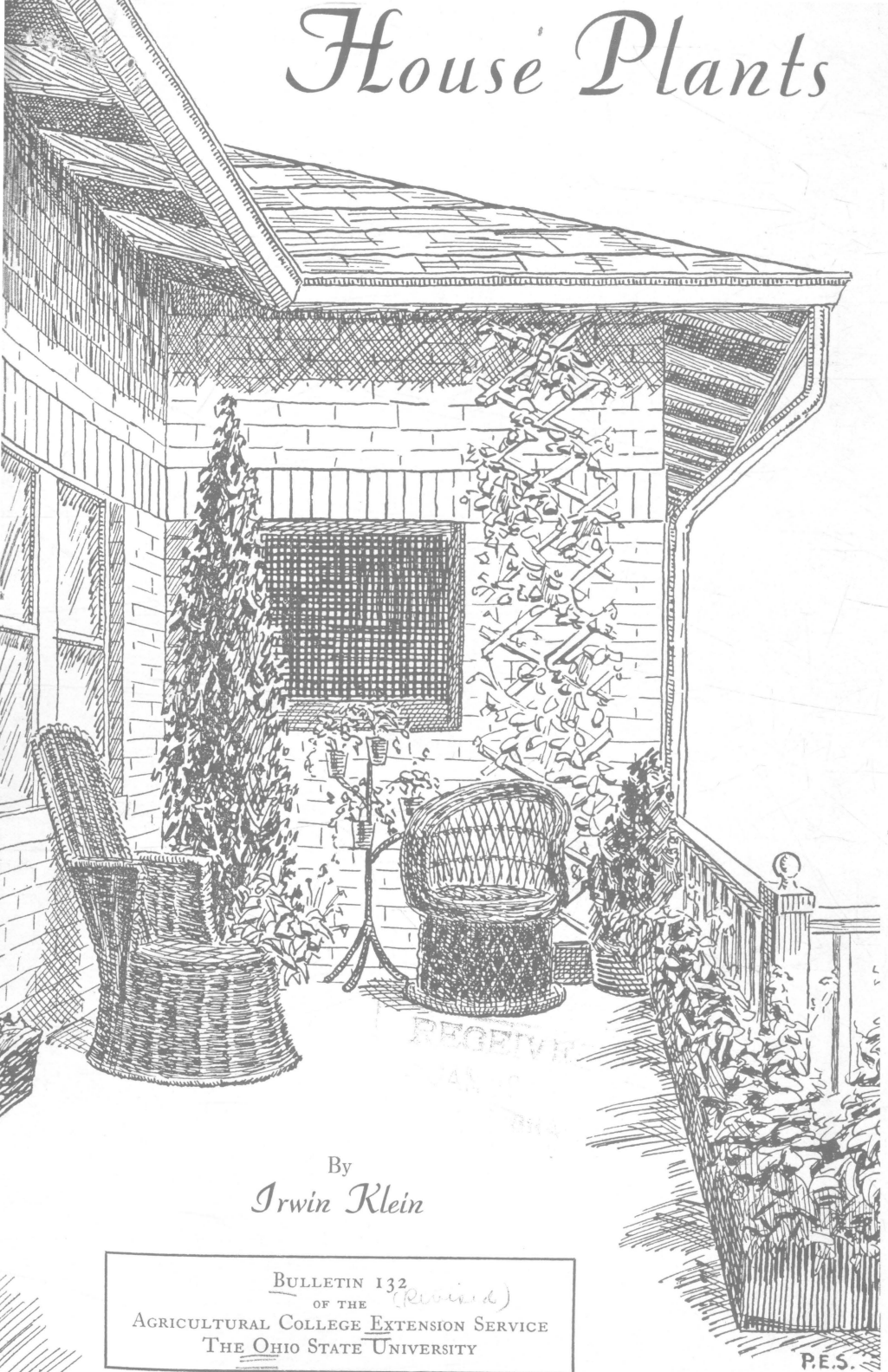


House Plants



By
Irwin Klein

BULLETIN 132
OF THE (Revised)
AGRICULTURAL COLLEGE EXTENSION SERVICE
THE OHIO STATE UNIVERSITY

P.E.S.

Contents

CHIEF REQUIREMENTS OF PLANTS:	
Light the prime necessity.....	4
Suitable temperature is required.....	4
Moisture is essential.....	4
Humidifiers	5
Soil moisture	6
Ventilation is important	7
Soils and fertilizers for plant development .. .	7
A good soil for potted plants.....	7
Fertilizers for potted plants.....	8
Lime	8
Controlling insects and diseases.....	8
Insects	8
Diseases	10
CARE AND MANAGEMENT OF HOUSE PLANTS:	
Spring and summer care of house plants	11
Annuals and perennials used as house plants .. .	11
Potting of plants.....	12
How to pot.....	12
Kind of pot to use.....	12
Forcing bulbs in winter .. .	13
Propagation of house plants	14
How to make and grow cuttings	14
Leaf cuttings of fleshy-leaved plants .. .	15
Pot layering of a few house plants .. .	16
Care of cut flowers.....	16
LIST OF HOUSE PLANTS:	
Foliage plants	18
Flowering plants	23
Aquatic plants for the fishbowl.	25
Floating plants	26
Indoor pools	26
Cacti	26
Window and porch boxes.....	26
Winter boxes	29
Fernery	29
Hanging baskets	30
Glass gardens	31
Porch gardens	32
Dish gardens	32

Extension Bulletin 132—Second edition, November, 1936

THE OHIO STATE UNIVERSITY, COOPERATING WITH THE U. S. DEPARTMENT OF AGRICULTURE,
AGRICULTURAL EXTENSION SERVICE, H. C. RAMSOWER, *Director*, Columbus, Ohio
FREE—Cooperative Agricultural Extension Work—Acts of May 8, and June 30, 1914

House Plants

By IRWIN KLEIN

Former Specialist in Floriculture, The Ohio State University



HOUSE PLANTS are those which are capable of being readily and satisfactorily grown in a home, for adornment and decoration. No special aptitude is necessary to grow plants successfully in the house. Failure is attributed frequently to the neglect of cultural requirements. Anyone can grow house plants if a favorable environment is supplied, but conditions for growth in the average home are not always ideal. In most instances lack of success may be attributed directly to high temperature, too dry an atmosphere (low humidity), the presence of noxious gases, and improper aeration.

Too frequently houses are heated to such a degree that they become unhealthy for their occupants. Plants growing under this condition will wilt and drop their leaves. Because of the high temperature the air in the rooms frequently becomes too dry, and the plants are forced to give off moisture, reducing their turgidity and resulting in stunted growth and abnormal shapes.

In cities where coal is used for heating, exhaust gases saturate the atmosphere and produce injurious effects as they come in contact with plants in the house. Illuminating gas used in cooking and lighting is responsible, also, for poor growth (see Fig. 1).

A by-product, ethylene gas, even in very dilute quantities, will in a very short time cause plants to become sickly. When no attention is given to this factor, plants soon turn yellow and die. Poor ventilation, which allows these gases to accumulate, hastens the death of the plants.

There is no truth in the statement that plants kept in the room at night are injurious to the occupants. It is true that plants, during the daytime, absorb carbon dioxide from the air, while at night

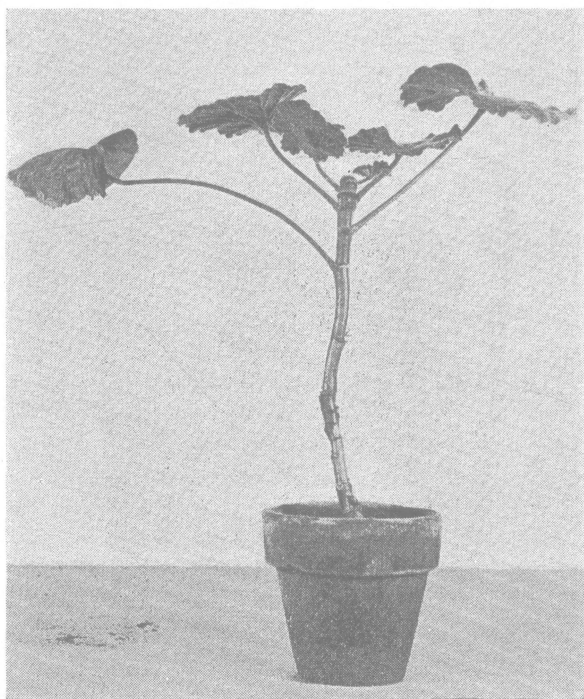


Fig. 1.—A Geranium injured by illuminating gas.

they release this gas. However, the amount of interchange is so small as to be negligible so far as its effect on the health of people is concerned. A whole greenhouse full of plants would not give off enough carbon dioxide to affect adversely the composition of the air.

