and their suroundings of our fair city.

The box itself must be deep enough and wide enough to furnish room and strength for the roots of the plants to grow, as it takes considerable nourishment to grow good healthy plants in a window box. Of course, the length will have to be governed by the space available, but a box less than four feet long does not have the appearance one would expect from a window box. We have found that boxes nine inches deep, ten inches wide (inside measurement), and eight feet long provide the most effective showing. It is advisable to paint the box and decorative trimmings, and it should have several one-inch holes bored through the bottom for drainage.

The mixture for filling should consist of one half good garden soil, one-quarter well-rotted cow manure, and the remaining quarter made up of sand and peat or leaf mold. These should be well mixed, sieved. For extra drainage the bottom of the box should be covered to a depth of two inches with coarse rotted manure and rotted sods. The box may be filled and planted before placing it on the brackets where it is to remain, but we have usually followed the practice of filling the box about three-quarters full of the earth, then placing it on the brackets and then arranging the plants to the best advantage. Care must be taken to use sufficiently strong brackets and have them well bolted to the building, as they will have a tremendous weight to support when the boxes are watered or after heavy rains.

As far as variety of flowers is concerned, it is difficult to specify, as everyone has his own particular favorites, but it is well to bear in mind that certain flowers like a lot of

water while others do not want as much. Therefore it is advisable to keep these groups in separate boxes.

In our opinion, geraniums, tuberous begonias, trailing lobelia, with perhaps two or three variegated coleus make the best showing in a box. Some people like the small rosebud or camellia flowered balsams as background, and others like salvias for that purpose, but here again good soil is required and a fairly large box as the roots of salvia plants take a large amount of both room and nourishment. A box having begonias, geraniums, coleus, and asparagus fern does very well in a northern exposure, while one having several petunias, patience plants, balsam, salvia and blue lobelia does much better in a sunny location.

Besides the regular watering, a good soaking with liquid manure or any commercial fertilizer is necessary once a week to provide sufficient plant food.

Flower boxes can always be counted on to add beauty to the home grounds, and five or six can be used to excellent advantage. Besides having them on the front and back of the dwelling house and on the front and sides of the garage or greenhouse, try setting one on the compost box in the back corner. The beautiful view when looking towards the lane will more than repay you for any extra trouble you may have taken.

A Few Garden Hints

Fruit trees and some shrubs as well as small evergreens are injured by heat reflected by the white snow during February and March. The days have clear skies many times, daylight is much longer, and consequently it is quite warm on the sunny side, especially where there is shelter from the north. Sap may move up only to be frozen at night. Expansion and contraction proves disastrous to the lower trunks and branches. By setting upright boards to shade such exposed parts reduces this danger. Sacking loosely wrapped about low-growing everygreens, having south or west exposure, will save them from browning.

* * *

Boughs lopped off the Christmas trees after the festive season and laid on the rockery or exposed perennial border beds protects the plants from starting to grow too soon and suffer from frost.

* * *

Covering perennial chrysanthemums for three or four days in July with a light black cloth will advance the period of bloom and so lengthen the season of bloom of these choice plants.

* * *

Crab Grass, a much discussed weed in American publications, is much like Barnyard Grass and not troublesome in this area .

* * *

All garden tools will be needed next year, and so should be assembled at the close of any season, cleaned, repaired where necessary, sharpened, and smeared with oil or vaseline and then hung or placed where they will be ready for use next year.

* * *

At the close of each gardening season, it will be a valued help to take the notebook used during the season, and make an inventory of the successes and failures. Record the varieties that did real well and those that did not. Where

reasons have been observed, note these. List any varieties that some one else did well with. Estimate next year's requirements, keeping in mind the necessity of rotation of crops. Prepare a plan for the next year, alloting definite location and space for each variety. This applies to both vegetables and flowers. By careful planning then, the hurry of spring work will not spoil the pleasing effect that may be obtained.

* * *

When the chimney-sweep cleans the chimneys have him place the pure soot in some pail, box or other container. Leave it to cool well and aerate for a month. Then use it when planting or repotting, being careful not to use it too lavishly or allow it to gather as a dust on the foliage.

* * *

Empty tin cans with both ends removed provide effective protection against cutworms destroying tomatoes and other transplants. After setting the plants lower the can over and around the plant and press into the soil about an inch.

* * *

If mice are likely to girdle your fruit trees during the winter, they may be checked by tramping the snow firmly around close to the trunk. This may be done a couple of times to make the hardened layer thick enough to stop the mice.

* * *

In the case of roses, wet, soggy soil is not healthy, and they cannot compete with weeds. Roses like plenty of water, in evenings or mornings during hot, dry weather, but object to being sprayed or washed on bright sunny days. They respond to plentiful fertilizer . They like air filtered through the soil, so cultivate the soil at least twice during the season. Grass clippings sprinkled between the bushes when fresh make a real good mulch, holding the moisture over the dry spells. When dry and dug in these clippings make good fertilizer, and make the soil friable and loamy. To save the bush from reverting, watch closely for shoots from the root and remove. Choose a sunny location for your roses.

