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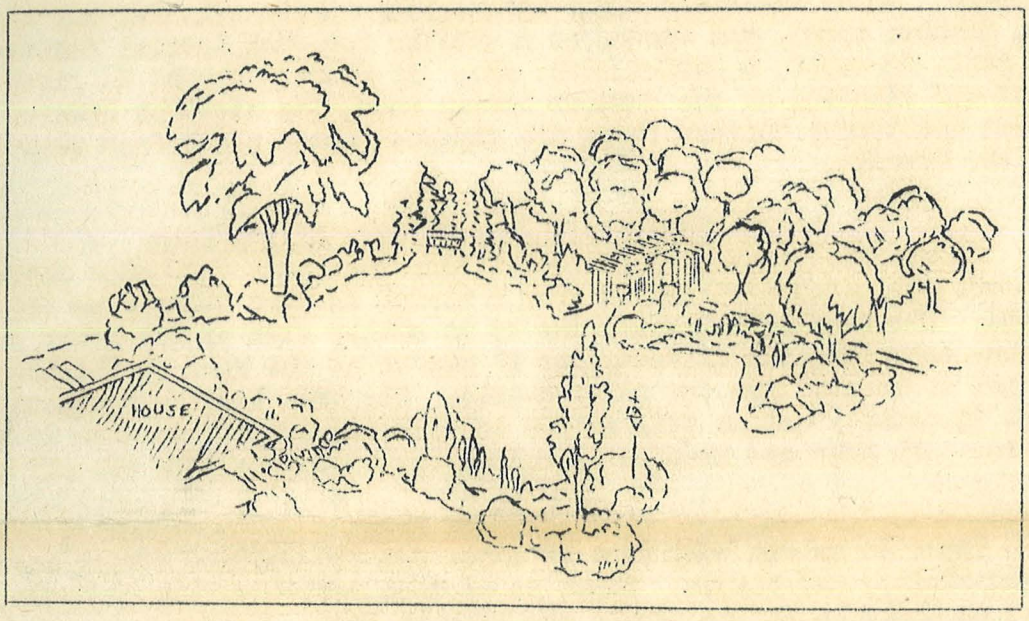
MAKING THE OUTDOOR LIVING ROOM



Who Makes A Garden?

"Whoever makes a garden
Has never worked alone:
The rain has always found it,
The sun has always known
The wind has blown across it
And helped to scatter seeds--
Whoever makes a garden
Has all the help he needs."

"Whoever makes a garden
Should surely not complain
With someone like the sunshine,
And someone like the rain,
And someone like the breezes
To aid him at his toil,
And someone like the Father,
Who gave the garden-soil."

"Whoever makes a garden
Has, oh, so many friends!--
The glory of the morning,
The dew when daylight ends.
For wind, and rain, and sunshine,
And dew, and fertile sod,
And he who makes a garden,
Works hand-in-hand with God."

- Douglas Malloch

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MAKING THE OUTDOOR LIVING ROOM

The outdoor living room is an enclosed garden adjoining or at least close to the house. Here is the place where the family can enjoy the outdoors in comparative privacy. It is the place where interesting garden pictures may be created with flowers, shrubs, trees, and lawns, as a setting for such special features as a bird bath, a pool, an arbor, a garden seat, etc. If proper thought is given to the arrangement and planting of the outdoor living room, the pictures created there will not become monotonous because there are changes taking place from week to week in many of the details.

Location of the Outdoor Living Room

If possible, have the outdoor living room near the house where it may be enjoyed from the kitchen window or from a window in some other room that is used a great deal. The area to be chosen may be at either side of the house but preferably on the side away from the driveway, or it may be at the rear of the house, if this area is not to be used for the service area. The area between the house and the road or street is usually not so well suited to this purpose. This area is better suited as a public lawn area and treated in such a way as to properly set off the house.

Size and Shape

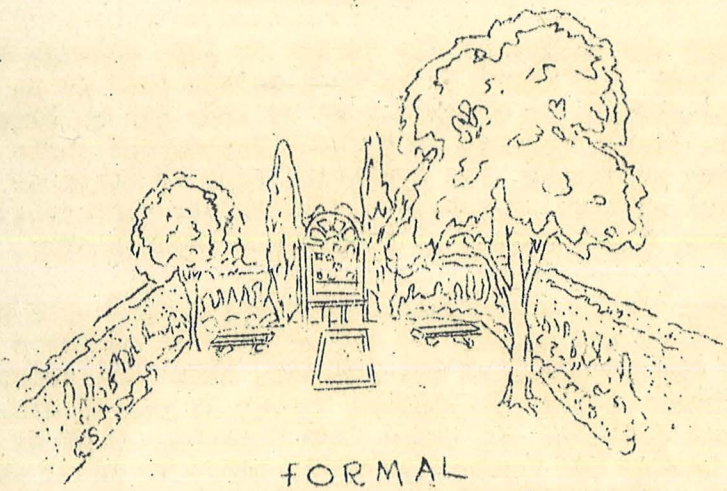
There is no one best size or shape for the outdoor living room that will fit all conditions and places. There is as much individuality in homes and their surroundings as there is in the people who live in them. Furthermore people vary in their likes and dislikes. No matter whether the area selected be square, oblong or oval, it can be made attractive. As a rule, however, the oblong type is most easily developed. The size varies with the space available. But in general the relation between the length and the width should remain about the same, namely, as 5 is to 7 or 8. In other words, a garden that is 25 feet wide should be from 35 to 40 feet long. This is especially important where the area is to be developed formally. The size of the outdoor living room will also depend upon the amount of time and money the owner wants to devote to it. The larger the area the more time will be needed to properly care for it and the greater will be the cost for plant materials.

Shall the Design be Formal or Informal?

