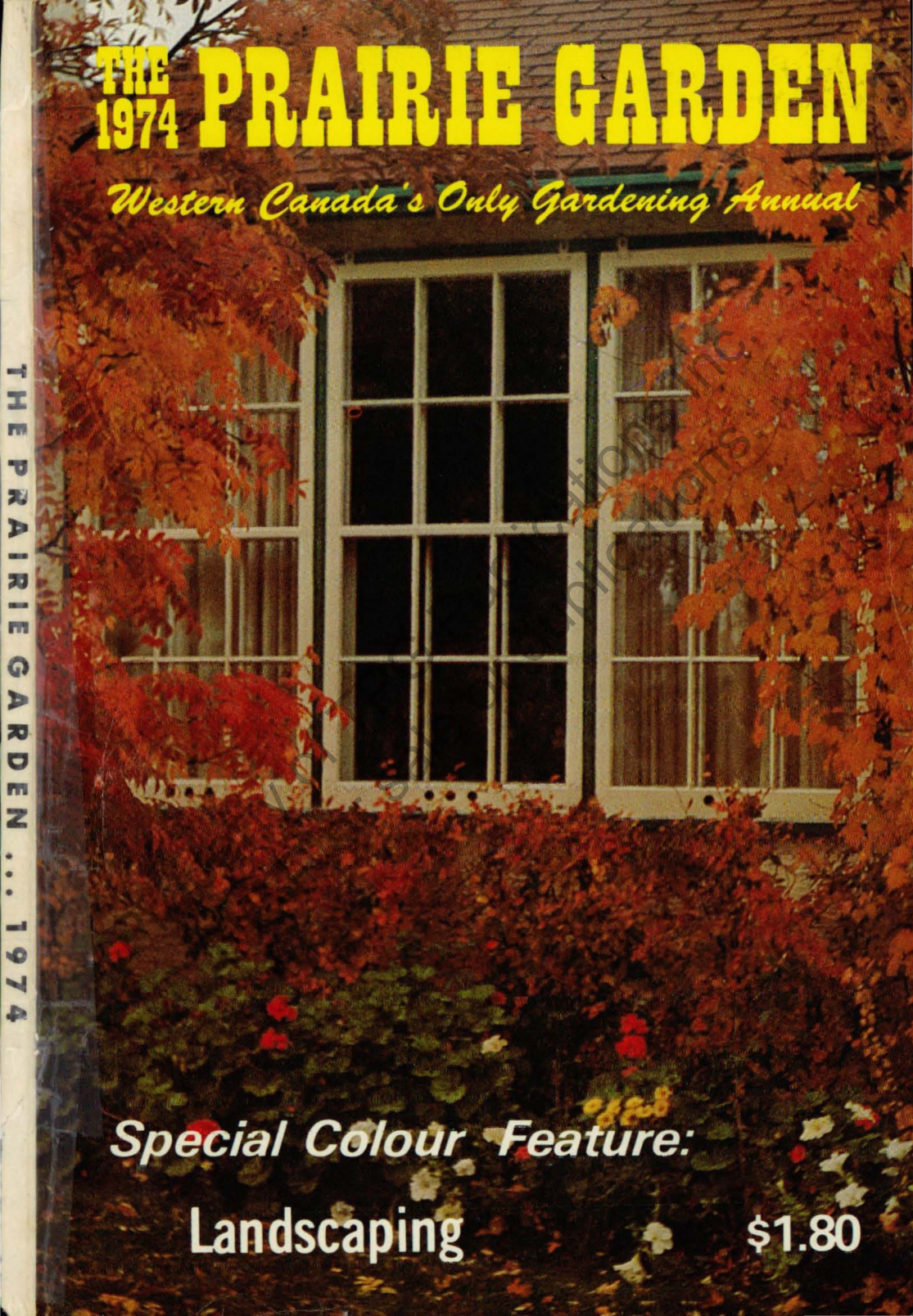
THE 1974 PRAIRIE GARDEN

Western Canada's Only Gardening Annual



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The Prairie Garden

WESTERN CANADA'S ONLY GARDENING ANNUAL

WRITTEN BY AND FOR WESTERN GARDENERS AND HOMEOWNERS

A non-profit publication dedicated to the advancement of horticulture in the prairie provinces.

Published by
WINNIPEG HORTICULTURAL SOCIETY
Winnipeg, Manitoba 31st Annual Edition, February, 1974

1974 THEME — LANDSCAPING THE HOME GROUNDS

Price — $1.80 per Copy

Special quantity prices to Horticultural Societies, Garden Clubs, Commerical Outlets, etc.

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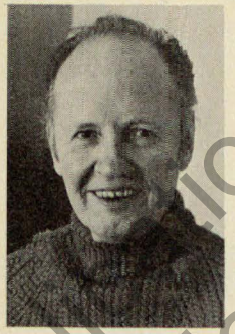
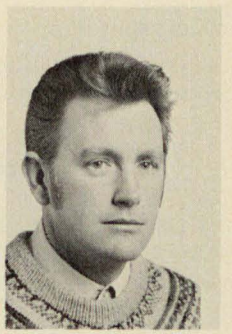
Editorial Changes



G. S. Reycraft

Phyllis Thomson



Roger Brown

For sixteen years the name Glad Reycraft was synonymous with the Prairie Garden. Mr. Reycraft as editor, together with the members of the Prairie Garden Committee, gathered the materials and worked hard to put out a meaningful publication annually. The publication progressed and now has a beautiful colored section in it. Last spring Mr. Reycraft decided to shed the editorial mantle, but agreed to stay on as a member of the Prairie Garden Committee. This committee held a special dinner for Glad and his wife to thank them both for this labor of love. We are sure that all our readers will wish to join us in thanking Glad for his long and faithful services.

The Prairie Garden Committee was pleased to find a competent replacement for editor in the person of Mrs. Phyllis Thomson. Mrs. Thomson has considerable experience in the editorial field. Her daily work is involved with laying out and editing publications and bulletins. The Prairie Garden once again is in good hands.

When Mr. Reycraft was editor he also took care of the Prairie Garden finances. It was decided to appoint both an editor and a treasurer. Mr. Roger Brown is our new treasurer. He presently is the president of the Winnipeg Horticultural Society. We are fortunate indeed to have this young dedicated horticulturist as our treasurer.

All correspondence to the editor, treasurer or any other Prairie Garden member should be mailed to the following address:

The Prairie Garden
P.O. Box 517
Winnipeg, Manitoba
R3C 2J3

All of us in the Prairie Garden Committee greatly appreciate the support of all those who write for it. We are grateful to all Horticultural Societies for selling and promoting the Prairie Garden.

P.J. Peters, Chairman
Prairie Garden Committee

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Winnipeg - A City of Natural Museums

BRUCE W. RICHARDS

Almost every city in North America possesses one or more fine buildings dedicated to the display of various artifacts from the history of man and nature. While extremely interesting and educational techniques have been developed to appropriately display these artifacts to the public, the situations are nevertheless only simulations of the real thing. Various citizens of Winnipeg from both the private and public sector are endeavoring to remedy the situation of artificially reconstructing portions of the natural system in glass display cases. Through quirks of fate, four ecological plant and animal communities have withstood the encroachment of the expanding city suburbs. Each natural community is a good representative of much larger communities which once covered the entire Winnipeg area, Tallgrass Prairie, Mixed Oak and Aspen Forest, Riverbank Hardwood Forests and Prairie Marshland.

While each natural area is a mere fragment of the original expanses of prairie vegetation, they are presently self-sustaining and will continue to be so if protected and assisted by man. Two of the communities have already been designated as natural museums; 150 acres of Tallgrass Prairie in 1970 were officially dedicated as the Living Prairie Museum and earlier this year approximately 700 acres of Mixed Oak and Aspen Forest were allocated for preservation as the Assiniboine Forest. A task force of several professionals from various fields are presently conducting an all-encompassing study on the establishment of nearly 75 acres of Riverbank Hardwood Forests as a park preserve, extending from the Red River along Bunn's Creek approximately two miles upstream. Recently, a five-acre site in the south-eastern sector of the city has been discovered to be an excellent example of a Prairie Marshland community. Preliminary data is presently being gathered on the native flora and fauna in the area with intentions and desire that it, too, will eventually be designated as a natural museum.

The four sites display a rich and distinctive legacy of ecological interrelationships between flora and fauna. While evidence of man's presence and interference appears on each site, it is generally minimal and with the initiation of a program of assistance under the guidance of a team of ecologists, zoologists and botanists, the sites should recover their pristine quality within a relatively short time. There are numerous and complex problems

Characteristics of the Assiniboine Forest are meadow clearings surrounded by thick forest stands of Aspen and Oak.

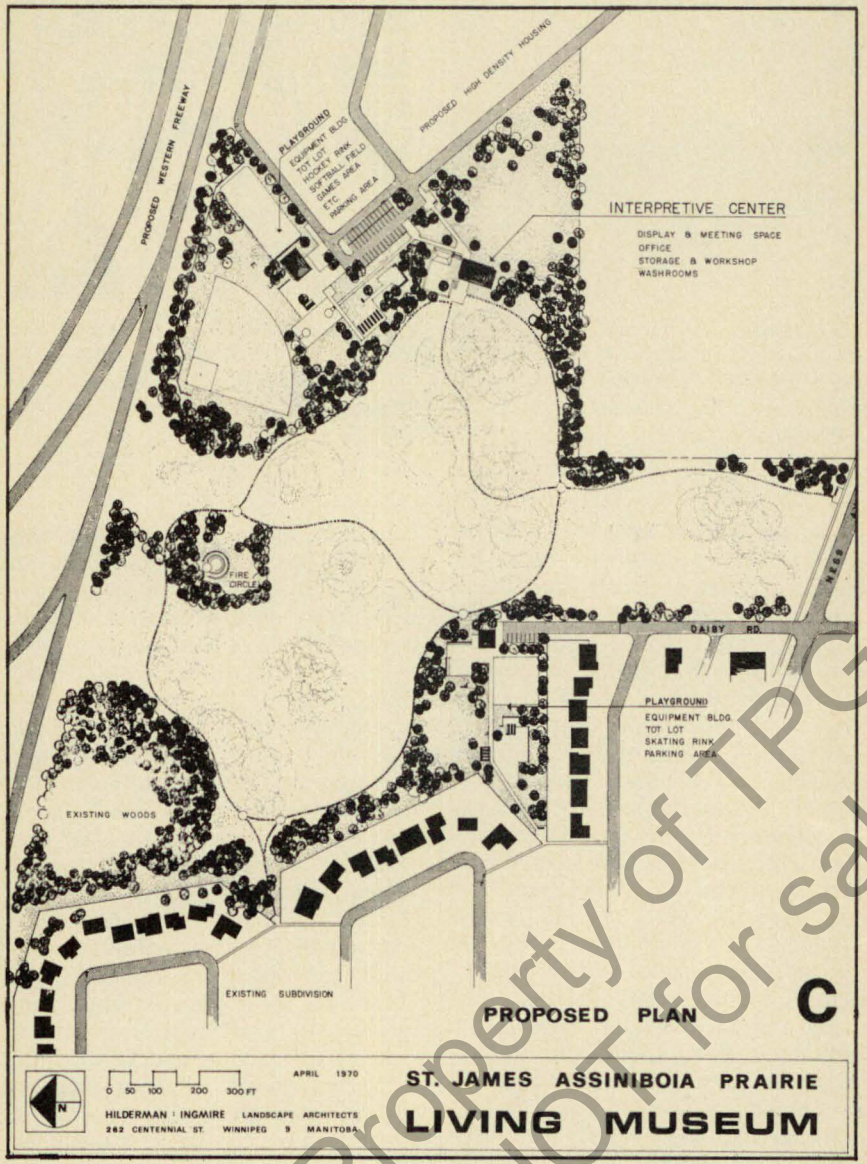
(Photography by Museum of Man and Nature).

Deer abound on the Assiniboine Forest site and can be viewed at close range as this winter scene shows.

(Photography by Museum of Man and Nature).

to be worked out associated with the requirements peculiar to each site. However, these problems must be resolved and compromises made if the designation of almost a 1,000 acres of City property for natural museums is to be justified. Once all the necessary steps and precautions are taken to satisfactorily guarantee the future compatability of these natural areas within the city system, work can begin on developing interpretive programs for each park. Plans have already been prepared for an interpretive centre and facilities for the "Living Prairie Museum". The interpretive centres for the wilderness parks should include lecture rooms, small theatres, and space and facilities for displays. In addition to being staffed with trained personnel to provide information to the public, a system of labelling characteristic species and their ecological relationships with the community should be displayed along carefully laid out systems of paths and trails.

The creation of natural parks in Winnipeg will add a new dimension of education and pleasure to an already extensive system of parks within the City limits. Until recent years, parks were exclusively created along the traditional lines of multi-purpose, intensive use. While there is still an ongoing need for this more manicured type of park, there is now a realization that the natural, primarily single-purpose park has an important role to play in a well balanced parks' system. Just as sports parks fulfil a great need for various kinds of physical recreation, natural parks fulfil the need for passive recreation and a greater understanding and appreciation of nature. In addition to providing practical experience in outdoor classrooms for schools and various nature oriented organizations, such as Boy Scouts and Girl Guides, the general public will appreciate and benefit from the healthful exercise inherent in the concept of a wilderness park. Hiking, jogging, cycling, cross-country skiing and snow-shoeing are all viable and compatible means of transversing nature parks. Consideration is also being given to introducing inconspicuous exercise facilities at



Development plans have already been prepared for the Living Prairie Museum. The other natural museum sites are expected to be developed along similar lines.

(Drawings by Garry Hilderman & Associates, Landscape Architects and Planners).

Another forest community under study for preservation occurs along the banks of Bunn's Creek where Elm and Willow dominate the tree cover.

(Photography by E. Letinsky).

intervals along some of the paths. The visitor then has the option of nature appreciation or healthful exercise, or both.

On a continent that has only in recent years become ecology conscious, Winnipeg is setting a fine example. The city indeed is extremely fortunate to have some remnants of its natural history still available close at hand, whereas many other large centres are suffering the consequences and trying to find remedies for the heedless destruction of their own natural environments. The concept of preserving wilderness areas as nature-museum parks in Winnipeg dates back only to the 1960's when support was first generated for the establishment of "Assiniboine Forest" in 1964, and the "Living Prairie Museum" in 1967. As Winnipeg is celebrating its 100th Anniversary of incorporation as a city this year, what more fitting Centennial project could be conceived than the enthusiastic support of its citizens to further the establishment and preparation of permanent museums as legacies of natural history.

A New Concept for the Urban Street Scene

BRUCE W. RICHARDS, B. E. S.

At the time when most North American cities were incorporated, nature spread for miles and miles in every direction. The citizens of these early urban centres were not concerned about preserving areas of nature within the city. They were more concerned with duplicating the "big city" image found in cities of the "civilized" world. As time passed and the city spread out to engulf the natural environment, the original city core evolved into the "concrete jungle". Nature ceased to exist in or near many of these centres and the inhabitants were forced to travel greater and greater distances to catch a glimpse of the system from which they evolved. Sociologists from many fields have formulated the argument that because man is a part of the natural system, he must remain in contact with it if he is to function properly. We now realize that more psychological and sociological problems exist for residents of the innermost areas of the city than for the suburban areas. While the contributing factors are many, a major one is the lack of what is referred to as "green space". Because it is extremely difficult, if not impossible, to secure land for parks in the downtown area, the remaining viable alternative for reinstating nature into the city system is found in the street environment.

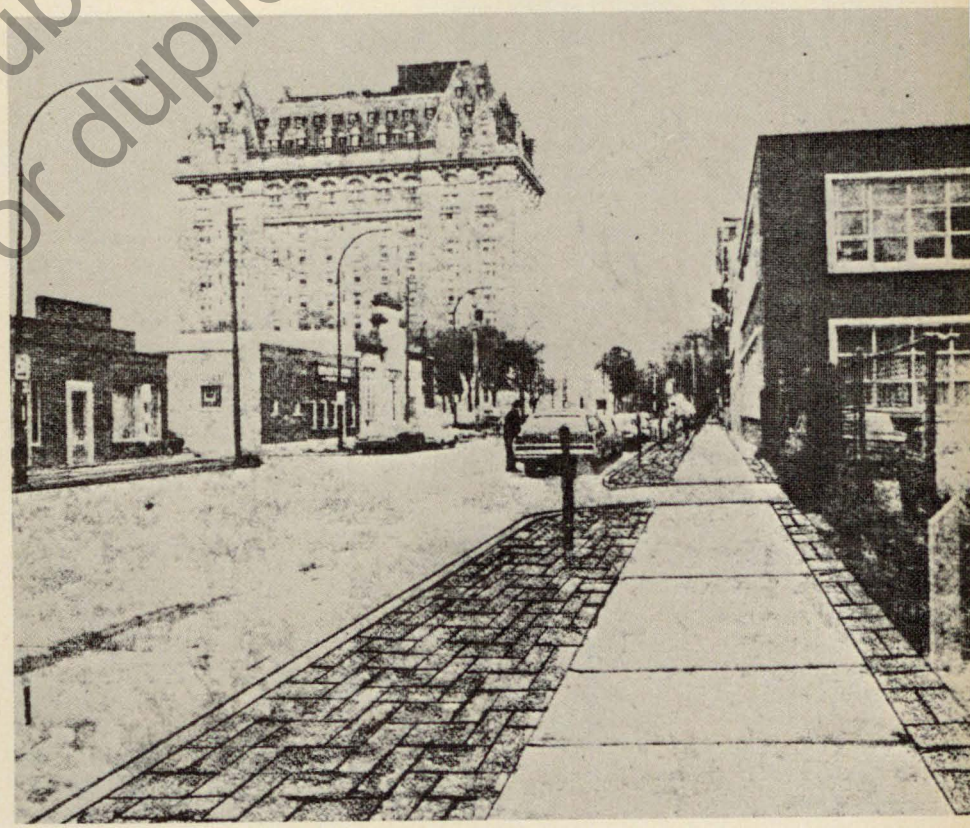
While the traditional techniques of utilizing trees and shrubs on turfed boulevards is still the most appropriate means of creating a visually satisfying and pleasant street environment in the suburban areas, they can no longer have general application to the downtown area. A host of limitations to such techniques have evolved in the urban environment. The micro-climate in most urban centres is no longer conducive for plant material. Pollution as emitted in vast quantities from automobiles and furnaces, intensified temperature variations, excessive ground compaction from decades of pedestrian trampling, and immence concentrations of salt from snow-clearing, combine to create an extremely harsh and hostile environment for plant life. Many of the remaining original boulevard treatments in the downtown area reflect the adverse conditions that have evolved. Many boulevards are unsightly and help to create a poor image of the downtown area. It is interesting that visitors are quick to realize and criticize these occurrences in other cities but, however, do not recognize them in their own city. Because of the constant

Illustration 1

The treatment of narrow downtown boulevards with hard, textured and colorful materials will improve the overall image of the street by replacing the unkept appearance of the boulevard with an organized, "neat", allweather surface.

Photo by G. A. Schoch

Sketches by B. W. Richards



presence in daily life, people tend to be unaware of many unpleasant situations until they make a conscious effort to look around for them. When they do, the result can be quite disquieting when they realize that many of their street scenes do create, in fact, negative impressions for visitors. Civic-minded citizens, once aware, will inevitably exert pressure to upgrade the visual appearance of the city's "street-scape".

Since only limited use can be made of plant material, the redevelopment of the street environment should utilize organic as well as inorganic components of nature (Illustration 1). Stone, brick, or colored pre-cast pavers can be incorporated into even a narrow street right-of-way to create color and texture in an otherwise drab environment. On narrow streets, where all the public right-of-ways must be devoted to vehicular and pedestrian traffic, adjacent landowners may be persuaded to landscape the fronts of their properties if sufficient building setback allows. If the buildings front directly on the city right-of-way, then encouraging several adjoining property owners to redevelop the facades to conform with an overall design will do much to enhance the street scene. This method has met with considerable success in various North American cities where dilapidated commercial districts have redeveloped according to a uniform design concept and financially benefited from the renewed public interest in the area. The elimination of utility poles and overhead wiring, and the design coordination of street accessories such as signs, telephone booths, waste receptacles, etc., will create a new "spaciousness" in a previously "cluttered" looking street.

Where wide street allowances permit, plant material can be utilized. Many wide solid concrete sidewalks are never fully utilized by pedestrians. A strip of several feet adjacent to the road is usually seldom used by pedestrians. Here a "buffer strip" of landscape can be created which has a functional as well as visual benefit (Illustration 2). Besides visually diminishing the vast open expanse of concrete, the landscaping separates pedestrian from vehicular movement. As shown in the illustration, a variety of features can be incorporated into a flexible design to allow for the presence of underground utilities, transit stops, parking meters, etc. The resulting variety will create a visually pleasant and interesting experience for both pedestrians and motorists (Illustration 3).

The use of organic and inorganic landscape materials to diminish wide, sterile, expanses of concrete can be incorporated into street medians (Illustration 4), and other surplus lands in the downtown area. Where maximum visibility is desirable, such as islands between converging traffic routes, the landscape treatment can be kept low by incorporating materials of texture and color into the horizontal plain. Trees with a high branching habit could also be included, if sufficient space is available, without significantly obstructing views.

The street environments of most downtown North American cities can be greatly enhanced by re-introducing aspects of nature back into the urban setting. To be sure there are many difficulties that will be encountered, created by the numerous variables found in any dynamic city structure. No specific solution can be generally applied to the entire downtown area. The number of factors to be consider-

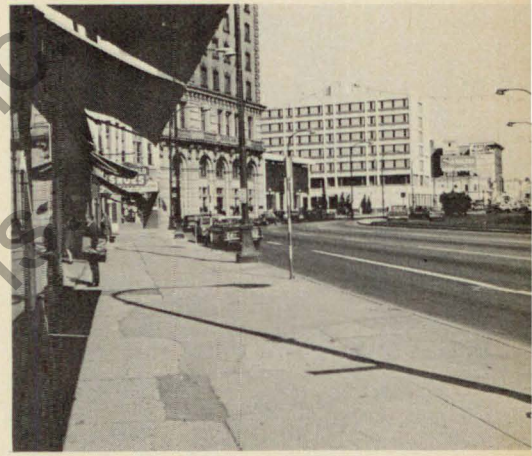
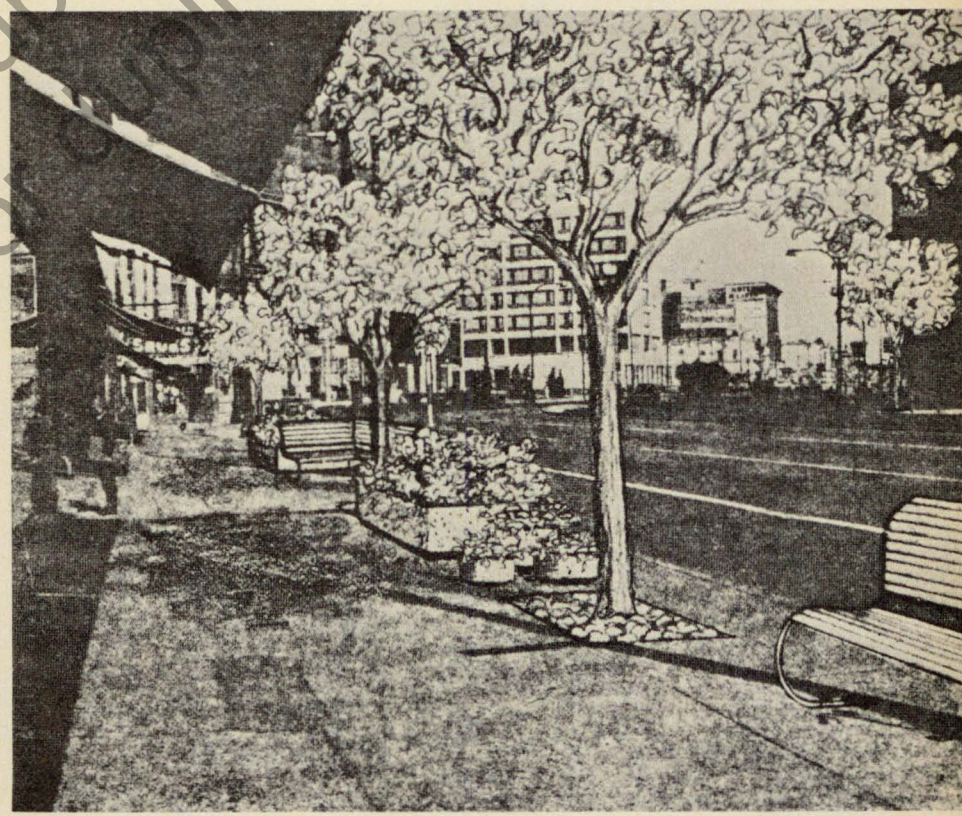


Illustration 2

The incorporation of trees, shrubs, and flowers into a six-foot, landscaped buffer strip separating motorists and pedestrians would alleviate the human psychological need for nature in the "concrete jungle" environment. The buffer strip being visual rather than physical would also provide a human scale for pedestrians.

Photo by G. A. Schoch

Sketches by B. W. Richards



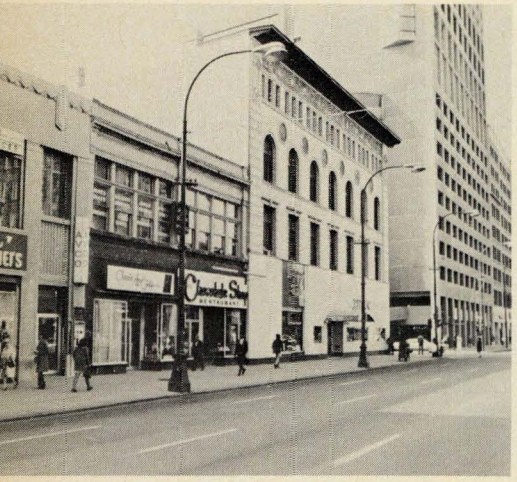
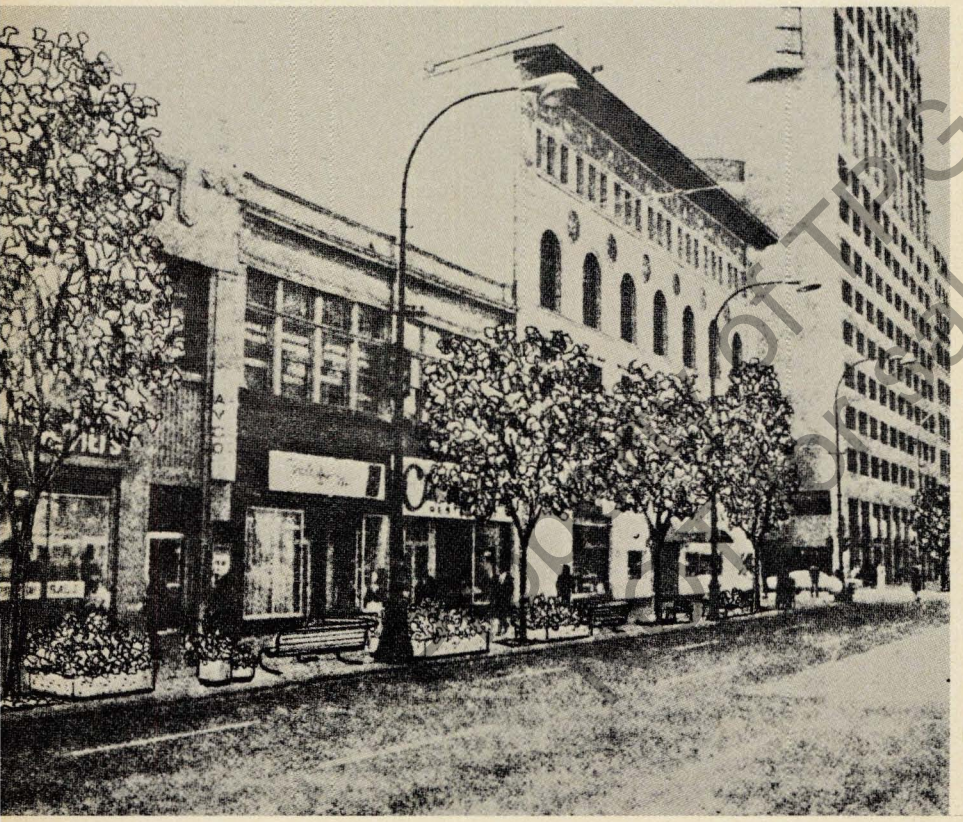


Illustration 3

The landscaped buffer strip would provide motorists with visually pleasant and organized setting while obscuring some of the more distracting features, such as commercial advertising on buildings.