Although it is not always possible to bring about perfect conditions for growing plants indoors, many obstacles can be removed or partially corrected if we know the requirements of the plants. From observations of nature, and the growing of plants in greenhouses, we realize that the factors of light, temperature, moisture, aeration, soils, fertilizers, and pest control are of chief importance. These topics are discussed on the following pages.

Chief Requirements of Plants



LIGHT, THE PRIME NECESSITY

Plants require light in order to manufacture food which is built into various tissues—stems, leaves, and flowers. However, not every plant requires the same amount of sunlight. During the winter there is little danger that any plant will receive too much light, but with the approach of spring the plants should be placed in positions according to their tolerance to light.

Ferns, vines, and other foliage plants do best in partial shade, especially during the long summer days. These plants thrive when exposed to the light on the east or north sides of the house. When this is impossible, they may be placed some distance away from the south or west windows. Often a translucent curtain placed between the foliage plant and the window will produce sufficient shade.

Many of the flowering plants—Roses, Geraniums, Fuschias, Lantana, Primroses, etc.—require full sunlight, and attain their best development in east, south, or west exposures.

SUITABLE TEMPERATURE IS REQUIRED

Although some house plants such as Ferns, Palms, and Poinsettias grow best at fairly high night temperature (65-70° Fahrenheit), the majority prefer 50-65°. During the daytime, the temperature of the room should not exceed 70° F. In general, the cooler parts of the house are the best for growing most house plants. The keeping qualities of the flowers are better at the lower temperatures.

Fluctuations of temperature are as injurious as high temperatures, reducing the vitality of the plant with subsequent susceptibility to attacks of pests.

MOISTURE IS ESSENTIAL

Homes heated by means of hot water furnish better atmospheric conditions for growing plants than steam, hot air, or gas heat. The hot water heating system provides some moisture in the air, while the others produce dryness or release toxic gases. A moist atmosphere is highly desirable but is

...ing in the average home. This deficiency is followed by the dryness of the soil, the stunting of the plants, and the hardening of the stems.

Humidifiers.—To correct this condition humidifiers are frequently used. A shallow, rust-proof pan, about 1½ inches deep, filled with an inch of small stones and supplied with sufficient water to wet the bottom thoroughly, provides a receptacle for holding the potted plants and at the same time increases the humidity, by means of evaporation. Excessive moisture is undesirable. Water allowed to collect in the pan so that the base of the pot is covered will inhibit the entrance of oxygen to the roots and will produce sickly plants. Many radiators in homes are now equipped with humidifiers, which also help to maintain proper humidity.

Another method of reducing excessive evaporation of moisture is by frequent wetting of the foliage with a spray gun or atomizer. An occasional bath will benefit most plants. A film of dust and soot frequently settles on the leaves and clogs the stomata or breathing pores, and hinders growth. Only a thorough washing can remove this accumulation. A bright day is the best time to bathe plants.

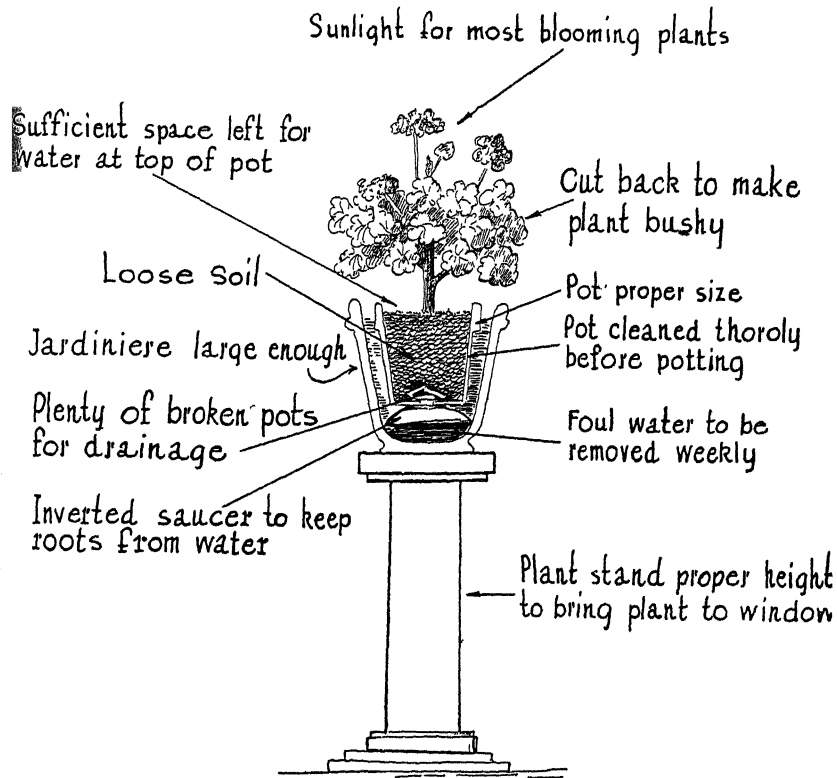


Fig. 2.—Graphic illustration of good conditions for a house plant. Your plants cannot help but thrive if requirements for growth are studied.

Soil Moisture.—This is equally as important as humidity. Water deficiencies in soil produce stunted woody plants with small leaves which drop off. An oversupply of water causes the tips of leaves to brown and with plants like Primroses and Cyclamen, rot and decay will set in at the crowns. Excessive watering will also cause the lower buds to drop or fail to open.

Soil water acts as a solvent of nutrients which are essential for growth. When too much is applied, all the spaces between the soil particles are filled with water. This prevents the entrance of oxygen, which is necessary to develop roots and to maintain other functions of the plant. Water supplied at the top of the pot is preferred to absorption through the bottom. By the former method stale air, water, and toxic substances are washed down through the soil and out through the drainage hole, while absorption upward merely supplies additional moisture.

Plants in small pots require more frequent watering than those in large containers. The clay of which most pots are made is very porous and, consequently, small pots permit rapid evaporation and drying out of the soil. Fast growing plants like Coleus, Begonias, and Ferns require more water than the slower growing types, such as Primroses, Cyclamen, and Lantana. During sunny days all plants require more water than during dull days. Too much water on dull days causes the flower buds to drop and the leaves to turn yellow.

Plants should not be allowed to become dry enough to wilt before they are watered. By scratching the soil to a depth of about an inch one can tell whether the soil requires additional water. If the soil puddles or lumps when rolled between the thumb and finger, no water is necessary, but if it crumbles or pulverizes, more water is needed. Another method of telling whether water is needed is to tap the pot with the knuckles; a hollow sound indicates the lack of water, while a dull thud signifies a sufficiency.

It is a good practice to water plants thoroughly when moisture is required and to avoid frequent light sprinklings. The roots of plants penetrate to the bottom of the pots, and unless the soil is thoroughly soaked the lower roots will suffer. Furthermore, light applications of water encourage surface roots which may dry out during hot weather.

The kitchen affords an ideal place for growing many house plants which require a high humidity and a high temperature. The water used in cooking provides moisture to the air, increasing the humidity, while the heat necessary in the culinary arts supplies the high temperature. The escape of ethylene from gas stoves is not greater, generally, in the kitchen than any other rooms in the house. Ethylene is slightly lighter than air, but where the humidity is high, the moisture weighs the gas down, reducing its toxic effect. Furthermore, as long as the pipe connections of the stoves are tight, the escape of unignited gas is very little. Plants which are growing poorly in other rooms are rejuvenated when allowed to remain in the kitchen for a period of time chiefly because of the higher humidity.

VENTILATION IS IMPORTANT

Ventilation is another important factor. Poor circulation of air within the house permits injurious gases to accumulate and lessens the amount of oxygen. Opening the windows or doors for a short time each morning will allow the stale air to escape and fresh air to take its place. Drafts should be avoided.

During the cold months of winter, plants placed near windows should either be removed at night or protected from freezing by drawing the curtains.