Before plantings are definitely made the home owner should determine whether the plan to be worked out is to be formal or informal. If the area is small and close to the house, the formal style is to be preferred as a rule. Here the architectural lines of the house are extended into the garden. A picket fence or a lattice fence covered with vines or a hedge may serve as the boundary. The flower beds are arranged in various geometrical figures to carry out the design. If there is to be a pool it should be square or round or some other geometric figure. Walks are the backbone of the formal plan since they accentuate the design. Slopes are not as well suited to formal development as are level areas; but by arranging the garden on several different levels, separated by terraces or rock walls, more interesting and pleasing effects can be created than if the entire area were on the same level.

The informal living room has no definite, regular shape or pattern. Here the center is left open, the plantings being arranged around the border along graceful curving lines. The boundaries should vary in width and height. If definite

paths are desired they should likewise be curved gracefully. Planting should be in irregular groups rather than in rows and the plants are allowed to develop naturally rather than sheared to conform to a definite design as in the formal development. If there is to be a pool its outline should be irregular in shape. A rock garden can be incorporated into this type of garden whereas it would be out of place in the formal garden.



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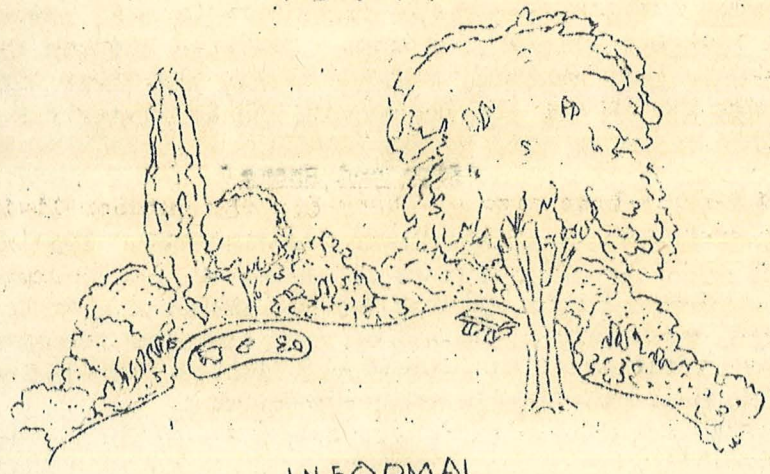

INFORMAL

Fig. 1

Enclosure and Background

The outdoor living room whether it be formal or informal, must have a border to give it outline. (A few flower beds around a bird bath or sun dial will not pass as an outdoor living room.) The border likewise serves as a background for flower beds thus setting off the flowers to much better advantage than where the open fields or barnyards serve as the background. Furthermore, the border is useful in hiding undesirable views and in making the area private.

In the small formal garden, space must be conserved for flowers. Here the border should be narrow, being made up of a picket or a wire fence or perhaps lattice work, upon which vines are trained. Climbing roses, bittersweet, wild grapes Virginia creeper, clematis, Halls honeysuckle, are some of the most common hardy sorts that could be used. If annual vines are desired a choice may be made from the following list: Cardinal creeper, moon vine, madiera vine, cucumber vine, cup and saucer vine.

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If the formal garden is fairly wide (35 feet or more) a wall or a hedge may be used for the border. Where a high hedge is desired in 3 or 4 years vigorous plants like Russian mulberry, Russian olive or buckthorn must be selected. For medium sized hedges Amoor privet, Van Houtin's spirea, or cotoneaster might be used. Evergreens like red cedar or arbor vitae may likewise be sheared into a formal hedge, but of course these species are slow in developing.

A few trees are needed in the border or just outside the border to create an interesting sky line. If there is to be a garden seat or an arbor at the end of the main axis of the garden, an upright type of tree may be placed at each side. Moline elms, Kieffer pears, Whitney or Yellow Transparent apple trees may be used. Or, if evergreens are preferred, the pyramidal type of Cedar or of Arbor Vitae can be set there. At the corners spreading varieties are preferred like hackberry, American elm, red oak, honey locust or Austrian or Scotch pine.

The outdoor living room treated informally must also have a border, but here it varies in height and width. If the area to be enclosed is large, the border is made wide by the use of trees at the outside, then tall shrubs, then medium sized shrubs and at the front either low growing shrubs or perennials. As a rule the area is fenced to keep out chickens and other farm animals. Here is where some people have difficulty in making the border informal, since it is so easy to plant shrubs in rows along the fence. The accompanying planting plan will suggest to you how to arrange pleasing informal groups of shrubs. Informal borders that are thoughtfully planned will not only have graceful curving lines, but there will be pleasing flower and foliage effects during the growing season and in winter the evergreens and the shrubs with colored twigs or with bright berries, will help to provide interest.

First of all the border serves as a boundary for the outdoor living room, taking the place of the walls of the indoor living room. Next it serves as a background for annual and perennial flowers and other garden features such as the pool, bird bath, rock garden and as a setting for the arbor or garden seat. It also serves as a screen to hide unsightly views and to make the area private. Furthermore it will be useful as a windbreak, to protect the flowers from hot south winds in summer and the perennials from cold drying winds in winter.

Soil

Most Nebraska top soils are sufficiently rich for the growth of ornamentals without the addition of fertilizers. Frequently, however, the soil excavated from the basement of the house is used to fill in the yard. Perhaps, it is a sticky clay which runs together when wet and which cracks badly when dry. Such a soil certainly is not well adapted for growing flowers. A deep, loose, friable soil containing a large amount of decaying vegetable matter is best suited to most garden flowers. Such a soil holds water well and is easily worked. A heavy soil may be made more suitable by plowing under or spading under a heavy application of well rotted strawy manure preferable in the fall. Sifted coal ashes may also be incorporated into a stiff clay soil to make it lighter and to keep it from cracking. But there is not fertilizer value in coal ashes. Every year or two thereafter a light top dressing of well rotted manure should be applied to keep up the humus content and to provide the necessary food materials for the plants.