Photo by G. A. Schoch

Sketches by B. W. Richards



ed are many and their various combinations throughout the city over time and space are infinite. An appropriate solution for enhancing one particular street scene may be completely inappropriate when applied to another only a short distance away. What may be considered a pleasant and functional street environment today may be a total failure a decade from now when other variables have been introduced into the system. The number of appropriate solutions for upgrading the street environments are as infinite as the variable interactions which must be satisfied. The different organic and inorganic materials utilized in numerous combinations for specific situations will produce a variety throughout the downtown area which cannot help but be beneficial to the overall image of the city as well as the psychological well-being of its inhabitants.

Illustration 4

An excellent example of visual upgrading of the streetscape is the Portage Avenue median in Winnipeg where trees, colorful planters of flowers, fieldstone groupings, and colored concrete pavers have been used to create a pleasantly organized but, nevertheless, varied experience to motorists.

Prior to their redevelopment, the boulevards, in addition to requiring extensive maintenance, were extremely uninteresting and unsightly.

Photo by G. A. Schoch

Steps in the Landscape

GUNTER A. SCHOCH

Steps are obviously a means of getting from one level to another, however, in the landscape or in our garden they should do more than just fulfil this utilitarian purpose. Garden steps should be comfortable to walk on, aesthetically pleasing and, above all, should be appropriate in relationship to the architecture or landscaping around them.

For economy and convenience, steps should be built of a material that is easily obtained in the immediate locality. Their construction should be safe, durable and easily maintained. They may be constructed of brick, stone, concrete, wood, grass or a combination of these, depending on their surroundings and the material used in nearby structures.

As a general rule, outdoor steps should be much more shallow than any used indoors. If we deal with a gently sloping area, a riser of four inches with a tread of 17 - 18 inches is best. Steps with risers of more than 4 inches are not advisable for outdoor use, unless a steep slope makes this absolutely necessary. The relationship between riser and tread is based on the assumption that the average human step is 25 inches. The formula is twice the height of the riser plus the width of the tread equals 25. For instance, if the riser is 4 inches, we multiply it by 2, to equal 8. In order to arrive at 25, we add 17. Therefore, a 4-inch riser requires a 17-inch tread.

Steps are usually set into a slope or a wall. Let us first examine the slope. At least three different methods may be used to place the steps:

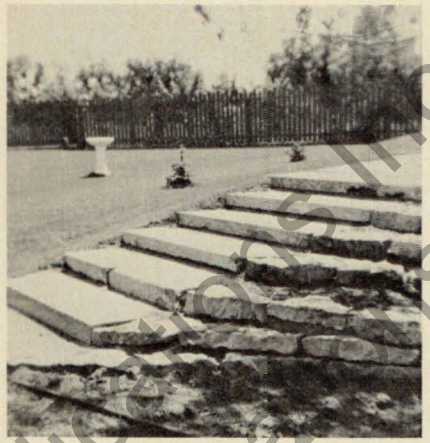
(a) They protrude above the face of the slope. In other words, they stand the height of one riser out of the slope, eliminating any chance of soil washing over the treads.

(b) They may be built right into the slope, having the front edge of each step level with the face of the slope. This may be quite satisfactory, if the slope is sodded.

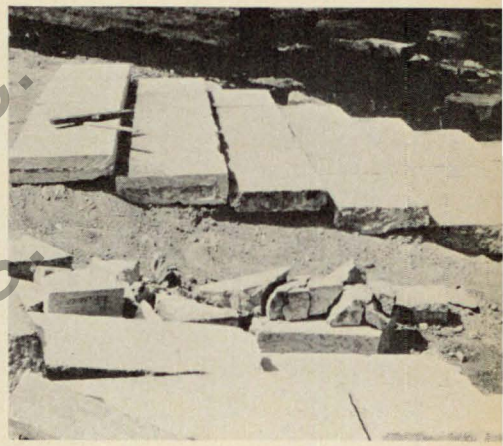
(c) Again, built into the slope, but both sides of the steps lined with an edging material (wooden plank, a row of bricks on edge, etc.). This would also prevent soil being washed on the treads.

The variety of methods is even larger when the steps are built into a wall. The first or lowest step may be set back behind the wall line; it may be in line with the wall; it may extend in front of the wall; or even two and more steps may extend outside the wall line. In most cases, it will be necessary to continue the retaining wall around the corner along the sides of the steps which are called wing walls.

As mentioned earlier, a great variety of materials may be used to construct steps in the landscape. If they form part of a constantly used sidewalk, concrete construction with proper foundation may be necessary. However, steps used occasionally can be built quite safely on a sand or gravel foundation. As most landscape details, they are successful only when in harmony with their surroundings. Wooden steps may tie directly in with the fences, gates and arbors used in the garden or they may be combined with stones, bricks, precasted concrete blocks or asphalt that are used in walls or paving, to add variety to the composition. This is true, especially in the small garden, where all contributions, no matter how minor, are noticed and enjoyed.



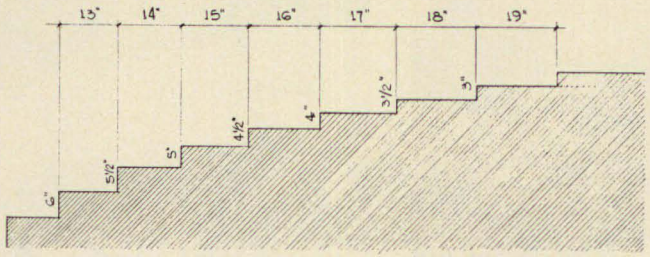
Each stone layer of the retaining wall is terminating level with a step of this Tyndall stone stairway.



A Tyndall stone stairway under construction. Shallow risers and long treads as shown are highly desirable for outdoor steps.

Photography by Gunter A. Schoch

A rustic but safe stairway, blending well into the landscape. Split granite, laid in concrete, has been used with steps protruding above the face of the slope.



RELATIONSHIPS OF RISERS TO TREADS

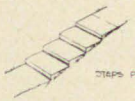
FORMULA

2 x H + W = 25"

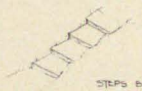
2 x HEIGHT OF RISER + WIDTH OF TREAD = 25" (AVERAGE STEP)

EXAMPLE: 2 x 4" RISE = 8" + 17" (TREAD) = 25"

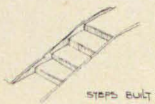
STEPS SET INTO A SLOPE



STEPS PROTRUDING ABOVE FACE OF SLOPE

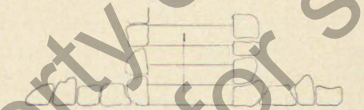


STEPS BUILT INTO SLOPE



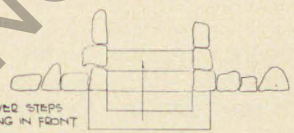
STEPS BUILT INTO SLOPE WITH RETAINING EDGE

STEPS SET INTO WALL

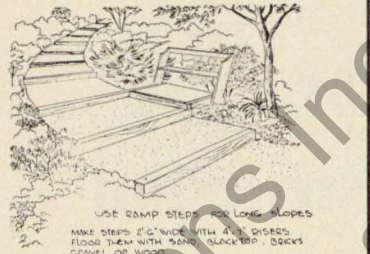


LOWER STEP IN LINE WITH WALL

LOWER STEP EXTENDED IN FRONT OF WALL

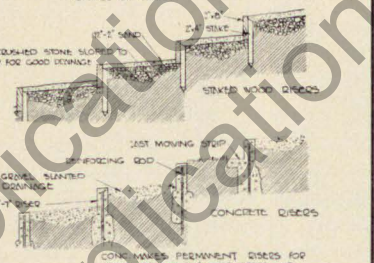


TWO LOWER STEPS EXTENDING IN FRONT OF WALL

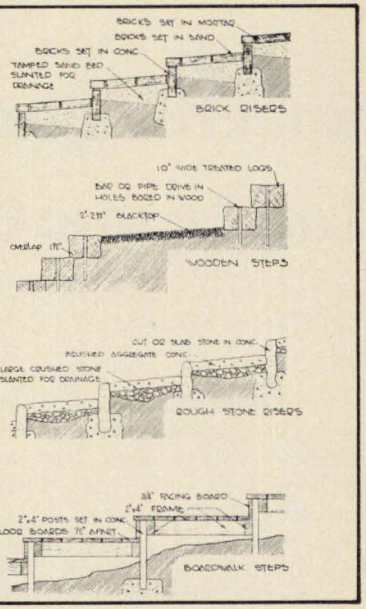


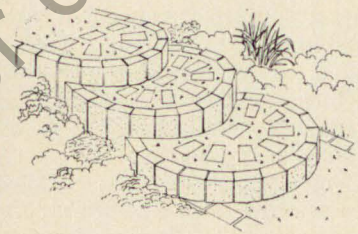
USE RAMP STEPS FOR LONG SLOPES

MAKE STEPS 2'-6" WIDE WITH 4" RISERS. FLOOR THEM WITH SAND, BLACKTOP, BRICKS, GRAVEL OR WOOD.

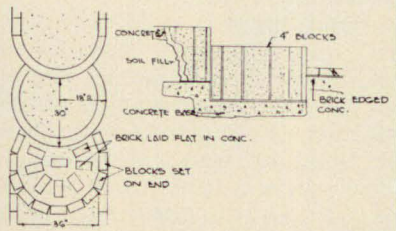


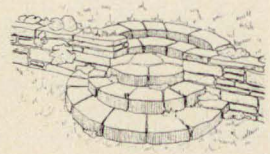
CONC MAKES PERMANENT RISERS FOR GRAVEL, BLACKTOP & CONC. STEPS. IF LAWN IS USED, MOVING STRIP EASES CUTTING.



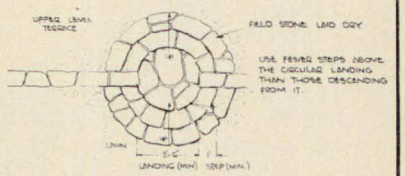


BREAK STRAIGHT LINES WITH CIRCLES





STEPS WITH OPPOSING CIRCLES



Specifications for Landscape Construction

GUNTER A. SCHOCH

If a homeground or any other area is to be landscaped by a contractor, essential requirements are working drawings and specifications. If properly prepared, these two items will enable the owner to obtain meaningful quotations from different landscape contractors, allowing all firms to bid on exactly the very same conditions, materials and workmanship and to compete on even terms. After the satisfactory bidder has been chosen, his work is guided by the plans and specifications. At the same time, the owner is placed in the position of controlling the product he receives and for which he is paying.

Especially for larger projects, it is definitely advisable to obtain professional assistance by contacting a landscape architect or consultant for the preparation of plans and specifications. However, even for a simple sodding job, the owner should be able to make the contractor aware of the details expected, as to the quality of grading necessary, the amount of top soil required, the grade of sod expected, the type and quantity of top dressing, top seeding, rolling and watering desired, as well as the special requirements for sodding of slopes and possible maintenance after completion. All these items are briefly, but precisely, spelled out in a set of good specifications. The very same would apply to any other aspect of landscape work, such as seeding, preparation of planting areas, supply, planting and guarantee of nursery stock, construction of walks, patios, steps, retaining walls, rock gardens, and any other feature.

Of course, it is of paramount importance that both working drawings and specifications complement each other, rather than contradict, overlap or fail to convey the needed information. On the drawings reference is made to those items that can best be shown pictorially or graphically. It is evident that dimensions can easily be indicated on a plan, as can relative placement and the arrangement of details. However, the quality of the materials, installation practices, description of acceptable workmanship, as well as short-term maintenance, inspection procedures and guarantees would form part of the specifications.

During the past two years, an effort has been made in Manitoba by landscape architects and the Nursery and Landscape Association to develop standard specifications for all phases of landscape work. Unfortunately, these standards have not as yet been finalized. To assist homeowners in this regard, sample specifications can be made available on request, from the Regional Parks Department of the City of Winnipeg. These specs, used for all landscape projects of the City, constantly have been up-dated and may be closest to the desirable standards.

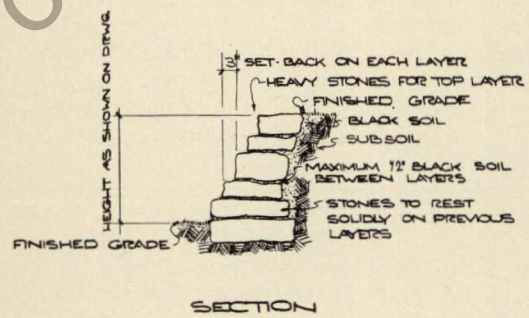
Summarizing any specification has a twofold purpose. In conjunction with the contract, it is a legal document which you can prove binding on all parties involved, often serving as a determining factor in an arbitration award or judgement. Secondly, it is an instruction and information document to assist and advise toward the proper completion of a project, structure and procedure. Even if only informal arrangements are made between the owner and contractor, adequate specifications should be used for the benefit of all parties concerned.

Specifications for RETAINING WALL

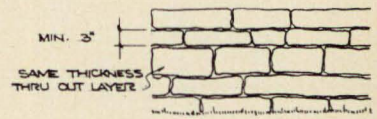
Retaining wall(s) shall be constructed at location and height indicated on the drawing(s).

The material to be used shall consist of rubble limestone (without smooth surface) of not less than 1-1/2 square feet in size and not less than three (3) inches thick.

The stone shall be laid in horizontal layers using running bond with staggered vertical joints. Stone shall be well fitted using maximum 1/2" joints. Stones used in any one layer shall have the same thickness. Each layer shall be set back three (3) inches and shall rest solidly on the previous layer. Not more than 1/2 inch of black soil shall be placed between layers.



SECTION



ELEVATION

Specifications

for

RETAINING WALL

Retaining wall(s) shall be constructed at location and height indicated on the drawing(s).

The material to be used shall consist of rubble limestone (without smooth surface) of not less than 1-1/2 square feet in size and not less than three (3) inches thick.

The stone shall be laid in horizontal layers using running bond with staggered vertical joints. Stone shall be well fitted using maximum 1/2" joints. Stones used in any one layer shall have the same thickness. Each layer shall rest solidly on the previous layer with not more than 1/2 inch of black soil placed between layers. Front of wall shall form a neat, vertical viewing surface.

Specifications

for

CONSTRUCTION OF CRUSHED STONE WALKWAYS

The areas indicated as walkway shall be staked in accordance with the drawing(s) and excavated to a depth of six (6) inches below finished grade of adjacent areas. The sub-base or subgrade surface shall be true to design, profile and cross section before any crushed stone is deposited. It shall have a pitch or crown of 1/4" for each foot of its width.

A three (3) inch layer of 1-1 1/2" size crushed stone shall be placed evenly on the subgrade and compacted by a roller not less than 500 lbs in weight. A 1-1/2" layer of 1/4 - 3/4" limestone screening shall be spread evenly on top of the base course, covered by a 1/2" layer of limestone dust. This material shall be rolled as indicated above, wetted and rolled again.

The final grade of the walkway edges shall be 1" below any adjacent lawn level, but shall be even with adjoining concrete walks or curbs.

Specifications

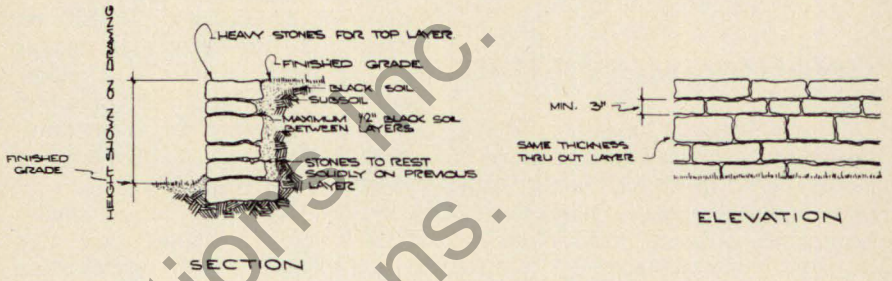
for

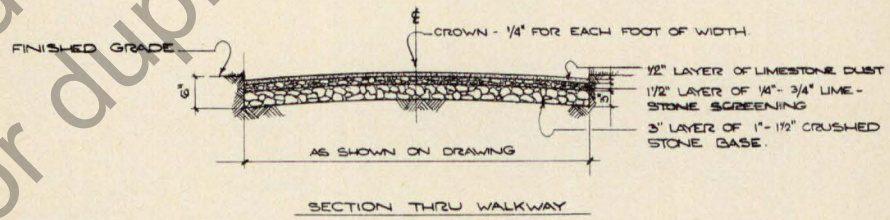
CONSTRUCTION OF CONCRETE WALKWAY

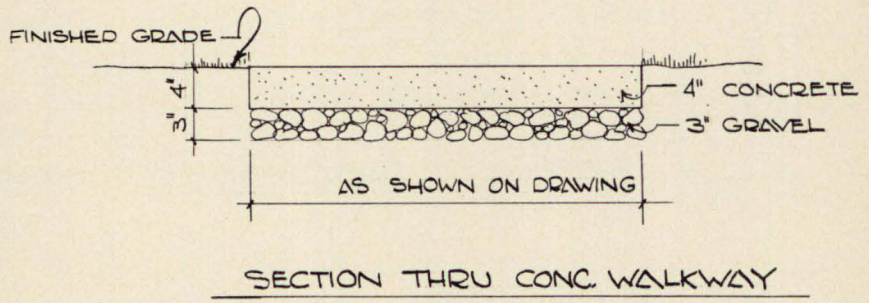
Concrete walkway shall be not less than 4" thick with weakened plane joints at intervals not exceeding one and one half (1-1/2) times the walk width. Sub-base shall be compacted sand and gravel mixture having a thickness of not less than three (3) inches. The contractor shall be responsible for the grading and compaction of the sub-grade.

Walkway to the front entrance shall be not less than thirty-six (36) inches wide and not less than twenty-four (24) inches wide to other required entrances.

Walkways should be sloped 2" in 10'-0". Minimum drainage slope is 1-1/4" in 10'-0"; maximum slope is 7" in 10'-0".







Specifications

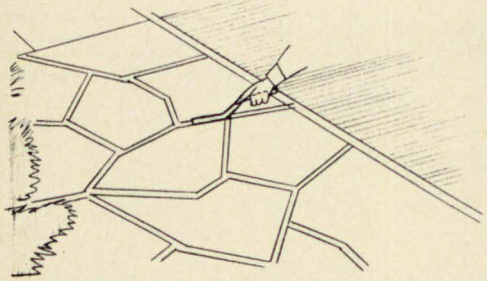
for

CONCRETE PATIO CAST IN PLACE

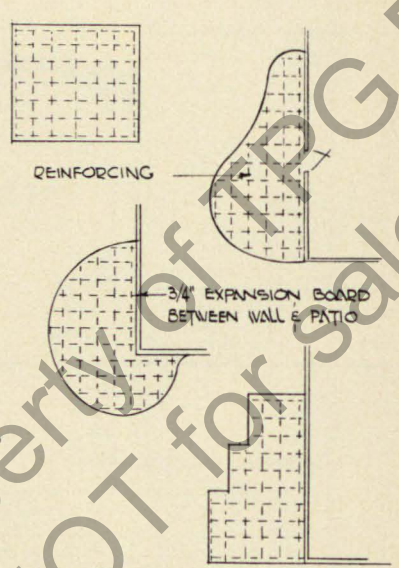
Area designated for patio shall be staked and excavated to a depth of 9 inches. Forms of 2" x 6" lumber shall be set up at perimeter of patio area to final grade, allowing positive surface drainage of approximately 3/4" per 10 feet of patio width. If installed next to a building or structure, a 3/4" expansion board shall be placed between wall and patio.

Five inches of 3/4" fill gravel shall be placed evenly on the sub base and tamped well. Then 3/8" reinforcement rods shall be installed at 12" on centre, tied with tie wire at meeting points, at an elevation of 1-1/2" below final patio level. Concrete of 2,000 p.s.i. (5 parts gravel, 1 part cement plus water) shall be poured into place and levelled off by moving straight 2" x 4" back and forth across forms, filling in all small voids. A wooden float shall be used to finish off the surface and a fine-bristled broom to texture the surface.

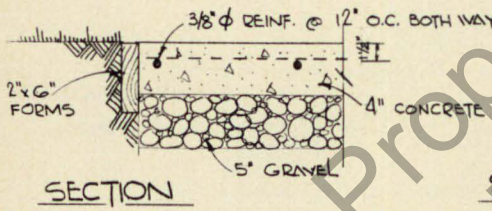
The finished slab shall be covered with polyethylene weighted at edges in order to contain moisture for curing during a period of at least 5 days.



RANDOM SCORING USING A PIECE OF S-SHAPED COPPER TUBING.



SUGGESTED PATIO LAYOUT



SECTION

Specifications

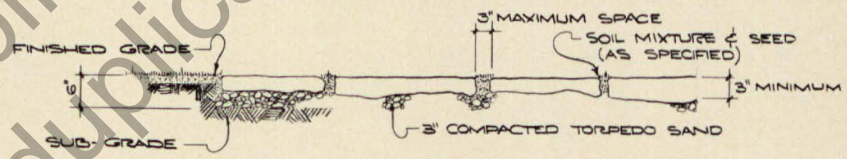
for

FLAGSTONE AREAS

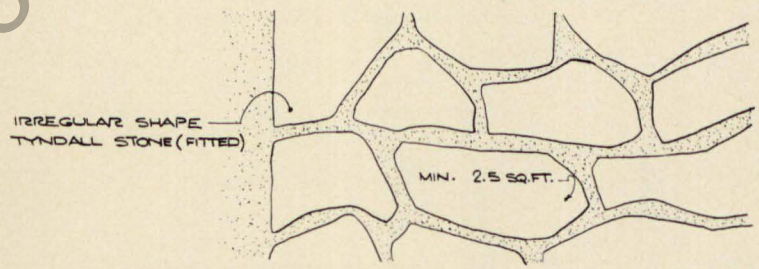
The area indicated as flagstone or patio shall be excavated six (6) inches below final grade. A three (3) inch layer of compacted torpedo sand shall be placed evenly over the subgrade.

The material to be used for patio construction shall be Tyndall Limestone, irregular shaped with smooth walking surface. Each slab shall have a minimum size of 2.5 sq. ft. and shall be not less than three (3) inches thick. The slabs shall be cut to the required shape and fitted beside each other, leaving a space of not more than three (3) inches between slabs.

After completion the slabs shall form an even surface, sloping slightly away from any building (minimum: six (6) inches in every 100 feet). Each slab shall rest solidly on the sand base and the space between slabs shall be filled with the soil mixture specified for flower beds. These areas shall then be seeded as specified in the specifications for landscaping.



SECTION



PLAN

SC. 1/2" = 1'-0"

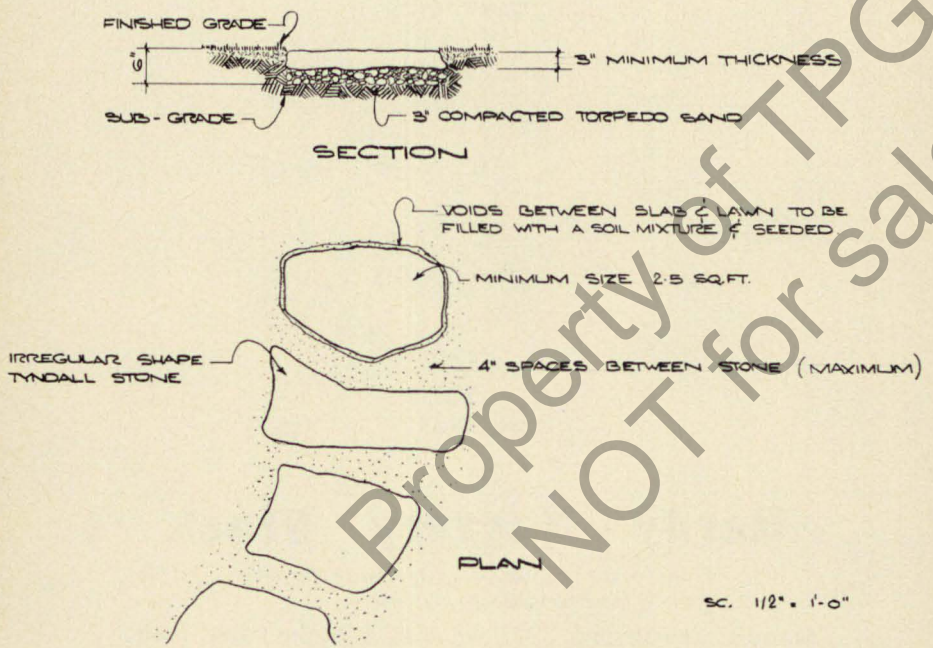
Specifications for STEPPING STONES IN LAWN

The material to be used as stepping stones shall be Tyndall Limestone, irregular shaped with smooth walking surface. Each slab shall have a minimum size of 2.5 sq. ft. and shall be not less than three (3) inches thick. The slabs shall be cut to the required shape and layed on the existing lawn or newly grassed area at locations indicated on the drawing(s). For convenient walking, the slabs shall be laid in single row not more than four (4) inches apart.

The perimeter outline of each slab shall be cut into the lawn surface, the slabs layed aside and each slab area shall be excavated to a depth of six (6) inches. The excavated material shall be removed from the construction site, and approximately three (3) inches of torpedo sand shall be filled into the bottom of each excavation.

Each slab shall then be fitted into the excavation of equivalent size, by the addition or removal of torpedo sand, so that the top of the slab lays flat with the lawn level, forming a solid surface.

Any possible voids between slabs and lawn shall be filled with the soil mixture indicated for flower beds and seeded as specified in the "Specifications for Landscaping".



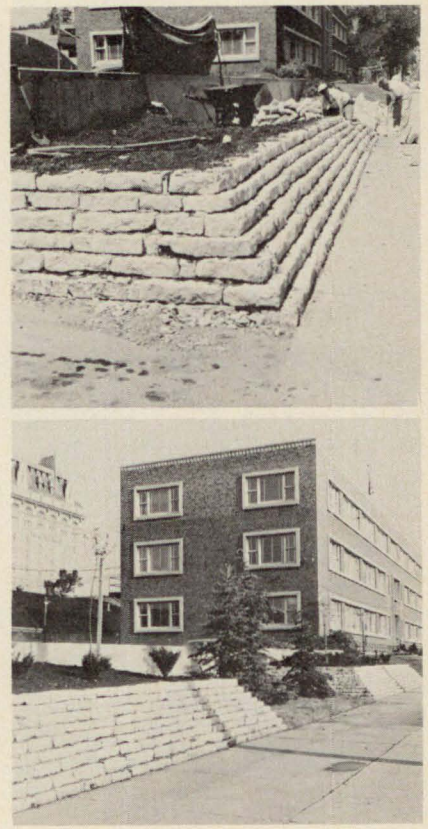
Retaining Walls

GUNTER A. SCHOCH

Walls are frequently used in the landscape, either to hold one level of soil above a lower elevation or to create raised planting areas. While it is more expensive to build a retaining wall than a common slope, it has the advantage of little maintenance and of giving considerably more room to an area than the bank does. A wall may take up 12 - 18 inches for each 3 feet of height, while a slope requires 6 - 9 feet for the same height.