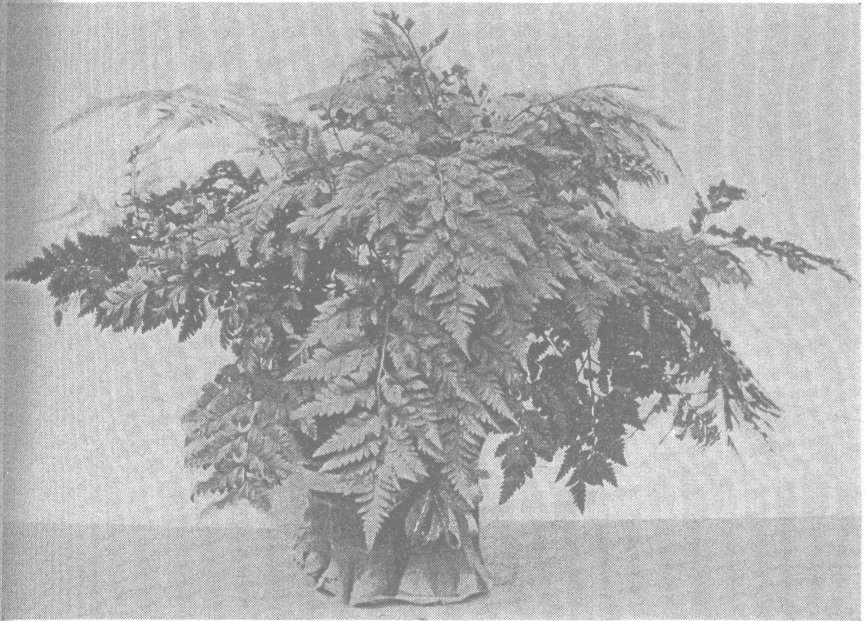


Fig. 3.—East Indian Holly Fern (*Polystichum aristatum*).

SOILS AND FERTILIZERS FOR PLANT DEVELOPMENT

The type of soil for plants is not as important as we are led to believe. It is true they may do better in one kind of soil than another, but the difference is not sufficient to warrant special treatments. In fact, recent tests showed that plants can be grown successfully in pure sand if a sufficient quantity of a complete fertilizer is added.

A Good Soil for Potted Plants.—Such a soil should be loose, and should contain organic matter (rotted plant material) and available nutrients. Organic matter increases the water-holding capacity and improves the texture of the soil. Ordinary garden loam usually contains fair amounts of organic matter, together with some clay and coarser materials. Sand is often added

to lighten heavy garden soils which do not drain readily. A good soil mixture is composed of one-half garden loam, one-quarter clean sand, and one-quarter leaf mold or well-rotted manure. In the place of manure one-fifth peat may be substituted. Peat mixed with manure is often better than the former used alone, because the manure supplies the bacteria which will cause the peat to disintegrate more rapidly. Because of its high water holding capacity peat should not be added in large quantities.

Fertilizers for Potted Plants.—Although garden soils contain fair amounts of nutrients, there is usually not enough to supply the plant until maturity. The roots, restricted to a small area of soil, take up the available nutrients rapidly. To maintain continuous growth more nutrients must be added in the form of fertilizers. Since soils are apt to be deficient in elements of nitrogen, phosphorus, and potash, a complete fertilizer containing these minerals in a balanced proportion is recommended. A 3-inch potful mixed with a bushel of soil will be enough to last for a couple of months.

When the plants begin to show yellowing of the foliage, reduction of size of leaves, and shortening of stems, a light application of fertilizer, a teaspoonful to a 6-inch pot, may be added and watered into the soil. When only a few plants are grown the nutrients may be supplied about every two weeks in the form of tablets inserted into the soil before watering. The tablets dissolve and their contents are absorbed gradually by the roots. Many complete fertilizers, under various trade names, are acceptable but should be used always according to specified directions.

Lime.—Lime is used to correct soils which are very acid. Since house plants do best in a slightly acid medium, additions of lime are seldom necessary. For growing such plants as Hydrangeas and Azaleas it may be necessary to make the soil more acid. This can be done by mixing one-eighth part of acid peat with the soil. To determine the acidity, the soil may be tested with color indicators such as "Soil-tex" or by sending a sample of the soil to the Soils Department of The Ohio State University or the Agricultural Experiment Station at Wooster, Ohio. Yellowing of Hydrangeas is an indication of the soil being too sweet (alkaline). Blue Hydrangea flowers can be produced by additions of 1 teaspoon of aluminum sulfate (alum) to a 6-inch pot of soil.

CONTROLLING INSECTS AND DISEASES

Insects.—Insects are troublesome on many house plants. Lack of vigorous growth, yellowing of foliage, and imperfect flowers are caused, frequently, by insect infestations. Unless controlled they spread rapidly and may cause death of the plants.

Most insects and animal pests may be classified for convenience as *chewing* or *sucking*. Punctured leaves or those nibbled at their edges are the result of chewing insects. The sucking insects sometimes turn the leaves yellow. It is important to bear in mind that insects work chiefly on the underside of the leaves. Consequently, insecticides to be effective must cover both the

lower and upper surfaces of the foliage. Frequently, more than one application of the spray is necessary.

Chewing insects seldom attack house plants. If they do, the easiest and best method of destroying them is by hand picking. Drop or shake them into a vessel containing kerosene or gasoline, and your worries are over. Where many plants are attacked a dust or spray of arsenate of lead will kill the insects.

The sucking insects are more numerous. Among this group are included the common aphids or lice, red spider, thrips, white fly, mealy bugs, and scales. Aphids, which are small green insects, are the most common pests on house plants. Often they are found sucking the juices from succulent tips of shoots



Fig. 4.—Asparagus Ferns. Sprenger's Asparagus (on the left) trails downward, and is good for hanging baskets. Plumose Asparagus (on the right) is a lacy variety which can be trained to climb.

and the undersides of leaves. If only a few plants are infested, dip the plant into a solution of nicotine sulfate dissolved at the rate of $1\frac{1}{2}$ teaspoons to a gallon of soapy water. A better way is to spray the plants with this solution. Pyrethrum sprays are also effective.

Red spiders are more difficult to control than aphids. These creatures are small red mites barely visible to the naked eye. They cause a mottled yellow appearance to the leaves. The mites protect themselves with a web which may cover the entire lower side of the leaf. A strong spray of water is often effective in destroying these insects. Powdered glue, dissolved in lukewarm water at the rate of $\frac{1}{4}$ pound to 2 gallons of water, when applied as a spray is destructive to the red spider without injuring the foliage. Sponging the

foliage with water for three or four successive days will remove all the dead creatures and the glue. Other types of mites may cause curling of the margins of the leaves and flower buds. The same insecticide may be used for all mites.

Thrips scrape the undersurface of leaves and suck the juices, causing the leaves to turn yellow. When they are discovered, spray with a pyrethrum product. White fly is common on most household plants. Ferns are affected chiefly. Because of the active habits of the fly, it is difficult to control. In greenhouses hydrocyanic gas is effective, but since it is very poisonous its use in the home is not recommended. Several sprays, including pyrethrum, nicotine sulfate, and oils, are effective on the young which develop from minute eggs.

The soft, reddish-brown bodies of mealy bugs are thickly covered with a white, waxy substance which is difficult to penetrate with most insecticides. Oil emulsions are the most effective, although a thorough job of spraying is necessary to secure good results. A strong stream of water is used, occasionally, to wash off the insects from the plants. Usually they collect in the crotches of the stems, making it difficult to wash them off. They are particularly fond of Coleus and Crotons, but are found also on some other plants.

Scales are of many kinds and shapes—globular, elongated, and irregular. All are raised and visible to the naked eye. After the hard outer shell is formed the insects cease to move around. They cause injury by piercing the stems or leaves, and by extracting the plant juices. Oil emulsion sprays will suffocate the insects, causing their death. On ferns the brown spores on the underside of the leaves are mistaken often for scales. These brown spores are seeds and not insects. The spores break down into a fine dust when touched, while the scales have hard shells, which upon removal are easily identified as insects.

Soil pests, like earthworms, root lice, and maggots, may at times be troublesome. When earthworms are too plentiful a light dressing of lime applied to the soil and watered in will hold them in check. Tobacco dust or stems added as a light covering to the soil will destroy the maggots and the root lice.