* * *

The Horticultural Society will be pleased to learn of other hints. Bring them along to the winter discussion meetings. Everyone can contribute a little and have a share in making the society helpful.

Fruit Tree Varieties for Trial in Winnipeg

E. T. ANDERSEN

The Winnipeg gardener is not favoured with ideal conditions for tree fruit growth. Probably among the least desirable conditions is the heavy, poorly drained, alkaline soil into which most of us must plant our trees. Were the soils more porous and less alkaline, the number of kinds and varieties which would grow here well, would no doubt be increased considerably. Nevertheless, much satisfaction and enjoyment may be gained from them.

The following suggestions give some of the better varieties which should prove worthwhile in the area.

CRABAPPLES

In this group we have probably the best of tree fruits from the standpoint of hardiness, fruit production, and ornamental value. Dolgo is a highly ornamental, medium early, small dark red-fruited crab which enjoys high popularity as a jelly crab and has proven quite well adapted to Winnipeg conditions.

Osman, Bedford, Columbia and Florence are other varieties which have given good performance, are larger fruited, and better suited for use as sweet preserves than Dolgo and also make good jelly. There are other varieties in this class which may be equally as hardy and produce satisfactory fruit.

In the apple crab or small apple class the variety Rescue appears to be particularly outstanding. The fruit size of Rescue is a little larger than the regular crabapple and in eating quality it compares very favourably with the good varieties of dessert apples. This variety deserves a place in every garden. The variety Trail is of similar type but has not proven entirely hardy in the Winnipeg area.

APPLES

There are no high quality dessert apples that are dependable in the area. A few varieties having fair to good quality fruit deserve a limited space. Heyer No. 12 is a small apple

which matures early and has fair dessert quality when consumed within a short time of maturity. Moscow Pear is another early fall apple which has poor storagability, but is very pleasant as a dessert or sauce apple when in good condition. Haralson is a winter apple of good quality and storageability. It is not mature till near the end of December and will be disappointing if used as dessert much before that time. It is not as dependable as the two former varieties, but good success has been obtained in a few cases.

Hibernal is a large fruited variety about as hardy as Moscow Pear and has good storage qualities. It is very acid for use as a dessert variety, but makes excellent pies or sauce.

PLUMS

Many varieties of the native Manitoba plum are hardy. None produce fruit of good quality for canning. The fruits of this type are useful for jamming and for mixing with other fruits for jelly making. They are also quite appealing when eaten raw as dessert. Some of the better varieties in this class are Mina, Bounty, Norther and Dandy.

Certain hybrid varieties produce better fruit than the above group but are not quite so hardy. The number of varieties in this group are quite numerous and many might be named. Pembina has been very productive in many parts of the province and is no doubt one of the best from the standpoint of adaptation. Grenville has excellent dessert quality and has given some success in the area, but is less hardy than Pembina.

CHERRY PLUMS

This group consists of selections made from crosses between the small hardy bush sandcherry and the Japanese plum They all have the bush habit of the sandcherry and should not be pruned to grow like trees. If pruned to tree form they tend to kill back and the grafted variety may be lost.

Varieties of this type are the most dependable plums for the area and will fruit heavily in good seasons and almost never fail to produce some fruit. The fruit quality is good for preserves or canning and excellent for jamming. It is fair as raw dessert.

Manor, Dura and Sapa, are three dark red-fleshed varieties which have given good results. The two former are hardier than the latter. Opata and Mordena are green or yellow-fleshed and have shown themselves to be highly de-

pendable. Opata is probably the most widely grown of all plum varieties in the province at the present time and is dependable almost everywhere.

PEARS AND APRICOTS

Neither of these fruits have proven satisfactory in the area but a few varieties deserve mention as they might succeed under highly favourable circumstances. Pear varieties, Tait Dropmore, Pioneer No. 3, and Bantam are three of the hardiest. The Asiatic sand pear or Ussurian pear is hardy but produces fruit having little edible value.

In apricots the variety Scout is one of the hardiest. The fruit is of good desert quality and fair size. Siberian apricot is quite hardy but produces inedible small sized fruits.

The foregoing is a brief review of tree fruit varieties suggested for the Winnipeg area. Many other varieties have been grown and might prove equally as satisfactory. The limited number given is an attempt to eliminate confusion for the beginner and at the same time select those most likely to prove successful. With all kinds of fruit trees it is advisable to plant at least two varieties of each to permit cross pollination and thus ensure better fruiting.

—Division of Plant Science, The University of Manitoba.

Winnipeg, January, 1950.

The Make-Up and Functions of Modern Plant Foods

G. S. REYCRAFT

Many of us think of the soil as the media in which plants grow and from which plants obtain most of their plant foods. In actuality, plants obtain most of their nutrients from the air, not the soil. Plants take in carbon-dioxide from the air through their leaves. From this carbon-dioxide (CO_2) nature makes sugars which are converted to starches and to the fibre in plants. Carbon and oxygen, the components of carbon-dioxide, are the keystone of all organic substances. In plants, carbon is a brick in the cell walls of the tissue, a component of sugar, an atom in the flavor of juices, a part of the structure of color, and even an element in the fragrance of the blossom while oxygen makes up approximately 50 percent of the composition of the dry matter of the plant. Oxygen enters into combination with all the elements to form oxides and complex organic compounds. The energy which makes all this possible comes from the sun.