Basically, we define two different construction methods in building stone walls. The end products are referred to as a "wet wall", consisting of stones laid in mortar, or a "dry wall", with stones laid in soil. The dry wall undoubtedly is easier to build, less expensive and can be integrated more successfully into the natural elements of the landscape.

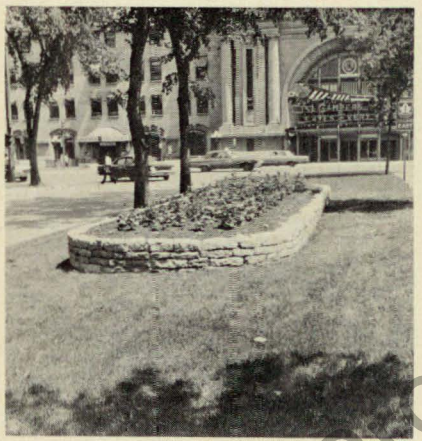
The most suitable material for dry walls are stones that are naturally rather flat, those which come from stratified outcroppings or occur naturally as flat blocks. Rounded boulders or fieldstones are not suitable for dry walls and many cause failure due to their shape. We are fortunate in the Winnipeg area in having the most suitable stone available. I am referring to the Stony Mountain limestone, available in cream color to



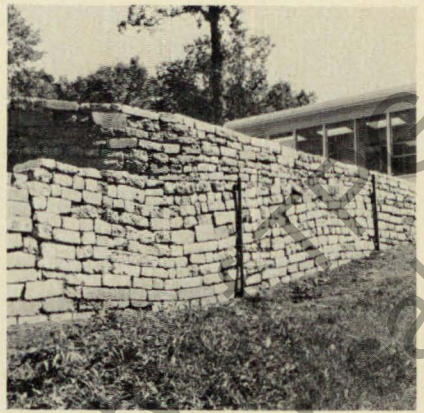
A well built, stable retaining wall of Stony Mountain limestone. An interesting effect is achieved by using a setback of 3" for each layer.

If large differences in grades have to be retained, it is advisable to create a series of smaller walls, each set back to create terraces, instead of one high wall.

Retaining walls do not have to form straight lines. Sweeping curves can add a great deal of interest to any landscape project.



Most important for all wall or planter construction is the placing of perfectly horizontal layers. On this sloping area, three layers of stone are visible on the right side of the planter, while four layers can be seen on the left side.



A striking example of poor retaining wall construction. Basically, three mistakes have been made:

a) The stone was not placed in horizontal layers;

b) The wall is too high to be stable. Either a 1 - 3" setback per layer or 2 - 3 smaller walls should have been considered;

c) Poor choice of material is obvious, as smooth surfaces are interrupted by broken edges. Rough limestone is better suited for walls than the cut Tyndall stone used here.

reddish colorations – not the Tyndall stone which is usually smoothly cut on at least one side.

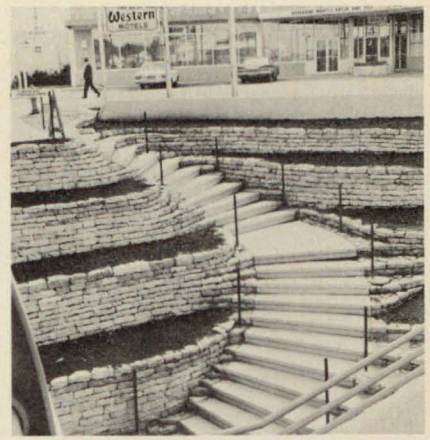
The dry stone wall does not require any foundation, the lower stones merely being set in a 6 - 12-inch deep trench on a base layer of crushed stone or gravel.

The secret of a well built wall is really the selection of stones prior to construction. If a load of limestone is ordered from a supplier, it can be expected that up to one-half of it will be unsuitable material. If one is experienced in using a stone hammer, the loss may be reduced to only one-quarter of the material supplied. The ideal stone may well be irregularly shaped but should be at least 3 inches thick and of equal thickness throughout. It should have at least one fairly straight edge to form the face of the wall, and it should not be less than 1-1/2 square feet in size.

The stones are placed in horizontal layers. All stones in one layer should have approximately the same thickness, although the thickness of different layers may well vary from 3 inches to 5 or 6 inches. About 1/2 inch of black soil is placed between the layers, in order to have each layer resting solidly on the previous one. Within a layer, the stones should be fitted together, allowing not more than an 1/2 inch vertical joint. Of course, the joints should be staggered, which means simply that a joint between two stones in the second layer should never be right above a joint of the first layer.

In general, larger and thicker stones should be used for the bottom layers, to assure good stability. However, a pleasant effect can be achieved by varying thicker and thinner layers throughout the wall. Most important is to have as the top layer fairly heavy stones, since they are primarily exposed to abuse. Sometime, just children balancing on the wall may loosen some of the smaller stones.

If a wall is only 18 - 24 inches high, the front face may well be vertical. For higher walls it is advisable to have the front face sloping back, about one inch in every foot of its height. As a general rule, the width of the



Curved retaining walls in connection with stairways can be pleasantly integrated with each individual step.

wall at the bottom of the footings must always be at least 1/3 the total height of the wall. An interesting effect and stable wall can also be achieved by using a set back of 3 inches for each layer. As each layer of stone is placed, the excavation behind the wall is filled up with soil which is well compacted. At the same time, the 1/2-inch layer of soil required is placed on top of the completed layer of stone.

Of course, dry stone retaining walls or planters do not have to form straight lines by any means. The most beautiful sweeping curves can be created with these walls. Ideally, they should be planted with rock garden perennials and trailing or creeping annuals, either on top of the wall or even between the layers of stone.

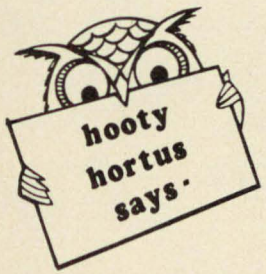
Photography by Gunter A. Schoch

PRUNING FRUIT TREES

The art of pruning fruit trees is dealt with in an article by Professor J.A. Menzies and Mr. A Gudziak in the 1969 Prairie Garden. Back numbers of the Prairie Garden form a valuable horticultural library. See the order form in this issue of the Prairie Garden.

O

Subscribers will have to consult their own or friends' libraries for this article, since the 1969 issue is out of stock.

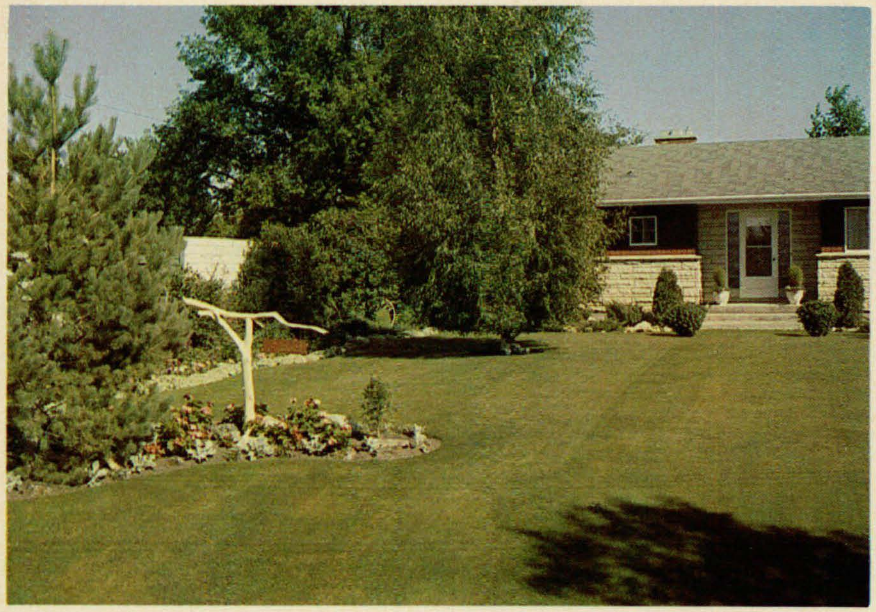


PEPEROMIA. Indoor gardeners who are looking for low-growing foliage plants for coffee tables and window sills will find a number of excellent possibilities among the wide variety of leaf shapes and colors within this species. All have unusually thick leaves and grow less than 12 inches tall.

They grow best in bright indirect light – 400 footcandles, and do well in ordinary room temperatures. During winter let the soil become moderately dry between thorough waterings.

Landscape Pictorial

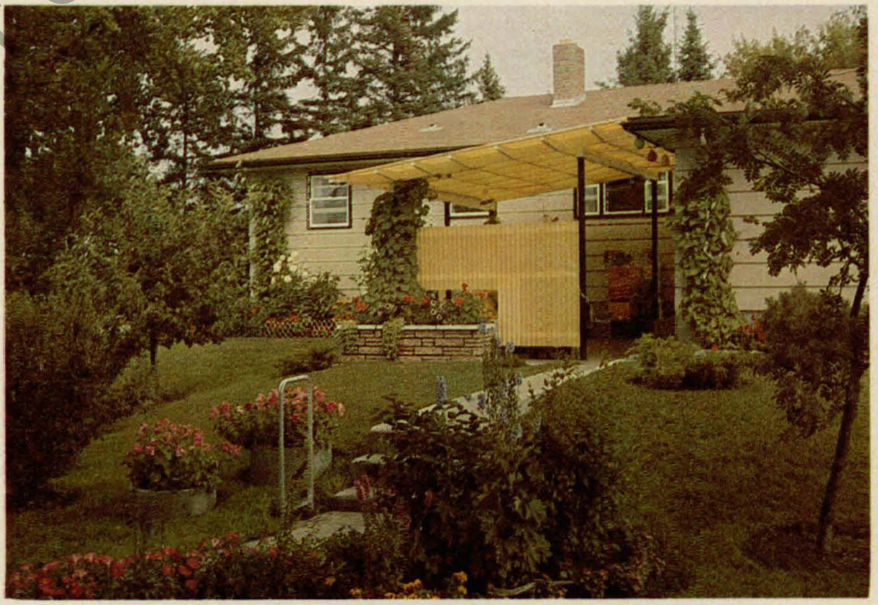
Effective use of annual flowers where space is limited.



Arrange plantings at margins of lawn.

Pleasing background and approach plantings are featured here.

Colorful WELCOME to farm home.



A satisfactory treatment of a rising approach to house.

Tulips and dwarf irises occupy this early-spring garden.

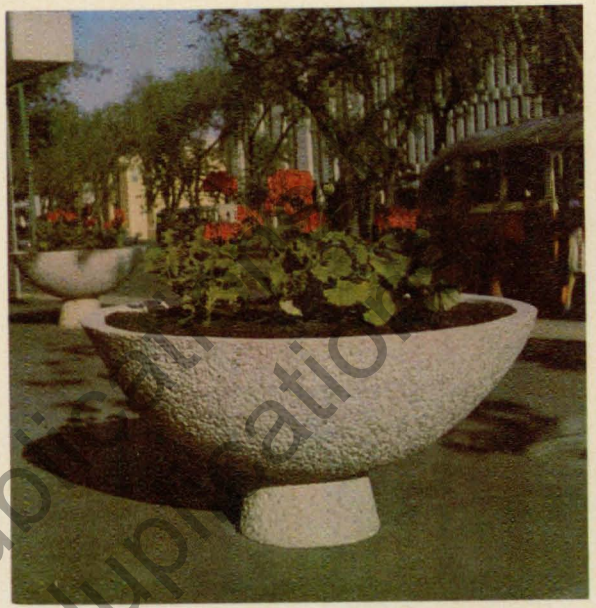
An excellent border display of geraniums, petunias, pansies and lobellia.

Attractive groups of annual flowers in association with perennials and woody ornamentals.

Vigorous snapdragons and ageratum in a well managed raised bed.

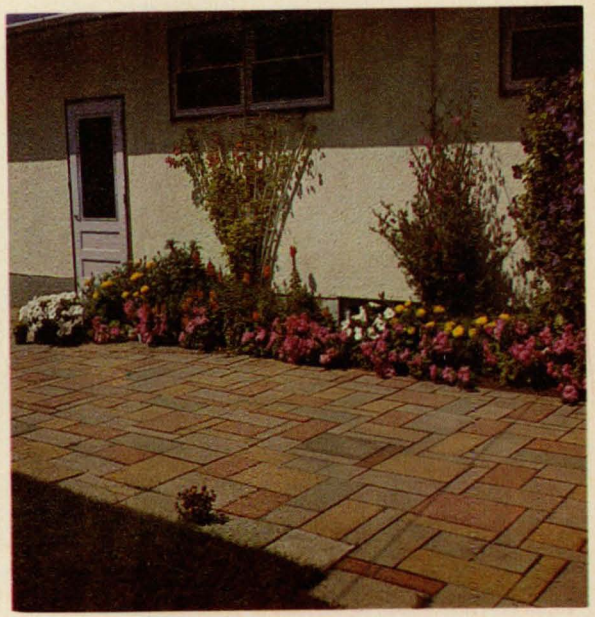
Add interest to flower borders with curved edges and background features.

With suitable backgrounds, flower borders can brighten up small gardens.



Make public areas attractive with utility flower containers.

A pleasing setting for an enjoyable patio area.

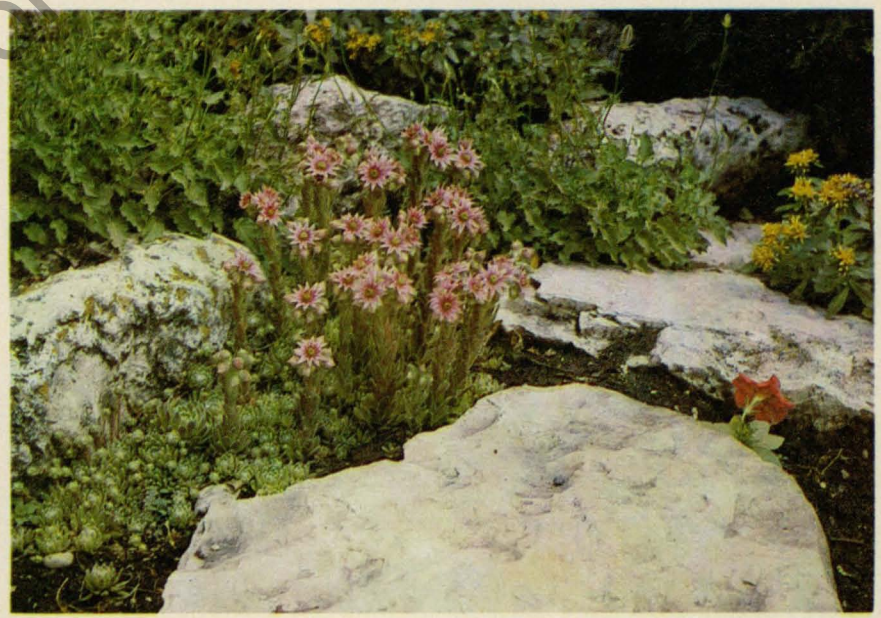


Note the essential elements of this attractive lily pool.

Public or front garden area can be suitably connected with private outdoor living area.

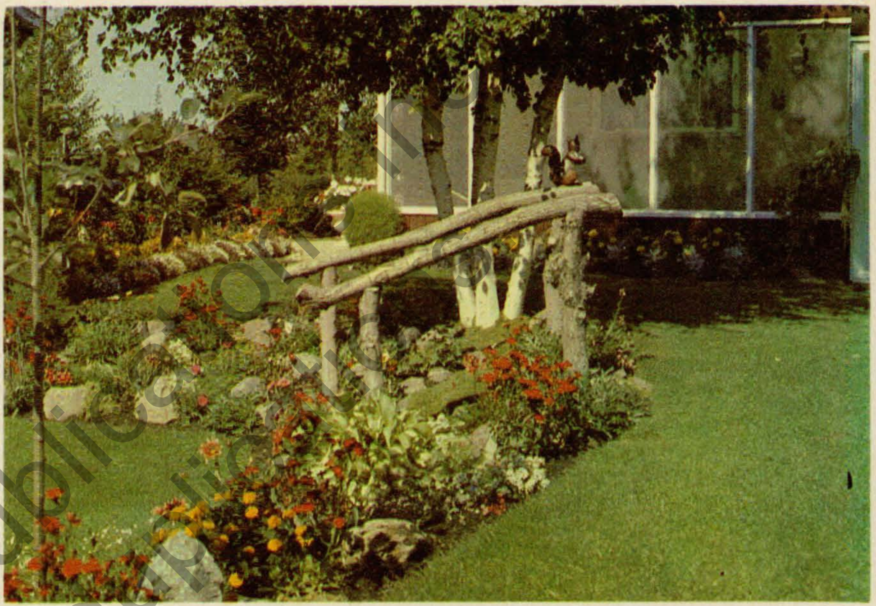
Use trellis, vines, window box to brighten up garage or other outbuilding.

An ideal location for rock garden plants: e.g. Sempervivum tectorum (hen and chickens).



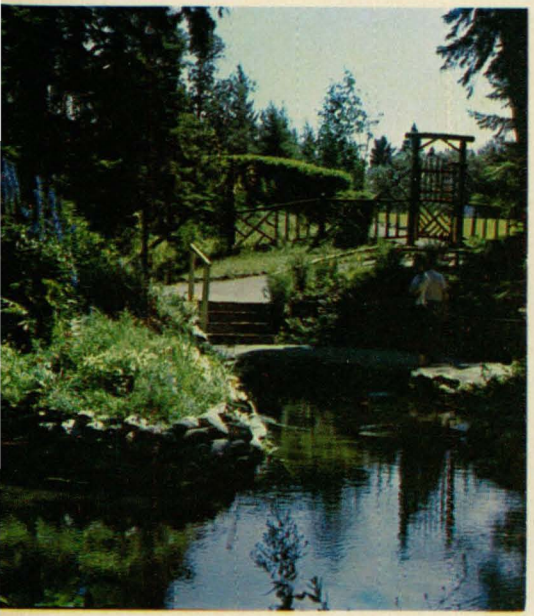
Flowers and spruce trees make the approach to this farmstead attractive.

Early flowering Thyme, Dianthus, Iceland poppy and perennial Candytuft featured in a rock garden.



A simple but effective method of treating a garden area on two levels.

Shrubbery and vines give privacy to entrance to house and trees provide a suitable background.



Sunshine, shade and shadow — a retreat for reflection!

A pleasing balance of open lawn, flowers, trees and shrubs.

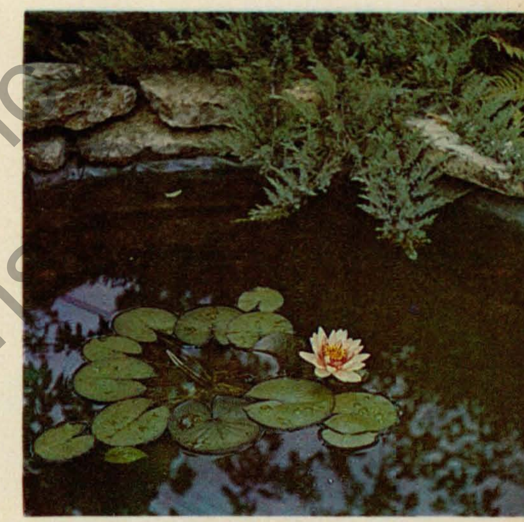
Neighborly cooperation can enlarge the attractiveness of home surroundings.

A simple but pleasing treatment of shallow planters.

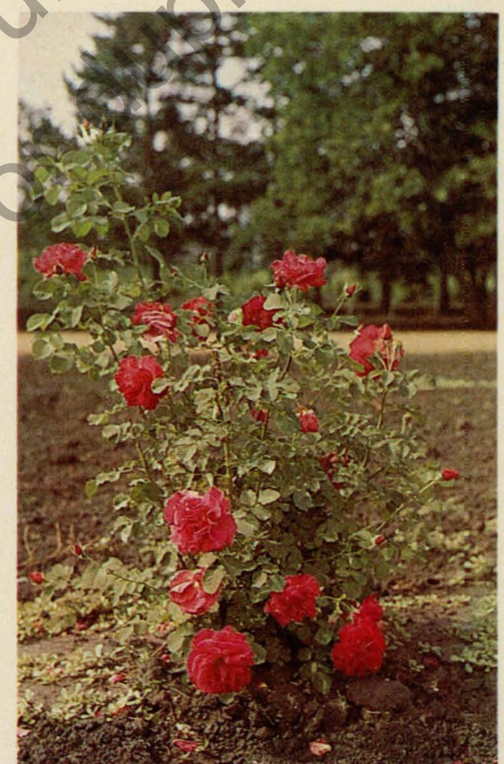
A readily-accessible, easily maintained and inviting outdoor living area.

A place to enjoy shade and to relax in interesting surroundings.

Even a miniature pool in a garden gives a restful and cooling effect.



A splendid specimen of Cuthbert Grant rose.



Attractive flower beds in front of the Saskatchewan Legislative Building, Regina.

Sectional view of the Alberta Legislative Building, Edmonton.

Hoar frost contributes to the beauty of home grounds.

Patio blocks give direction and dimension in home garden landscaping.

Landscaping features appropriate for the size of the home property.

A combination of trees, shrubs and flowers to create a pleasing private garden.

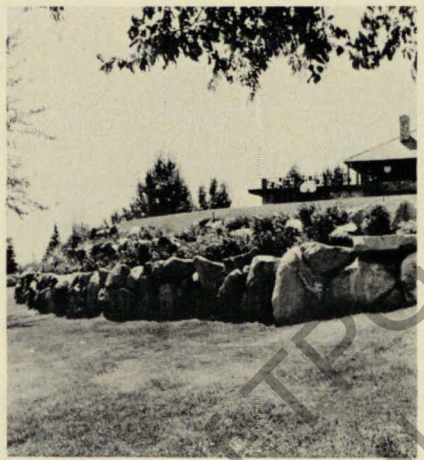
Interest can be maintained through the use of various garden features.

Stonework, gravel and boulders can replace plants where plant growth may be weak.

Rock Gardens - Illustrated

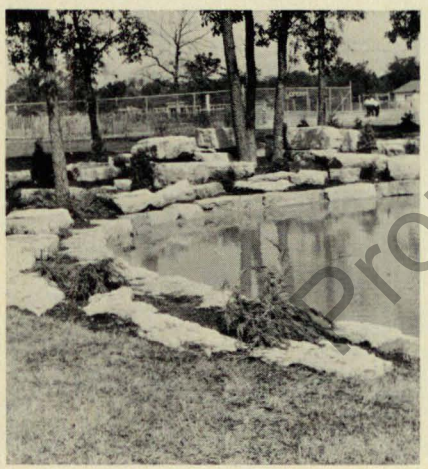
GUNTER A. SCHOCH

In the 1966 edition of THE PRAIRIE GARDEN, an excellent article was published entitled "Our Rock Garden", by Dr. W.R. Leslie. As this detailed information and description of rock gardens can hardly be surpassed, a new article on the same subject could not be justified. Therefore, it is suggested that interested "rock gardeners" look up their 1966 PRAIRIE GARDEN (limited number of copies still available) and perhaps use the following illustrations for further assistance.



Although fieldstone is generally not recommended for rock garden construction, this impressive rock wall, well planted, has its merits.

Photo by G.A. Schoch

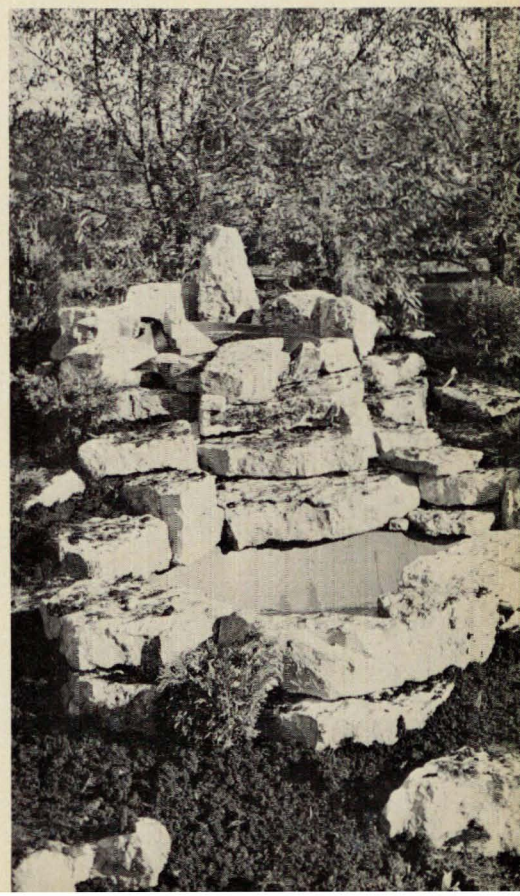


An unusual, but extremely effective, limestone rock garden, built on level ground in conjunction with a large pond.

Photo by G.A. Schoch

An excellent example of a well built rock garden of Stony Mountain limestone. The rock work was just completed when this picture was taken thus some alpine perennials are yet required to be planted to fill the space among the stones.

Photo by M. Moskal



The same rockery from another angle, showing the provision of a waterfall between the two small ponds. Only the upright stone at the very top prevents it from being a flawless example of outstanding workmanship.

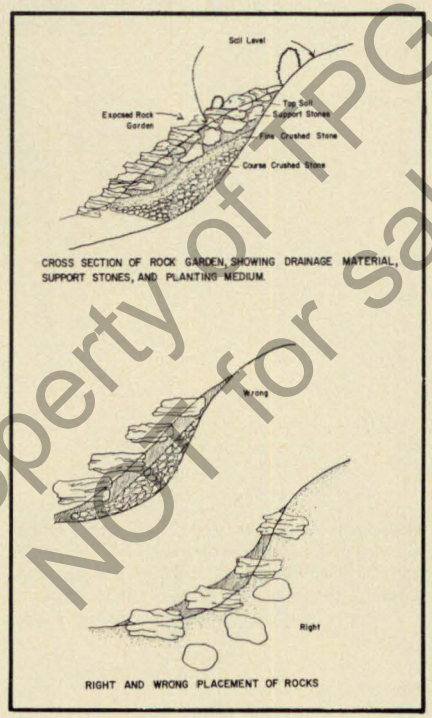
Photo by M. Moskal

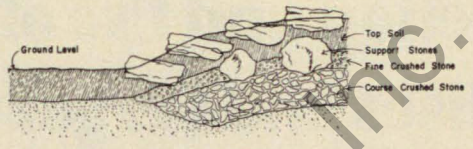
Irregular rock walls are forming terraces on the side of a large hill. An exquisite setting for a multitude of low plants.

Photography by Gunter A. Schoch

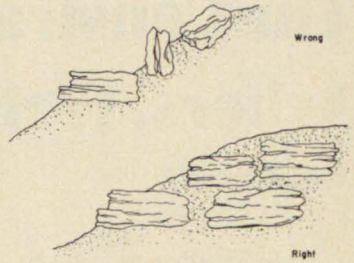
This type of rockery can hardly be described as a rock garden. However, it has its purpose in that it provides texture along downtown streets or on slopes, where lawn or other plant material cannot be maintained.