Diseases.—Only occasionally are house plants affected with diseases. When plants turn yellow or otherwise appear sickly, the cause may be attributed to improper care, too much water, an insufficient amount of light, extremes in temperature, poor aeration, or improper feeding with fertilizers. In severe cases it is best to throw the plants away. In mild infestations remove diseased portions, such as leaves, and burn, and reduce the amount of water supplied to the soil.

The common symptoms of disease are as follows: on leaves—colored spots (brown, black or gray); on stems—cankers (as on roses), mushy discolored tissue close to level of the soil; on roots—shriveled or soft, and the absence of small white roots at tips of the larger roots. Dusting with sulfur or spraying with bordeaux mixture should keep these diseases under control.

Care and Management of House Plants



SPRING AND SUMMER CARE

During the warm weather of spring, summer and early fall, house plants do best in cool, shaded places. With the increase of temperature, such insects as red spiders and aphids take on a new lease of life and making living conditions for the plants unpleasant.

The outdoor garden helps to solve the problem. A shady section of the garden will do wonders for potted plants during the summer months. Here many of the flowering plants will bloom again if they receive the proper care. Among these are Fuchsias, Begonias, Primroses, Azaleas, and Hydrangeas. It is a good practice to prune back the branches before removing the plants outdoors. Any time after frosts are past, which is usually after the middle of May, it is safe to remove the plants from the house. The method used by florists is "plunging" or sinking the pots in the ground almost up to the rims of the pots. For best results the soil in which the plants are plunged should drain rapidly.

In a partially shaded spot, the plants will require little care during their vacation outdoors. During drought or very hot days careful attention to watering is necessary.

Flowering shrubs, including Lilacs, flowering Almonds, and hardy Roses, which are grown sometimes as house plants, may be removed from their pots and planted out into the garden in late spring. It is important to prune back the tops and loosen the soil about the roots before planting.

Between the middle of September and the first of October is the best time to lift the pots out of the ground. After cleaning the pots and examining the root development by knocking the ball from the pot, the plants may be moved into their fall and winter quarters.

Many of the bulbous plants, including the Tulips, Daffodils, Hyacinths, White Narcissi, and Crocuses, will often bloom again the following year if they receive proper care. After blooming in the house allow the bulbs to die back normally, gradually reducing the amount of water; finally, in spring, remove the dried leaves and store the bulbs in a cool, dry place until fall when they can be planted in the garden. Other bulbous plants like Calla Lilies and Amaryllis should be dried off after flowering by tipping the pots over on their sides and allowing them to remain in this position without water until September. After this rest the bulbs may be repotted and handled like any other plant. Gloxinias and tuberous rooted Begonias should be cared for in the same way. Cyclamens are difficult to carry over. It is usually best to purchase new plants grown from seed from a florist.

ANNUALS AND PERENNIALS USED AS HOUSE PLANTS

Many annual flowers are used as house plants. Several kinds, including the Snapdragons, Marigolds, Ageratum, Calendulas, and Zinnias, mature

early and drop their seeds to the ground. These seedlings may be transplanted to small pots and grown as house plants. Frequently the older plants may be potted if they are severely pruned back to stimulate growth. In fact, nearly all house plants will be more sightly if the branches are cut back. A more balanced and shapely plant will result from this practice.

A few perennials, in small clumps, do well in the house. The kind to select are those which bloom continuously throughout the summer, as Gerberas, Gaillardias, Pinks, and hardy Chrysanthemums. Perennials like Delphiniums, Phloxes, Campanulas, Coreopsis, Poppies, Aconitums, and Larkspurs, require comparatively long rest periods, and therefore do not make good house plants. If some of the latter group are allowed to freeze, then lifted some time after January, potted, kept in a cool place for about a week and then gradually removed to a warmer location, the plants can be forced successfully into bloom.

POTTING OF PLANTS

How to Pot.—The task of potting is not difficult. Coleus, Hen-and-Chickens, Vinca, and other plants grown in the flower garden can be lifted and grown as house plants. Select a clay pot only slightly larger than the "ball" of soil surrounding the roots of the plant. Place a piece of broken crockery or cinders at the bottom so as not to plug the drainage hole. This opening permits excess water to drain out through the soil and allows oxygen to come in contact with the roots.

Hold the plant in the center of the pot, sift soil around the "ball" and pack with the thumbs. Wet soil should be partially dried before it is used. Allow $\frac{1}{2}$ inch of space between the top surface of soil and the rim of the pot for holding water. Immediately after potting apply water to the soil thoroughly and place the plant in a shady position for a few days until new roots develop.

Plants to be repotted are handled in the same manner, except that the "shoulders" and the bottom of the "ball" are broken to permit the new roots to penetrate the new soil more easily. Adding some fertilizer to the soil at this time is a good practice. Mix the fertilizer thoroughly with the soil so that it does not come in immediate contact with the roots, otherwise injury to the plant may occur.

Most house plants require repotting at least once each year. When the plants become "pot-bound" producing a mass of roots surrounding the ball of soil, repotting is necessary. Pot-bound plants will continue to grow and flower freely with additions of nutrients but with some loss in vitality. By inverting the plant, holding the crown between the first and second fingers, and tapping the rim on a support the plant is easily removed from the pot (see Fig. 5). Observe the roots to determine if repotting is necessary.

The Kind of Pot to Use.—Small plants placed in large pots grow poorly, the foliage turns yellow and the plants remain dwarfed. The oversize pots hold excessive amounts of water and prevent the entrance of air. Roots forced to grow under such conditions soon become inactive and frequently rot,

Clay pots are porous, permitting the entrance of air, and are preferred to glazed or painted pots which are not porous. The latter require more attention because of the danger of overwatering and because of the exclusion of air. Old pots should be thoroughly washed before using. New ones should be soaked in water for two hours, otherwise the soil will dry too rapidly.

Jardinieres are not satisfactory receptacles in which to grow plants because of their lack of porosity and means of drainage. Even when jardinieres are used as containers for potted plants their value is questionable. Unless care is taken to remove the water which settles at the bottom, injury to the plant is apt to result because the circulation of the air is hindered. If

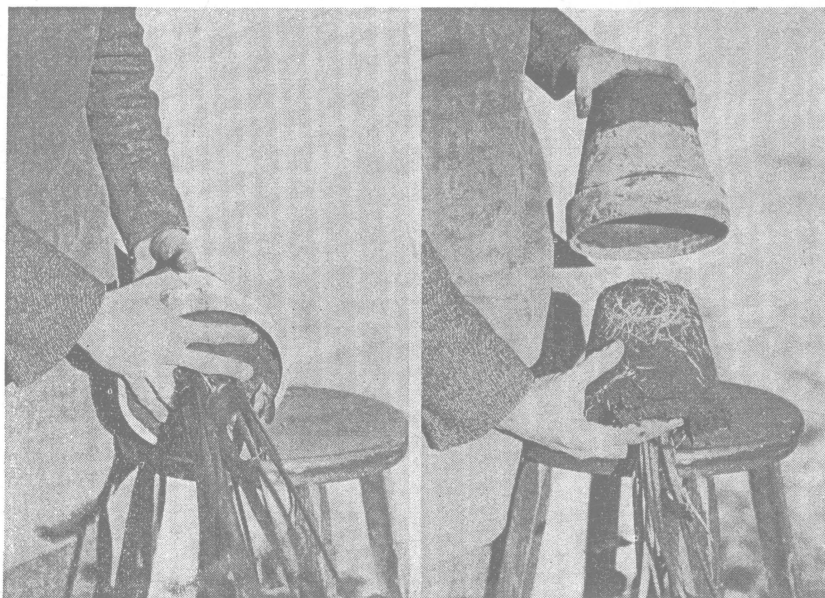


Fig. 5.—To remove a plant from a pot, place the fingers around the plant, invert it, and tap the flower pot lightly so that the ball of earth falls from the pot.

potted plants are placed on blocks within the jardinieres the danger of injury is lessened (see Fig. 2). For large plants, rubbers and palms, tubs make excellent receptacles. Although not so porous as clay pots nor as attractive as jardinieres, tubs will withstand rough handling.

FORCING BULBS IN WINTER

Bulbous plants supply much of the color in the homes during the winter months. They are interesting to watch grow, and are quick to come into bloom after the roots are well developed. Hyacinths, Tulips, Narcissi, Daffodils, Freesia, and Crocuses are some of the most popular kinds.