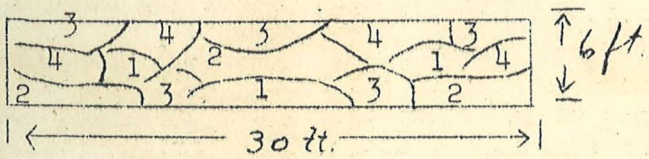
Perennial Flower Borders

Perennials are those flowering plants which die to the ground each winter, but throw out new leaf shoots and flower stems the following year. Many of them are beautiful in themselves; but when arranged in the border in pleasing color combinations and with thought as to the season of bloom, they give a maximum of satisfactio. The ideal flower border is one that attracts attention and arouses interest throughout the growing season from early spring until frost. To attain this ideal, divide the border into seasonal groups as shown in Fig. 2. Then the owner will be enticed into the garden and encouraged to keep down the weeds, control pests and give the plants other necessary attention. The groups of perennials should help to carry out the lines of the design. If the border is to be long and narrow the various perennial groups should be similarly arranged, especially at the front. In the formal garden the perennials are arranged in rows and every effort made to keep them in rows or at least in symmetrical groups to help carry out the design. Perennials may be secured from nurseries either in clumps or as pot grown plants or as two year field grown plants. The larger the plants the greater is the cost, but of course the better is the effect the first year. The cheapest way of securing most of the perennials is to buy the seed and (1) sow in light well pulverized soil after danger from spring frosts. By the middle of August they should be large enough to transplant in their permanent places. If not large enough by this time better leave them until the following spring.

2. The seeds may be sown between August 1 and September 1 in cold frames and protected over winter. In spring the seedlings are transplanted to their permanent places.

3. Seeds are started in flats in the house during February or March, transplanted to small pots that may be placed in a cold frame and when danger from spring frosts is over, transplanted to their permanent places. Not all perennials can be started from seeds. Bulbs like tulips, hyacinths, crocus, lilies, etc. are generally available in September and may be set out from then on until December 1. Peonies are transplanted in September, iris at almost any time during the growing season. In general spring blooming sorts are transplanted in the fall and fall blooming plants in spring.

Design of Perennial Border
Into Seasons



1. Early Spring
2. Spring
3. Summer
4. Fall

Dividing Perennials

Some perennials like peonies, baby's breath, bleeding heart, and oriental poppy, may be left for many years without transplanting. But others, like delphinium, columbine, phlox, iris produce new plants so rapidly that the old clumps should be divided every three or four years. Generally speaking early flowering sorts should be divided in August or September and late flowering sorts in early spring.

Some perennials require protection if they are to survive the winter. As a rule the most serious damage comes from freezing and thawing. This damage may be prevented by first covering the crowns of the plants with coarse litter such as small branches or corn stalks and then 4 to 6 inches of coarse straw or leaves.

Annuals

Every garden lover has use for annuals. With the best of care there will be some spots in the perennial border that will need patching and annuals serve remarkably well for this purpose. Annuals are frequently used to fill in between shrubs or perennials, while new plantings are becoming established. In the formal outdoor living room they are especially valuable for carrying out designs. As a rule they are much more luxuriant bloomers than are the perennials, especially if the seed pods are not allowed to develop. Many of them self-sow. For cutting purposes they are unequalled. And finally, they are cheap making it possible for those who rent their homes or their farms to beautify the home surroundings at a very low cost for materials.

The following sorts may be sown in the fall: Sweet alyssum, snapdragon, calendula, cornflower, larkspur, chine pinks, California poppy, candytuft, pansies, moss rose, sweet peas. After the beds are prepared and the seeds sown, a mulch of well rotted, pulverized manure is placed over them, but the mulch should not be over an inch deep or the seedlings may be smothered.

If you have had the following annuals in your garden this year look out for young seedlings early next spring: Ageratum, alyssum, snapdragon, calendula, cornflower, coreopsis, cosmos, larkspur, California poppy, Shirley poppy, baby's breath, candytuft, balsam, pansy, petunia, moss rose, marigold and zinnia.

Some annuals require a long growing season and are sensitive to cold. They should be sown in flats in March and placed in a sunny window or they may be started in a hotbed. In this class belong the following: Sweet sultan, China aster, strawflower, flax, lobelia, petunia, phlox drummondi, scabiosa, salpiglossis and verbena.

KEY TO PLANTINGS FOR AN OUTDOOR LIVING ROOM

1. Japanese Barberry
2. Hybrid Rugosa Roses
3. Highbush Cranberry
4. Coral berry
5. Scotch Pine
6. Virginal Mock Orange
7. Mugho Pine
8. Persian Lilac
9. Savins Juniper
10. Hackberry
11. Red Dogwood
12. Spirea Anthony Waterer
13. Syringa Philadelphus
14. Spirea Van Houttii
15. Wahoo
16. Hydrangea Aborescens
17. Flowering Crab
18. Japanese Quince
19. Cotoneaster
20. Keifer Pear