Fortunately, the earth is blessed with a liberal supply of oxygen, but carbon is a limiting factor as air contains only about 3/100 of 1% of carbon-dioxide. In fact, if the air was richer in this substance, plants could grow bigger than they now do. The plants of the coal age did grow bigger than modern plants and some geologists hold the theory that the reason for this growth was the existence of more carbon-dioxide in the air. The carbon and oxygen taken into the leaves of the plant through the energy of the sun plus water (H_2O) makes up 93% of the plant.

We have now approximately 7% left; what is this? It is the mortar that holds the 93% together and is made up of a dozen or maybe more separate plant nutrients, closely interrelated and dependent upon each other in fulfilling their functions. The better known or sometimes called major plant elements are nitrogen, phosphorus, potassium; the secondary elements are calcium, magnesium, sulphur and iron, and the so-called minor elements, the most important of which are manganese, boron, copper and zinc. These minor elements are just as essential as the major and secondary elements but

are required in smaller amounts. Some of these elements serve as partial substitutes for other nutrients, while others appear to work in pairs such as boron and zinc, and even where they do not enter into the nutrient solutions, they have very important catalytic properties.

Before going into the separate functions of these elements and the deficiency symptoms of plants, it may be interesting to outline briefly the source and composition of these elements.

Nitrogen—is a colorless, odorless and very unreactive gas constituting about 78 percent of the atmosphere by weight, but to most plants it is as useless in this form as sea water to a thirsty man. But just as sea water must be distilled to make it suitable for drinking, the atmospheric nitrogen must be combined with oxygen, carbon or hydrogen before it is of any use to growing plants.

Some bacteria, such as those on legume roots, are able to perform this miracle. Fortunately, modern chemistry is also able to do this for nature on her own is very short of available nitrogen and can only produce it through the slow decomposition of organic matter.

Plants take up nitrogen in the form of ammonium and nitrate salts. Knowing this the chemist takes atmospheric nitrogen and causes it to react with hydrogen gas by placing these two gases in contact with each other under high pressure and temperature, in the presence of a catalyst. The resultant product is ammonia (NH_3) which is volatile and must be held under pressure. However, when this ammonia is combined with sulphuric acid (H_2SO_4) or with nitric acid (HNO_3), we obtain ammonium sulphate and ammonium nitrate, respectively. These two forms of nitrogen are 100% soluble and supply readily available nitrogen to plants when dissolved in the soil solution.

Phosphorus—as an element is normally a yellow wax-like substance which catches fire spontaneously when exposed to air. In this form phosphorus cannot be used by the plant.

In order to supply soluble phosphates which can be used by growing plants, raw phosphate rock, of which the United States has over one-half of the world's known supply, is mined out of the earth both in Florida and in the Northwestern States. This raw material contains very little available phosphorus. However, when this rock is treated with sulphuric acid the end product contains phosphorus, calcium and sulphur in a form available to plants and is either termed superphosphate or triplesuperphosphate. Triple-

superphosphate is merely a more concentrated grade of superphosphate containing a higher percent of available phosphate.

Potassium—as an element is a soft bright metal that will tarnish in air almost instantly. When a small piece of potassium is dropped in water it will burn with a purplish flame. However, in the form of a soluble salt available to plants, it is known as Murate of Potash. Murate of Potash contains from 50% to 60% available potash. Large quantities of Murate of Potash are taken from the ground in New Mexico and California by methods similar to those used in mining common salt.

SECONDARY ELEMENTS

Calcium—as an element is a hard and brittle metal. It is usually supplied in plant foods as the calcium sulphate in superphosphates and from dolomite limestone in the form of carbonate of lime and carbonate of magnesia. These forms of calcium are non-alkaline forming.

Magnesium—as an element is a very light weight and bright metal. As a source of plant food it is usually supplied in the form of carbonate of magnesia from dolomite limestone.

Sulphur—is also mined from the earth as sulphur or is a by-product of other mining operations. It is a valuable ingredient of plant food but has been principally incorporated into plant foods by the use of sulphuric acid (H_2SO_4) in the manufacture of ammonium sulphate and superphosphates.

Iron—must also be supplied, not as an element, but as a soluble salt in the form of iron sulphate.

MINOR ELEMENTS

Manganese—is a very hard reddish grey metal. It is supplied as a soluble salt in the form of manganese sulphate.

Copper—must also be supplied in the form of a soluble salt. Copper sulphate is usually used.

Zinc—is a bluish white metallic element. In its soluble form it is known as zinc sulphate.

Boron—in the form of the element is a chestnut colored powdery substance. It is supplied to plants in its available form as common borax.