Pot the bulbs in October, being careful not to cover too deeply. The tips of the bulbs need to be barely covered. Pack the soil well around each

bulb. Place the potted bulbs in a cool cellar, 45° F., or remove to a cold frame, water thoroughly and cover with a foot or more of strawy mulch. If no cold frame is at hand bury the pots in the soil outdoors. After the roots are well developed, about December, remove the soil or mulch and carry the plants to a cool back porch for a week or two. Then place a few beside a window in the house to force into bloom.

Darwin Tulips should not be removed from cold frames or soil until February for they do not force as readily as other types.

Some bulbs, chiefly Hyacinths and paper white Narcissi, may be grown in bowls of water, pebbles, or sand. The requirements are the same as soil grown bulbs, except that the bowls are kept in a cool, dark place in the house for several weeks before being brought into a warm and sunny room. Select the best grades of bulbs for satisfactory results.

After the bulbs which were planted in soil have bloomed, allow the leaves to die down gradually, withholding water. As soon as weather permits, plant them out into the garden, beneath the shrubs or in masses among the perennials. The bulbs will rest during the summer, develop roots in the fall and winter, and in the spring send up foliage and flowers. Hyacinths, Tulips, and others grown in water are not worth saving, because these flowers received all their nourishment directly from the bulbs, leaving little or none for developing new offspring for the following year. Those grown in soil absorbed some nutrients from the soil, and consequently were able better to produce new plants.

PROPAGATION OF HOUSE PLANTS

How to Make and Grow Cuttings ("Slips").—Instead of lifting the entire plant from the garden, cuttings or "slips" are often taken. Cuttings can be made almost any time of the year. If fairly large specimens are desired by fall the cuttings should be made some time in spring before the plants are placed outdoors. The branches removed in pruning the plants in spring or fall make good material for cuttings. Some plants like Wandering Jew and Coleus root very easily, while woody plants like Lantana and Fuchsia require more time and attention.

Cuttings from healthy plants make the best plants. To make a cutting, choose a young, vigorous shoot, one that is not too soft or too hard, and cut off below a leaf where it joins the stem, making a slanting downward stroke. A sharp knife is desirable. Make each cutting about three or four inches long. Remove most of the lower leaves, leaving only about two to three near the tip (see Fig. 6). Plants with large broad leaves, such as Geraniums, need trimmings of the foliage to reduce the amount of evaporating surface. Remove flowers and buds as they appear. Allowing flowers to develop on cuttings hinders root formation.

Sharp, clean sand is the most common rooting medium. When only a few cuttings are made, use a shallow flower pot about 3 or 4 inches high. Small boxes, with the bottom boards separated $\frac{1}{4}$ inch to allow for drainage,

are often used. Cold frames make good propagating beds, if 4 or 5 inches of sand is placed on top of the soil. Pack the sand around the cuttings and water them; do not over-water, otherwise a cutting may rot. Shade the cuttings with newspaper for a week to reduce loss of moisture.

Depending on the time of the year and the plant material, cuttings will root usually in two to six weeks. When the roots are $\frac{1}{2}$ inch long remove them to small pots. Use a good soil without the addition of fertilizers. After a few weeks, when the plants are ready to take up nutrients, small amounts of fertilizers may be applied to the surface of the soil.

Leaf Cuttings of Fleshy-leaved Plants.—Plants like Begonias, Sansevieria, Bryophyllum, Crassula, and Sedums which have thick, fleshy leaves,

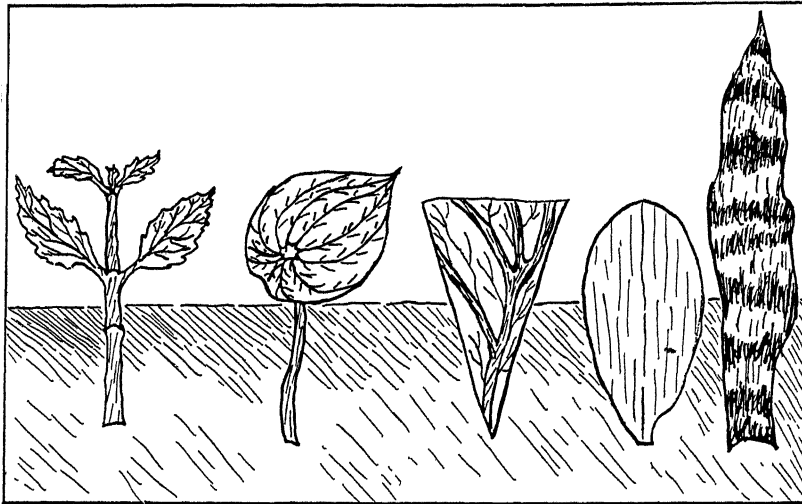


Fig. 6.—Cuttings. Left to right: (1) Stem cutting of Coleus, (2) petiole cutting of Peperomia; (3) wedge shaped leaf cutting of Rex Begonia; (4) leaf cutting of Chinese Rubber Plant (*Crassula arborescens*); (5) leaf cutting of Bowstring Hemp (*Sansevieria*).

are propagated by leaf cuttings. The leaves of Rex Begonias are cut into triangular sections each containing a midrib, and inserted into the sand with the point downward (see Fig. 6). Another method is to cut through the large veins and pin the entire leaf to the sand, covering lightly with sand or peat. New plants will arise from each cut. Other leaf cuttings are made by cutting the petiole close to the leaf blade and inserting the lower portion in the sand to the depth of $1\frac{1}{2}$ inches (see Fig. 6). Still others like Peperomias, Gloxinias, and thin-leaved Begonias are propagated by petiole leaf cuttings. The petiole is placed in the sand to the base of the leaf blade.

For more difficult rooting plants, heel cuttings are used. A small piece of stem is removed with the leaf and inserted into the sand in the usual manner. Rubber plants are handled frequently in this way, although more

time is required to develop a fair-sized plant. The leaves of the plant are rolled and tied with raffia or soft string while in the propagating medium.

Pot-layering of a Few House Plants.—Straggly or large plants like Dracaenas, Lemons, Oranges, and Rubber Plants are propagated by pot-layering. January to March is considered the best time. A cut is made upward about three-fourths of the distance through the stem and about 12 inches from the tip of the plant. Place a small piece of wood in the incision to hold it open. Next cover the cut with wet sphagnum moss and wrap a piece of burlap tightly around it and tie it firmly in place with twine.

Formerly a pot cut in two was used in place of the burlap, from which practice the name, pot-layering, is derived. When the partially severed branch is well rooted it can be cut from the mother plant and potted in soil. This practice will not injure the parent plant.

CARE OF CUT FLOWERS

A direct relationship exists between the care of cut flowers and house plants. The same factors—moisture, temperature, and aeration (ventilation)—are involved in both cases. Unless the flowers receive an abundance of water, wilting will occur or the buds will fail to open. In the case of cut flowers there are no roots to be injured from excess of water; and the stems are the only means through which water is carried to the flowers.

With either cut flowers or house plants the blossoms will wilt if excessive temperatures are maintained. Likewise, high temperatures will cause buds to open rapidly or "pop." Roses illustrate this fact strikingly. Consequently, if flowers are to be kept for any length of time it is extremely important that they be placed in a cool situation. To revive flowers which are kept in warm places during the day, it is a good practice to remove the container with the flowers to a back porch or a similar room where the temperature is low but not below 35° F.

Ventilation, or the circulation of air, is essential for all flowers. Stagnant air permits the accumulation of toxic gases, such as ethylene from gas heaters or stoves. Although a free movement of air is necessary at all times, drafts will shorten the lives of flowers. These sudden changes in temperature injure the delicate tissues of the blossoms, causing them to turn brown or droop. Gardenias are so tender that when they are exposed to the air their petals are oxidized rapidly to a yellow color. Carnations are more tolerant.

Besides the above discussed factors there are a few precautionary measures worth considering. Bacteria, which cause decay, are found always in the atmosphere. As they settle down into the water and come in contact with the base of the stems the tissues disintegrate, clogging the water conducting vessels and preventing the movement of water upward to the flowers; consequently, the flowers wilt. Disinfectants applied to the water will keep the bacteria in check and permit the normal functions of the stem, foliage, and flowers to continue unhampered. Cutting the stems and changing the water each day will do much to prolong the life of the flowers.