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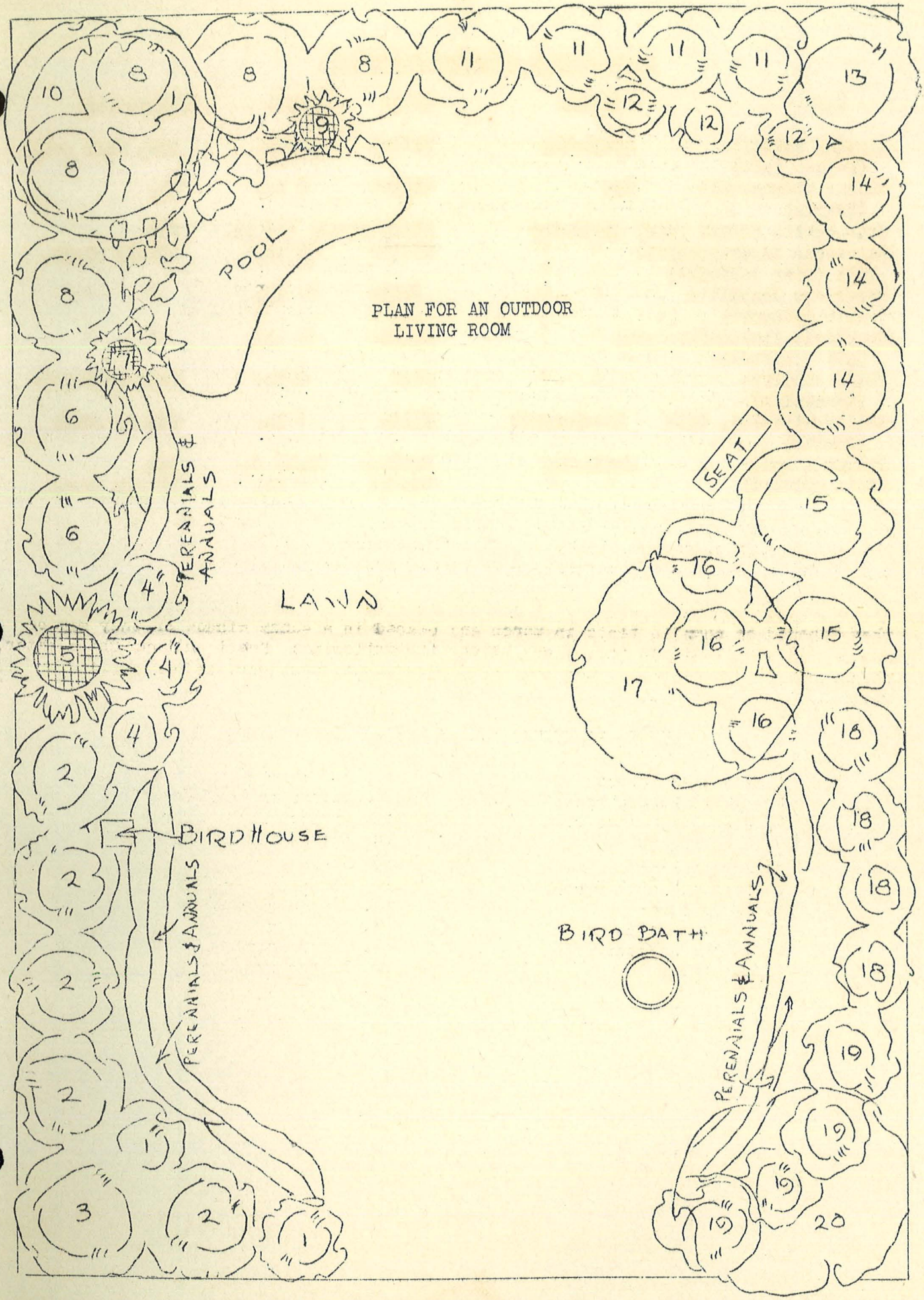

PLAN FOR AN OUTDOOR
LIVING ROOM

Early Spring Blooming Perennials

Name	Season	Color	Height	Adaptation
Alyssum saxatile (Golden tuft)	April-May	Yellow	12 in.	Sun, poor soil
Crocus vernus-bulb (Crocus)	May	Violet	6 in.	Sun
Iris pumila (dwarf iris)	April-May	White-purple	4-6 in.	Sun
Narcissus incomparabilis bulb (Star daffodil)	" " " "	Yellow	18 in.	Plenty shade
Narcissus Jonquilla bulb (Jonquil)	" "	White	12 in.	" "
Narcissus Pseudo-Narcissus bulb (Daffodil)	" "	Yellow	18 in.	" "
Phlox subulata (Moss-pink)	" "	Pink	6 in.	Sun, poor soil
Scilla sibirica, bulb (Squill)	March-April	White	6 in.	Sun or shade
Tulips - bulb	April-May	Various	10-24 in.	Sun
Viola (Violet)	" "	Violet	4 in.	Plenty shade

Spring Blooming Perennials

Name	Season	Color	Height	Adaptation
Anemone sylvestris (Windflower)	May-June	(White (Pink	18 in.	Rich soil-shade
Aquilegia (Columbine)	" "	Various	18 in.	Sun or part shade
Chrysanthemum maximum (Hartje and Elder daisy	" "	White	12 in.	Sun
Convallaria majalis (Lily of the Valley)	" "	White	8 in.	Shade
Dianthus plumarius (Scotch pink)	" " " "	Pink-white	12 in.	Sun
Gypsophila repens (Low baby breath)	June-July	Pale pink	6 in.	Sun
Iris Germanica (German iris)	May-June	Various	1½-2 ft.	Sun-dry
Linum perenne (Perennial flax)	June-Aug.	Blue	1-1½ ft.	Sun or part shade
Myosotis palustris (Forget-me-not)	May-Sept.	Blue	6-8 in.	Shade
Papaver orientale (Oriental poppy)	June	Chinese red	2-3 ft.	Sun
Peonies	May-June	Various	2-4 ft.	Sun or part shade
Phlox divaricata (Wild phlox)	May	Lavender	1-1½ ft.	Part shade-moist
Ranunculus (Buttercup)	May-June	Yellow	6-10 in.	Shade

Summer Blooming Perennials

Althea rosea (biennial) (Hollyhock)	July	Various	6 ft.	Sun
Chrysanthemum maximum (Shasta daisy)	July-August	White	1-2 ft.	Sun
Coreopsis lanceolata (Tickweed)	" "	Yellow	1-2 ft.	Sun, any soil
Coreopsis rosea	Aug.-September	Rose	1 ft.	Sun
Delphinium varieties (Larkspur)	June-July	Light to dark blue	2-4 ft.	Sun or plenty shade
Dianthus barbatus (Sweet William)	" "	Various	12-18 in.	Sun
Dianthus plumarius (Scotch pink)	" "	Various	8-12 in.	Sun
Funkia in variety (Plantain-lily)	July-August	Various	1-2 ft.	Plenty shade
Gaillardia aristata (Blanket flower)	June-September	Orange	1½-3 ft.	Sun-poor soil
Hemerocallis in variety (Day lily or lemon lily)	June-August	Orange-yellow	2-3 ft.	Plenty shade
Heuchera sanguinea (Coral bells)	July-September	Red	12-18 in.	Sun or partial shade