Now, with an understanding of what the various essential plant food elements are, and how they are constituted, let us now outline their functions in plant growth and the deficiency symptoms shown by plants when one or more of these elements are missing or unavailable.

MAJOR ELEMENTS

Nitrogen

1. Produces leaf growth, greener leaves.
2. Essential to cell production in plants.
3. Is esesntial component of plant proteins.
4. Lengthens growth period.
5. Tends to increase set of fruit.
6. A deficiency causes yellow leaves and stunted growth.
7. Excess delays flowering, causes excess elongation of stems, reduces quality of fruits, causes lodging, renders plants less resistant to disease.

Phophorus

1. Hastens maturity.
2. Increases bloom and seed yield.
3. Produces larger bloom and seed yield.
4. Reduces lodging.
5. Increases root development—reduces "heaving out."
6. Increases resistance to winter kill and diseases.
7. Increases vitamin and mineral content of plants.
8. A deficiency causes purplish colored leaves, stunted growth, poor seed yield, sterile seed.
9. Excesses are rarely encountered; deficiencies are fairly general.

Potassium

1. Is essential for cell division or growth.
2. Makes plants more resistant to disease.
3. Reduces winter kill.
4. Improves keeping quality and color of fruits and vegetables.
5. Aids in the production of starches, sugar, oils.
6. Decreases water requirements of plants.
7. Aids plant to utilize nitrogen.
8. Balances effect of excess nitrogen or calcium.
9. Reduces boron requirements.
10. A deficiency causes firing of the edges of leaves which later turn brown and die. Affects lower leaves first, causes shrivelled sterile seeds.
11. Excesses are rarely encountered.

SECONDARY ELEMENTS

Calcium

1. Increases strength of plant tissues.
2. Aids in movement of starch from leaves.
3. Necessary for root development.
4. Corrects acidity for soil and plant.
5. Encourages bacterial activity.
6. Assists in utilization by plants of potash, boron and magnesium.
7. Removes toxic acids from soil sap in plants.
8. Aids in the development of legume nodules.
9. A deficiency causes "yellow top"; leaves of terminal bud die back at tip and margins; roots develop poorly.
10. Excess reduces availability of iron, manganese and phosphorus, aggravates a deficiency of potash or magnesium.

Magnesium

1. An important part of chlorophyl, the green part of leaves.
2. An essential for plant utilization of nitrogen, phosphorus and sulphur.
3. Regulates uptake of plant foods, especially calcium.
4. Aids in protein formation.
5. Corrects acidity in plants and soils.
6. Deficiency causes lower leaves to turn yellow between the veins which remain green. Leaf edges burn first. Color changes to orange and brown in later stages. Leaf soon dies.
7. Excess rarely encountered. Causes calcium deficiency.

Sulphur

1. Essential in the form of sulphates to all plants.
2. Essential for chlorophyl production.
3. A component of plant proteins.
4. Promotes nodule formation on legumes.
5. Is associated with odors of plants and flowers.
6. Will increase soil acidity.
7. Deficiency causes yellowing on top of leaves identical to that of nitrogen deficiency (do not confuse with "yellow top" due to calcium or boron deficiencies).

Iron

1. Essential for chlorophyl development.
2. Influences color of flowers.
3. Intimately related to carbohydrates production.
4. Acts as a catalyst.
5. A deficiency shows the same symptoms as those for nitrogen and sulphur. Deficiencies are common in calcerous and alkali soils.

MINOR ELEMENTS

Nutrients are just as essential as major elements, but required in smaller amounts and may be toxic if used excessively.

Manganese

1. Acts as a catalyst.
2. Enables plants to use other plant food nutrients to better advantage.
3. On alkaline soils where manganese is frequently available, it supplies this important plant nutrient.

Boron

1. Acts as a catalyst.
2. Is closely related to the calcium supply.
3. Functions in protein formation.
4. Associated with terminal growth and terminal bud development.
5. Prevents "cork" in apples, "split stem" in celery, "heart rot" in beets, "whiptail" in cauliflower.
6. Functions in seed formation in legumes.

Zinc

1. Acts as a catalyst.
2. Increases photosynthetic activity.
3. Appears to function most effectively along with boron.

Copper

1. Acts as a catalyst.
2. Functions in seed production.
3. Related to pigment of leaves and flowers.

How to Diagnose Deficiency Symptoms for Many Plants

Symptoms shown in lower part of plant or in whole plant:

Whole plant shows—Nitrogen: Chlorosis of all leaves, short slender stems.

Chlorosis, or leaves (lower) dry up and die—Phosphorus: Leaves purplish green, lower leaves turn yellow, brown or black and die; stems short and slender.

Lower part of plant only affected—Potassium: Leaves first turn yellow at edges then brown with spots between veins, stems slender. Magnesium: Lower leaves chlorotic, without spots, stems slender.

Symptoms shown in upper part of plant only:

Chlorosis of upper leaves—Iron: Leaves chlorotic, no spots. Principal veins green. Stems slender and short.