Photography by Gunter A. Schoch

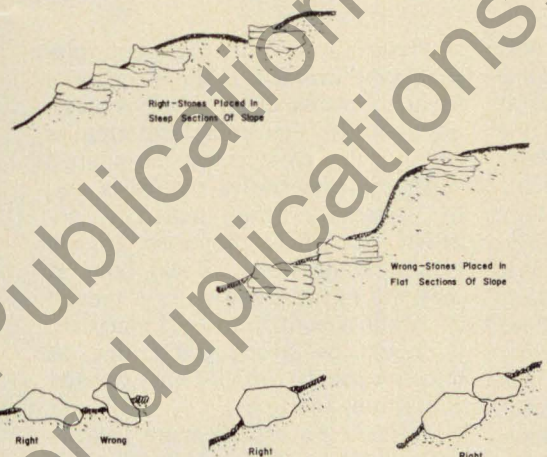




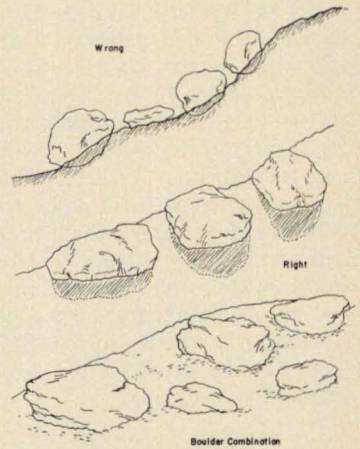
CROSS SECTION OF LOW LEDGE GARDEN.



RIGHT AND WRONG ALIGNMENT OF STRATUM LINES.



PLACING OF FIELD STONES



PROPER USE OF BOULDERS IN CONSTRUCTING A ROCK GARDEN.

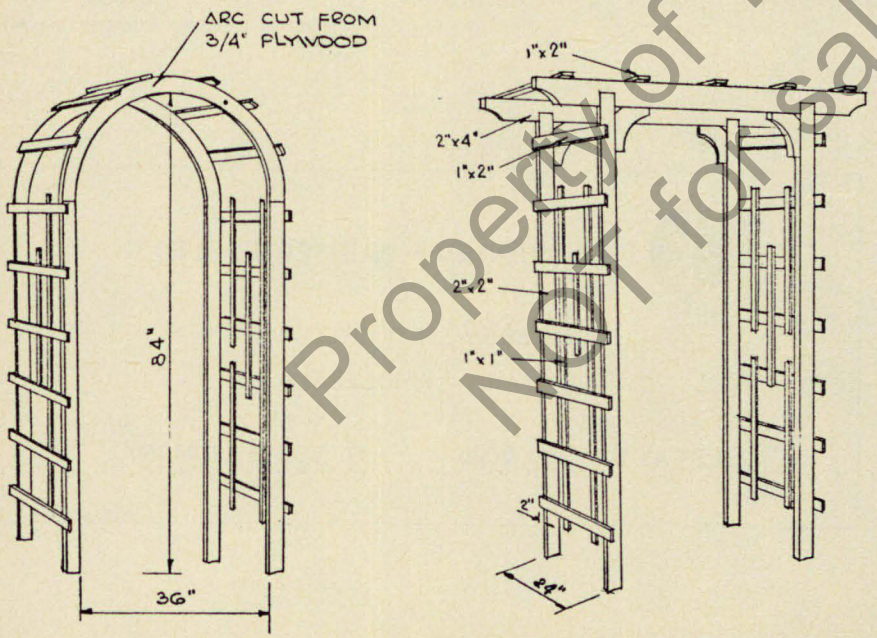
The Construction and Use of Arbors, Trellises and Pergolas

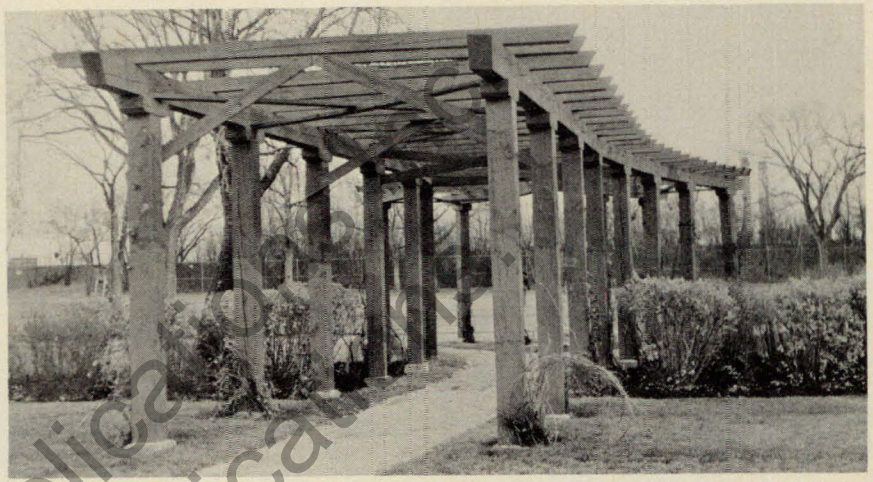
GORDON A. MARTIN

An arbor is basically an open framework structure built of light building material, primarily wood. Usually it forms an arched gateway supporting climbing vines or shrubs. Many different kinds of wood are available at the local lumber dealers and they are either stock sizes or they can be cut to suit your project. The most desirable material to use in construction is redwood or cedar which both have a tendency to resist decay. However, woods such as pine, spruce or fir can also be used and, if given a good coat of wood preservative such as Cuprinol, they can be expected to give many years of good service.

Preservatives such as Creosote should be avoided as they can cause harm to plants. Many colorful stains are available from your local supplier and a color to suit may be applied when the preservative coating is dry. In fastening the materials together, it would be wise to use galvanized nails, screws and bolts as they will not rust and stain. Although an Arbor is built from light materials, it should be strong and lasting, as repairs would be difficult once covered with shrubs and vines.

Trellises are usually more delicate lattice work, built to support climbing annuals and vines. They can also be





This massive prototype of a sturdy pergola was built many years ago in one of Winnipeg's parks. The climbers obviously require some support in form of strings or chicken wire, in order to fulfill their purpose.

A well-built and pleasing arbor, forming the gateway to a patio area. Virginia Creeper was planted as quick climber, covering the structure after two growing seasons.

used in a garden as a divider or to create privacy. Trellises may be attached to walls of houses or garages for the training of climbing plants, or can be supported by an existing fence.

As with Arbors, redwood or cedar provide the best wood, but once again other materials can be used.

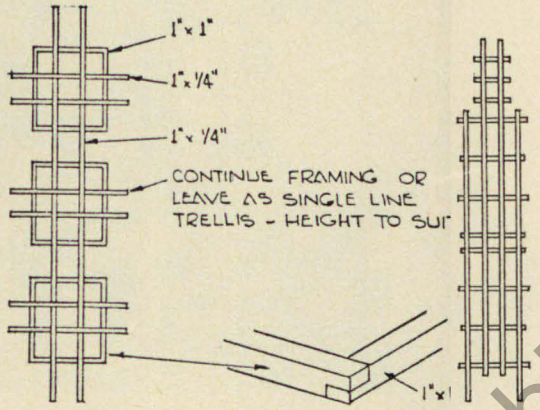
The framework of trellises can be constructed of wood measuring approximately 1-inch square. It should be half-lapped at all corners and meeting points in order to provide a flat surface to which the lath may be attached. The framework may be prepared in any shape or form desired, then to be set in place on lath material of 1-inch width and 1/4-inch thickness. These laths allow a slight amount of bending and even a woven effect can be created. Large trellises used with heavier-type vines and shrubs will have to be built using a larger dimension of wood. Galvanized fasteners should be used as with Arbors, and stain or paint may be applied to give the desired finished appearance.

Pergolas are also constructed of lumber and have a dual purpose, that of forming a bower, a partially shaded

Although built of heavy timber logs, this pergola at Riding Mountain National Park has, in its particular setting, an almost graceful appearance.

Pergolas are often used as shady breeze-ways or as architectural links between other structures. However, if not provided with climbing vegetation, their real purpose has not been met.

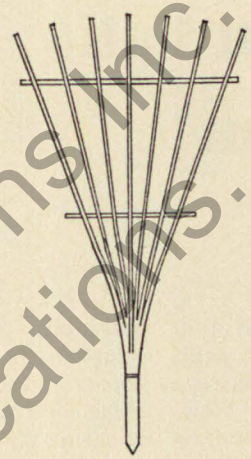
Photography by Gunter A. Schoch

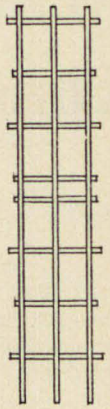


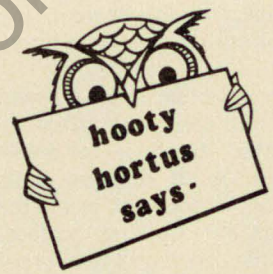
seating or walking area, and for the purpose of supporting woody climbers. Needless to say, both purposes complement each other.

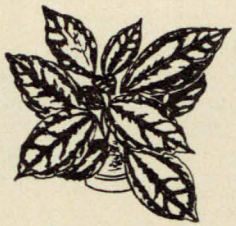
The pergola can be of simple construction or it may be built of heavier material to any width or length desired. Walkways under Pergolas should be at least 6'0" wide. Headroom of at least 7'0" should be allowed. Upright posts of 4" x 4" or larger should be treated with a good wood preservative for at least the bottom 24 inches and set into the ground at least 18 inches. Cross members can be 3" x 3" or 2" x 3" lumber. Woods such as redwood, cedar and pine are very suitable for the construction of Pergolas which can be built in 8'0" or 10'0" sections and joined to any desired length.

Provided these wood structures are well designed and constructed as well as planted with suitable plant material, they can be tremendous assets, interesting features and useful additions to any landscaped area.









PILEA, also known as aluminum plants. These plants grow about ten inches tall and have 2½ to 3½ inch leaves, each with three conspicuous sunken veins. The quilted sections appear to have been brushed with aluminum paint. They do best in bright indirect light – 400 footcandles. Are ideally suited for window sills and tables. When old, plants become straggly; it is time to start new plants, from stem cuttings or by dividing the roots, in early spring. Keep the soil barely moist at all times.

Materials for Patio Construction

GUNTER A. SCHOCH

A good variety of materials is available for the construction of a patio or a walkway. The determining consideration may be their expense. However, other factors should not be ignored. The suitability of the materials, their colour, texture and durability should enter into the choice. The existing materials used in the construction of house, retaining walls, fences, shelters or arbors are also factors to take into account.

If a contractor is employed for patio or walkway construction, costs may range from $1.00 to $20.00 per square yard for the supply and installation of the selected material. Placed in order of cost, a list of available materials would be as follows:

Wood chips
Sand or gravel
Crushed stone
Asphalt
Wooden slabs (laid in sand)
Precast concrete slabs (laid in sand)
Concrete poured in place
  Smooth or broom finish
  Exposed aggregate finish
Tyndall stone (laid in sand)
Bricks (laid in sand).

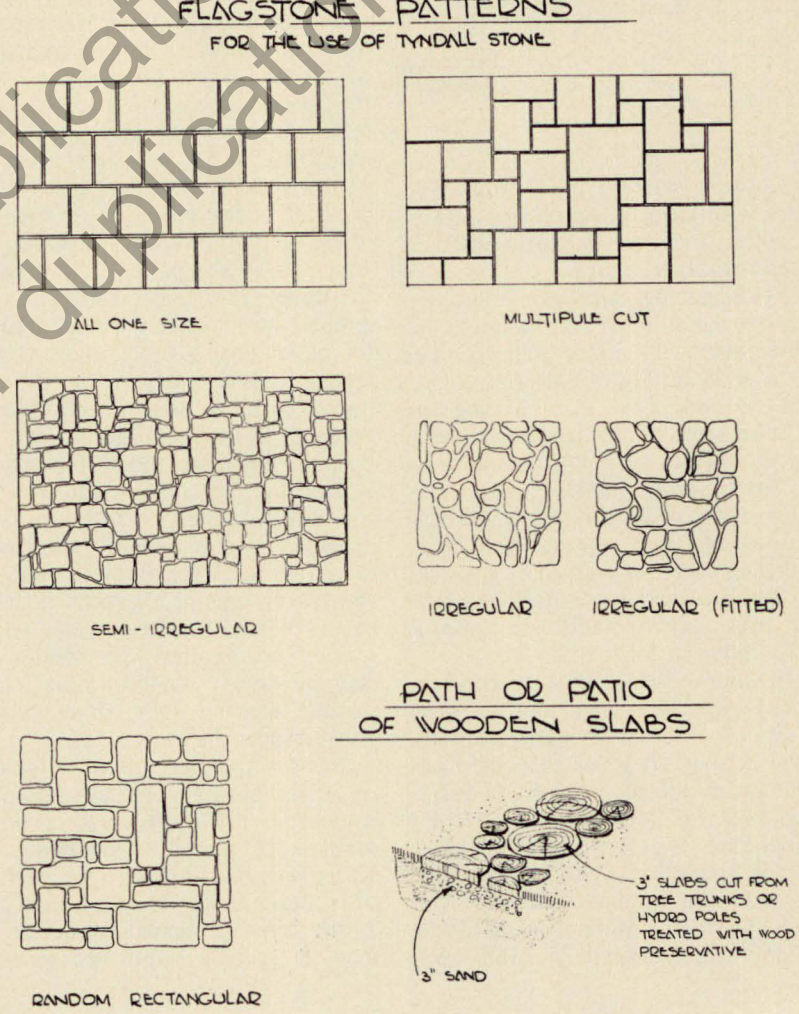
The least expensive material, undoubtedly, is **wood chips**. Since it is available as a by-product of pruning operations (wherever a mechanical chipper is used for the shredding of smaller branches), it can often be obtained free of charge. Perhaps not suited for formal and intensively landscaped areas or near a building, it is ideally useful for rustic effect in the proper setting. In areas with natural growth, wood chips are used increasingly for nature trails. It may also be considered for play areas, around and underneath play apparatus. If applied 3 inches thick, it will prevent any muddy conditions, even after a heavy downpour.

The other low-cost material, **sand or gravel**, is not used very often by itself, for surface treatment of walks or patio areas. As it remains in its loose condition, it does not create the most comfortable walking surface. However, for play areas and temporary walkways, applied one inch thick, it is quite satisfactory for at least a year's duration.

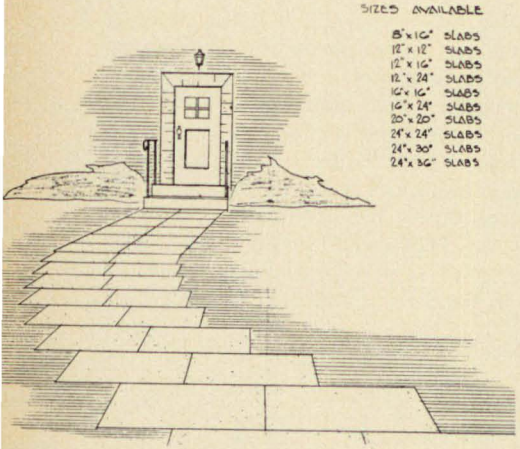
Another loose material which can be compacted, however, to form a solid surface, is the locally available **crushed limestone**. It can be ordered in different sizes from about 2 inches in diameter to dust, at approximately $4.00 per cubic yard. For maximum use, the walk or patio area is excavated to a depth of 5 inches, keeping the

necessary slope or profile of 1/4-inch crown to each foot of width in mind. A 3-inch layer of 1 - 1-1/2 inch crushed stone is placed at the bottom, followed by a 1-1/2-inch layer of 1/4 - 3/4-inch material, and topped by a 1/2-inch layer of limestone dust. This material is rolled and wetted, to form a perfectly stable and hard walking surface.

Compared to loose materials, permanent paving, of course, is preferable, as it provides a better walking surface and longer durability. But even here, a rather low-cost material is available that may add a great deal of interest and texture to a landscaped area. Again, it can be a by-product of a pruning operation by simply slicing tree trunks in 3 - 5-inch-thick **wooden slabs**. They should first be treated with a good preserver (Stangard, Caprinol or Timberlox) and then laid in gravel.



CURVED WALK OR PATIO
USING PRECASTED CONCRETE SLABS



The spaces between the slabs are also filled with sand, gravel or wood chips. A wide variety of slab sizes will add interest to such an area.

Brick paving, although most expensive because of the amount of labor involved, offers opportunities for a wide variety of patterns, colors, and textures. Bricks are among the most versatile of paving material, lending themselves to many uses because of their small, modular size. This allows them to be laid flat or on edge and to be used in a straight line, sweeping curve, or even a circle. Bricks are also placed on a 3-inch sand base and after laying additional sand is swept between the joints.

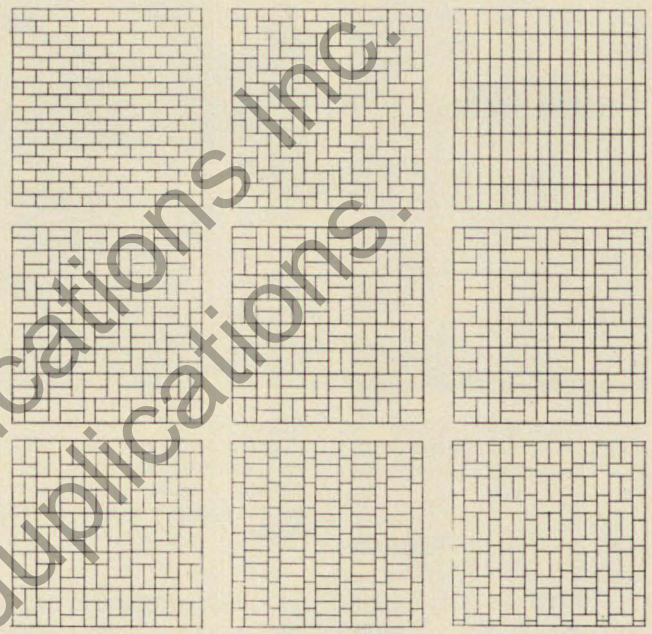
In recent years, **precast concrete blocks** have been generally accepted as durable material for patio and walk construction. They are available from different producers in 1-1/2 - 2-1/2-inch thickness, in at least six different colors and in more than 10 sizes, ranging from 8" x 16" to 2' x 3'. Some are produced in the traditional "wet pour" method, steel reinforced, having a compression strength of 3,000 P.S.I. Others are pressed and vibrated, using a low water content mixture (Vibro process) and have a compression strength of up to 5,500 P.S.I. A similar strength is provided in the Hydra-prest blocks from another company, which are produced with a 450-ton hydraulic press and do not require reinforcement.

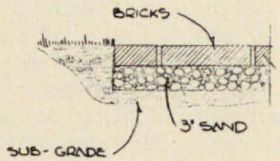
The patterns imprinted on the surface of these blocks provide a large selection of interesting textures. Although basically suited for straight lines, curved walks can be created by off-setting each slab sideways from the previous one. As most other materials, they are laid on a 3-inch sand base. For the construction of narrow walks, a string may be stretched on both sides in order to have the proper elevation always at hand. For wider walks and patios, it is advisable to frame the area with 2" x 4" lumber, installed at the final grade of the patio. Then a straight-edge is used, resting at both sides on the 2" x 4" frame, to allow constant checking of the grade as the blocks are laid.

Unfortunately, too often **asphalt** is used for the construction of walks and patios, simply because it is inexpensive and reasonably permanent. However, from the aesthetic point-of-view, it is one of the least desirable paving materials, as it provides neither texture nor interest. In addition, it may be rather uncomfortable in hot weather for the users, since its dark color absorbs the heat.

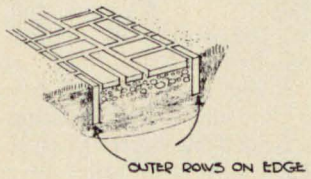
If asphalt is used, the work is usually carried out by a specially equipped contractor. In most cases, a 6-inch sub-base of gravel or crushed stone is supplied and compacted by mechanical rollers. This is then covered by a 2-inch layer of asphalt. Walks of less than 8 feet in width are generally more expensive to construct, as extensive hand labor is required. On wider areas, asphalt spreading machines can be used at more economical cost.

BRICK PATTERNS



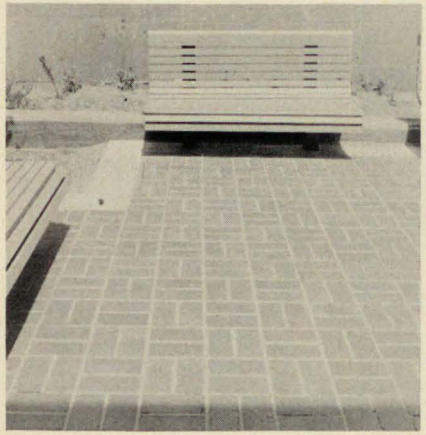


SECTION

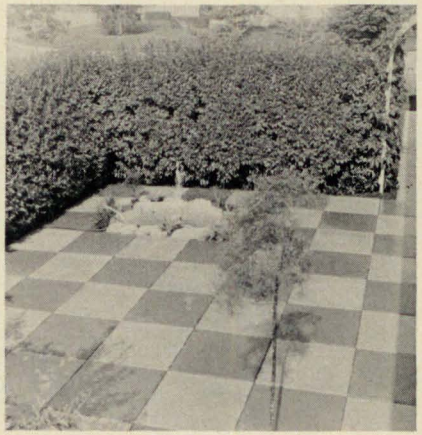


Concrete is, of course, the most durable and most adaptable material for paving. It can be used as a base for bricks or precast slabs or, when used by itself, can be cast in any shape, finished in different textures and colored in a variety of pleasing shades.

If larger areas, such as patios, are to be poured in concrete, the excavation should be to a depth of 9 inches and the perimeter of the areas to be paved are formed by 2" x 6". The top of these forms should be at the final grade, allowing positive surface drainage of 1/8" per foot. Five inches of 1/4-inch fill gravel is placed evenly on the sub-base and is tamped



Bricks are among the most versatile of paving materials, lending themselves to many uses because of their small, modular size.



Precast concrete blocks have been generally accepted as durable material for patio and walk construction. Here, 2' x 2' slabs are forming a patio in checker-board fashion by the use of red and natural colored blocks.

well. Then 3/8 inch of reinforcement rods are installed at 12 inches on centre, tied with tie wires at meeting points at an elevation of 1-1/2 inches below the final patio level. Concrete of 2,000 P.S.I. (5 parts gravel, 1 part cement, plus water) is then poured into place and levelled off by moving a straight 2" x 4" back and forth across the form. A wooden float should be used to finish off the surface and a fine-bristled broom to texture the surface. Construction joints are provided by inserting tar board at regular intervals in order to control any cracking tendencies. They are usually spaced at intervals equal to the width of the slab but should not be more than on 20-foot intervals. When the slab is completed, it should be covered with polyethylene in order to contain the moisture for the curing process during a 5-day period.

Other finishes can be created by the use of special tools or objects. The desirable exposed aggregate effect can be achieved by spraying or brushing concrete retardant over the surface just prior to the setting of the concrete. After the concrete has set, the surface is brushed and hosed down with water.

For narrow walks, usually 3 inches of gravel and 4 inches of concrete without reinforcement are adequate.

For many park and garden areas, the most suitable material for walk and patio construction is natural stone. Its texture and color and its natural beauty are only enhanced by time and weather. In the Winnipeg area, we are fortunate in having **Tyndall stone** available, which has the added attraction of extensive fossil occurrence. Not specially cut material is necessary, but large pieces of broken slabs, irregularly shaped with a smooth walk surface, are ideally suited for patio and walk construction. The material should be at least 3 inches thick, since thinner flagstones break easily.

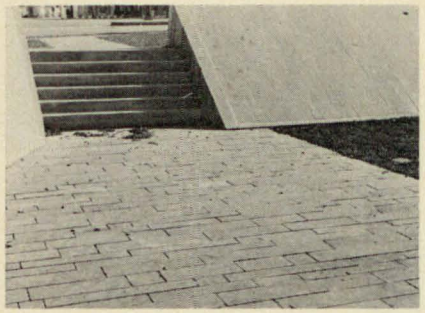
One of the most suitable materials for paving in the landscape is natural stone. Especially Tyndall stone, irregularly shaped with 3" grassed joints, is ideally suited for patio areas.

If narrow joints are desired, Tyndall stone may be cut on the construction site and fitted closely together

The area should be excavated 6 inches deep, allowing for 3 inches of sand as sub-base. While precast concrete blocks are laid close together and the narrow joints are filled with sand, irregularly shaped Tyndall stone is placed further apart, leaving 2-3 inch joints between the slabs. These are filled with good black soil and seeded with grass seed.

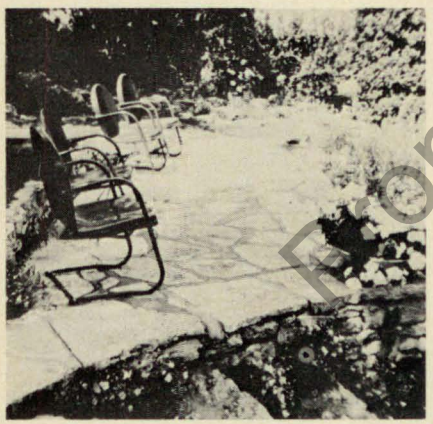
For heavily used areas, these wide grassed joints may not be satisfactory. A close fit and narrow joints between stones would then be preferable. This can be achieved by cutting the stone on the construction site with appropriate stone cutting equipment to obtain the desired shape and size. The basic, random pattern is still maintained, although the sides of each stone consists of more or less straight lines.

If slabs placed on a sand base should settle after a few years, they are easily lifted up and placed in level position by filling sand under the low spots. If a more permanent solution is desired, flagstones may be set in mortar on a concrete slab. Of course, it should be a properly reinforced slab which is a rather expensive proposition. In general, flagstone areas placed on a sand base have been quite satisfactory in our area. They may not be as permanent as poured concrete, but they certainly are much more attractive, especially in a park or garden setting.



Another application of Tyndall stone is the use of material pre-cut in 6" - 8" strips of different length.

Even 6" x 6" squares of Tyndall stone can be used effectively in interesting patterns for patio construction.

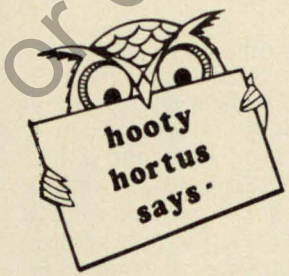


While in most construction methods shown sand or gravel is applied as base material, this patio was prepared with concrete joints. For durability, a reinforced concrete slab should form the base for this type of patio.

Tyndall stone, as well as precast concrete, slabs are also suited for stepping stones in the lawn or across a planting area. The spacing is important. For convenient walking, the centre of the slabs should be 25 inches apart. Each individual slab should be at least 2.5 square feet in size and may be laid in sand or directly into the ground.

Edging of patio and walking areas is only done if loose materials are used, such as crushed stone, wood chips, sand or gravel. But even for these materials, a sodded lawn edge, 1 inch higher than the walking surface (minimum 3-foot widths, for convenient mowing) is often adequate. Otherwise, bricks, precast concrete blocks, or pieces of 2" x 4" lumber placed on edge are quite satisfactory as edging material. Solid paving materials are usually installed level with the lawn area, which would eliminate any hand clipping and thus reduce maintenance costs. However, if planting areas are immediately next to the walk or patio area, some type of edging is definitely advisable to avoid washing of soil onto the walking surface.

Photography by Gunter A. Schoch



The perennial Spring Adonis is worthy of a place in your garden. There is not too much information available on this flower but it has been grown successfully for at least ten years in Regina and Saskatoon. It is also included in a list of perennials "hardy at Morden". Spring Adonis, Adonis vernalis, is a low growing perennial with finely cut foliage and bright yellow flowers. It is one of the first plants to add a touch of color to the garden in springtime, as it comes into bloom in early May. Unfortunately it does not seem to be readily available in the nursery trade.

Water as a Landscape Design Element

E. J. WALKER

Apart from watching water disappear into the ground from a hose, sprinkler or rainstorm, there are other contributions that can be added to the beauty and enjoyment of residential, business and public property by the capture, ponding and pressurizing of water.

The form the water arrangement may take and the form in relation to function is in order as a starting point. The different handling of water can establish different moods and feelings.