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Name	Season	Color	Height	Adaptation
Iris Laevigata (Japanese Iris)	June-July	Various	2-3 ft.	Sun moist
Lilium in variety	July-August	White to orange	2-4 ft.	Sun or shade
Lychnis chalcedonica (Maltese cross)	July-August	Red	2-3 ft.	Sun or plenty shade
Phlox paniculata in variety (Hardy phlox)	" "	Various	3-4 ft.	Sun
Pyrethrum coccineum (Painted daisy)	June-July	"	1-2 ft.	Sun
Rudbeckia laciniata (Golden glow)	July-September	Yellow	4-7 ft.	Sun
Rudbeckia newmanni (Black eyed Susan)	" "	"	2-3 ft.	Sun
Statice latifolia (Sea lavender)	July-August	Purple	1-2 ft.	Sun
Veronica longifolia (Speedwell)	July-August	Blue Spikes	2 ft.	Sun
Yucca filamentosa	June-July	White	3-6 ft.	Sun-dry

Late Blooming Perennials

Anemone japonica (Windflower)	Sept-October	White-rose	2-4 ft.	Shade-rich soil
Aster in variety (Hardy aster)	August-October	Various	3-5 ft.	Sun but moist
Chrysanthemum hortorum (Hardy chrysanthemum)	Sept. to frost	Various	Various	Sun
Funkia landefolia (Plantain-lily)	July-September	Pale lavender	1-2 ft.	Shade
Liatris pycnostachya (Kansas gay feather)	July-September	Purple	3-4 ft.	Sun
Lilium Tigrinum (Tiger lily)	July-September	Orange	2-4 ft.	Sun or plenty shade
Tritoma pfitzeri (Red hot poker)	August-October	Orange-red	3-4 ft.	Sun

Annuals

Name	Color	Season	Height	Adaptation	Use
Ageratum (Floss flower)	Blue	July-frost	6-18 in.	Good soil, sun	Edging
Alyssum maritimum (Sweet alyssum)	White	June to frost	4-8 in.	Sun, any soil	"
Antirrhinum majus (Snapdragon)	Various	July-Sept.	2-3 ft.	Sun, part shade	Mass
Calendula officinalis (Pot marigold)	Orange, yellow	July-Oct.	1-1½ ft.	Sun, any soil	Mass or cutting
Callistephus chinensis (China aster)	Various	August-Oct.	1-2 ft.	Sun	Cutting
Centaurea cyanus (Bachelors button)	Blue	July-frost	2 ft.	Any soil	Mass or cutting
Centaurea Cineraria (Dusty miller)	Purple rose	August-Oct.	1-2 ft.	Any soil	Mass or cutting
Centaurea Moschata (Sweet sultan)	Various	August-Oct.	2-3 ft.	Any soil	Mass or cutting
Coreopsis tinctoria (Calliopisi	Yellow	All summer	1-3 ft.	Sun	Mass or cutting
Cosmos bipinnatus (Cosmos)	Various	Aug- frost	3-5 ft.	Sun	Mass or cutting
Delphinium ajacis (Larkspur)	Various	July-Sept.	18 in.	Sun or part shade	Mass
Dianthus chinensis (China pink)	Various	" "	10-12 in.	Sun	Mass
Eschscholzia californica (California poppy)	Yellow-Orange	June to frost	8-12 in.	Sun, poor soil	Cutting, Ground Cover
Gaillardia pulchella (blanket flower)	Orange, red	June to frost	6-12 in.	Poor soil, sun	Mass
Gomphrena globosa (Globe amaranth)	White to purple	July to Oct.	12-18 in.	Sun	Mass, winter bouquet
Helichrysum bracteatum (Strawflower)	Yellows	" "	1½-3 ft.	Sun	" " "
Iberis umbellata (Candytuft)	Various	June-Sept.	6-8 in.	Sun dry	Edging
Lathyrus odoratus (Sweet pea)	Various	June-July	Climbing	Rich soil	Cutting
Lobelia erinus (Lobelia)	Blue	July-Aug.	6-8 in.	Sun	Edging
Petunia hybrida (Petunia)	Various	July-frost	12-18 in.	Any soil	Mass
Phlox drummondi (Annual phlox)	Various	July-Oct.	1 ft.	Sun	Mass
Portulaca grandiflora (Rose moss)	Various	July-Oct.	4-8 in.	Sun, heat	Ground cover
Salpiglossis sinuata (Painted tongue)	Various	July-Oct.	2 ft.	Light soils	Interplanting
Salvia splendens (Scarlet sage)	Scarlet	July-frost	2 ft.	Part shade	Interplanting

Annuals (Cont.)

Name	Color	Season	Height	Adaptation	Use
Scabiosa atropurpurea (scarlet sage)	Scarlet	July-Oct.	2-3 ft.	Sun	Edging
Tagetes erecta (African marigold)	Yellow-orange	Aug.-frost	2-3 ft.	Sun, any soil	Cutting
Tagetes patula (French marigold)	Yellow-orange	Aug.-Oct.	1-2 ft.	" " "	Edging-cutting
Tagetes signata pumila (Mexican marigold)	Gold	Aug.-Oct	8 in.	Sun, " "	Edging
Tropaeolum minor (Nasturtium)	Yellow-red	July-Oct.	6-8 in.	Poor soil	Edging
Verbena hybrida (Verbena)	Various	July-Oct.	1 ft.	P. shade	Ground cover
Viola tricolor (Pansy)	Various	June-frost	6-8 in.	P. shade	Cutting
Zinnia elegans (Zinnia)	Various	July-Oct.	2-3 ft.	Any soil	Mass.

GARDEN FEATURES

The outdoor living room, if the name means anything, should be more than a place to look at. It should contain facilities for enjoying the outdoors. There should be seats or chairs available in shady places which command good views of the garden. If the garden has been treated informally, rustic chairs and a table may be placed in the shade of a large tree or a rustic arbor may be built in the border and vines trained over it to provide shade. In the formal garden the seats or arbors should be in harmony with the architecture of the house. The arbor generally serves as a terminal for the main axis whereas the small stone seat may be placed either at the end of a minor axis or along the main walk at a point where good views of the garden may be had.