Terminal bud remains alive — Manganese: Leaves chlorotic, spotted; small veins green producing checking effect on leaf. Sulphur: Leaves chlorotic, veins lighter than intervein tissue, stems short and slender.

Chlorosis of upper leaves—Calcium: Leaves of terminal bud die back at tip and margins. Later growth gives cut out appearance.

Terminal plant dies—Boron: Leaves of terminal bud first light green at base, gradually turns brown. Later growth tends to twist the leaf.

In using the Deficiency Chart shown in this article ,it is well to bear in mind that actual hunger signs appear only when the deficiency of a plant nutrient is extreme. Long before starvation symptoms appear, preceeding plants may have yielded or bloomed poorly. Accordingly, although this chart should be of assistance to you, the best practice is not to wait for deficiency signs but to do away with the possibility by using properly balanced commercial plant food containing all the essential plant nutrients as part of your gardening programme.

It will also be well to understand that the use of a commercial plant food is not a substitute for organic matter but

rather a supplement to make a balanced diet for your plants. Further, commercial plant foods, being concentrated soluble salts of the essential plant nutrients, must first be dissolved into the soil solution around the roots of the plants before they are available. Also as organic matter increases the water holding capacity of all soils as well as tending to bind loose soils and open up heavy soils, it is understanding that the better the physical condition of the soil, the greater the organic matter, the more effectively can commercial plant food improve your gardening results.

The application of organic matter to the soil also supplies a small amount of plant nutrients. But as organic matter normally only contains from one-half to two percent nitrogen, about the same amount of potash, and possibly about one-half of one percent of phosphoric acid, the application of commercial plant food as well as organic matter to the soil is necessary to assure the best gardening results.

There is one more angle worthy of consideration, particularly with regard to the vegetable garden. Plants do perform miracles but they cannot perform the miracle of extracting from the soil minerals it does not contain. As well as organic matter our soils formerly contained sufficient quantities of such elements as manganese, copper, zinc, boron and iron, but in many soils they have been badly depleted by soil cropping and leaching. More and more we are beginning to realize that in order to obtain better quality vegetable crops, better flavor, and more important—better health, we must add to our soils not only nitrogen phosphorus and potash, but many of the minor elements as well, in order that the vegetables that we eat will supply our diet with the minerals essential to human health. It has also been discovered that where minerals are high, vitamins are abundant also. Therefore, vegetables grown on soil on which a complete commercial plant food, containing all the essential elements has been applied, will supply to the human diet not only the essential minerals but a higher level of vitamins also.

Summing up, organic matter and a commercial plant food containing all the essential elements, along with good garden practice, will supply you with better, more abundant and healthier flowers as well as tastier, more nutritious and more bountiful vegetable harvests.

Winter Storage of Semi-Tender Plants

W. R. LESLIE

The home gardener of prairie Canada recognizes that warm summer gives way to cold winter. Among his most cherished plants are some that immigrated from milder zones. These require considerate treatment to have them in health and vigor for planting out again in the garden next April or May.

Dahlias, for example, remain in the ground until early frosts kill top growth. Then the stalks are severed about three inches above the ground. After a week the roots are dug with spading forks, digging around about 16 inches from the stalks, to avoid injuring the spreading root system. The object is to pull up the entire clump without breaking any 'necks' 'of the large, fleshy roots. It is at the point where the root is attached to the old stalk that the eyes (sprouts) develop to produce next season's plants. Each clump should have the variety name attached by wire label.

After two or three hours in the sun, the roots are removed to a potato storage cellar or cool place in the cellar having a temperature of about 35 to 45 degrees Fahrenheit. Dahlias enjoy the humidity found in cool storages with earthen floors and the moisture given off from a heap of potato tubers. Some gardeners merely place the clumps on top of a pile of potatoes. Others pack them in shallow boxes with granulated acid peat moss which is slightly damp. Lacking a potato cellar the roots are packed in butter or apple boxes with peat moss, granulated cork, vermiculite or dry sand packed around them, and set in a cool location in the basement.

In late December the clumps are unpacked. Any rot is cut out and the roots with the broken necks thrown out. All cut surfaces are rubbed in powdered sulphur. If shrivelling has begun, a fine spray is applied to make the covering material slightly moist. Periodic inspections are made, but well-ripened roots are expected to winter well without any further attention following the December grooming and repair job.

Gladioli are dug three or four weeks after flowering is over. Plants are dug on a warm, sunny day so that plants are in a dry condition. The tops are clipped off to a length of one or two inches. The corms are then allowed to cure for three or four days in the sun or in warm dry air. Thereafter

they are placed in clean flats or crates and stored in a room or warm cellar for a few weeks, when the new corms can be easily separated from the tops of the old corms upon which they developed. Further gradual drying of the new corms continues for a week or so. Then they are treated against thrips. The old treatment was to place up to 100 corms in a paper bag, sprinkle in a teaspoonful of napthalene flakes, tie and leave for three weeks. Then either retrieve the flakes or leave them, but perforate the bags by making numerous holes with a paper punch or a skewer. This permits aeration. Store by tieing to the wall or place the bags in trays or grape baskets in a coolish cellar at about 40 degrees F.