To conserve moisture and reduce wilting, cut garden flowers early in

the morning or late in the day. A sharp knife is preferred to any other tools. Shears and the like may pinch the tissues of the stem and lower the rate of water absorption.

As soon as a few flowers are cut, place them immediately in a deep container filled with water. When the stems have absorbed a quantity of water, the flowers are ready to be arranged in the receptacles. However, before starting the arrangement, remove the lower leaves on the stem to permit greater aeration, and to prevent decomposition.

Large open-mouthed containers are to be preferred to narrow-necked vases. More flowers can be placed in the former without crowding. Character, not mass effect, is the goal to strive for.

Flowers like Poinsettias, Dahlias, Poppies, and Heliotrope should have an inch or two of their stems dipped in boiling water and then immersed in cold water, to stop the outflow of cell sap. These flowers will receive water through the outer surface of the stems above the sealed wound.

Flowers borne on woody outdoor plants such as Lilacs, Forsythias, and Chrysanthemums, will absorb water more readily if the stems are slit through the middle for a distance of 6 inches.

Wilted flowers may be revived by cutting their stems short, plunging them deep in water and storing in a cool dark place for 10 hours or more. Hot water treatment is also useful in this case. Immerse the stems in hot water (not boiling water) for half an hour, keeping them in the dark, and then change to cool water. Usually several hours are required for the restoration. Thin petaled flowers should not be immersed in water to revive them, but thick petaled kinds like Hyacinth and Daffodil will be benefited by being covered completely with cold water.



Fig. 7.—Cut roses retain their beauty and fragrance if kept in a cool temperature.

List of House Plants

House plants are two types, foliage and flowering. Although foliage plants are grown primarily for their leaves, many of them will develop flowers and seed under proper conditions. The following list is a fairly complete collection of desirable house plants which are discussed in order of their comparative desirability and tolerance to fluctuations of temperature, humidity, aeration, and general care.

FOLIAGE PLANTS

CAST-IRON PLANT (*Aspidistra lurida*).—This plant easily rates as the most tolerant house plant. It will live for months without direct sunlight; it doesn't object to too much or too little water, and it can withstand fluctuations of temperature. Because of its extreme tolerance the plant is put to many uses.

The leaves are large with long petioles arising from the rhizome. The drooping leaves give the plant a somewhat graceful appearance. Insects seldom attack this plant. An occasional bath will make it appear attractive at all times.

WANDERING-JEW (*Tradescantia fluminensis*).—This is a trailing vine of succulent growth with green leaves, often purplish beneath. Its requirements are few; plenty of moisture, a fair amount of sunlight, and approximately 60° temperature. Any type of soil will do; in fact, it will grow well in water. It is easily propagated by cuttings, placed in water, sand, or soil.

ENGLISH IVY (*Hedera helix*).—Another popular plant, perhaps because it does well in places receiving little sunlight and heat. It takes rapid growth under normal conditions and can be trained to supports for unusual effectiveness. If a bushy plant is desired, the ends of the branches should be pinched off. These removed branches may be used as cuttings to propagate new plants. Occasionally aphids attack the young foliage. A spray of nicotine sulfate will hold the insects in check. The variegated form, Mexican and California Ivy, is attractive but not as vigorous as the ordinary kind.

BOWSTRING HEMP (*Sansevieria*).—There are two species of this plant: *S. zeylanica*, mottled with a light color; and *S. laurenti*, which has leaves with a definite white margin. Either will exist under trying conditions. The leaves which arise from the base are of a fleshy, tough texture. They are propagated by division or leaf cuttings; however, *S. laurenti* will not come true to color from cuttings.

EAST INDIAN HOLLYFERN (*Polystichum aristatum*).—This is one of the most tolerant of all ferns for the house (see Fig. 3). It is very easily grown, requires moderate amounts of water, and prefers shade. The plant grows 12 to 18 inches tall and each leaf is 12 to 24 inches long and 10 inches wide. Although coarser in appearance than the Boston fern, it is very vigorous in habit and stands rough treatment.

RUBBER PLANTS (*Ficus*).—These are popular with most people. They are sensitive to overwatering and prefer partial shade. A temperature of 60-65° is best. All rubber plants will do best outdoors during the summer. Frequent sponging will remove dust and eliminate clogging of the breathing pores. *Ficus pandurata* (Fiddleleaf) with its large, fiddle-shaped and deeply veined leaves, is somewhat more attractive than the common *F. elastica*.

CREEPING FIG (*Ficus repens*).—This is a dainty trailing plant with small leaves close to the stem. The dense growth and rich green color make it a desirable plant. It is native to Japan and China.

PALMS.—Many of these decorative evergreens are frequently used as house plants. All require a temperature of about 60-65° F. Although they require plenty of moisture during the summer they suffer from an overwatering in winter. Most palms do best if not repotted too frequently. *Kentia belmoreana* is a graceful plant with rather broad fan-shaped leaves (see Fig. 9). The leaves of the *Phoenix* are finer and more graceful. In its native habitat this species produces dates. *Areca lutescens* is a rapid grower with feathery foliage on long yellow stems.

NORFOLK-ISLAND-PINE (*Araucaria excelsa*).—This plant is a beautiful evergreen, a fairly rapid grower, and quite tolerant. As a small plant it makes an excellent table centerpiece. It requires a medium rich soil and a temperature of 60° F. During the summer it thrives in partial shade.



Fig. 8.—Japanese Grape (*Cissus rhombifolia*).

JAPANESE GRAPE (*Cissus rhombifolia*).—An excellent trailing, evergreen plant with three parted leaflets. Each leaf is about 4 inches long. New plants are grown from cuttings.

ST.-BERNARDLILY (*Anthericum liliago*).—A herb that grows rapidly from stolons like the strawberry plant. Because of its rapid growth and trailing habit it is very useful for hanging baskets. Propagation is most easily effected by stolons, although it is sometimes perpetuated by division or seeds. Usually, the plant does not suffer from the effects of overwatering.

COLEUS.—Among these plants, *Coleus blumei* is the most common cultivated species. To produce a bushy, well-balanced plant the stems require frequent pinching to encourage branching. Full sunlight, high humidity, and a temperature of 60° F. are the cultural requirements. The easiest method of propagation is by cuttings, although seeds germinate readily and provide many interesting variations

in pattern. Mealy bugs are the worst enemies of this plant. Frequent washing and syringing will help to keep the insects in check. Painting the insects with alcohol insures instant death.

UMBRELLA PLANT (*Cyperus alternifolius*).—A peculiar looking plant which derives its common name from the appearance of the foliage, a long petiole with leaves (blade) arranged similarly to the ribs of an umbrella (see Fig. 10.). It is native to Africa and therefore needs a warm temperature (65° F.) and plenty of water. Fertilize occasionally. Sometimes mealy bugs are a serious pest.



Fig. 9.—Kentia Palm, a standard species, able to withstand a dry, heated atmosphere.

Fig. 10.—The Umbrella Plant—of airy gracefulness. It needs plenty of water.

PHILODENDRON.—This is a very interesting and rapid growing vine, although not quite so tolerant as the English Ivy. The leaves are large, bright green, and somewhat heart-shaped. It requires a fair amount of sunlight and much moisture; in fact, stems are frequently placed directly in water in ivy bowls, where they root and thrive if nutrients are occasionally supplied.

BABYSTEARS (*Helxine soleiroli*).—A dainty creeping plant with very small leaves, forming a dense mat. In homes it is found frequently on kitchen windowsills where the high temperature and abundance of moisture are particularly favorable for its development. It thrives in partial shade. Avoid excessive watering during the winter.

SILK-OAK (*Grevillea robusta*).—Not a particularly showy plant, but a very rapid, vigorous grower. In its native land of Australia it becomes a tree 150 feet tall. As a pot plant it produces a slender stem with long horizontal branches with feathery fern-like leaves. The usual method of propagation is by seed.

PERIWINKLE (*Vinca minor*).—An excellent vine for window boxes and wall vases. The variety with variegated foliage is most attractive.

LEOPARDPLANT (*Ligularia kaempferi*).—This plant is used chiefly for its spotted foliage of white, yellow, or pink. New plants are started by cuttings or division.