The flat surface or pool serves to actually increase the apparent size of the garden space by brightening it with cast light and by mirroring, and therefore doubling, the objects reflected within the surface. The edge form of the pool can be either natural or irregular, with portions of the edge hidden (Japanese or any natural lake), or formal as a lily pond or swimming pool, (Moorish and Italian gardens). The feeling imparted by flat surfaces is usually one of serenity and quietness, either from appreciation of natural beauty or through geometric forms resulting in awe. A contrast to serenity and quietness, of course, results in the activity of the contemporary swimming pool!

As opposed to quiet pools, moving water is expressed by fountains and jets. These vertical forms require substantial pressure systems. Waterfalls, babbling brooks and water staircases are other beautiful moving forms that appear natural, although if constructed in a garden, a hidden power source is required.

A new dimension of design, namely sound and sparkle, is added with moving water. The mood imparted by this handling tends to be more exciting and stimulating. In either the vertical thrust form or the cascade, water is more refreshing and more pleasing to the viewer than the flat pool surface. The cascade or waterfall tends to be more restful than the fountain or jet and may cause moods of reflection and nostalgia, however, the addition of supplemental lighting for the evening increases the excitement and stimulation of fountains more so than pools. Lighting is an attractive added component to garden designs and should be considered.

The methods of pool construction are many. The basic elements include:

1. The containing vessel. For a permanent installation this could be reinforced concrete, fiberglass or even a wooden box lined with copper or fiberglass. For the less permanent and therefore more adaptable to change, (and subject to less damage with the heaving quality of heavy prairie soils) plastic liners covered with pebbles and gravel serve the purpose well.

2. The drainage and water supply lines, although not essential as permanent components of small decorative pools.

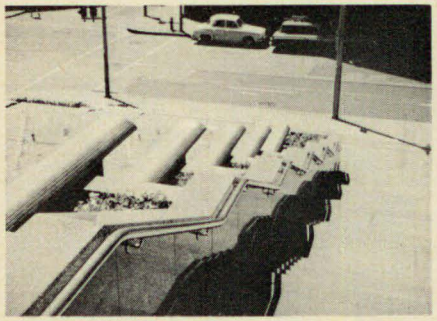
3. The power supply and associated pump fountain and, if desired, lighting. Although no comprehensive list of aquatic plants suitable for pools is given here, they are the essential element which ties the water feature to the total garden-building picture. The plants should be culturally adaptable of course. Within the water body lilies float, and reed and decorative grasses show off their silhouettes by both back lighting and shadow patterns cast on the water surface. Weeping forms of plants are commonly associated with water but, again, relate to the mood you wish to create. Evergreens are more functionally correct near a swimming pool as fewer leaves need to be cleaned out of the water, however, in the natural setting, floating leaves are appropriate. Large leaved plants, such as the castor bean, tend to suggest a tropical locale but also make the garden appear smaller, so that a careful relation of the space you have available to the scale of the water element must be made.

Pebble and rock selection should strengthen the picture rather than disrupt it. Generally geometric or angular stones are associated with still waters, while rounded pebbles, worn ledges and soft-edged containers look better and result from the moving water of streams, waterfalls and fountains.

Refreshing and light-hearted feature in a zoo setting.

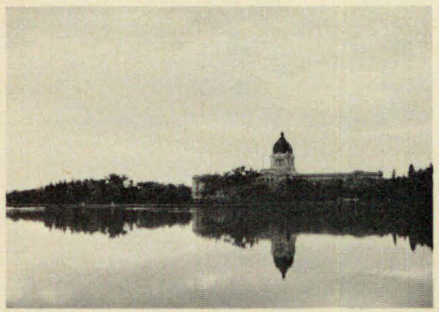
Verticals serve as a reference point in large natural park setting.

The introduction of a water feature into the landscape adds dimensions and interest that is hard to achieve through static structures and planting.



Water staircase formal and controlled in an urban setting.

Functional swimming pool in an integrated natural setting. Free stand sculptural diving element.



Serenity and spaciousness reflected on quiet surface.

Sound in a quiet entry area or garden corner.

Falling water – constructed form – rocks and plants to soften.

Formal approach for a building setting. Good integration of contemporary structure to formal garden.

(1) "But the seeds, bulbs, and plants are really the smallest part of gardening. The biggest part is the blisters. . . . You spend ten hours on Saturday planting tulips and your knees are gonna look like they're blowing bubble gum."

(2) **Gardening:** *Man's effort to improve his lot.*

(3) **Plain Talk**

To stress the evils of soil erosion, a farm magazine published pictures of a dilapidated house and a washed-away field and invited its readers to "tell your own story of the two photos." An Oklahoma Indian won over 2,604 contestants with the following:

"Both pictures show white man crazy. Make big tepee, plow hill. Water wash. Wind blow soil, grass all gone. Squaw gone, papoose, too. No chuckaway. No pig, no corn, no hay, no cow, no pony. Indian no plow land. Keep grass. Buffalo eat. Indian eat buffalo, hide make tepee, moccasins, too. Indian no make terrace. No build dam. No give dam. All time eat. No hunt job. No hitchhike. No ask relief. No shoot pig. Great Spirit make grass. Indian no waste anything. Indian no work, White man heap crazy.

(4) **Definition of a good neighbor:** *One who does not borrow his garden hose back too often.*

(5) The little boy ran to his father, exclaiming, "Wow! You should see the great new lawn mower next door. It doesn't need electricity or anything! All you have to do is just push it!"

Farm Landscaping - Before and After

F. J. WEIR

It is assumed that "before" means after the house-site has been selected and the shelterbelt planted. It is not practical, of course, for a farmer to even consider much landscaping unless he has already arranged for protection of his farmstead, lawn and his building area, otherwise, he would be extremely limited in the types of plant material which could be used. Without protection from the damaging north and west winds only the hardiest of plants could be used, and most of these, once established, would soon become very monotonous and uninteresting.

THE HOUSE YARD

One of the first projects is the establishment of a lawn at the front, sides and rear of the house, and any other areas on the farmstead where turf is needed, except where livestock, other than fowl may be kept. A lawn all around the house will provide a play area for the children, and will cut down on the amount of soil and dirt tracked into the house. The construction of a patio near the kitchen door will also provide a play area for youngsters when grass is wet and can even be fenced for a few years to keep the youngest toddlers in a restricted and safe area.

TEMPORARY FOUNDATION PLANTS

Until the lawn is established it may be advisable for the first year or so, while plans are being made for more permanent plants, to use annual flowers around the foundation. The effect can be quite impressive if a proper selection is made. Taller flowers can be used on either side of the front and back doors and at the corners of the house; such as Castor Oil Bean, for emphasis and to soften the harsh architectural lines of the house. Castor Beans usually attain a height of five to six feet and give almost an oriental effect. As the skin covering the seed of Castor Beans is highly poisonous, it would be advisable to remove the flowers which are rather insignificant, before seed has been set. If taller plants, eight to ten feet, are required, providing water and fertilizer for Castor Oil Beans would be helpful, or such plants as Impatiens, Spider Flower *(Cleome)*, Rose Mallow *(lavatera)*, Hollyhocks *(Althaea)* might be used. Plants on the sunny side of the house (south and east) could be Zinnias or Geraniums and even Petunias could be planted, for in this location it might be rather hot and dry. On the east and north sides, Pansies and Marigolds could be used to good effect. Tuberous Begonias are attractive and would grow well on the east side of the house.

PERMANENT FOUNDATION PLANTS

In order to cut down on the cost of foundation plants over the years, however, it would be wise to plant for a permanent type of planting, using shrubs or perennials which would not need to be set out every spring. Initially, the cost of such plant material would be greater, but over a period of years this would diminish to much less than providing bedding out plants each spring. It is a little difficult to use many perennials as foundation plants as most of them tend to increase naturally by seed and may spread around by themselves, thus necessitating a periodic removal when they become too prolific. However, such perennials as Peony, Iris, Bleeding Heart and Lythrum are reasonably satisfactory.

The main idea in having foundation plants is to make the building look as if it belongs in the area. To do this, taller shrubs can be planted at the corners (but usually three or more makes an artistic grouping) and medium-tall shrubs on either side of the doorway and in blank areas between the windows and lower or dwarf-type shrubs could be planted under the windows.

Shrubs should be selected which will reach the right height and size against the foundation and so require a minimum of pruning, have a fine texture of leaves, and be attractive enough without detracting interest from the house itself. Some shrubs have beautiful blooms, others may have colored leaves during the season, attractively colored bark or colorful fruit or foliage in the fall. There are a few shrubs which exhibit most of these characteristics but caution must be observed in their selection in order to attain sufficient variety without making collection of too many different ones. Lists of varieties recommended for different areas can be obtained from most agricultural offices, either provincial or federal, or from prairie universities.

For year-round effect, the low-growing or dwarf evergreens are quite satisfactory as they are attractive throughout the year. However, the use of these plants exclusively will give a rather sombre, depressing effect to the whole farmstead. In addition, on the prairies there is not the variety of such evergreens as may be found in areas where the temperatures are more moderate and the humidity is somewhat higher. Many evergreens in this part of the country suffer from lack of sufficient moisture in the air during the wintertime and in the ground and, consequently, suffer from an ailment commonly called "sunscald". This damage can be kept to a minimum, or to a point where little damage results, if these evergreens are planted in areas where they will receive shade from the house or other structure, or on the north side of a shrub border, and are watered thoroughly before freeze-up. When this is done the sun's rays do not reach the plants and do not cause the sap to move up the south side and escape into the dry air. The Wareana or Siberian Cedar, reaching a height and spread of about seven feet, seems to be reasonably satisfactory on any side of the house as well as the dwarf Junipers, Skandia and Arcadia which attain a height of 12 inches and 18

inches respectively. Perhaps one of the factors in the hardiness of these junipers is because they are so low that they are usually covered with snow in winter.

Very attractive arrangements can be achieved by the judicious use of both evergreens and deciduous permanent material.

SHADE TREES

The same year that the foundation shrubs or permanent material around the house is to be planted, attention should be given to the location and selection of a shade tree or trees. In some farmstead locations, a tree for shade purposes might need to be planted to provide shade for a kitchen window on the south-east or western side of the house. Even though shade may be required during the summer, and an attractive evergreen tree might provide this, sunshine might be a welcome visitor into the kitchen window during the wintertime. If this is the case, one of the most satisfactory trees would be the green or black ash as it would be late in leafing out in the spring and early in losing its leaves in the fall. An ash tree with female flowers would be preferred, as the flowers on each tree are either male or female and an insect frequently causes galls to appear on the male flowers which make them unsightly. As this tree attains a hight of approximately 30 feet at maturity, it could be planted about a minimum of 30 feet from the kitchen window. Both green and black ash trees have attractive golden-colored foliage in the fall.

Depending on the location of the livingroom or family room, if located on the west side of the house, it may be necessary to plant a tree or trees to give shade for the window of this room in the late afternoon. Satisfactory trees for this area would be the Mountainash, Paper Birch, or Ornamental Crabapple. To find the direction that this tree should be planted from the house, one should walk toward the sun at the same time of day the shade is required in this area, and the spot marked where the tree could be planted the following spring. A tree reaching the size of an American Elm should be located no closer than 60 feet from the house to avoid damage to the foundation by the root system. Many home owners are quite impatient as far as a shade tree is concerned, they want almost instant shade instead of admiring a fine tree as it grows. If this is the case, a few years can be saved by obtaining a tree which has been grown in a container in the nursery. Usually, it suffers less shock when transplanted but the cost for such a tree is much higher, although they easily may be planted in almost any time of year.

In most cases where a shade tree is required, it will be of more use to the family if planted in the back lawn. Unless the back lawn is very large, one tree is usually all that is necessary in the open area. Most other plantings should be restricted to the edges of the property or to round out the rough corners of the lot.

On the farm there is usually not the need for dense privacy provided by a high hedge on either side, as may be required in the city. Good effects can often be achieved by planting clumps of three to five trees in a group along the sides of the lawn, allowing the centre of the lawn to be kept reasonably open and expansive. If the rear lawn is extra large in area it can be broken up by putting in carefully selected varieties of trees as clumps with the area around or under each clump being cultivated.

Too many farmers think that when the lawn is in, foundation planting completed, and suitable trees and shrubs in the backyard planted, the job of landscaping is finished. However, with most farmsteads, there is need for the planting of trees or large shrubs to screen off unsightly views of the farmstead or farm buildings and individuals working in the area of the farm buildings.

Planting of taller shrubs in front of unsightly farm buildings will do much to improve the general appearance of the yard, as well as giving a unified appearance to the whole farmstead. Trees and shrubs and livestock, however, are not too compatible, and if plantings are to be made they should be placed in areas where cattle will not eat off the leaves or use the trunks for scratching posts. Often plantings can be made far enough inside or outside a fence to eliminate such a temptation on the part of livestock. Most trees are not too happy if the soil over their roots is kept tramped down. Often planting taller trees behind the farm buildings will be advantageous in providing a background setting for the buildings.

FRUIT AND VEGETABLE GARDENS

Some farm families may want to have a few fruit trees. On the prairies the most dependable fruit trees for most areas are crabapples, but in some favoured sites hardy apples can be used. The wise farmer will plant several varieties in order to have ample pollination, and will arrange for these to be in an area where some protection is given by the farm shelterbelt. For ease of cultivation, they should be in rows, and spaced far enough apart that the necessary cultivation can be done with farm machinery. Apples should be located about 20 feet apart, plums 12 to 15 feet and the smaller fruit plants such as sand-cherry plum hybrids, currants and gooseberries, about six to eight feet apart. Perennial plants such as apples, crabapples, plums, raspberries and strawberries should be located generally in the same area and away from the vegetable garden so the latter can be plowed regularly without any danger of damaging roots of fruit trees or fruit plants.

SUMMARY

Landscaping of farmstead is not a job to be taken lightly and no attempt should be made to try to do the job in one or two years. Eight or ten years is not too long a period to consider for such a worthwhile project. A well-planned farmstead will provide the farm family with many years of enjoyment, as well as fresh nourishing food to help cut down the cost of living. Sometimes we tend to try to measure everything by putting a monetary figure on it, but farming can not only be a way to make a living, it is also a way of life.

RASPBERRY SAWFLY

Those raspberry leaves with so many holes in them that the leaves look like skeletons were attacked by the skinny green caterpillars that are the larvae of the raspberry sawfly. To prevent this damage spray with four teaspoons of Diazinon 12-1/2 EC per gallon of water when blossom buds first separate (before blossoms open).

O

Take Time to Landscape

E. B. CASEMENT

All too often in this fast moving society, the new home owner wants his lot professionally landscaped overnight, yet does not wish to direct any effort thereafter in maintaining it. For this type of person, apartment complexes and condominiums were designed where the owner or developer is responsible for the maintenance.

Fortunately, there are many families who take time to choose a lot with special features and wish to plan and plant their own gardens.

There are articles on landscaping in this issue, so I will deal more specifically with the implementation of the plan. This schedule calls for the work to be spread over three or four years.

THE LAWN

During the first year, the lawn is the major item. The sub-soil should be graded and if top soil is to be added the sub-grade should be smooth and four to six inches below the finished grade. Add the top soil, making sure it is of even thickness throughout the garden. At the time of delivery take a representative soil sample and have it analysed, the recommendations provided by the laboratory should be followed for good soil fertility.

You may want to kill perennial weeds if there are some present, and this is the stage to do it. TCA, the old standby, can be used but this means another three months of waiting. You may wish to try other chemicals but get information on them from your provincial people. Mix in peat, compost or well rotted manure to give some body to the soil, if it is needed. Usually it should be spread about an inch deep on the surface and cultivated in.

If there are flower or shrub beds in the plan, make them at this stage and plant with annual flowers. A garden hose can be used very effectively for marking the boundaries. Rotovate the soil in the lawn areas, compact it by walking over it then water again. A long piece of heavy timber should be dragged back and forward over the lawn area to get it as smooth and as level as possible. It may be desirable to top dress the lawn with some nitrogen fertilizer, 3 lbs./1,000 sq. ft. of lawn area should be sufficient, spread evenly in two directions. Rake the surface lightly and sow the seed.

The grass seed mixture should be chosen from those recommended for your province. This is not the place to economize, get the best seed possible. Cheap seed often contains unsuitable grasses and weed seeds. Sow the seed in two directions, such as north-south and east-west, this will ensure good coverage. A light rolling at this time will help germination. A thin layer (1/8 inch) of peat moss can be applied over the seed to retain moisture. After seeding, water the area; a fine mist nozzle on the hose will not wash out the seeds. Keep the area moist until germination takes place. Allow the young grass to get about three inches high before mowing and then mow it high, at two inches or more. Do not worry about annual weeds, they will be choked out, there should not be any perennial weeds. Once the lawn is established you may wish to build fences or plant hedges if needed during the remainer of this first year.

FOUNDATION PLANTINGS

The second year calls for foundation plantings and trees for shade. After a year in your home, you will have a much better idea of where you need the shade trees. Again follow your provincial suggestions when choosing the trees and shrubs. Trees and shrubs are available bare-root, balled and burlapped, container grown or potted. During the planting time in spring, any of these can be planted, during the late spring or summer the container grown plants are the best.

Dig the hole wide enough to take the root system without crowding, and deep enough to provide space for at least six inches of good top soil under the roots. Mix the top soil with about 1/4 or its volume with peat, well-rotted manure or compost. Set the plant in the hole so that the top of the root system is no more than one inch below its former level. Spread out the roots and fill in the hole gradually being careful to get the soil in and around the roots, tread the soil firmly in place. Leave a slight depression to hold water around the plant and water thoroughly several times.

It is best to use two stakes to hold the tree steady, one each side connected by weaving stockings from one stake around the other side of the tree and back to the same side of the second stake, tie the stockings to the stakes, not the tree. Large trees should be held upright by guy wires. Transplanted trees and shrubs should be pruned to counteract the loss of roots. This should be done at the Nursery but rarely is. About 1/3 to 1/2 of the top growth should be removed by a combination of thinning and heading back. Thinning is the removal of an entire branch while heading back entails the cutting back of a branch. Always make clean cuts, flush with the trunk or branch or one quarter of an inch at a 45° angle away from and above the bud, which is pointing in the direction that growth is required. Treat all wounds over one half inch in diameter with a tree wound dressing.

SHRUBS & FLOWERS

During the third year emphasis is on shrub and flower borders. Allow plenty of room for the shrubs to develop. They may look too far apart when planted, but they do not take long to fill in. If you are planting perennial flowers, remember to plant iris in August, and peonies and bulbs in September.

The fourth year of this schedule calls for the completion of the projects that were not done earlier, and the building or development of any special features.

With this schedule, which is by no means fixed, you should be able to enjoy your garden, yet have time for other activities. Gardening is a rewarding hobby, take time to enjoy it!

Soil Fill Over Tree Roots

JOHN WALKER

In building construction and alteration operations there is often the problem of a *build-up of soil*, or the *removal of soil* from tree roots in the area around the building. Both these conditions can have long lasting and harmful effects if preventive and corrective measures are not taken.

Questions posed to the property owner are:

- If there are only a few trees on the lot should they all be saved?
- Are they healthy or sickly, long-lived or short-lived, valuable or otherwise, or would it be wise to replace existing trees with younger ones to be located for better landscape effect when the final grade is established?

As a preventive measure where there is to be a build-up or fill of soil, a circular wall (brick, stone, concrete) from four to eight feet in diameter should be constructed around the tree trunk to the height of the proposed fill. This forms what is generally called a well.

In addition, drainage tiles should be laid on the existing grade in the pattern of wheel spokes, numbering eight or more, and extending from the wall to the outermost spread of tree branches and sloping slightly in that direction. The object of the tiles is to ensure the availability of water and plant food to the roots of the tree. A space of about one inch, therefore, should separate the tiles when laid end to end. It is often advisable to place one or two tiles in an upright position at the outer end of each "spoke" to facilitate a freer movement of air to the root area.

Wells and drainage tiles are very necessary where there is clay soil and a clay soil fill because of poor drainage. In areas of lighter soil, crushed rock and coarse gravel may replace tiles.

Before a soil fill is made trees should be given commercial fertilizer at the rate of four tablespoons of 14-14-7, and the ground well watered. Placing the fertilizer in holes punched to a depth of 12 inches with a crowbar or drilling at three-foot centers prior to the application of water is recommended. If the soil fill is to be shallow, the only preliminary treatment needed may be shallow cultivation, feeding with fertilizer and heavy watering. When the well is finished it may be filled with crushed rock or gravel, particularly if the safety of children may be involved.

Why is soil fill over tree roots likely to be harmful? Until the placing of soil fill over the roots, development has taken place in a favorable environment where the top soil has been open and with a more or less natural covering. With the soil fill:

1) air which is necessary for the health of roots, soil bacteria and the neutralization of toxic substances is excluded.
2) roots are now at a depth where temperatures remain colder than formerly and the release of plant food takes place slowly.
3) penetration of the soil by water and fertilizer in solution needed for soil micro-organisms, as well as for trees, is hindered. In other words, plants are deprived of essential food elements.
4) bark on the trunks of trees in close contact with soil fill is likely to be injured, particularly for birches, oaks and evergreens.

What effects may be manifested by trees where there is soil fill? The degree of change or injury will be governed by the quantity and extent of the soil fill.

First, the natural flare or widening of the trunk at ground level will not be visible.

Although no visible effects may be apparent on above-ground parts for several years, eventually new growth at the tips of branches may be weak. Dead twigs will appear near the tops of the trees and foliage will not have a healthy, vivid green color. New shoots may arise near the base of the trunk.

Damage will be readily apparent if the soil fill over tree roots is basement clay and has been leveled and packed by a bulldozer when wet. This creates an almost hopeless condition as far as plant growth is concerned.

Where the soil fill is shallow and is applied gradually over a period of years no ill effects are likely to result, especially if the soil fill is similar in texture to the existing soil.

REMOVAL OF SOIL FROM TREE ROOTS

The removal of soil, or the lowering of the grade around established trees, is usually less harmful than soil fill over tree roots. In each case the amount and rapidity of visible injury will depend upon vigor, age and general health of the trees and the depth and extent of soil removal or soil fill.

Main reasons why injury may result from the removal of soil from roots are:

1) Valuable, fertile top soil has been removed.

2) Roots may not only be injured during the process but become exposed to heat and wind in summer and to freezing temperatures in winter.

3) The number of potentially active and supporting roots may be greatly reduced.

4) The maintenance of an adequate water supply may be difficult if the new grade is uneven.

5) There may be continuing damage to roots by pedestrian and other traffic.

Injury by removal of soil from roots may be kept at a minimum by first making sure the tree roots do not become dry. Then apply a mixture of peatmoss, leaf mold and loam in equal parts, by volume, over the roots to the depth of at least two inches, and cover it with a layer of sod. The area should then be fertilized and watered as previously recommended.

To keep injury from soil removal at a minimum, it should be tackled either in the early spring to permit the sod to become established before the heat of summer, or in the early fall to insure protection to roots against frost damage in winter and early readjustment of roots in spring.

Fencing can eliminate injury by traffic.

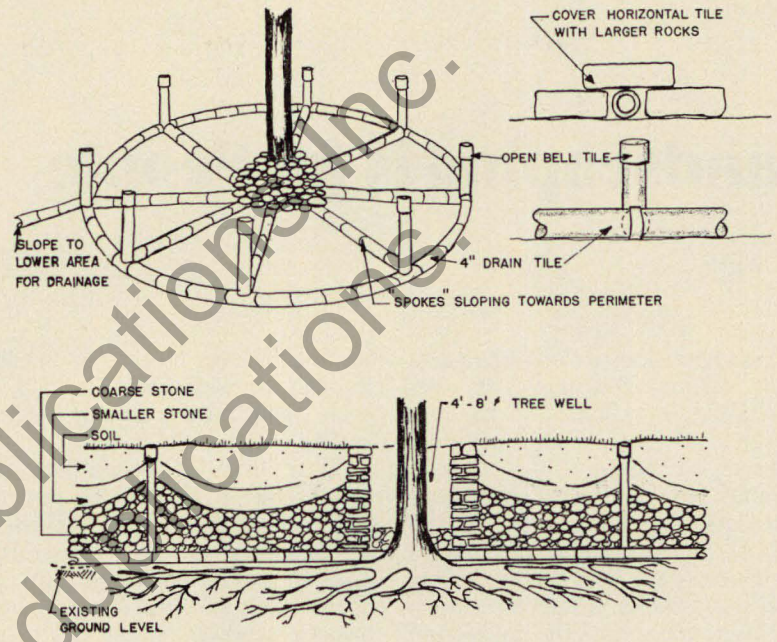
Where soil removal may be considered inadvisable, two alternative plans are suggested:

1) Change the grade slightly by establishing a new gradient or slope in the tree area.

2) Retain the original grade for an area 10 to 12 feet in diameter around the tree trunk and enclose it in a dry stone wall. If the general area is sloping, the retaining wall may be needed only on the lower side.

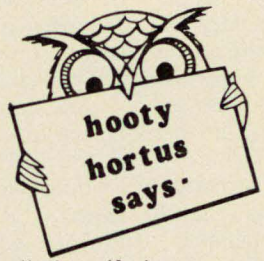
Treatment for tree where the natural grade has been covered.

Details of "facing" for a tree well.



PREVENTING TREE INJURY FROM EARTH FILL

(Upright tiles optional if the earth fill is shallow)



SCINDAPUS, also known as pothos or devil's ivy. These plants are attractive in hanging containers or in flower pots on a table, with the vines arching over the pot on to the table surface. They make handsome climbers if given a support. They also grow remarkably well in plain water. The stems grow indefinetely but can be pinched back at any size. The green leaves are extensively marked with silver, cream or yellow blotchings according to variety.

They do best in bright indirect light – 400 footcandles. Adapt well to average home temperatures. Soil should be allowed to become moderately dry between waterings.

Landscaping is for People

F. J. WEIR

First impressions are important and, usually, lasting. This applies in cases where a lady may look at a hat or a man at a suit, or a couple consider purchasing a home. Unless one is favorably impressed with the article at the outset, a salesman has a big job ahead of him before he can make a sale. If one is not favorably impressed at the start, the unsatisfactory aspects must all be adjusted to the satisfaction of the buyer so that they do not seem unsatisfactory, and then the attractive features emphasized.

In purchasing a home most couples have a preconceived idea of what they would like as far as the house itself is concerned, and often this factor is present also as far as the grounds or property on which it is located are concerned. Of course there are many people who are not interested in the grounds — as far as some care, these could be cemented over! Fortunately, there are not many in this category. For most people, if the first sight of the house and grounds is not pleasing to them, or if they feel that they cannot make corrections easily so that they can be eventually satisfied with them, they will not be happy, even though most other features are satisfactory. As mentioned, there is a small minority who are interested only in the house itself, and it is not difficult for the average citizen, as he drives through a community, to pick out cases where owners are not interested in their grounds.

What kind of people are these folks? One is tempted to generalize and say that they are lazy, indifferent or uninterested. These descriptions may fit some individuals but, it is hoped, not too many. There are homeowners, however, whose health does not permit intensive gardening or heavy maintenance. These are individuals who feel that they cannot afford to spend money required for planting and upkeep. There are individuals who feel that they do not have the time required to look after their yards. With most people it is a question of priorities, and golf or fishing may come first. There are families who own a cottage or summer home at the lake and because most of their leisure time is spent there, the home place must suffer.

On the other hand, one would like to be able to say that the owners of all attractively planned and planted homegrounds are industrious, hard-working, happy people, interested in their families and in their community, in short, fine, dependable citizens. Such is not the case either. There are some home owners who have summer homes who also find the time to spend

on their home places. No doubt some of these are in the financial situation where they have commercial gardeners grooming their grounds twice a week. Some have larger families, and the family members may all be sharing in the maintenance chores. Some families may have moved in very recently and the credit for their attractive grounds should be given to the previous owners.