A newer treatment against insect enemies is to blow one ounce of five percent D.D.T. over a bushel of corms in such a way that the surfaces are evenly coated. Then store in four to six-pound perforated paper sacks.

Where disease is probable, the corms are soaked 15 to 20 minutes in late April in a solution of one ounce of the new improved Ceresan and three teaspoonfuls of Graselli's Sticker in two and one-half gallons of water. The two chemicals are first mixed with a wooden paddle. Continue stirring the water as it is added. Hands are kept out of the chemicals. Fumes and dusts are not to be inhaled. After soaking, the corms are planted at once.

Tuberous begonias are accorded temperature treatment much like the canna; preferably at about 50 degrees F. The plants are dug up before hurtful frosts arrive and it may be best to leave the balls of soil which adhere to the roots. Pot the plants individually or severally in a box of soil. Set them in a basement and water them sparingly, allowing the tops to dry down. This results in strength going back to the bulbs. Thus they mature favourably and have optimum chance of coming through the winter.

In April the old roots are rubbed off with the old soil. Re-pot and bring up to the light, warmth and water to begin the 1950 season. Some growers plant the roots bare of soil, in acid peat and sand, rather than potting them in soil.

Geraniums from the border garden are often lifted in late September, potted, the top cut back and grown on as a house plant during the winter. In February, cuttings three or four inches long are made from the ends of the branches. These are rooted and grown to furnish the garden in the coming season. Another method is to take cuttings in autumn before frost injury ocurs and root them in the sunroom. A third method of carrying over stock is to dig the roots in Sep-

tember. Pack in boxes of soil and store in the basement in front of a south window. Light is needful for well-being. Water is withheld except for about one winter watering. Keeping the plants on the dry side is important, since much water makes for sappy growth and weakened stock. A fourth treatment, sometimes attempted, is to dig with the soil adhering to the roots and hang upside down from the ceiling of the potato cellar. This is of questionable effectiveness.

The canna, with foliage resembling those of its cousin, the banana, is being easily grown. Storage of roots is much like that for the dahlia, but the storage room is drier and warmer. Temperature should not sink below 45 degrees F. Roots are placed in a box containing granulated acid peat. A mixture of half peat and half sand is good. Sand alone or even sandy soil may do, but preference is the peat. If the material is damp when the plants are placed in it, very little light sprinkling may be needed once or twice during the winter. Use only enough to prevent shrivelling. Relative dryness is the objective.

—Reprinted by permission from Country Guide.

Please Patronize Our Advertisers

May They Long Be Remembered

PROF. F. W. BRODRICK

FREDERICK PUGH

Feb. 8, 1879—Aug. 14, 1948

Fred Pugh, as he was generally known by his friends and acquaintances, was a horticultural enthusiast. He was a keen grower of flowers, fruits and vegetables, and was an ardent supporter of many public efforts that tended toward the betterment of horticulture in his province. He always displayed a keen interest in new and promising types of the various classes of horticultural plants.

For a number of years he edited Eaton's Farm News Service.

Though he was an active businessman, he spent most of his leisure time in the development of a fine horticultural environment around his attractive suburban home. From his gardens he supplied quantities of material for provincial and local horticultural exhibitions.

Fred Pugh was a good citizen, a trusted friend, and a reliable supporter of many worthy causes. For his interest in and his assistance to prairie horticulture, he was elected to Honorary Life Membership in the Manitoba Horticultural Association.

* * *

GEORGE ROBERT BATHO

Feb. 13, 1873—Jan. 30, 1948

Those who were privileged to know George Batho during the years he lived in Winnipeg, had an opportunity of realizing the great contribution he made to Manitoba's horticulture. This contribution was principally in the inspiration given and the information supplied over a number of years to amateur horticulturists. This was while he served as Agricultural Editor of the North-West Farmer, a foremost western publication. He was later Superintendent of Publications, for the Provincial Department of Agriculture. While in this effort, he supervised the publication known as the Manitoba Horticulturist. This was a monthly publication which was distributed to interested horticulturists throughout the province. Needless to say it was much valued as a source of horticultural information.

In 1917 he was president of the Manitoba Horticulture Association, and was twice secretary of this provincial organization. He was a director for a number of years and in 1922 served as chairman of the Provincial Garden Show.

For the many services he rendered to Manitoba horticulture he was made Honorary Life Member of the Manitoba Horticultural Association.

Mr. Batho was a man of kindly disposition, and a sincere friend. In his religious life, and in the support which he gave to worthy causes, he displayed a marked sincerity of purpose and exemplified many of the characteristics of sound citizenship.

Winnipeg Horticultural Society

Report of the Home Grounds Committee for 1949

The various competitions handled by this committee were satisfactory. Two classes in the Greater Winnipeg Competitions for home grounds were won by members of the Society. Mrs. M. Harding won out for lots from 33 ft. to 66 ft. and also captured the Shaughnessy trophy for the best home grounds in all classes. Mrs. W. Gyles won the class for lots up to 33 ft.