Wooden furniture is usually painted white or cream to make a pleasing contrast with the different shades of green found in the garden.

One of the most interesting and useful ornaments that can be placed in the garden is a bird bath. The type that is on a pedestal is most practical since cats or dogs are not likely to bother the birds. In the informal garden it may be placed 5 or 6 feet in front of a corner planting whereas in the formal garden it should serve as a terminal of one of the minor axes. Other garden features that may found interesting are, sun dial, bird house and large vases.

Garden Pools

A well planned pool is unquestionably the most interesting garden feature. The water lilies, the gold fish and the water itself hold a fascination that no other part of the garden can equal.

Pools are of two general types, formal and informal. If the garden is formal in design, the pool should likewise be formal, its outline conforming in pattern with the general outline of the garden. As a rule the pool is located on the main axis of the garden.

Where the garden has irregular curved border lines the informal type of pool is chosen. It is located in a sunny spot, not in the center of the lawn area but near the shrub border so that the shrubs will serve as a background on one or two sides. The shape is of no great importance just so the pool looks natural in its surroundings. Irregularity and naturalness are created by a proper combination of plants for the background and by arranging rocks and water plants along the back edge of the pool as one sees them in nature. If rocks are easily gotten, they may be used at the front also or the lawn may extend to the edge of the water. In no case should the concrete side wall extend above the level of the lawn.

Pool Construction. The most desirable type of pool is one that will withstand freezing and thawing and side pressure without cracking. The most satisfactory material to use is reinforced concrete. Space will not permit in this circular of going into the details of construction, but a cross-sectional plan of an informal pool is given. See Fig. 3.

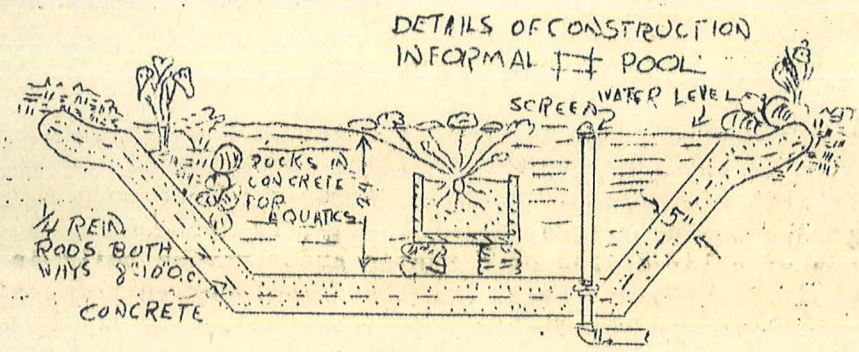

Fig. 3

Safety Devices. An unprotected pool is dangerous to small children. A low fence might be constructed around it or wire netting might be stretched over it, but these detract from the beauty of the pool. A safe method which is not objectionable is to construct a frame of ½ inch pipe the exact size of the inside of the pool. Over this is stretched large meshed woven wire. This frame is fastened to the wall of the pool 3 inches below the surface of the water after the plants have been set in place.

Aquatic Plants

The water lilies are by far the most popular aquatic plants on account of their exquisite blooms. There are two general classes, hardy and tropical or tender. The hardy ones are most popular because they can be kept from year to year if their roots are protected against freezing. The tender or tropical varieties are usually treated as annuals unless an indoor aquarium of suitable size is available for overwintering them.

Each lily plant should be permitted to occupy from 9 to 12 square feet of water surface. If the pool is shallow (12 to 14 inches deep) the bottom is covered with soil composed of 1 part well rotted cow manure and 2 parts garden soil and the rhizomes (rī′zōms - a tuber-like root) are planted horizontally just underneath the surface. If the pool is 18 to 24 inches deep the plants are planted in boxes, tubs

or pails set upon tile or stone or brick to bring the top of the container within 7 to 9 inches of the surface of the water. The container should be large enough to hold about 1 cubic foot of soil.

Hardy lilies may be planted the latter past of April or early in May, but tender lilies should not be planted until late in May or early in June, as they are easily injured by low temperatures.

There are hundreds of varieties of water lilies. Here are some of the better varieties.

Hardy Varieties	Tropical Varieties
Gloriosa - red	Pennsylvania - blue
Chromatilla - yellow	Juno - white
Marliac Rose - deep rose	General Pershing - pink
Marliac White - white	August Kock - Violet - blue
Paul Hariot - orange pink	
Aurora - yellow to red.	

The lotus is another attractive water plant. It has large shield-like leaves and many-petaled fragrant flowers produced on tall stiff stems. The Egyptian lotus has pink flowers, the American lotus has yellow flowers and those from China are generally red.

Floating Water Plants. Water lettuce, water hyacinth and water snowflakes are plants that float on the surface.

Submerged plants. Every pool should have a few plants of this type. They are useful as well as ornamental as they give off oxygen which helps to purify the water and serve to protect young fish. They are either placed in the boxes with the water lilies or merely submerged in the water. Parrot's feather, coon tail, fanwort and loosestrife are common plants of this type.

Shallow water plants. The edges of most ponds or lakes are generally shallow. There are a number of attractive plants that are adapted to such locations where the water is 3 or 4 inches deep. Arrowhead, pickerel rush, water plaintain and wild calla are plants of this type.

Winter protection. Most of the water plants mentioned above except the tender lilies, may be carried thru the winter by covering the pool with boards and a thick layer of straw or the plants may be removed in their containers to a cool basement or cave which does not reach freezing temperatures. It is necessary in this event to water them every week or two. The tender lilies are very difficult to keep thru the winter unless they can be placed in a warm room under conditions favorable for continuous growth.

Water Animals

A pool would be incomplete without fish. They not only add interest to the pool, but they also perform a useful service to humanity by devouring mosquito larvae. The water in the lily pool is generally calm since lilies will not do well where cold water is being added constantly. Neither do lilies flourish with water spraying on

their leaves continually. Naturally then, mosquitoes will use the warm waters of the pool as a breeding place. Gold fish and tropical fish will see to it that the mosquito larvae will not develop into adults, If submerged plants are used in the pool, the water will contain sufficient oxygen so that it will not be necessary to add fresh water for this purpose. The leaves of such plants are likewise eaten by the fish and they need not be fed artificial foods while in the outdoor pool.