BOSTON FERN (*Nephrolepis exaltata bostoniensis*).—One of the most popular house plants, although many people find it difficult to grow properly. Ferns are sensitive and require a temperature between 65 and 70° F.; lower or higher temperatures may cause poor growth. Poor drainage, together with overwatering, will turn the leaves yellow. Oversized pots create excessive moisture in the soil. High humidity (air moisture) is essential, which may be provided by frequent washing of the leaves. A partial shade is preferred to direct sunlight. All ferns are propagated by runners or division. Be on the lookout for white flies, aphids, and scales.

ASPARAGUS FERN.—This fern is a native of South Africa. The species *A. Sprengeri* and *A. plumosus* are the two most common types used as house plants. Both produce long fronds which occasionally bear red to black berries (see Fig. 4). Overwatering and a hot dry atmosphere will cause the leaves to drop.

HOUSE HOLLYFERN (*Cyrtomium falcatum*).—This interesting plant has dark green, glossy, pinnate leaves. The fronds are long and graceful.

DUMB CANE (*Dieffenbachia brasiliensis*).—Grown as a potted plant because of its broad, 5 to 7-inch variegated leaves. It is propagated from short stem cuttings, planted horizontally in sand. The natives of Central and South America become temporarily paralyzed from chewing the canes, the juice of which has a spicy taste.

CHINESE RUBBER PLANT (*Grassula arborescens*).—A slow growing plant with very fleshy, oval leaves, and a thick stem, growing well in partial shade with moderate amounts of water. Most Japanese gardens contain at



Fig. 11.—Dumb Cane (*Dieffenbachia brasiliensis*).

least one of these plants which are propagated from tip cuttings or the fleshy leaves. A warm temperature with moderate humidity is necessary.

NANDINA (*Nandina domestica*).—An evergreen shrub native in China and Japan. As a house plant it makes an excellent specimen with its thin branches, bright red berries, and delicately colored leaves. It thrives in shady or sunny positions. Seed is the usual method of propagation.

COPPER-LEAF (*Acalypha macaefana*).—A colorful plant, with copper colored leaves. It is propagated by heel cuttings. A temperature of 65° F. is best.

SCREWPINE (*Pandanus*).—The most common species of the Screw-pines is *P. Veitchi*. The leaves are long, variegated, sword-like, with sharp teeth on the margins (see Fig. 12). It objects to excessive moisture in the winter and insufficient sunlight. New plants are produced by offsets.



Fig. 12.—Screw-pine—a plant which props itself above the soil surface.

DRACENAS (*Dracaena*).—Beautiful plants, grown for their variegated foliage. The genus *Cardylina* is similar to *Dracaena*, differing only in the flower parts. *Dracaena* (Corn-plant) is most common, with its large corn-like leaves. *Cordylina* (*indivisa*) has long, drooping, narrow leaves. The leaves of *D. godseffiana* are in whorls or opposite on the stem, 3 to 4 inches long, with numerous white flowers are greenish yellow. *C. terminalis* has large leaves (12 to 30 inches long by 3 to 4 inches wide) in many colors. *D. goldieana* is a fine foliage plant with its broad rounded leaves (7 to 8 inches long and 4 to 5 inches wide) of white and green bands. Sponging the leaves with water at frequent intervals will improve their growth. Moderately warm temperature is necessary. The leaves will brown if overwatered.

BIRDSNEST FERN (*Asplenium nidus-avis*).—This interesting plant is sometimes grown as a house plant. The leaves are broad and of a delicate green color. The arrangement of the leaves suggests a nest for birds. Strong sunlight will spot the leaves, and too much moisture may cause a loss of color.

Small plants such as *Pteris fern*, *Peperomia maculosa*, *Mesembryanthemum*, *Peperomia microphylla* (*Artillery Plant*) find use as potted plants. Because these plants are usually slow growers, small sized pots are best. Full sunlight is required.

FLOWERING PLANTS

Most of the flowering house plants are best grown if purchased as small plants from the florists. Home germination of seed is not very satisfactory.

LEMON, ORANGE, AND GRAPEFRUIT.—These are the most common citrus plants used as house plants. Of all flowering plants these are the most tolerant. They thrive in the high temperature of the average home. Although tolerant to shade they grow better in full sunlight. Overwatering is objectionable only in the winter. They react favorably to additions of complete fertilizers at frequent intervals. On mature plants scales are troublesome occasionally.

GARDEN BALSAM (*Impatiens balsamina*).—An old-fashioned plant popular to most people. The stems and leaves are quite succulent and the flowers are of various colors borne close to the stems. Pinching the terminal growths keeps the plant bushy and shapely. It thrives in a fertile soil in direct sunlight when supplied with plenty of water. It can be perpetuated by seeds or cuttings.

CALLA LILY (*Zantedeschia aethiopica*).—This species of Calla Lily is well known to most people. After flowering in June the bulbs are dried off completely in September and then started into growth. Frequent watering with ammonium sulfate, 1 ounce to 2 gallons of water, supplies sufficient nutrients to make the plant bloom freely.

AMARYLLIS (*Amaryllis hybrida*).—One of the South African bulbous plants with large lily-like flowers. It is a vigorous grower and indifferent to adverse conditions. After flowering, allow the plants to die down naturally and occasionally withhold the water. Place the pots of dried bulbs and soil outdoors until they then bring them into the house and keep dry until the middle of December. At this time repot the bulbs into a good fibrous loam soil and handle like any other bulbous plants. Never force the bulb into growth before it has had the necessary rest.

CIGAR-FLOWER (*Cuphea platycentra*).—A native of Mexico. The flowers resemble a cigar, with their bright red calyx and white mouth with a dark ring at the end. It is easily grown in the house and is propagated by seeds.

GERANIUM (*Pelargonium*).—Includes many species, such as the Fish Geranium, one of the most common house plants. The Lady Washington Pelargoniums

are smaller leaved, many flowered, white to red with black blotches on the upper petals. Madame Sellori, a variety of the Fish Geranium, is characterized by its variegated leaves. All species prefer plenty of sunlight and an abundant water, although overwatering during the winter may cause the leaves to drop. A temperature between 65 and 70° F. increases flower production. Application of fertilizer in fall and spring will improve the quality of the foliage and flowers.

BEGONIA is another old favorite. Many species are grown but not with satisfactory results. *B. semperflorens* is the most tolerant. The leaves are glabrous and somewhat succulent and the white, pink, and red flowers are numerous. A mold or peaty soil is best. Begonias require protection from direct sun and amounts of water, especially in the spring. They are easily increased by cutting.

FUCHSIA (*Fuchsia hybrida*).—A house plant in use for many years. When allowed to grow spindly it becomes unsightly, but when kept pruned back it remains a fine, bushy plant. After flowering in the fall, allow it to mature completely and store away in a cool place, with an occasional watering, until January or February. At this time repot and start the plant into growth. If the winter blooming variety is grown, give the plant a rest during the summer and repot in September.

PRIMROSE (*Primula*).—There are many species, but only three are widely grown, namely, *P. obconica*, *P. malacoides*, and *P. chinensis*. The *P. obconica* is the large flower type, but is objectionable to some people, as it sometimes causes a skin rash. *P. malacoides* has small flowers well above the foliage, while the *chinensis* produces its flowers among the foliage. Primroses thrive at a temperature of 55-60° F. in full sunlight, and are sensitive to overwatering.

CINERARIA.—This is another easy plant to grow. The cultural requirements are the same as for the primrose except that it requires more water and an abundance of sunlight. Aphids, red spider, and white fly have a strong affinity for this plant.

CYCLAMEN (*G. persicum*).—A plant sensitive to water requirements. Once it receives a check in growth a long time is required to recuperate. It requires a cool temperature, much sunshine, and careful watering. If repotting is necessary be sure that the surface of the swollen stem (corm) appears above the surface of the soil. Cyclamen mite is sometimes a serious pest which can be controlled by spreading a few crystals of paradichlorobenzene on the soil. Aphids are easily killed with a spray of nicotine sulfate. It takes a florist 18 months to produce a flowering plant from seed.

ROSES (*Rosa*).—Many species make good house plants if given proper attention. A temperature of 60° F. is most desirable. When the plants are in flower a lower temperature and less water is essential. In the spring they may be placed out into the garden. Red spider is the most serious insect to fight. Frequent washing and syringing with water will give satisfactory control when applied during bright, sunny days. Dust with sulfur to prevent the spread of mildew, a white powdery growth which appears on the leaves.