Several recommendations submitted by this committee were adopted by the Society. Among these the following should be noted:

(a) Judges from points outside of Winnipeg be secured if possible and that judges be changed each year.

(b) Any member winning first prize in sections 1, 2 or 3 in the home grounds competitions, be barred from competition for two years.

(c) The competition for perennials be discontinued and in place of it a novice competition for Rock gardens be substituted.

The Swift Canadian Co. kindly donated a trophy for annual competition in the Utility Garden class, and we are indebted to the following who generously donated prizes:

The Winnipeg Free Press, The Winnipeg Tribune, C. H. McFadyen Co., Mrs. A. M. Oswald, Morden Nurseries Ltd., J. H. Ashdown Hardware Co., Patmore Nurseries Ltd., Wallace Nurseries Ltd., Burpee Seed Co., Hudson's Bay Co., Dixon Reid Co., Skinner's Nurseries Ltd., Charleswood Nursery, Burns and Co., Swift Canadian Co., People's Credit Jewellers, and Consolidated Mining and Smelting Co.

The various trophies were won by:

McFadyen Trophies (for lots up to 33 ft. and aggregate points)—Mrs. W. Gyles.

McFadyen Trophy (for lots 34 to 66 ft.)—Mrs. M. Harding.

McFadyen Trophy (for lots over 66 ft.)—Mrs. P. D. Curry.

Howard Trophy (for novice home grounds)—Mrs. W. Heintz.

Vigoro Trophy (for utility garden)—Mr. D. E. Walker.

Your committee wishes to thank the following for judging the Home Ground competitions in which there were 39 competitors: Mr. F. J. Weir, Prof. C. W. Lowe and Mr. Wm. Godfry. The winners were:

Lots up to 33 ft.—
1—Mrs. W .W. Gyles
2—Mrs. J. M. Cielen.
3—Mrs. J. I. Huston.

Lots 34 to 66 ft.—
1—Mrs. M. Harding.
2—Mr. P. H. Hammond.
3—Mr. W. G. D. Robbins.
4—Mr. F. Skocdopole.

Lots over 66 ft.—
1—Mrs. P. D. Curry.
2—Mr. H. C. Dawson.
3—Mr. A. R. Burt.
4—Mr. Peter Finn.

Novice Home Grounds—
1—Mr. W. Heintz.
2—Mr. D. E. Walker.
3—Mr. W. Mitchell.
4—Mr. R. W. Bunyon.

Flower Garden—
1—Mrs. M. Harding.
2—Mr. H. C. Dawson.
3—Mrs. P. D. Curry.
4—Mr. W. G. D. Robbins.

Rock Gardens: Class A—
1—Mr. R. V. Walsh.
2—Mr. W. G. D. Robbins.
3—Mr. R. C. Pragnell.

Rock Gardens, Class B, Novice—
1—Mr. R. J. Emerson.
2—Mr. J. E. Federowich.
3—Mr. F. J. Lowry.

Utility Garden—
1—Mrs. D. E. Walker.
2—Mrs. W. Heintz.
3—Mr. Peter Finn.
4—Mrs. Rose Glesby.

Window Boxes—
1—Mrs. E. Gandy.
2—Mr. F. Skocdopole.
3—Mr. W. G. D. Robbins.
4—Mrs. P. D. Curry.

Lawns—
1—Mr. D. E. Walker.
2—Mr. J. I. Huston.
3—Mrs. L. Pullmer.
4—Mrs. M. Thompson.

Highest Aggregate—Mrs. W. W. Gyles.

In the Vegetable garden competition, sponsored by the Free Press, there were 86 competitors, and the judges were: Mesrs. G. Churcher, R. H. Hikida, E. F. Ball and R. W. Brown. The winners were:

Class A—1, Mrs. Rose Glesby; 2, Mr. G. Hennigar; 3, Mr. H. Gornik; 4, Mrs. Joyce Newfield; 5, Mrs. F. T. Morgan.

Class B—1, Mr. F. C. Bolton; 2, Mr. D. E. Walker; 3, Mrs. P. Hayer; 4, Mr. A. G. Crawley; 5, Mr. R. J. Herriot.

Class C—1, Mr. C. F. Polley; 2, Mr. L. Mercier; 3, Mrs. A. Zapotoczny; 4, Mr. W. J. Gresham; 5, Mr. Frank Peatfield.

Class D—1, Mr. M. Hervo; 2, Mr. J. A. Chabot; 3, Mr. C. Hughes; 4, Mr. Eric P. Jones; 5, Mr. Norman P. Smith.

HECTOR MacDONALD,
Chairman of Committee.

Annual Flower, Fruit and Vegetable Show

The annual Flower and Vegetable Show of your Society was held in the Civic-Caledonian Curling Rink on August 24th and 25th, 1949. As the Manitoba Horticultural Association did not sponsor a fruit show this year, your directors decided to issue a prize list for anyone wishing to send in entries.