In most towns, cities and villages there are certain streets which are well-known for the garden activities of the owners. One may find several home grounds in a row on one or both sides of the street, and it would appear that each home owner was trying to out-do his neighbour in making his property attractive. Sometimes a beautification program like this is started by one individual who sets an example for others, however, this is not the case in all instances. People of similar incomes, temperaments and interests often tend to locate in the same general area. In many cases they locate close to their places of business. All kinds and sorts of excuses are given by people explaining why they have not improved their grounds.

A certain amount of blame for lack of home ground improvement must be laid at the feet of the real estate business and the real estate agent. The term "landscaped" to most agencies and salesmen and of course through them, to the homeowners, refers to property where only the lawn has been put in. Many new homeowners never get past this stage in the development of their properties.

Some homeowners claim that they do not know what they ought to do, in fact, this is the explanation given by most people. Most of them would have a general idea where they wished to have plantings in order to get the final effect, but would not know what trees and shrubs to plant in these areas, or why specific ones would be better than others in such locations.

An interesting sidelight in this respect appears from a survey undertaken by the Pennsylvania State University in 1965. In this survey of 435 households it was indicated that a lack of knowledge pertaining to landscaping was manifested by most individuals, but this appeared to be independent of the adequacy of their home landscaping.

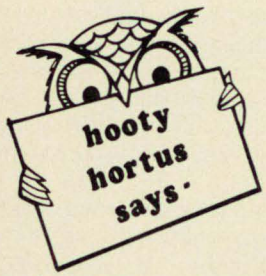
In the same study it was indicated that better landscaped homes tend to be associated with older residents, fewer children and higher priced homes. On the other hand, those living in poorly landscaped homes were more likely to agree that landscaping involves too much time, work and money, and would be more willing to hire someone to do their yard work if they could afford it.

A factor often used in encouraging homeowners to landscape their home grounds is that the real estate values of their properties are much increased. This may be so in some cases, and more so on farmsteads where landscaping includes shelterbelt plantings as well as the ornamental and other utility plantings, but most individuals who have done these plantings feel that they would not be able to recover the money spent in landscaping if they were to sell their properties. This is an encouraging piece of information, and reinforces one of the ideas I've always had about people who have spent time and money in landscaping in that they have done so, not for any increase in value of their property, but to have attractive surroundings and to set an example for their families and communities. They achieve their satisfaction and their reward from having an interesting hobby which

adds to better living.

What then can we, as practising horticulturists, do to help these poor unfortunate citizens who are indifferent, lazy, too busy, or just not interested in landscaping?

We can set a good example by seeing that our own places are in a good state of planting, and adequately maintained. We must be missionaries and give all possible encouragement to new and young homeowners who are getting established. It is up to us to see that they do not make any of the mistakes we have made. It is up to us to see that they are given ideas as to where they can obtain help, if we cannot give it ourselves. They should be shown that proper planning and planting of hardy, permanent material will save time and money over the years. It should be demonstrated to them that careful planning and study beforehand will make day-to-day maintenance easier and lighter.



MARANTA, commonly called "prayer" plant. These plants derive their common name from the unique response their leaves have to light. In light the leaves are held horizontally, in darkness the leaves rise to a vertical position that makes them look like hands in prayer. The plants are especially interesting when grown beneath a table lamp. When the light is turned on after dark, the "sleeping" leaves awaken and spread to their horizontal position in a matter of minutes, then become vertical again after the lights are turned off.

There are a number of interesting species, with different vein colorings and leaf spottings. They grow well in bright indirect light – 400 footcandles, at normal home temperatures. They do best where the humidity is 30% or more. Keep the soil evenly moist except during the winter when the soil should be allowed to dry a bit between waterings.

Establish Your New Lawn by Easy Steps

JOHN WALKER

Lawns are considered to be carpets of the garden or outdoor living room, with other features placed around them, and they vary from house to house, district to district in shape and size and general appearance. A lawn makes a beautiful setting for anyone's home but it must be cared for, it is intended to be a closely mown area of grass not marred by weeds.

Suppose you are preparing one from scratch! What to do? To begin with if the area is not completely level, a surface sloping away from the house one inch in four feet is better than constructing a terrace and making two or more separate levels.

For a healthy lawn the area must have good sub-surface drainage. This may mean the replacement of basement clay with friable loam soil, especially if the former has been packed by a bulldozer. This is often the case for many newly-built homes. In such a soil mix, drainage is practically nil and plant nutrients very low. Steps recommended to improve the drainage and texture are deep digging, cultivation or plowing in the fall, with subsequent exposure to frost action during the winter.

A percentage of clay is desirable in the subsoil but the surface soil needs to be especially prepared, eg. sandy loam soil plus peatmoss 3:1, or heavy loam soil plus rotted manure plus sand 1:1:1, and applied to a depth of three to five inches.

The final preparation and levelling before seeding or sodding will be the removal from the surface, or breakdown, of coarse material by the use of a rake or plank drag. In this step the surface should be dry, so that the particles may pulverize readily. Slight hollows should be filled instead of packing slight knolls. Next, add ammonium phosphate, 11-48-0, to the soil at the rate of 10 lbs. per 1000 square feet just prior to sowing the seed or laying the sod. This should be worked into the soil by raking back and forth.

ESTABLISHING THE LAWN:

(1) **Sodding** – sodding provides a quick covering which is not injured by traffic. Fertilizing and watering are less complicated as compared with sowing grass seed, and the planting and care of shrubs, flowers, etc. can be carried out without hindrance. Problems may be, weeds, poor and unsuitable grass mixture, and uneven surface if thickness of sods varies. Cost for sodding is likely to be higher than for seeding.

To fill spaces between strips of sod, a light topdressing containing pulverized peatmoss and/or rotted manure should be applied followed by ample watering. Watering must be repeated as required. Even if there is additional cost, the margins of every new lawn should be sodded. These sods provide a firm footing for the planting and care of flowers in adjacent borders without disturbing or destroying sprouting grass seed.

(2) **Seeding** – seeding is the usual method of establishing a lawn on large areas. By using the highest grade of lawn grass species recommended for your soil and area, the problems listed under sodding will be largely eliminated. Possible disadvantages of seeding are: (1) under dry, windy conditions seed may germinate unevenly or fail to do so; (2) during heavy rains the seed may be washed away or into hollows.

If the soil has been prepared in the manner already outlined, and conditions as to moisture are favorable, seed may be sown from August 15 to September 10. The surface of the soil should be dry. Various mechanical seeders are available, and the rate of seeding will be governed by the size of seed which varies with variety and kind.

When the seed is broadcast a light topdressing, vigorous raking and careful rolling should follow. The surface of the soil must then be kept moist to encourage rapid germination and strong growth of grass before winter. Actually, germination should take place within three weeks.

If the lawn area is well sheltered from exposure to wind and a good snow cover is likely to remain throughout the winter, the seed may also be sown just before freeze-up. Branches placed along the margins will keep traffic off the area and assist in holding the snow cover. In this instance germination will not take place until spring.

Seeding in early spring, around May 1, when moisture is plentiful, is also satisfactory. Steps .suggested for fall seeding should be followed. Again, to insure satisfactory germination and development, the soil surface should not be allowed to dry out. One purpose of the topdressing is to lessen moisture loss from the soil surface.

Lawn grass mixtures are not usually recommended or desirable, except where the mixture may be suitable for an unusual site, eg. very deep shade. Mixtures may contain grasses that vary in color, texture (width of leaf blade), growth habit and tolerance to drought.

Kentucky Blue – Park strain – is highly recommended. It is semi-stoloniferous, (some trailing branches develop roots), is of a dark green color and grows vigorously in the early summer and in the early fall. Sow at the rate of 3 to 4 lb. per 1000 sq. ft. of lawn area. Small weeds, which can easily be destroyed before going to seed by amine formulations of M.C.P.A. or 2,4-D herbicides when a 70° temperature prevails, may help to shade the developing young grass seedlings.

Do not mow new lawn grass until a height of two inches has been reached. Vigorous top growth is necessary for the development of a strong root system. For the winter, leave it at least one and one-half inches long. A topdressing of well-rotted manure or leaf mold about two inches deep, applied after freeze-up, will provide a beneficial soil mulch after the coarse material has been raked off in the spring.

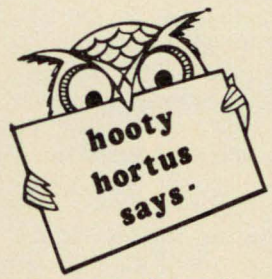
Information about other lawn grass species may be obtained from specific lawn pamphlets (1). Suffice it to say here that varieties of fescue grasses, eg. Duraturf, are more drought tolerant than Kentucky Blue and prefer light, sandy soils. Mowing is best done when the grass is slightly wet. 'Bent' grasses flourish in soils with more clay but require much more attention as to topdressing, fertilizing, mowing, brushing and watering than other more commonly-used lawn grasses.

The amount of chemical fertilizer to use on a lawn at any time is related to the amount of water applied. If no more than an inch of water per week is given, (by rain or from the hose), 3 to 5 lb. of chemical fertilizer per 1000 sq. ft. may be applied at a four-week interval during the period of active growth in May and June, the first containing Nitrogen, (21-0-0), and the second containing Nitrogen and Phosphorus, (16-20-0). Mix the chemical fertilizer with dry soil or sand, apply evenly when the grass is dry, and water immediately. No burning should result. Fertilizers must be used on lawn to replace essential nutrient elements removed, because one ton of grass cut off by mowing removes approximately 30 lb. of Nitrogen, 15 lb. of Phosphorus and 35 lb. of Potassium.

Effective control of moss in lawns and turf may be obtained by dissolving one-quarter ounce of Permanganate of Potash in two gallons of water and applying it to three square yards of area. The grass is improved by this treatment.

Control of ants and earthworms, which sometimes appear in lawns, may be effected by the use of Chlordane. Check manufacturer's directions, place a small quantity on top of the ant hill and carry the solution into it by applying water from a watering can; treatment may need to be repeated.

(1) Lawns, Their Preparation and Care. Manitoba Dept. of Agriculture Publ. 233 (Rev.)



AGLONEMA, also known as Chinese Evergreen – These are tough plants that grow in the dark corners of a room, while most other plants would perish. They also grow well in plain water. Normally grow one to two feet tall and have gleaming dark green lance like leaves six to nine inches long and two to three inches wide. There are variegated species with different markings usually white or silver.

They do well in the shadowless light of a north window – 150 footcandles. Grow well in average home conditions. Keep the soil barely moist at all times.

Lawn Plant Foods

GEORGE BONNEFOY

Would you like to grow the best looking lawn on your street? If yes, then the most important thing to do is to feed your lawn properly.

In this article I will not discuss the other important practices such as preparing a good seed bed, selecting a good variety of Bluegrass seed, using good weed control practices, and watering and mowing the grass properly.

This article will deal with the fertility requirements of your lawn. Let us start by discussing what is meant by the fertilizer analysis. Fertilizer manufacturers are required by law to list the percentages of nitrogen (N), phosphoric acid (P_2O_5) and potash (K_2O) on the container in which the fertilizer is sold. These figures such as 11-48-0 indicate that the fertilizer contains 11 percent nitrogen, 48 percent phosphate and no potash. Similarly, 10-30-10 indicates 10 percent nitrogen, 30 percent phosphate and 10 percent potash. These figures do not add to 100 percent because the nitrogen, phosphate and potash are combined with other elements not included in the analysis. The pounds of nitrogen, phosphate and potash that a fertilizer will supply to the lawn can be calculated from the fertilizer analysis. Example: If 11-48-0 fertilizer is applied to the lawn at the rate of 10 pounds per 1000 square feet the amount of:

Nitrogen (N) applied is 11/100 x 10 lbs = 1.1 lbs of actual nitrogen.

Phosphate (P_2O_5) applied is 48/100 x 10 = 4.8 lbs of actual phosphate.

Potassium (K_2O) applied is 0/100 x 10 = 0 lbs of potash.

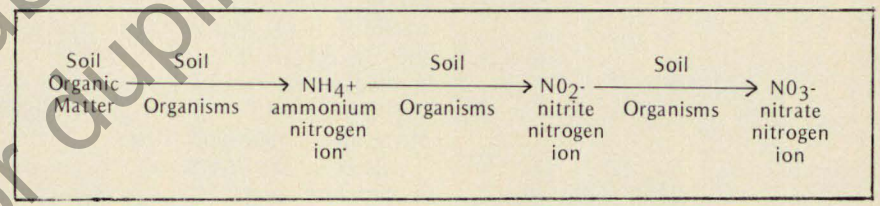
Is there any difference in fertilizers besides their analysis? There are basically two kinds of fertilizers, a) organic and b) in-organic. The difference between the two kinds is in the time required to release the nutrients, although the nutrients released from both sources are exactly the same. Organic fertilizers contain organic materials such as manures, composts, wood shavings and sawdust, grass clippings or leaf molds and peat moss. The nutrients become released when the organic materials are decomposed by the soil organisms and the nutrients are made available to the plants in the forms of ions. Inorganic fertilizers are usually higher in analysis and are more readily available because the nutrients are water soluble and ionize immediately to become available to the plant.

Let's discuss the fertility requirements of a lawn. Here we will start after the topsoil has been added, as is the case for establishing a new lawn. Before the roto-tiller is used to mix in the topsoil, one application of phosphate fertilizer should be broadcast over the surface at the rate of five pounds actual phosphorus per 1000 square feet. Example using 11-48-0:

5 lbs x 100/48 = 10 lbs fertilizer per 1000 square feet. The topsoil should then be roto-tilled to incorporate the fertilizer into the upper four or five inches. Since phosphorus develops a good rooting system, it is very important that the fertilizer be placed close to the rooting system of the plant. A good, strong and vigorous rooting system is essential for a strong healthy lawn. On established lawns an annual application of phosphorus should be applied broadcast at the rate of two pounds actual per 1000 square feet.

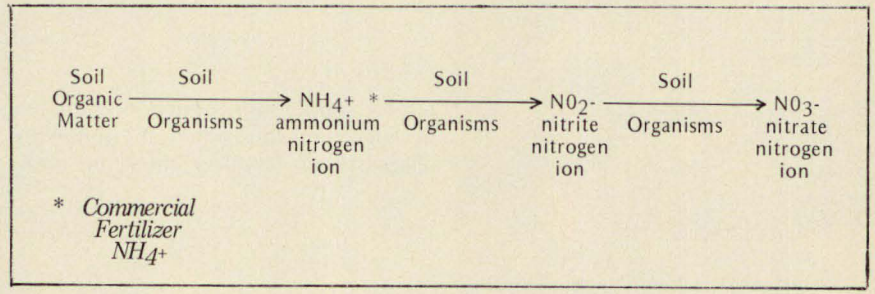
For an established lawn, the nutrient necessary to give your lawn a beautiful lush green color, fast regrowth and thick stooling is nitrogen. Nitrogen starvation is the prime cause of weak, thin, weed infested lawns. Grasses are very heavy feeders of nitrogen and this nutrient must be available regularly. Nitrogen fertilizers are necessary to supplement what the soil cannot supply in adequate amounts. In nature the organic matter* in the soil supplies the nutrients necessary for plant growth. The soil organisms break down the organic matter into a form the plants can utilize – the nitrate nitrogen ion.

Illustration:



The above reaction takes place in the soil as a natural process.

By adding a commercial fertilizer we are adding a source of ammonium nitrogen ion NH_4 + or as in the case of ammonium nitrate fertilizer, a source of both the ammonium ion (NH_4 +) and the nitrate nitrogen ion NO_3 -.



* Organic matter is the humus in the soil supplied by decayed animal and plant residues.

The ammonium ion supplied by the fertilizer is exactly the same as the ammonium ion supplied from the soil organic matter. The ammonium ion is then converted by soil micro-organisms to the nitrite ion and finally to the nitrate ion used by the plants. Soil organic matter releases the nitrogen too slowly for a luxurious and healthy lawn. It is necessary therefore, to add a regular source of chemical fertilizer to supply the nitrogen requirements of the grass. A good lawn will produce 15 to 20 tons of 20 percent dry matter per acre. In order to produce such a crop up to six pounds of actual nitrate nitrogen per 1000 square feet is required. This nitrogen fertilizer should be applied four times during the summer, around the following dates: May 1, June 7, July 14 and August 21.

The six pounds actual nitrogen would be divided into four applications of 1½ pounds each per 1000 square feet. Example: If a fertilizer such as 34-0-0 is used, it should be applied at the rate of 1.5 x 100/34 = 4.5 lbs of fertilizer material on each of the above mentioned dates.

Nitrogen fertilizers should not be applied late in the fall as it keeps the lawn growing lush and green which could aggravate a snow mold fungus problem. Nitrogen fertilizers must be applied when the grass is dry and watered after application to dilute and soak the nitrogen down to the roots. Uniform application is important for two reasons, 1) to obtain a uniform lawn and 2) to prevent spot burnings from spills. A broadcast cyclone spreader is the fastest and most accurate means of application. A soil test will provide a measure of the major soil nutrients, namely nitrogen, phosphorus, potassium and sulfur at the time of sampling. However, the nitrate nitrogen levels vary from month to month and season to season. Therefore, soil testing becomes tedious and expensive to determine the fertilizer needs of your lawn but it can be very useful to monitor the level in the soil so that an excessive level does not build up in the soil. Excessive applications could leach into the subsoil and add nitrates to the ground water and streams.

Sands and sandy loam soils are frequently low in available potassium. A soil test is recommended to determine the extent of the deficiency and to apply the exact amounts of potash fertilizers to correct the deficiency.

Remember, when you are buying fertilizers you are buying plant food. The important thing to consider in selecting a fertilizer is the price per pound of actual nutrients that you wish to purchase, i.e. a nitrogen fertilizer containing 30 percent nitrogen should be worth twice as much as a fertilizer containing 15 percent nitrogen.

In conclusion, the most important practice necessary to obtain a good lawn is a good fertility program.

Now, if you follow this advice you will no doubt have the best looking lawn in the neighbourhood (unless you live on my street)!

TABLE I

To supply one pound of phosphate (P_2O_5) per 1000 square feet, the following amounts of fertilizer must be used.

(In addition to supplying one pound of P_2O_5, these amounts of fertilizer also supply a corresponding amount of nitrogen.)

Fertilizer

Fertilizer Analysis	Lbs Fertilizer	Lbs N
11-48-0	2.08	.22
11-55-0	1.81	.19
16-20-0	5.00	.80
23-23-0	4.34	1.00
27-14-0	7.14	1.93
10-30-10*	3.33	.33
14-14-7 *	7.14	1.00
13-13-13*	7.69	1.00
8-16-8 *	6.25	.50
6- 9-6 *	11.10	.67
4-12-8 *	8.33	.33
12- 5-7 *	20.00	2.40
10-52-17*	1.92	.19
5- 2-2 *	50.00	2.50
20-10-5 *	10.00	2.00
19-28-14*	3.57	.68
13-17-11*	5.88	.76
2-18-0 *	5.56	1.11
2- 1-2 *	100.00	2.00
9- 7-4 *	14.29	1.29
15-30-15*	3.33	.50
1- 1-1 *	100.00	1.00
10- 6-4 *	16.67	1.67
8-12-4 *	8.33	.73

* These fertilizers supply potash (K_2O) in addition to the nitrogen (N) and the phosphate (P_2O_5). Where high rates of potash are required, 0-0-60 or 0-0-50 may be used.

TABLE II

To supply one pound of nitrogen (N) per 1000 square feet, the following amounts of fertilizer must be used.

Fertilizer Analysis	Lbs Fertilizer
46-0-0	2.17
34-0-0	2.94
21-0-0	4.76
38-0-0	2.63

House Plant Tips. Too little humidity in your home will show up in your plants by leaf edges turning brown and eventually drying and falling off. It is one of our greatest house plant problems, particularly during our cold winter months.

The humidity in commercial greenhouses is kept up to a level of 70% or higher by wetting down the walkways and the plants with a hose or sprinkler system. Have you a humidity thermometer in your home so that you can keep check on the humidity level? I suggest that during the cold winter months the humidity in your home may well be no higher than 20%, unless you have a room-type humidifier or one installed in your heating system. With a humidifier your home should be up to at least 35% – and both you and your plants will be healthier.

You can also raise the humidity immediately around your plants by placing the pots on a bed of pebbles or keeping some other material moist, like perlite, in a holding tray. With a large plant I suggest that you place it in a larger container with moist peat between the pot and the other container. The reason is simple. The constant evaporation of the water can raise the humidity of the air around the plants by as much as three times or more than that of the rest of the room.

Hedges as Sound Barriers

E. V. PARUPS and
JUDITH M. HORTON

It is generally assumed that trees and hedges **per se** are effective in reducing noise. This view has been promoted in popular articles, i.e. the statement that: "at 100 feet, the sound of an outboard motor can be cut in half by an eight-foot coniferous planting" (1, 5). The few scientific publications dealing with sound attenuation by trees and shrubs are less positive. Thus, Beranek (2) states that the use of trees and hedges to control noise seldom turns out to be practicable because not only plantings of great density are required, with branches reaching to the ground, but also an appreciable height is necessary in order to avoid sound movement over, rather than through the barrier. Similarly, Lawrence (4) notes that trees and shrubs are not very effective in reducing noise. He states that in dense forest an overall reduction of noise, in the neighborhood of 7 dB/30 meters, was noted. However, it was also noted that within the first 30 m from the sound source there was some **sound amplification** at about 1000 H_z. A conclusion was drawn that a single line of shrubs or trees would have a very small sound attentuation effect. Noise attentuation in forests has been measured also by Embleton (3) and Wiener and Keast (6). The purpose of this work was to investigate the effectiveness of several well established and commonly grown hedges as reducers of sound emanating from a common source, i.e. lawn mower.

Sound results from vibrations at a source creating variations in air pressure transmitted through the atmosphere to the ear. The normal human ear can detect these vibrations occurring at frequencies between 25 and 15,000 cycles per second (cps). The commonly used unit of measure of the intensity of sound is the decibel (dB), where dB 0 is on the threshold of hearing by the most sensitive of human ears and a sound level of 140 dB is intensely painful. To measure the sound intensity a H.H. Scott Sound Level Meter, model -40-B was used. This instrument registers the sound pressure levels in dB's above 0.0002 dynes/cm^2 RMS (root-mean-square) pressure. The meter was set at ASA standard frequency response curve C, flat response from 60 to 8000 cps.

The source of sound in this experiment was a 2-stroke 21-inch rotary lawn mower with a constant speed of 3200 revolutions per minute (rpm). The atmospheric conditions at the time of testing under a cloudy sky were: temperature 25°C, relative humidity 58%, wind 5 mph from W, barometric pressure 1003.0 millibars at an altitude of 79 meters above sea level.

The hedges, located on the campus of the Central Experimental Farm, Ottawa, has been planted in NS direction. Only those without gaps and with branches reaching the ground were chosen to be tested, they were clipped, healthy, disease and insect-free. The sound level meter was placed at a distance of 1.0 meter above the ground level (turf cut at approx. 5 cm height), and 6.0 meters from the source of sound on the W side of the hedge (with the hedge to be tested in between the meter and source of sound). The sound source (lawn mower) was at ground level.

The hedges (Table 1) were rather ineffective as sound barriers and reduced sound by not more than 2dB's at the best. There were no differences between evergreen and deciduous plants. It appears that most of the reduction in noise level, little as it was, occurs if and when the hedges are tall and thick, i.e. *Syringa josikaea, S. villosa,* or *S. amurensis japonica.* In these cases the sound waves may be not only absorbed by the hedges, but also deflected over and away from the sound meter. The relatively small number of hedges tested and small differences (in dB) obtained does not permit a calculation of a correlation between the thickness, height or kind of hedge and the noise attenuation. This is not surprising since in dense evergreen forests of eastern Maine (3) the attenuation of sound was also very small at only 3dB per 30 meters. This work supports the views expressed by previous investigators (2, 3, 4, 6) that hedges are rather ineffective as sound barriers.

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TO FRUIT OR NOT TO FRUIT

No fruit on apricots? Apricots bloom very early. One of the causes of low or no fruit set may be spring frost. Another cause could be the lack of pollination. Apricots are pollinated by bees and other insects. Apricot trees need a different variety for cross pollination. A branch of a seedling apricot in full bloom placed in a jar of water beside your apricot tree while it is in bloom may help to give you a good crop.

IT'S VALUES AND LIMITS

Grafting and Budding

JOHN WALKER

The new fruit varieties arise either from seeds, as new seedlings, or as mutations sometimes called bud sports. The former are the product of sexual reproduction and formation of seeds, while the latter result from a change occurring in the normal body or plant cells. This change may be in outline or color of foliage, fruit or stem.

Two methods by which new varieties are produced from seeds are recognized: 1) by open or chance pollination where maternal parent only is known, and 2) by controlled or selective pollination where both paternal and maternal parents are known.

Bud sports or changes in body cells occur in nature, but through treatment of plants with X-Ray, colchicine, etc., the process can be accelerated.

Once new varieties have been thoroughly tested, plans are made to increase and make available to the public those considered superior in some respect to varieties usually recommended. Pieces of branches or stems from the new selection must be used for its increase, a process known as vegetative or asexual reproduction.

It is here that the practices of Grafting and Budding enter into the picture, the topic slated for discussion at this time.

To better understand the procedures of grafting and budding brief definitions or descriptions of various terms used are given, not necessarily to be considered in order of importance.

PROPAGATION TERMINOLOGY:

SCION GRAFTING, which involves the use of short stem, known as a scion (cion), may be analysed on basis of position and/or type of cut:

1. ON ROOT (or root piece): spoken of as bench grafting; material must be available in winter – pack in peat-moss, wrap in polyethylene and store in cool place.

2. ON CROWN near ground level; intermediate stock (stem piece) or new variety may be inserted.

3. ON BRANCHES by top working in which severe cutting back is practised, or by frame working in which grafting is carried out at end of branches; early bearing may be expected from the latter.

When the wood (cambium and xylem) is involved the type of grafting used may be CLEFT, WHIP and TONGUE, SIDE or STUB.

When the bark (cambium and phloem) is involved a single bud will be used – spoken of as BUD GRAFTING or BUDDING. In Shield or "T" budding bark must "slip" readily, but in Jones or Chip budding this is not necessary. Patch budding is employed for nut trees.

BUD STICK – shoot of current season's growth containing well-matured buds.

CALLUS – parenchyma or thin-walled cells which develop on both stock and scion (formation of new wood tissue is more desirable).

COMPATIBILITY – ability to unite or affinity between stock and scion. A strong (long-lasting) and healthy union forms provided other conditions and techniques are favorable; tissues are similar in make-up, behaviour and rate of growth; usually exists between varieties of same species.

SCION (cion) – mature stem of one-year wood (best), and constitutes the portion of a grafted plant ABOVE the graft union.

STOCK (understock, root stock) – whole root (or piece) in bench grafting and root and stem (s) or branch (es) in top or frame-working. Its age may vary but it constitutes the portion of a grafted plant BELOW the graft union.

REASONS FOR GRAFTING

Grafting (budding) is the art of joining parts of plants together in such a manner that they will unite and continue to grow as one plant. There must be compatibility between them for the union to take place; generally closely-related botanically.

Grafting is a means of increase that does not involve the use of seeds. Identity and valuable characteristics of a variety would be lost if increase is attempted by the use of seeds.

Other important values of grafting are:

1. It constitutes a rapid means of increasing plants of a particular variety.

2. By topworking (topgrafting), a poor qaulity tree may be made to produce good quality fruit.

3. Grafted trees may be expected to bear fruit early as compared with fruit bearing by a seedling.

4. It provides a means of hastening the fruit bearing of a seedling, (graft branch on to a mature tree).

5. Growth habit of a variety (vigor, height, spread) may be changed by the influence of root-stock, (clonal).

6. Pollination deficiencies may be overcome by grafting on the tree a few branches of a suitable and efficient variety.

7. Damage by machinery, rabbits, etc., to tree trunk may be repaired by bridge-grafting, (in April or May - if half bark area destroyed).