However, it is desirable to have a dozen or two snails and several clams in the pool to help remove decaying vegetable matter which might prove injurious to the fish if allowed to accumulate. Other water animals that might be placed in the pool to add interest are frogs, salamanders and turtles.

The Rock Garden

Rock gardening is a very fascinating form of gardening and if properly executed the rock garden will become a permanent part of many outdoor living rooms. If, however, it takes the form of a mound of rocks arranged merely for the purpose of growing a few rock plants it will be just a fad that will soon pass out. Neither is the rock garden to be a miniature mountain or a miniature range of rocky hills, for there are bound to be certain features that cannot be properly reproduced to scale. The most pleasing type of rock garden is one in which a tiny bit of natural scenery is built into the outdoor living room in such a way that it will appear to be a natural part of the surroundings.

It is very important, therefore, that a study be made of the placing of rocks in nature. Rarely are rocks of any kind found on the open flat prairie. Where the plains end and the foothills begin there are a few large isolated boulders and many smaller rocks. And as one goes up into the mountains many different arrangement can be seen, such as, walls of stratified rock, boulders, fissures between strata, et Sedimentary rock is typified by limestone deposits which are always laid down in horizontal lines. Where the soil waters have eroded such rocks there are cavities and frequently these are found filled with soil out of which grow perennials, shrubs, or even trees. In a glaciated area, the rocks are rounded and smooth. Here again there will be many small ones for each large one, but they are not arranged regularly in rows nor are they all of one size. No matter which type of rock is to be used, first of all a study should be made of the placing of the selected type in nature. If that can not be done, a study of pictures of rock gardens will be of considerable help.

Rock gardens are usually built on sloping ground. If there is no natural slope available in the garden an artificial slope may be provided by either hauling in soil or., if a pool is to be built also, the soil excavated from the pool may be thrown out on the side nearest the shrub border and subsequently coverted into a rock garden.

In placing the rocks most of the larger ones are arranged at the base of the slope; but two or three of these should be placed near the top to overcome the appearance of regularity. In no case should all of the rocks of the same size and shape be placed in rows along the slope. Neither should stratified rock be placed pointing upward. However, they are placed sloping slightly back toward the bank to carry the water back into the soil. If there is a pool at the base of the rock garden, pleasing effects are created by placing several large rocks along the edge

of the pool so that a part of each will jut out over the water. If there is no pool at the base of the rock garden, a large boulder or two may be placed a foot or two from the slope. The aim in laying the rocks should be to make the rock garden a thing that is pleasing to the eye before a single plant is set out.

Perennials for the Rock Garden

Name	Season	Color	Height (inches)	Adaptation
Achillea millefolium (Yarrow)	June-July	White & rose	18	Poor soil
Alyssum saxitile (Golden Tuft)	May	Yellow	18	Any soil
Aquilegia (columbine)	April-May	Various	20	Partial shade
Arabis alpina (Rockcress)	April	White	12	Anywhere in sun
Campanula carpatica (Carpathian Harebell)	June to	Blue & white	8	Edging
Cerastium Tomentosum (Snow in summer)	June	White - also white leaves	6	Ground cover
Dianthus arenarius (Sand Pink)	May & June	White	6	Sandy dry places
Dianthus caesius (Cheddar Pink)	June & July	Rose	8 - 12	Dry places
D. deltoides (Maiden Pink)	June	Rose	6 - 9	Dry places
Gysophila repens (Creeping baby breath)	June to July	Pale rose	4 - 8	Sunny place
Heuchera sanguinea (Coral bells)	July	Crimson	18	Sunny place
Iris pumila (Dwarf iris or flags)	April	Various	6	Edging
Leonotopodium (Edelweiss)	June &	White	9	Sunny place with limestone
Myosotis alpestris (Forget-me-not)	June & July	Blue	9	Partial shade
Phlox subulata (Moss phlox)	April & May	Rose purple	6	Well drained soil
Saxifraga megasea (Rockfoil)	May	Pink	15	Stones about roots
Sedum acre (Goldmoss)	June	Yellow	6	Anywhere in sun
Sedum alba (White sedum)	June.	White	3	" " "
Sedum sieboldi (Siebolds sedum)	August	Rose	4	" " "
Sedum spectabile (Showy sedum)	September & October.	Rose, crimson	18	" " "
Sempervivum soboliferum (Hen and chickens)	July	Yellow	6	" " "
Veronica repens (Creeping speedwell)	June	Blue	4	Shade
Veronica rupestris	June	Violet	4	Sun

Name	Season	Color	Height (Inches)	Adaptation
Viola cornuta (Tufted pansy)	April to October	Various	6 - 10	Sun and good soil
Yucca filamentosa	June	White	3 - 5 feet	Dry hot place - any soil

INSECTS, DISEASES AND THEIR CONTROL

Ornamentals, like most other plants, are subject to insect attack and to diseases. If the gardener is to be successful in growing plants and keeping them healthy, he must have a working knowledge of the way insects and disease work and common methods to use in their control.

Insects

There are two general classes of injurious insects, the division being based upon the method in which the damage is done.

Insects with chewing mouth parts. Belonging to this class are leaf eating insects, like currant worm, caterpillars of various sorts, beetles like the blister beetle, potato beetle, rose chafer and striped cucumber beetle. In general leaf eating insects are controlled with lead arsenate at the rate of 2 to 3 tablespoonsful to each gallon of water. Another convenient method of applying lead arsenate is to mix thoroughly one pound of this material with 10 pounds of hydrated lime. This mixture is placed in a burlap sack and the sack shaken several times over each plant. For the striped cucumber beetle calcium arsenate is used with the hydrated lime or better still with gypsum in the same proportions.

The blister beetle is not easily controlled with arsenate, but a new material called burium fluosilicate has been found reliable.