Last year for the first time in many years a peony show was held in June in the T. Eaton Co. Assembly Hall. While it was not particularly successful in regard to the number of entries, your directors felt that it should be encouraged and another show was held this year on the 29th and 30th of June with an increased prize list. Entries were again disappointing, total being 22 from seven exhibitors. Prizes totalling $65.00 were paid, and other expenses amounted to $7.25. We are greatly indebted to the T. Eaton Co. for the use of their assembly hall and to the members of their staff who so kindly assisted us in every way possible. Our thanks also to the University of Manitoba and Professor E. T. Andersen for a fine display of named varieties of peonies which attracted much attention.

Entries in the Flower, Fruit and Vegetable show were about the same as last year. The Flower section was particularly good. Some extra classes were added in the gladioli section, with excellent results, and the display of roses was the best we ever had. The Vegetable display was about the same as last year, but entries in the fruit section were not so good, which was to be expected owing to the damage caused by a severe frost in the late spring. Total entries were 740, from 96 exhibitors. Entry fees amounted to $55.10, and prizes amounting to $463.50 were paid. Rent of rink and other expenses amounted to $218.18, making the total cost of both shows $753.93. We are again greatly indebted to the T. Eaton Co. for their valuable assistance, they not only loaned us the counters for the show, but delivered them and returned them free of charge. We are also indebted to The Winnipeg Parks Board, who, under the capable direction of Mr. Ball, set up a fine display of cut flowers. These, and other flowers not taken away by exhibitors, were delivered to the Children's Hospital after the show closed. The Sadok Nursery again sent in a very fine display of fruits, and for this we extend our sincere thanks to Mr. and Mrs. Juskow. Our thanks also to the judges, Mr. George Wallace, Mr. Eric Goldstraw, Mr. Taper, Mr. De Jong, and Professor F. W. Brodrick for their valuable assistance at our flower show,

and to Professor E. T. Andersen and Mr. J. A. Ormiston for their judging of the peony show.

In closing, I would like to express my own personal thanks to those directors who worked so hard in setting up the show, to our secretary, Mr. Brown, and all those who helped him writing our entry forms, and also to all those who assisted the judges. A show of this size is quite a big undertaking, but the willing assistance of your directors and friends are mainly responsible for it being a very successful one.

Respectfully submitted,

W. J. TANNER,

Chairman, Flower Show Committee.

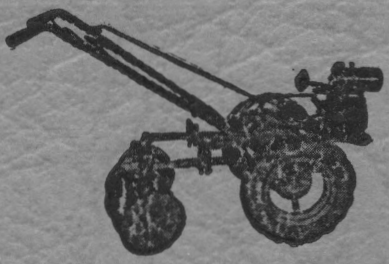
The blue skies smile, and flowers bloom on,
And rivers still keep flowing,
The dear God still his rain and sun
On good and ill bestowing.

His pine trees whisper, "Trust and wait!"
His flowers are prophesying
That all we dread of change or fate
His love is underlying.

—J. G. Whittier.

The Directors of the Winnipeg Horticultural Society wish to thank the advertisers who have made this edition of The Winnipeg Flower Garden possible, also the following who have kindly made donations:

MAC'S DRUG STORE
KING and JAMES SERVICE STATION
FRY'S IGNITION
OFFICE SPECIALTY CO.
E. M. ISBISTER MILLINER
A FRIEND
McKEAG'S FURNITURE STORE
NORTH WEST MAIL ORDER
MALL PHARMACY LTD.
POLLACK'S STORE
SHERBROOK MEAT MARKET
CLOSE RADIO
BJORNSSON'S BOOK STORE
ARLINGTON PHARMACY
BOWL ARENA
NORTH END TIRE CO.
CITY MACHINERY CO.
CHARLES REISS & CO.
KING'S FEATURE DISPLAY
DERBY SPECIALTY MFG. CO.
PRINCESS AUTO WRECKING CO.
HERBERT WINSTON CO.
MR. C. G. KEITH, K.C.
OSLER, HAMMOND and NANTON CO.
WINNIPEG TRIBUNE
WINNIPEG FREE PRESS



PLANET JR.

5 H.P. — 3 H.P. — 1½ H.P.

ALSO— WHEEL HOES
HAND SEEDERS
HORSE AND TRACTOR
DRAWN EQUIPMENT

CHOREMASTER

1½ H.P. One Wheel

FOR BETWEEN THE ROW CULTIVATION

MAKES YOUR OWN LAWN MOWER A POWER UNIT

SICKLE BAR—SNOW PLOW

AGENTS FOR:

HOWARD ROTARY HOE

HARDIG SPRAYERS

CHOREMASTER
(One Wheel Tractor)

EMPIRE GARDEN TRACTOR
(Two and Four Wheels)

Green Cross*

GREEN CROSS CHEMICAL

FOR CONTROL OF INSECTS — WEEDS AND FUNGUS

SPRAYERS AND DUSTERS FOR FARM AND GARDEN

H. GRAPENTINE CO. LTD.

YOUR JOHN DEERE DEALER

153 DONALD ST., WINNIPEG

1 Block South of Eaton's Mail Order