8. As an item of interest, many varieties of fruit may be produced on a single tree.

For experimental studies clonal (vegetative) rootstocks are desirable. Under field conditions this is particularly important otherwise variability due to soil variability is coupled with, and augmented by, variability introduced by seedling (rootstock) variability. To overcome some of the variability just mentioned an intermediate stock may be introduced.

DETAILS ESSENTIAL TO SUCCESS

From reading and experience you are no doubt aware that grafting is practised with *dicotyledonous* plants. For a graft or union to be successful a wide surface of the actively-dividing cells of the CAMBIUM layer of both stock and scion must be in close contact. The length of cambial surface

is governed by care in preparing stock and scion for grafting. If stock and scion are unequal in size (diameter), which they may be in Whip and Tongue grafting, the cambium layers on one side only should be matched.

Grafting should be scheduled so that temperature and other conditions are favorable for cell division and formation of callus tissue (45 degrees F. to 90 degrees F). Callus formation alone is not enough to make a good union. Cells become interlocked to give a continuous cambium ring; tissues do not mix. Water and plant nutrients are transported from stock to scion when union is complete.

Scions to be used for spring grafting, and bench grafting in winter, must be collected in the fall after there has been some cold weather. At that time the normal rest period will be broken but the likelihood of injury from cold or loss of moisture will be negligible. Scions should be stored during winter near the freezing point and preferably kept wrapped in polyethylene. Scions must be kept dormant until grafting has been completed.

A terminal bud is necessary on scion to insure new growth of the scion. Stocks must be in active growth for grafting and budding – exception bench grafting. For budding the bark of stock plants must "slip" easily. In the nursery row stock plants may need watering to insure satisfactory results, and the conditioning of seedling stock plants by hilling stems with soil is an essential preparatory step (soften bark tissue).

Various materials are available for securing grafts and buds; narrow rubber bands can be used to hold grafts and buds in place. Ties should be waxed except in budding. This step provides added insurance that graft unions may be successful by preventing stock and scion from dying out and by excluding diseases while the union is forming. With most plants, thorough waxing of the graft union, and thereby retaining the natural moisture of the tissues, is all that is required to provide the necessary humidity level or moisture content.

When using root pieces in bench grafting their polarity, or alignment as to upper or lower end, must be noted. Successful grafts may be obtained if the root piece is reversed, but the flow of nutrients to root from scion will be restricted and eventual death of the root piece will result.

Time required for unions to take place will vary according to species and other factors. For example, in the budding of roses on multiflora stock two weeks may be sufficient, but material must be carefully and properly prepared and other factors favorable.

The selection and use of the most suitable stock is very important. This is necessary for the continuing health and growth of scion. Effects operate both ways but the influence of stock on scion is most evident – we can only guess at the condition of the rootstock.

MAGGOTS IN CURRANTS

Tired of having tiny white maggots of the currant fruit fly inside your currants and gooseberries? Discolored blotches on the side of the fruit and prematurely ripened berries that fall to the ground announce their presence. You can prevent this by spraying with four teaspoons of Diazinon 12-1/2% E.C. per gallon of water when 80% of the fruit has set. After fruit is set, use Derris (Rotenonc) as a dust or spray.

The Tree Surgeon

A. BUCHWALD

The age of specialization has touched every part of our society. Recently I had tree trouble, a beautiful large oak was dying, and I immediately called a tree surgeon.

At first he didn't want to come. "I'm sorry, I don't make house calls," he explained.

"Then I'll cut down the tree and bring it into your office," I cried hysterically.

"Don't panic, I'll come over."

Three days later he arrived. He walked over to the oak and shook his head. He touched the trunk once, looked up at the branches and said:

"You have a very sick tree here."

"I know it. What can you do to save it?"

"I don't like the look of those lower limbs."

"Neither do I," I said. "What can you do about the limbs?"

"I'm not a limb man," the tree surgeon explained. "I only do general trunk work."

"Do you know of a good limb man?"

"I know of one and I only hope for your sake he's available. That will be $25, please."

A few days later the limb man came. He was all business.

"You've got two broken limbs and a wound on your main branch. Also, I dont like those stub lesions which are bleeding sap."

"Do whatever has to be done," I said.

"I can't touch the limbs until we heal the lesions."

"Then heal them."

"I'm not a stub lesion expert. I'll give you the name of one. When he gets finished, I'll come back and work on the limbs. That will be $50, please."

The stub lesion surgeon arrived and worked for 20 minutes. Then he said, "Your tree is suffering from malnutrition. It has to be fed."

"Feed it," I begged, "and don't worry about the cost."

"I don't feed trees," he said indignantly. "You need a root man for that."

"You don't know of a root man, do you?" I asked.

"There's one out in Chevy Chase. I'll see if I can get him to come. That will be $75."

A week later the root man arrived with his drill and started operating on the oak. He poured nourishment into the ground near the roots.

"Will it be all right?" I asked him.

"The well you have around the tree is much too small. You're strangling it. I can give it all the food in the world and it won't do any good if the tree can't get any air or water."

"Then why did you feed it?" I asked.

"You told me to," he replied.

"I don't suppose you have anything to do with tree wells?" I asked.

"I should hope not. You have to get a stonemason to do your work. No tree surgeon will touch a well."

"That's what I thought."

I finally found a stonemason who agreed to build a well around the tree for $400. It took him two days to do it and when he finally finished he said, "You know, mister, you got a real sick tree there."

"I know it," I said.

"It's none of my business, but if I was you I'd get myself a good tree surgeon."

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TIRED GOOSEBERRIES

Are your gooseberry bushes getting tired? Is the yield down and are the berries smaller? Prune out most of the wood that is older than three years. Leave about three stems of three year old, three or four stems of two year old and four stems of one year old wood per bush. Do the pruning before leafing out in spring. Apply about six inches of good old barnyard manure around the bush. This should rejuvenate your tired gooseberry bush.

PROGRESS WITH STEMBUILDERS

Growing apples on stembuilders was a success at the Morden Research Station. The Manitoba Department of Agriculture has several co-operators who are using this technique. The indications point to success. If you wish to know more about stembuilders, read Mr. Herman Temmerman's article on this subject in the 1969 Prairie Garden.

Insect Control on Trees and Shrubs

ANDY KOLACH

Presence of insects on trees is usually detected by defoliation, skeletonizing or curling of leaves, or lack of vigor. Insects such as the forest tent-caterpillar and fall cankerworm defoliate trees by eating the entire foliage. Pear slugs and leaf miners will cause a skeletonizing effect on leaves. Aphids will cause leaves to curl and usually can only be detected by unravelling the leaves. Leaf miners, as the name suggests, create a mined-out effect on the leaves. It is at the first sign of any of these symptoms that insects are suspected, and should be identified promptly and control measures employed.

The aforementioned insects are not the only pests of trees by far but perhaps, especially in the past few years, have been of greatest concern to back yard gardeners on the prairies because of high populations of the respective species and the amount of damage caused. Each species has its own peculiar behaviour and life history and this knowledge can be used to control effectively the pest before serious tree damage occurs.

The forest tent caterpillar is a bluish-black hairy caterpillar which feeds on poplar, apple and other deciduous trees. The tiny caterpillars emerge out of egg bands laid the previous summer on terminal branches. The egg bands remain on the tree over winter carrying the tiny caterpillars. After developing into mature caterpillars, usually by the end of June, a transformation into the cocoon stage occurs. The adult moth emerges usually in July, and during outbreak years can be seen in huge numbers. The moths mate and lay their eggs during mid summer.

Slide 1

Removal of the egg bands from trees in the fall, preferably after leaves have dropped and when they are more easily seen, will prevent the infestation the following spring. This would be more practical on smaller trees. An infestation of forest tent-caterpillars in the spring can be controlled by spraying either malathion, methoxychlor, or diazinon at label rates. To protect beneficial pollinators, fruit trees should be sprayed prior to blossom.

The fall cankerworm is a green to brown colored smooth caterpillar having a distinct looping manner of crawling. It also characteristically drops on a silken thread when disturbed. The tiny cankerworms emerge from egg masses laid on trees the previous fall. The cankerworms feed on most deciduous trees and, when mature, drop to the soil to pupate. The adult moths emerge from the soil in the fall, usually after the first frost, and continue laying eggs until wintery weather arrives.

(1) Egg bands of forest tent-caterpillar.

Egg laying of the fall cankerworm can be prevented by banding trees with sticky compounds just prior to emergence of the moths in the fall. One such compound commonly available is called tree tanglefoot. The banding is most suitable for large specimen trees, and is effective when properly applied and maintained because the adult female cankerworm moths are wingless and must crawl up tree trunks, where they are trapped by the band applied there.

Slide 2

Where banding is not employed and an infestation develops in the spring, trees can be sprayed with sevin, malathion or methoxychlor at label rates, preferably before any serious leaf damage occurs. Directions for using these insecticides are always explicitly given on container labels.

Pear slugs are dark green, slug-like, slime covered larvae of sawflies which feed mainly on leaves of cotoneaster, plum and cherry. The larvae remain overwinter in cocoons and transform into pupae in the spring. The adult sawflies emerge to lay their eggs on leaves of trees and shrubs. The larvae hatch, feed until mature, and drop to the soil to transform into a cocoon for the winter.

Slide 3

Control of pear slugs should be employed as soon as an infestation is detected, usually when a slight browning of the leaves is noticed. Malathion at label rates is effective and should be applied in sufficient water for good foliar coverage.

(2) Defoliation caused by fall canker-worm.

(3) Pear slug on cotoneaster.

There are many types of leaf miner insects on different kinds of trees. The larvae stage of leaf miners feeds within the outer and inner surfaces of leaves, and each one causes a characteristic type of mine in the leaf. There are leaf mining moths, flies, wasps and beetles with many species of each, but a leaf miner insect can generally be detected by the characteristic mining out of the leaf tissue.

One of the best insecticides to use for leaf miners is dimethoate (Cygon or Rogor) which is a systemic insecticide. Dimethoate is generally applied as a spray but can also be more easily painted directly from the bottle on to the trunk of some trees. More explicit directions for using dimethoate are on the label.

There are many species of aphids which can be found on trees. Aside from damaging leaves directly, aphids secrete honeydew which can be of considerable nuisance, particularly on cars parked under infested trees. Unique to aphids is the ability to reproduce parthenogenetically, that is, birth to living young. Under favorable hot weather, aphids can multiply extremely quickly to become serious pests in only a few days. Both adult and immature aphids feed by sucking out plant sap from the leaves, causing leaves to curl, discolor and eventually die. Aphids overwinter in the egg stage.

Control of aphids can be achieved with malathion, diazinon or dimethoate applied as foliage sprays. For some trees, dimethoate can be applied as a tree trunk, paint-on band.

There are many more insect pests on trees which, if conditions become right, can become numerous enough to cause damage and justify the effort and expense of chemical control. By watching trees regularly, an insect infestation can usually be detected in time to apply an insecticide to prevent a potential eyesore. There is a good selection of insecticides, and the ones suggested here are only a few of those that are available that can be used.

Roses

G. A. SMITH

Nearly everyone loves roses, their variety, coloring and beauty, are a delight, but many people feel they are too delicate to grow on the prairies. They are not as difficult to grow, however, as most people make out, in fact they are relatively easy to grow if a few basic rules are followed.

First, thoroughly prepare the soil by double digging to 12 or 24 inches, putting the subsoil on top and the good soil in the root zone. The soil should be modified by the use of liberal amounts of farmyard manure or, if it is not available, peat moss at approximately one bushel to 8 or 10 sq. ft. and adding a handful of 11.48.0 or 16.20.0 fertilizer and mixing well will suffice.

Secondly, when buying your rose stocks, only buy first class material and don't wait for sales – you get what you pay for. Check and keep the roots moist, for if they dry you have lost the plant.

When planting, dig a hole twice as large as the root system and sprinkle a handful of 11.48.0 fertilizer in the hole and incorporate it into the lower spit, if it is properly incorporated it will not burn the fibrous roots. Make a cone of soil in the bottom of the hole, and place the plant on top of it and arrange the roots carefully, adjust the cone so that the graft union is about three inches below ground level – for added insurance against the prairie winters. Prune all weak canes out, and head back all the other canes to three or four buds, making cuts at a 45° angle above an outward pointing bud. Put more soil over the roots and jiggle the plant gently to allow the soil particles to infiltrate the root system, firm and add more soil, leaving a slight depression for holding water. Soak thoroughly, and after the water has receded, hill up the soil around the plant. This protects the canes from late frosts and drying winds.

Now, sit back and wait for the leaves to unfold, then start spraying or dusting every ten days with the recommended chemicals, which are usually available from garden centers, hardware stores, and possibly drug stores.

With the development of the green buds you begin to anticipate the glorious colors of the high centered and perfumed blooms. Was it worth it? Of course, and already you are beginning to plan an increase in your rose garden for next year.

During the hot weather in July, roses benefit from a mulch. First, clean up the weeds and loosen the soil around the bushes, then soak the area thoroughly. Some 27.14.0 fertilizer can be added, using a handful between two or three plants. Cover the ground with a 2-inch layer of old manure, peat moss or grass clippings, these can later be dug into the build up of the soil.

Many ways have been tried to keep the more tender roses over winter. Straw, peat moss, soil, leaves and sawdust have been used to cover the plants but none appear to have given 100 percent success. Discuss protection with your Rose Society, neighbours, and try your own ideas. If you are successful, let us and other rose growers know about it.

Do not forget to use mouse bait if needed.

VARIETIES

Some varieties do better in some areas than in others, but given correct treatment most of them will give good results.

Some **Shrub Roses** for the prairies (these do not require winter protection and the newer varieties have a much longer blooming period).

Cuthbert Grant	– Dark Red
Theresa Bugnet	– Pink
Isabella Skinner	– Pink
Louis Bugnet	– White
Prairie Dawn	– Deep Salmon
Martin Frobesher	– Pink

Hybrid Perpetuals are also worthy of trial, and they require the same sort of winter protection as the Hybrid Teas.

Mrs. John Laing
George Arends
F.K. Druski
Queen of the Violets

Polyantha	– Orange Triumph
Hybrid Teas	– Peace, Queen Elizabeth, J. S. Armstrong, and others you may wish to try.
Half Hardy	– Dornroeschen
Shrub Roses	– and Seafoam.

PRUNING

Shrub Roses – These only require the removal of dead or diseased canes in the spring for the first two or three years. As the shrub gets older, however, remove the older briars to encourage the development of new wood. Keep the center open, whenever possible cutting out the old briars to ground level, and clean out old leaves and other debris.

Hybrid Teas and Hybrid Perpetuals – If mother nature has not already pruned them to ground level, clean out the center and prune back the weak growing plants to three or four buds. Up to 12 inches of cane can be left on the strong growers such as the Peace and the Hybrid Perpetuals.

After all this, only two blooms per plant will be enough to encourage you further.

Happy Rose Growing!

Primulas in Edmonton

PAT SEYMOUR

Primulas on the Prairies? Ridiculous! No, not really; many Primulas have been grown successfully over the past ten years at the Botanic Garden of the University of Alberta, Edmonton. They vary in many respects:

Size: from white to yellow, to orange, pink, red-purple and a near blue.

Situation: from Rock garden to Border to Bog garden.

Flowering: from late April to mid-August – Many are scented. The one factor that would appear to be essential is constant snow cover – at the Botanic Garden all the border and bog Primulas are where they are protected by snow all winter.

PROPAGATION

Sow inside in January - February in 4" pots. Water well, then freeze for a week – either outside or in deep-freeze. Bring in and keep as cool as possible – around 55 - 60°F is best. Germination should begin in 4 - 6 weeks. When large enough to handle put in 3" pots or peat pots. Plant out as soon as danger of frost is over.

DIVISION

Established plants can all be divided immediately after flowering provided that they are kept well watered until new growth has become well established.

ROCK GARDEN TYPES

Sunny, between stones. Best of this group is *Primula auricula.* 6", heads of yellow scented flowers from mid-May to mid-June. Also available in white to purple. Very hardy. *Primula integrifolia* and *Primula glaucescens,* both smaller 4" editions of *Primula auricula* but purple, flowering in May.

BORDER TYPES

Well dug, well manured, lots of peat or leaf mold, but not where roots will be too wet. Some shade advisable. Will do well in shelter of but not under, shrubs.

Primula veris "Cowslip", small yellow scented flowers in clusters on 6" - 9" stems flowering in May-June.

Primula veris hybrids "Polyanthus" shades of white, yellow, pink, red, and a blue-purple – in large clusters on 9" stems. Will even produce a few flowers in the early fall. Divide every 2 years to keep in good health. May-June flowering.

Primula denticulata, one of earliest to bloom. White or purple, round clusters of flowers or stems that eventually reach 1' - 2', strong grower.

BOG TYPES

These love damp rich soil – well dug with lots of peat and some manure. Keep well watered all summer. Will do well on west or northwest aspect with some protection from strong sun.

Height of flower stem depends on amount of watering. Two groups:

(a) *Sikkimensis* – These have scented flowers in terminal clusters on 1-2' stems.

Primula sikkimensis – Pale yellow moisture loving. 12" - 18". June-July. Has red and gold forms.

Primula alpicola – three forms, alba-white, luna-yellow and violacea-purple. 2' stems, larger flowers than *sikkimensis* about 1" across, late June early August.

Primula florindae – the giant among the ones that we grow. Yellow, large clusters of up to 40 flowers on 3' stems in July - early August. Strong grower, also a copper coloured form. Self sown at Botanic Garden. Seed heads and stems useful for dried flower arrangements!

(b) Candelabra group. These have flowers in successive whorls on 2'-3' stems.

Primula bulleyana hybrids – yellow - orange - orange red. One of the best – flowers mid June - early August. 2 - 3'.

Primula cockburniana – bright orange smaller than most. Up to 2'. Flowers June - July. Good in association with *Primula alpicola violacea.* Very late appearing.

Primula Inshriach hybrids – yellow, orange, to pink shades – mid-June early August.

The above is just a selection. We have up to 100 species and varieties at the Botanic Garden. Come and see them! If in Edmonton phone 432-3248 or 432-3484 for time of opening.

Calceolarias

D. R. ROBINSON

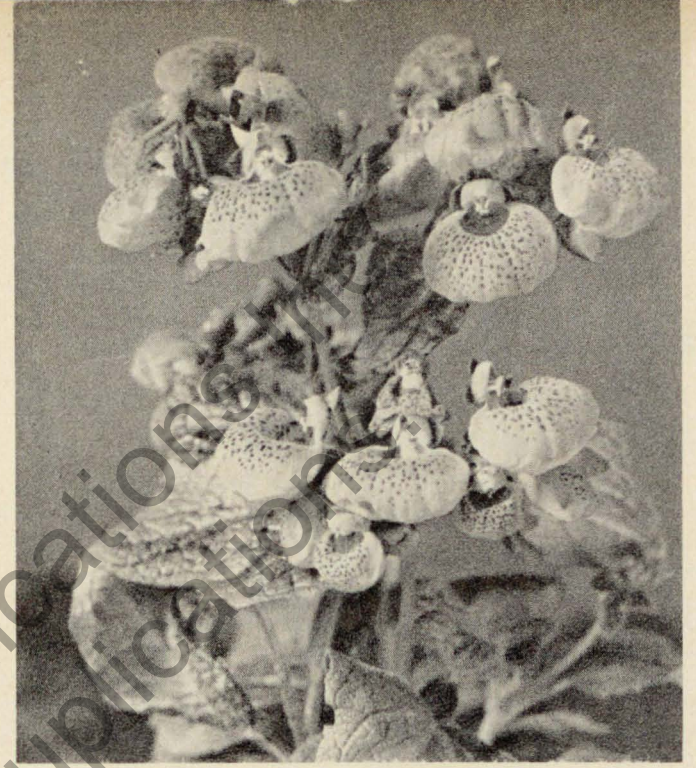
Last year a kind friend gave us a plant of the herbaceous form of calceolaria. A few weeks later it bloomed and, to our delight, it continued to bloom for almost two months. The conditions under which this plant was grown were not ideal, however, it was not exposed to bright sunlight and room temperature was about 70°F. The pouch-shaped flowers of the calceolaria are very dainty – of a yellow color heavily spotted with brown. Several strains are available in the trade and the colors range through yellow, orange and red. This flower is often called the slipper plant; the generic name *"calceolaria"* comes from the latin *"calceolus"* for slipper.

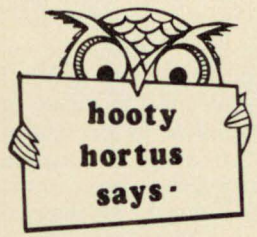
To a large extent the common form of calceolaria is propagated from seed and several hybrid strains are mentioned in the literature. There does seem to be some difference of opinion with respect to nomenclature, however, the herbaceous form is commonly referred to as *C. herbeohybrida.*

We have had reasonable success propagating this house plant from stem cuttings placed in water. Likewise, good results have been obtained with cuttings by using a rooting medium made up of equal parts by volume of peat and sharp sand. Two precautions are necessary, (a) the rooting medium should not be kept soaking wet, and (b) the temperature should be kept between 55 and 60°F if possible. Furthermore, temperatures in this range are most suitable for calceolarias when in bloom. Likewise, an east window or diffused light is much preferred for well grown plants and care must be taken to avoid overwatering.

We have not tried growing calceolarias from seed at home. However, this method of propagation is most commonly recommended. The seed is very small and care must be taken as regards seeding and watering. A soil mixture of approximately equal parts by volume of sand, peat and loam soil is generally used. The mixture should be sterilized, then, after placing in the flat or other container, the soil mixture is firmed and levelled. The seeds are sown on the surface and not covered with any additional soil. A cool location, 55 to 60°F, is important for seed germination. Good air circulation, keeping the soil surface on the dry side and the careful use of fungicides should avoid trouble from damping off. When the seedlings are large enough to handle they should be transplanted to individual containers. Here, the potting mixture will contain more soil in relation to the sand. A moderately low temperature, as indicated above, is important and care must be taken not to overwater.

In our opinion this fine house plant has been underrated. With newer facilities (fluorescent lights, fungicides for disease control, etc.) the calceolaria could be grown more commonly than it is today.





Three Easy to Grow Dark Corner House Plants that will do well under conditions where most other plants would perish:

Snake Plant – (Sanseviera). Survives dim light and little moisture. Leaves are snake-like, usually horizontally zigzagged with grayish white or pale green stripes.

Cast Iron Plant – (Aspidistra). It will grow to about three feet tall bearing handsome arching leaves 15 to 30 inches long and three to four inches wide. Will stand low light, heat, cold and drafts.

Japenese aucuba – (Aucuba). Will reach a height of three feet or more with four to six inch glistening green oval leaves. Some varieties have yellow varie-gations. Will tolerate low light, cold and drafts.

What to do with Flowers

MAUREEN SCHWANKE

I grew up in cities. It was only after reaching maturity, more or less, that I deserted the concrete and moved to the country. Now if there's one thing that's noticeable in the country it's that there are a lot of things growing. Even my urban mind took in the fact that greenery was abundant. I immediately identified trees and grass but it did not occur to me that there might be other things as well.

And then I went on a trip to Churchill, Manitoba last year. I went for a walk outside of town to look around. Through a break in the clouds of mosquitoes I could see that there were no trees and no grass. Then what was on the ground? A closer look showed me moss and lichens, but besides these were bright colours scattered everywhere: flowers, I finally discovered. I squished over the moss and lichens and found white flowers and yellow flowers, purple, violet and pink flowers. All very small and close to the ground, but all exquisite.

The only place I had noticed flowers before was in people's houses, in little pots. When I got back home from Churchill, I went for a walk in the woods. Now I am very fond of trees and grass, but this time I ignored these prolific plants and looked carefully at the ground. Eventually I saw a very small purplish sort of flower. I stopped and studied it. It had a vague resemblance to the African violets I had seen, so I thought it must be a wild violet. I was so thrilled by my discovery I thought I ought to do something about it. Pick the flower maybe? Or put it in a little pot and take it in the house?

As I gazed appreciatively at the delicate colour it finally occurred to me that it was not necessary to do anything at all. I would leave it where it was and I could come back and it would be there. My untutored mind grasped the fact that it was growing in that particular spot because the conditions were right for it and I also noticed that it was more beautiful there in the woods than it would be on a windowsill.

Admiration led to curiosity and a desire to learn more. I bought a book, "Wild Plants of the Canadian Prairies," by Archibald C. Budd and Keith F. Best. The authors are Canadians and the book is published by the Queen's Printer. There are about 1200 species of plants described in the book, among them 14 kinds of violets. Of these, six are described as being various shades of purple. Since it was impossible to identify it by the colour alone, I visited the mysterious violet again and this time I took a sketch book. I carefully drew the whole plant, stems, leaves, shape of petals, and then consulted my book again. From my unscientific research, I find that the delicate plant is rather inelegantly named the hairy blue violet.

Thereafter I began to notice wildflowers practically everywhere. Wild roses and bellflowers in the woods, daisy fleabanes on the creekbank, wild morning-glories in the marsh, masses of fireweed in a ditch. Each find is a rediscovery of pure beauty.

The marvellous thing to me is that they grow all by themselves. No labour is required on my part, no digging, planting, weeding. I don't have to worry about watering them too much or too little, or feeding them, or whether to put them in a south window or a north window. All I have to do is go outside and look for them.

I had thought that I would like to photograph flowers. However, an ordinary camera was not too satisfactory as I couldn't get very close to the plant. Then I was introduced to a camera with a macro lens, which allows shots as close up as you can get. With this fascinating lens you can have a picture of a pistil if you want.

One of my first attempts with the macro lens was of a flower that I thought was a bluebell. I sketched it as well, because, besides the fact that I enjoy making little drawings, in the process of drawing a plant I observe the shapes and details of petals, stems and leaves much more accurately than I would otherwise. Beside the sketch I write where I found the flower and when. So, armed with my photograph and sketch and little notes, I later identified the alleged bluebell as a harebell.

Last summer's discoveries have given me a mere glimpse into what was formerly an indistinguishable mass of verdure. In the spring the first of hundreds of flowers will start to grow, quietly, in their own time, in secret dark places, in sunny open spaces. The thought that they will be there for me to sketch and photograph and learn about, is a very pleasant one.

Merit Awards

W. A. CUMMING

The Merit Awards, given by the Western Canadian Society for Horticulture, are based on the performance of the plants in the merit trial gardens at the Morden Research Station. The first five plants receiving Merit Awards were described briefly in the 1968 edition of the "Prairie Garden". Nine more awards have been given for outstanding ornamental plants since that time.

Plant breeders on the Canadian prairies and adjacent States have sent a total of 173 newly developed plants to the Morden Research Station for inclusion in the merit trials. The fourteen plants which received Merit Awards represent eight percent of the total number of candidate plants submitted. Those receiving Merit Awards must be outstanding ornamentals. WATCH YOUR LOCAL NURSERY CATALOGUES FOR MERIT AWARD WINNERS!

The five described in the previous article were: *Rosa* 'Assiniboine' and *Heuchera* 'Brandon Pink' in 1965; *Juniperus horizontalis* 'Dunvegan Blue' and *Potentilla fruticosa* 'Coronation Triumph' in 1967 and *Malus* 'Royalty' in 1968.

In 1969 two awards were presented to H. F. Harp of the Morden Research Station for his Prairie Dawn rose and Morden Cameo chrysanthemum.

Rosa 'Prairie Dawn' is a hardy, upright growing shrub rose which may eventually reach five to six feet in height. Its glowing pink, 2½ inch double flowers begin in late June and are produced intermittently throughout the summer.

Chrysanthemum 'Morden Cameo' is a fully double, white garden chrysanthemum of very high quality. Its season of bloom is from mid-September until severe frost.