The borers also belong to this class, but they are much more difficult to control. In general the most satisfactory method is to cut them out with a sharp knife. The white grub, while not a borer in the true sense, works much like some borers in the crowns of perennials and it girdles shrubs and young trees below ground. They also injure lawns. Fall spading or plowing and leaving the surface rough is fairly effective for vegetable gardens or those parts of the flower garden devoted to annuals. A new method recommended in some states is to incorporate lead arsenate into the soil around shrubs and perennials at the rate of 1 pound to 150 square feet of ground.

Insects with sucking mouth parts. Plant lice, scale insects, leaf hoppers and red mites belong to this class altho the latter is not a true insect. Stomach poisons will not control these pests. Contact sprays which kill by merely touching the insect or by suffocating them are used. Plant lice and leaf hoppers are generally controlled with nicotine sulfate either in solution or in the dust form. A teaspoonful of nicotine sulfate is mixed up in a gallon of water in which has been dissolved an ounce of laundry soap. This mixture is used as a spray, being sure to hit the

insects rather than merely covering the foliage as is done with arsenical sprays. The dust is made by mixing 1 part by weight of the nicotine sulfate with 20 parts by weight of hydrated lime, then working it thru a sieve. This dust is used when the temperature is above 80 and preferably when there is no wind.

Scale insects are frequently found on lilac, Japanese quince, elms, etc. The old fashined remedy is liquid lime sulfur at the rate of 1 part to 9 parts of water. Oil sprays are available at present for scale insects and red spider. Some of these can be used only as dormant sprays. Others can be used as summer sprays. It is well, therefore, to follow the directions given by the manufacturer or damage may result to the plants upon which the spray is used.

Diseases

Ornamental plants are subject also to attacks of parasites belonging to the plant kingdom. There are two general types of these parasites, namely, fungi and bacteria. A third type is present in the sap of plants producing symptoms that are similar to those produced by the other two. This type is knownas a virus.

Fungi have two stages, vegetative and reproductive. In the vegetative stage the fungus produces many thread-like strands which enter the cells of the host plant and consume their contents. In the reproductive stage spores are produced which may be disseminated immediately or they may be of a type that can live over winter on the infected parts and be disseminated the next year. The spores are carried by winds or by splashing rain drops or by insects to healthy plants where they germinate if sufficient moisture is present. The vegetative strands (hyphae) produced, enter the host plant thru breathing pores or thru wounds. Control in general consists of gathering up the diseased parts in the fall and burning them and by making conditions unfavorable for the germination of the spores or for the entry of the hyphae into the host plant.

Bacteria are single celled organisms that reproduce by dividing. They do not produce spores as do fungi, but are spread easily nevertheless. Some are spread in the tubers, bulbs or rhizomes. Others may enter the seed, others live over in the soil and enter the host plant thru the under ground parts. They are also spread from diseased to healthy plants by insects or by means of pruning and cultivation tools. The virus type of disease is likewise spread thru planting infected tubers or bulbs and is carried from diseased plants to healthy plants by insects or with pruning tools or cultivating tools. In nearly all cases a certain type of fungus attacks only a certain species of plant. Rose mildew will not attack snowberry nor zinnia and vice versa, neither does the leaf spot, which affects peonies, attack phlox so that there need be no fear about placing these two side by side. Only a few of the common diseases will be discussed in this circular.

Mildew. The name mildew is applied to that type of disease which covers the leaves and stems with a white powdery like growth. It occurs on roses, lilac, ivy, columbine, golden glow, snowberry, zinnia, delphinium, dahlia and other ornamentals. It is especially bad in damp humid periods and under crowded conditions or in shady places or where there is poor circulation of air. Too much artificial watering may likewise aggravate the situation. Fairly good control may be secured by dusting with sulfur at weekly intervals during humid periods. Best results are

secured when the dusting is done at temperatures of 75° to 85°. If leaf eating insects are also present use a mixture of 85% of dusting sulfur and 15% of lead arsenate.

Rust. This disease is found on hollyhock, chrysanthemum, iris, aster, rose, snapdragon, ageratum, calendula, pansy, clematis, mallow and others. The leaves and stems are attacked. On the under side of the leaves there will be orange to brown raised spots which are the spore masses. Rusts are rather difficult to control in wet weather. In the fall the infected plant parts should be gathered up and burned. If the disease is very severe on only a few plants in early summer, these should be pulled up and destroyed. Sulfur dust may be used each week as suggested for mildew.

There are mamy leaf spot diseases in addition to the rusts for example, Black Spot of roses, leaf spot on phlox, on peonies, on hollyhock, on iris, on asters. Since these diseases all live over winter on old diseased leaves and stems, these parts should be gathered in the fall and burned.

Twig blight sometimes occurs on the ends of new shoots of lilac and occasionally on other plants. The infected twigs die, the bark turning black. The leaves also turn black and remain attached to the dead twigs. Infected shoots should be removed promptly, being sure to make the cut 5 or 6 inches below the point where the bark is black.

Root rots. occur with such plants as iris, delphinium, gladiolus, funkia, and others. Poor soil drainage, or too much artificial water and too much decaying vegetable matter in the soil may in some cases be responsible for the inroads by rot organisma. In severe cases the entire plant may have to be dug up and discarded and something else planted. In less severe cases the roots may be dug and badly infected portions cut out. The remainder should be disinfected with sublimate of mercury solution or some other mercury compound and the roots replanted in another more suitable location.

Virus diseases. Yellows of the china aster is responsible for most of the losses with this garden favorite. The disease also attacks Shasta Daisy, Pyrethrum, Gaillarida, Bachelors button, Strawflower, Coreopsis, Scabiosa, Sweet Alyssum, annual phlox and others. It probably lives over on weed plants like the sow thistle or wild daisy from which it is brought to the flower garden by leaf hoppers. To control, all the weeds that are suspected of harboring this disease should be destroyed. Young plants that show the Yellows should be pulled up and destroyed. The other plants should be sprayed every week or ten days with a nicotine spray to kill the lea hoppers.

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