H. H. Marshall of the Morden Research Station, received a Merit Award for his Cuthbert Grant rose in 1970. This double flowered, dark red rose blooms on the current season's growth and produces its clusters of three to six large flowers from early July to freeze-up.

In 1971, A. J. Porter, Honeywood Nursery, Parkside, Saskatchewan, won Merit Awards for two of his lily introductions:

Lilium 'Orange Light' – a vigorous growing, hardy lily to three feet in height, with upward facing, glistening orange flowers.

Lilium 'Redland' has upward facing, glowing deep red flowers on three foot stems.

In 1972, W. L. Kerr of Saskatoon, Saskatchewan, was given a Merit Award for his Goldenlocks elder:

Sambucus racemosa 'Goldenlocks' is a dwarf, golden-leafed form of the European red elder. This golden, cut-leaf elder matures to a compact, rounded bush at about three feet in height.

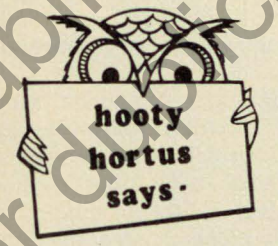
In 1973, W. A. Cumming of the Morden Research Station, received an Award of Merit for Kelsey ornamental crabapple:

Malus adstringens 'Kelsey' – a semi-double flowered rosybloom crabapple. The purplish red flowers are produced annually in profusion.

In 1974, H. H. Marshall and W. A. Cumming of the Morden Research Station, will receive Merit Awards for Neepawa monarda and Miss Canada lilac, respectively:

Monarda 'Neepawa' is a deep pink flowered monarda with broad petals. The numerous flower heads are produced in midsummer on vigorous plants to 30 inches in height.

Syringa 'Miss Canada' the brightest, pink flowered cultivar belonging to the late flowering group of lilacs. Three species are involved in the parentage of this new lilac – the Late lilac, *Syringa villosa;* the Hungarian lilac, *Syringa josikaea* and the Nodding lilac, *Syringa reflexa.*



The Anatomy of Insects as compared with men are: insects have no lungs, but breathe through spiracles; their blood has no red corpuscles and circulates without veins, arteries or capillaries; have widely scattered organs for hearing which are never evident as ears, and, organs of smell and taste which are chemical detectors scattered over body.

Chewing and Chafing Insects have similar teeth-like mouth parts, moving from side to side.

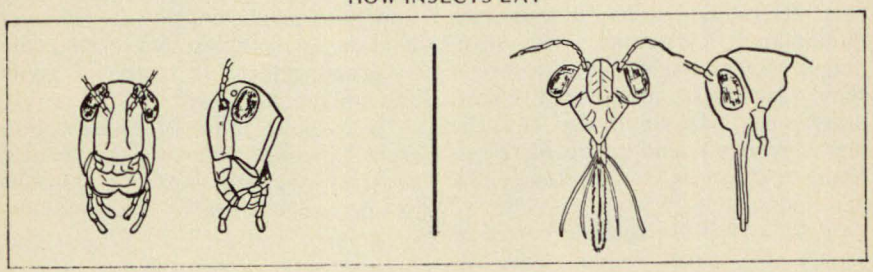
Damage: Chewing Insects – plant tissues eaten, leaving torn and missing sections of plant.

Damage: Chafing Insects – plant surface rasped and chafed leaving scored plant tissue.

Sucking Insects have slender pointed, piercing, sucking beaks.

Damage: Plant surface punctured, plant juices sucked up, leaving spotting, curling of leaves, browning and wilting.

HOW INSECTS EAT



Lime-Induced Chlorosis

L. J. LACROIX & L. M. LENZ

Chlorosis is a general term employed to describe plants whose leaves have a marked deficiency in chlorophyll content (chlorophyll is the green pigment common in most plants). This condition commonly is a symptom of iron deficiency and more specifically is expressed by the loss of green color between the leaf veins. The symptom appears on the newer growth first and under extreme conditions these leaves yellow and die. Trees subject to this condition may show chlorosis on isolated branches due to the differential zones of feeding of the root system. Affected annual plants, in general, will survive but may be severely limited in amount of growth and flowering. Yearly recurrence of the condition with perennials may result eventually in death of the plant.

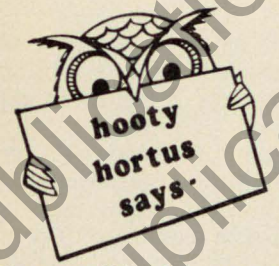
Some crop plants which are seriously affected by chlorosis include strawberries, raspberries, field beans, peas, corn and apples. Some ornamental plants susceptible to chlorosis are: rose, delphinium, spirea, Prunus spp., mountainash, geranium, iris, snapdragon and petunia. Within each species some varieties are more sensitive than others, e.g., Hansen Hedge and Dr. Merkeley roses tend to be more resistant to chlorosis than Persian Yellow and Hansa.

Most soils have sufficient iron to supply the small requirements for normal plant growth but this iron frequently is unavailable to the plant. A combination of high lime and neutral or alkaline soil conditions results in iron unavailability and thus the term lime-induced chlorosis. Soils of this type are widespread throughout the prairies.

Considerable care should be taken in selecting materials known to be resistant to iron deficiency problems, if the soil area to be landscaped is known to be high in lime. In this regard it is strongly recommended that soil analyses be carried out before planting is undertaken.

Although the application of iron chelates such as Versenol and Sequestrene 330 is still recommended as a remedial treatment for trees and shrubs suffering from iron deficiency, research has been directed to methods of selecting resistant clones of various species. As a result of the good will and generosity of Mr. E.R. McDonald of Gunton, Manitoba, the university now has a permanent test site here and considerable progress has been made in selecting resistant clones of apple and amur apple.

We would appreciate notification from anyone observing apparently resistant specimens of trees and shrubs as potential material for our test program.



TRADESCANTIA, commonly called the inch plant or wandering jew. An easy-to-grow vine for home culture usually white or yellow striped leaves and often with edges and undersides a purplish green. Grows well in plain water.

They do best in bright, indirect light – 400 footcandles. They will grow under lesser conditions but in that case the leaves of variegated types will turn almost all green. Average home temperatures are ideal. Let the soil become moderately dry between thorough waterings.

Disease Problems of Trees and Shrubs

R. G. PLATFORD

Home grounds and city streets would be grim places without the green of our enduring trees and shrubs. Although most are hardy and take a minimum of care, trees and shrubs are subject to a number of disorders or plant diseases.

Plant diseases may be caused by living organisms, or they may be due to too much water or too little, it may be the effect of the environment or a nutrient deficiency. Also an increasing problem today in industrial centers is, of course, air pollution.

The following table lists some of the more common diseases, plants affected, symptoms of the disease and control measures.

In treating a plant disease, it is not essential that the disease organism is known, but it is important that the type of disease be recognized. It is no use treating a leaf spot disease in the same manner as a dieback. Help in recognizing the particular disease problem, and information on control, can be obtained from provincial Agricultural Departments, and university Plant Science Departments.

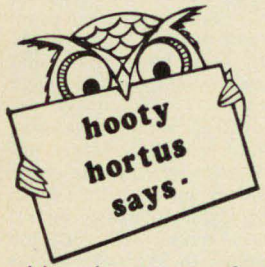
Disease	Trees & Shrubs Affected	Symptom	Control
Leaf Spot anthracnose	Many broad leaf trees & shrubs	Variously shaped spots or blotches on leaves, often tan, brown, reddish-brown, to black, in color. May be bordered by a ring of darker colored tissue. Spots may be coalese to affect large part of leaf surface and cause premature leaf drop.	Apply fungicide such as Captan 50% W.P. at rate of 2 tbsp./gal. water, thoroughly wet leaf surface. Repeat applications throughout growing season. May be necessary, especially during periods of humid weather. Rake up diseased leaves in fall and destroy.
Leaf Rust	Poplars Russian Olive Hawthornes	Orange pustules usually on underside of leaf.	Apply Zineb at 1-1/2 tbsp. per gal. water, thoroughly wet leaf surface or dust on powdered sulphur. Repeat as necessary.

Needle Rust	Spruce	Orange pustules on needles.	Apply Zineb as above
Gall Rust	Jack Pine White Pine Junipers	Swelling or blister-like growths on main stem or branches rust spores often exuded in gelatinous masses	Prune off affected galls if on side branch. If on main stem, prune out diseased tissue, swab area with Javex solution one part Javex to four parts water. Success in treating trees with rust galls on main stem is quite low.
Mildew	Lilac Poplar Willow	White powdery growth, like dust on surface of leaf.	Mildew is most severe in latter part of season, August and September. If damage is enough to warrant control, apply Benlate 50% W.P. at rate of 1 tbsp./gal. of water. Powdered sulphur or Karathane are also effective.
Needle Cast Evergreens	Scotch Pine Mugo Pine Spruce	Browning of needles starting with a yellow banding of needle.	Apply Captan or Maneb.
Canker	Poplar	Swelling on branches and main stem, often leaves wilt and die above the canker.	Prune off cankers on branches. Destroy severely infected trees. Hybrid poplars are very susceptible to cankers.
Dieback	Russian Olive Birch	Death of branches and crown of tree.	Russian Olive, Lombardy Poplar and Weeping Willow are not fully hardy in many areas of the Prairie Provinces. Russian Olive and Poplar are subject to wood rotting fungi which attack at wound points such as cracks at junction of branches and stem. When pruning off dead branches prune flush with main trunk and scrape wound to remove rough edges. This will allow rapid callousing over of wound and thus not allow points of entry for decay causing fungi. Birch trees often dieback due to winter injury. Water trees well in late autumn to reduce winter dessication of branches.
Needle Browning	Junipers Cedars (arbo-vitae), pine spruce	Needles on south west side of tree turn brown over winter.	Injury is caused by dessication of the needles during late winter months. Water is removed from needles by action of sun and drying winds, since ground is frozen, water cannot

			be replaced. Water trees well in late fall so they have a good supply of moisture in the needles. If possible, cover with burlap.
Fireblight	Crabapple Cotoneaster Hawthorne Mountain Ash	Scorching of leaves and young shoots, bark turns black, leaves turn brown and remain attached to branch. Fruit clusters dry up and are discolored.	Prune off infected branches 6 - 10" below last evidence of discolored bark. Sterilize shears between cuts using a solution of 1 part Javex (household bleach) to 4 parts water. If infection was present on tree, the previous year, spray with Agristep at a concentration of 100 ppm as soon as blossoms open. Repeat application during blossoming period after periods of rain.
Chlorosis	Rose Spirea Mountain Ash Crabapples	leaves turn yellow in area between veins, veins remain green.	Apply Iron Chelate (sequestrine)

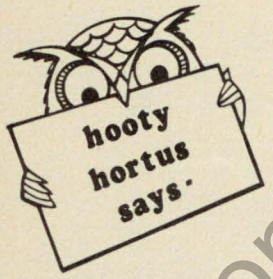
Mention of brand name pesticides does not imply that these are the only ones that can be used. The ones mentioned are those that have been found effective, readily available and safe to use. Other chemicals can be used provided they are recommended for a specific use on the label. Follow all directions as to use and safety precautions outlined on product label. Use chemical control only when situation justifies its use. Good sanitation consisting of destroying infected leaves and branches when noticed will help to reduce the spread of disease. Plant only trees and shrubs recommended for your area and, when possible, obtain them from a local nursery.

Consult 1973 issue of Prairie Garden re: Recommended Fungicides for The Gardener. P. 102 - 103.



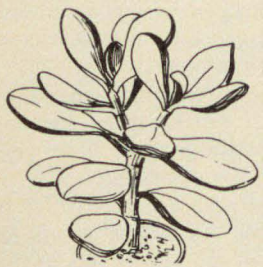
CHAMAEDOREA, also called NEANTHE bella palm, and PHOENIX, the miniature date palm. These two palms grow seldom more than 18 inches to two feet in height. As small plants they are often combined with other types of plants in dish gardens. Both these palms have arching featherlike fronds with the leaflets on the Phoenix being wider spaced than on the Neanthe bella palm.

The Neanthe bella palm requires only medium light such as supplied by a north window – 150 footcandles, while the Phoenix palm does best in bright indirect light – 400 footcandles. Home temperatures are ideal. Keep the soil reasonably moist but not wet, at all times.



TIPS ON ROOTING GERANIUM CUTTINGS.

1. *Take your cuttings from old plants in September – before frost threatens.*
2. *Take cuttings from the ends of branches and new growth formed along the stems.*
3. *Make clean cut just below a leaf joint.*
4. *Each cutting should be no longer than four to six inches and have all but the top three or four leaves removed.*
5. *To encourage rooting moisten the cut ends and dip them lightly into a No. 1 softwood rooting powder.*
6. *Lay cuttings out on a counter or table for four hours or more, to allow the ends to become calloused. This will lessen the tendency of the cut ends to rot rather than to root.*
7. *Use a sterile medium such as vermiculite or perlite. Flower pots may be used. A four inch pot will take three or four cuttings, a six inch pot, five or six. Place the cuttings 1½ to two inches deep in the medium, firm the medium down, and water thoroughly.*
8. *To maintain humidity enclose the pot and cuttings in a transparent plastic bag. You will not have to water again for some time, and then only sparingly.*
9. *Keep cuttings in a good light – not sunlight – until rooted. A good indication of rooting is new growth.*
10. *When the cuttings have rooted, pot individually in a light loamy soil. Good light, a cool area and water on the dry side will keep plants compact.*



CRASSULA, also known as jade plant. These easy-to-grow succulents make excellent house plants. They live indefinitely indoors; many are used in dish gardens and often takes the form of miniature trees. Their one to two inch smooth rounded or oval leaves are green with certain species colorations.

They grow best in a bright sunny window, 1000 footcandles, but will do well in any bright location. They will tolerate a wide range of temperatures. Let the soil become nearly dry between thorough waterings.

Hardy Shrub Roses

H. H. MARSHALL

Hardy shrub roses can be valuable ornamentals when used in the right place. Because they range in stature from 8 foot giants to 1.5 foot dwarfs, misplacing either can lead to disappointment or inconvenience. They differ markedly from the well known hybrid teas and are, therefore, better used for a different purpose. They can be striking as a shrub for landscaping but a disappointment as cut flowers. Some will make a ground cover in a sunny location but not a multicolored bed of roses. Some provide winter color in fruit or bark which none of the tender roses do.

A few thousand rose cultivars have been named. Most of these are hybrid teas, floribundas and similar roses. For bedding and for cutting, they are the world's most beautiful roses and, some would say, most beautiful flowers, however, they were developed from non-hardy species and they have not been selected for hardiness. Many cultivars can be grown as annual flowers or as perennials if one is prepared to invest considerable time and material in their care. No doubt enthusiasts will continue to do so.

Hardy roses are a diverse lot, reflecting the character of the several species used as parents and the ideas of many rose breeders. More than 100 cultivars and species are growing at the Research Station at Morden. Some very large shrubs have *Rosa rugosa* as a parent, but other species have also given very large shrubbery selections. The smallest types include the double forms of *R. arkansana (R. suffulta)* such as John Allen, Woodrow and also *R. nitida* and Dr. Merkeley. The first group may be used for background or foundation plantings while the latter might serve better as ground cover. The *R. arkansana* types will grow fairly well in dry or exposed situations even if tops are severely damaged in winter as by snow removal.

A large number of shrub roses have been named. Several of the better old ones are listed in Manitoba Department of Agriculture publication No. 329. Some newer ones that may find a place in prairie gardens are discussed below but first a word for two that are not as new. 'Therese Bugnet' This is outstanding as an upright six foot hardy floriferous shrub. Flowers are double pink, occurring mainly at the end of June but also scattered throughout late summer.

'Dr. Merkeley' will make a dense ground cover two to three feet in height with clean green foliage and good double pink flowers.

'Metis' is a four foot shrub which is outstanding for its bright green *R. nitida* foliage which colors red in the fall. Flowers are borne freely but are the double pink seen in many hardy shrub roses. 'Aylsham' is a similar appearing cultivar.

'Rita Bugnet' is a five foot wide-spreading shrub which bears double white flowers. 'Wasagaming' is similar in habits but bears double pink, strongly scented flowers.

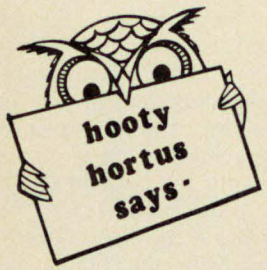
'Prairie Dawn' is another six footer with pink double flowers. It should replace Prairie Youth which is similar but less hardy. It also bears some bloom in late summer.

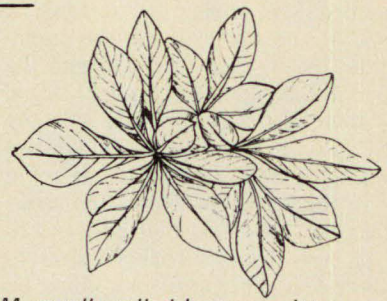
'Assiniboine' is a *R. arkansana* hybrid and quite different from those listed above. Flowers have about 15 red petals and a yellow open centre. They are borne freely on new growth giving a long season of bloom beginning in July. Healthy, established plants will bloom if they are cut back to the ground in spring. It might serve well where tops are likely to be damaged by snow removal.

'Cuthbert Grant' also has *R. arkansana* in its parentage but might be treated as a hardier hybrid tea or floribunda. Flowers are large, semi-double, crimson and are borne from July to October. This is Manitoba's Centennial Rose.

Cultural requirements for all roses are similar excepting for pruning. Shrub roses produce the best bloom on stems that grew in the preceding two years. Older stems and weak or misplaced ones should be cut out at the base, just above the soil, early each spring. Excess suckers should also be removed at this time for most shrub roses sucker more or less. This becomes confusing if the rose is grafted on a stock which also suckers. Hardy roses are best on their own roots and suckers may be used to establish new plants.

Plant your shrub roses in the proper place, in a sunny well drained location in good garden soil. Keep the weeds under control and spray occasionally for insects or diseases. Use some fertilizer and irrigate when dry. This should still leave some time for other yard chores and an occasional pause to listen to the neighbors admiring the shrub roses.





PITTOSPORUM, usually called Japanese pittosporums. These plants are extremely accommodating house plants, surviving for years with relatively little care. They tolerate chills and are especially valuable in drafty locations where other plants would not do well. They have shiny leathery leaves arranged in whorls at the tips of branches.

They will grow to three to four feet tall but can be kept smaller by pruning. As the plants grow in flat planes, they are particularly suited to bonsai pruning.

They do best in a good sunny location – 800 footcandles, but do fairly well in bright indirect light. Let the soil become moderately dry between thorough waterings.

Tomato Family Planning

JOHN A. VELIATH

In some developing, overpopulated countries such as India and China, it is a common sight to see large billboards with captions "small family, happy family." You might wonder why a small family should be necessarily happy. What the message really implies is that fewer mouths mean more food, fuller stomachs and, therefore, happier dispositions.

What has all this to do with tomatoes? Strange as it may seem, very similar principles apply to the growth of determinate or bush-type tomatoes. The smaller the number of fruits on the plant, the more carbohydrate (food) each fruit gets and the larger it becomes. You might argue that there is not much sense in doing this because you are getting fewer fruits. This is true, but bear in mind that in the prairie provinces the growing season is so short that only five to six clusters have sufficient time to mature. The other fruits are killed by frost and, as such, are of no practical value, in fact, they merely sap the plant's food supply. What would happen if they were removed and each plant was allowed to bear only the number of fruits it normally matures? Here at the University of Manitoba we tried to answer questions such as this by means of experiments which have been affectionately dubbed "Tomato Family Planning." These experiments were conducted over a period of three summers and proved beyond doubt that the fewer the fruits, the larger they become. More important, with five to six clusters on each plant, the total weight yield is increased 20 to 30% when compared to plants which have a full load of fruit.

How can the tomato family plan be implemented? It is really quite simple. Leave the first six clusters, then pinch off the others while they are still in the bud or flower stage. Of course, more will develop and these must also be removed. This process of hand deblossoming should be continued at weekly intervals throughout the season. As far as possible, do not permit fruit to set on any but the six elite clusters.

Hand deblossoming does involve an appreciable amount of work, but most home gardeners have so few plants that they are only too glad to lavish them with a little extra TLC. The fruits are well worth the effort: larger, juicier tomatoes. As for the commercial grower — well, we have been testing various chemicals to find a suitable substitute for manual deflowering. As yet we have had limited success, but perhaps someday someone will come up with the perfect tomato pill.

Easy Tips for You

ISABELLE R. YOUNG F.R.H.S.

If cats are a nuisance around your property, scatter pieces of orange peel around your flower beds, etc. They hate the smell of orange. Moth balls will work too, but this is not safe where there are pets or small children.

House plants can be kept in good condition when you go on a short holiday (approximately 2 weeks) by enclosing in a plastic bag, with a few holes punched in it, and keeping out of direct sun. A large piece of black plastic is convenient to cover a compost pile if you find it hard to hide any other way. It also keeps the moisture in and helps to hasten decomposition.

Having trouble with white fly in your greenhouse? Some people find that by growing a few Calendula among the plants does help. The white fly seems to be attracted to these plants. Once they start sucking the sap of the Calendulas they remain there, because the sap is sticky and acts as a flycatcher. Eventually, the Calendulas become sickly and die and these will have to be removed, replacing them with others.

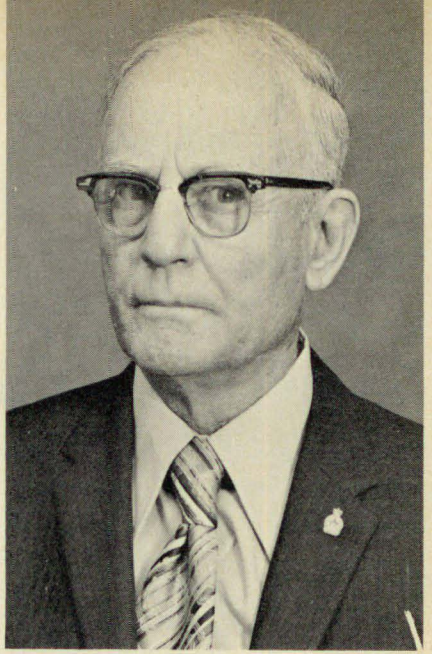
Cutworms can cause considerable damage in a garden. They are slightly brownish-grey, about one inch long and curl up in a ball when disturbed. Normally, they feed just under the surface of the soil, cutting plants off at ground level. Others may eat the foliage at night. You can use ashes around the plants, cutworms do not like ashes.

To tint dried flowers, use liquid food coloring. Do not subject flowers to direct sunlight as this causes fading.

Basic tools are a "must". If you are just a beginner in gardening, you will need a spading fork, and a long handled shovel is best for a large amount of deep digging. An iron rake is essential for levelling off the earth after it has been dug. For setting out plants, a trowel is almost a necessity. There is always a certain amount of cultivating to do, so either a hoe or a pronged cultivator will be needed. If you have any trees or shrubs, pruning shears are handy. For your lawn, you will need a good mower, a lawn rake and clippers for trimming the edge. And don't forget, you will need a hose for watering (either plastic or rubber), along with a nozzle and sprinkler.

It is a good idea to label plants in your garden — roses, perennials, etc. There are a number of good label makers on the market, or you can write on the stakes with a waterproof pencil. If you attach labels to plants with wire, make sure it does not cut into the bark or stem. Plastic bottles, cut to the desired size, make ideal labels for greenhouse work, bedding-out plants, etc.

Extension Horticulturist Retires



E. A. MAGINNES

June 20, 1973, marked the retirement of David R. Robinson from the Extension Division, University of Saskatchewan, Saskatoon, after 29 years of service.

Dave, a long-time resident of Saskatchewan, was born in Belmont, Manitoba. His family moved about one year later, however, to a homestead near Pasweigan, Saskatchewan and he received his primary and secondary education in that school area.

After receiving a Bachelor of Science in Agriculture from the University of Saskatchewan in 1928, he obtained employment with the Department of Horticulture, University of Saskatchewan, where he worked until 1928. From 1938 to 1941 he instructed winter classes in horticulture under the Dominion Provincial Youth Training Program, and operated a farm in the summer.

Dave saw active service with the Royal Canadian Artillery from 1941 to 1943. In the fall of 1944 he accepted an appointment as Horticultural Specialist with what was formerly known as the Extension Department, University of Saskatchewan. On retirement he was an Associate Professor of Horticultural Extension.

Dave's professional career was devoted to extending horticultural information. In addition to spending many hours instructing at horticultural short courses throughout Saskatchewan, considerable emphasis was placed on the propagation and distribution of seeds and plants of many ornamental and fruit-bearing plants. Through his interest in hardy fruits, a series of test orchards were established in Saskatchewan.

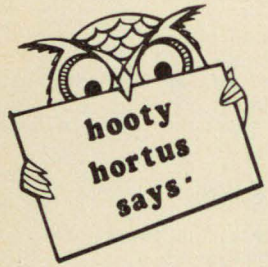
Dave was instrumental in establishing The Gardeners' Guild mailing service. This popular service included the highly regarded quarterly publication, The Gardeners' Bulletin.

Considerable time was devoted to horticultural groups. From 1944 until retirement he was Secretary of the Provincial Fruit Show. He also held the position of assistant-secretary of the Saskatchewan Horticultural Association from 1945 to 1950, while from 1950 until retirement he assumed the role of secretary-treasurer. Under his guidance, Horticultural Society membership in the Association grew from 19 in 1951 to 38 in 1972.

Dave has been held in high regard by Saskatchewan and Prairie horticulturists; he has received honorary life memberships in the Saskatoon Horticultural Society, Saskatchewan Horticultural Association and the Western Canadian Society for Horticulture.

A further honor was bestowed on him at the 41st Annual Meeting of the Saskatchewan Horticultural Association when they announced the establishment of the David R. Robinson Award in Horticulture. This award was named after Dave as a recognition of the contributions he has made to a greater understanding and appreciation of horticulture husbandry in Saskatchewan. Announcement of this award coincided fairly closely with Dave's retirement and is a very fitting recognition for a person who has devoted his life to further horticulture in Saskatchewan.

Dave and his wife Hazel plan to continue residence in Saskatoon, and devote considerable time to travel.



SYNGONIUM, also known as NEPHTHYTIS – common name, Arrowhead Vine. This is one of the most useful and undemanding foliage plants for the home. Young plants have simple 3 inch long arrowhead shaped leaves. As the plant matures the leaves become larger and increasingly complex, finally developing into the shape of an open fan. Many plants can have all stages simultaneously.

When young, different species have silvery white or yellow markings along the major veins of their leaves. As the leaves develop they gradually become entirely green.

These plants do well in the heat and humidity of the average home. They do best in bright indirect light – 400 footcandles. Pinch off long stems, at any season, to increase branching and develop young growth with foliage markings. Propagate at any season from stem cuttings.

Contributing Authors

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HOOTY HORTUS — G.S. Reycraft, former Editor, Prairie Garden. Editor "Over the Garden Wall", Winnipeg Free Press.

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Dr. L.J. LaCROIX — Professor, Plant Physiology, Plant Science Department, University of Manitoba.

L. LENZ — Professor, Ornamental Horticulture, Plant Science Department, University of Manitoba.

Dr. E.A. MAGINNES — Professor, Department of Horticulture Science, University of Saskatchewan, Saskatoon, Saskatchewan.

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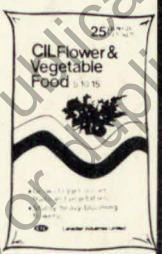

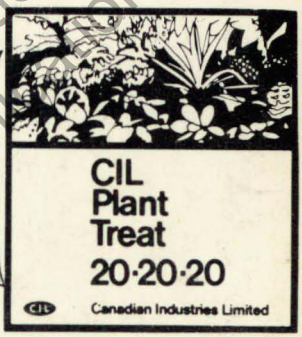

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