POCKET-BOOK PLANT (*Calceolaria hybrida*).—A very attractive plant. The flowers are shaped like an open purse, and are of many brilliant colors. Good drainage is essential. A good fibrous loam soil will produce quality plants if grown at a temperature not above 50° F.

POINSETTIA (*Euphorbia pulcherrima*).—This is the favorite Christmas flower. While the plant is in bloom, refrain from adding much water. During its growing season it requires a temperature of 65° F. and plenty of sunlight. Avoid sudden chills. The plant is propagated by cuttings taken in early summer from plants carried from the previous winter. If the flower is cut from the plant, dip the end of the stem into boiling water or sear with a flame to prevent bleeding.

The true parts of the flower are not the large red, modified leaves, but the small appendages in the center.

HYDRANGEA (*Hydrangea*).—This beautiful plant seldom makes a good house plant because it is impossible to satisfy its needs in the ordinary home. It requires a cool temperature, an abundance of water, and an acid soil. If hydrangeas are desired in the home it is best to secure the plants from a florist while they are in flower. In spring transplant to a place in the garden having an acid soil. Protected the first year with a mulch they overwinter well outdoors. To be used again as a house plant they require a light freezing before lifting. Keep the plants in a cool place until December and then force into growth.

GLOXINIA (*Sinningea speciosa*).—An interesting plant. The flowers are large and bell-shaped, in velvety colors of violet, to red, or even white. It requires a warm humid atmosphere and partial shade. After blooming, the tubers should be stored in a cool place until February when they may be started into growth. Be careful not to wet the foliage. Flowering plants can be produced from seeds or cuttings in about twelve months.

AGERATUM, HELIOTROPE, LANTANA.—These are all grown occasionally as house plants. They all require full sunshine, a moderate amount of water, and a temperature of 60-65° F.

LILY-OF-THE-VALLEY.—This fragrant flower responds quickly to indoor forcing. The "pips" or roots are sold by many florists. The greenhouse pips can be forced any time after September. The garden plants may be lifted in February for forcing in the house. Plant the pips in a box of sand placed near a radiator or sunny window where a temperature of 65° can be maintained. In about three weeks the flowers will be ready to cut.

The pips may be dug in the fall and left outdoors to freeze until ready to force. After they have bloomed they may be replanted in the garden.

AQUATIC PLANTS FOR THE FISHBOWL

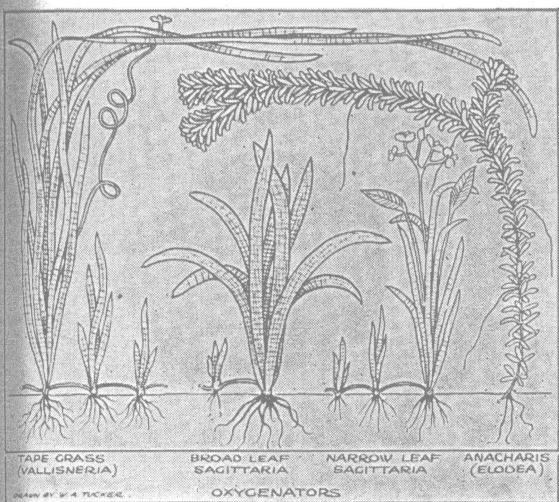


Fig. 13.—Plants for the aquarium.
(Courtesy Walter A. Tucker Company)

Fishbowls and small aquariums are improved by the addition of a few aquatic plants. Besides improving the appearance of the aquariums, these plants release oxygen which is required by the fish.

Where a sufficient number of these oxygenating plants is used, changing water is unnecessary.

The following plants are commonly used:

TAPE-GRASS (Eel Grass) (*Vallisneria*).—The best plant for small aquariums. It is a moderate grower and will not clutter up the bowl too quickly. Plant the roots in sand at the bottom of the bowl. About six plants to a 2-gallon bowl are sufficient.

ELODEA.—A rapid-growing plant in sunny positions. Frequently it is necessary to remove some of the new growth to prevent overcrowding.

SAGITTARIA.—This is a coarser plant than *Vallisneria*, used chiefly in large-sized bowls.

CABOMBA.—A plant that grows entirely submerged. The flowers are white with two yellow spots.

FLOATING PLANTS

SALVINIA BRASILIENSIS.—A plant which has soft, circular, green leaves with delicate hairs on the surface.

WATER LETTUCE (*Pistia stratioides*).—This plant forms a loose rosette of green corrugated leaves producing striking resemblance to the garden lettuce.

INDOOR POOLS

It is recommended, in making an indoor pool, that a gallon of water be used for every 2-inch goldfish or 4-inch tropical fish.

UMBRELLA PLANT (*Cyperus alternifolius*).—A sedge which is both an aquatic and a house plant. Placed in shallow water it thrives well (see Fig. 10).

BROOKLIME (*Veronica americana*).—This makes a good creeping plant to the edges of the pool. It has light blue flowers.

HORN FERN (*Ceratopteris thalictroides*).—Grows rapidly in shallow water. The feathery fronds are interesting.

CACTI

The growing of cacti in small bowls is popular with many people. Their peculiar shapes and habits of growth attract attention. Very few of the cacti will bloom in the average home, but in their native habitat their flowers are extremely beautiful. The only cactus which blooms under house conditions is the Christmas Cactus, with red flowers, which blossoms at Christmas.

Most species will grow in a sandy soil, and but little water is required by these plants. An occasional sprinkling of water over the plant will suffice. A temperature of 65-70° F. is desirable.

WINDOW AND PORCH BOXES

To soften the stiffness of architectural features and to add a touch of color and life, window boxes are in demand, and play an important role. Before erecting any of these boxes, be sure that they will harmonize with the style of architecture.

Where two or more windows are grouped on one side of the house, place a box beneath each window in order to maintain balance and unity. Likewise, it is important to consider the plant material in relation to the color and composition of the building. Reds and purples are not desirable against a red brick wall, and yellows and whites are not distinctive with a light stucco background. In other words, light colors should be used against dark materials, while dark colors will be more effective against light backgrounds.

mixture of colors is undesirable since such a conglomeration lacks character; however, green foliage plants help to soften brilliant and mixed colored plants.

The wooden box is considered most desirable. Its depth and width are of importance. Narrow and shallow boxes do not permit proper arrangement and growth of the plants. A depth of 7 to 8 inches and a width of 8 to 9 inches will satisfy the usual requirements. Drainage should be supplied to the boxes in the form of cinders at the bottom and a $\frac{1}{4}$ inch space between the bottom boards. A medium heavy garden loam mixed with well-rotted manure or peat will provide a good medium for growing most plants. With an ordinary sized window box, 6 feet long, 4 ounces (or 8 heaping tablespoons) of fertilizer watered into the soil about every three weeks will keep



Fig. 14.—Porch boxes used effectively.

the plants in a good growing condition. The box should be filled with soil to within 1 inch of the top to allow for watering.

A pleasing effect is produced by placing the tallest plant at the center, with smaller plants on either side, and about three to five ivies located around the edges of the box.

An over-abundance of vines creates a heavy appearance. Viewing from a distance the house where vines predominate and are long, the building may appear lower than it actually is, producing an optical illusion.

After planting, water the plants well. Thoroughness of watering is essential at all times. Light watering draws the roots to the surface of the soil, and during dry weather may cause injury to the plants.

Good flowering plants are as follows: Petunia, Heliotrope, Marigold, Lantana, Mexican Zinnia, Geranium, Ageratum, Phlox, Portulaca, Salvia.

Verbena, Bachelors-button, Pink, Fuchsia, English Daisy, and Nasturtium. Practically all of the flowering plants do best in full sunlight. However, Snapdragon, Aster, Sweet Alyssum, Pansy, Chrysanthemum, Lobelia, and Candytuft will grow in partial shade.

Foliage plants for window boxes are more numerous. For sunny places use Pandanus, Dusty Miller, German Ivy, English Ivy, Coleus, Dracaena, Croton, and Acalpha. For shady positions the following are good: Asparagus Ferns, Boston Ferns, Anthericum, English Ivy, Pandanus, Wandering Jew, Vinca, Sansevieria, Iresine.

Porch boxes are handled in the same manner as window boxes. Figures 14 and 15 show summer and winter effects.

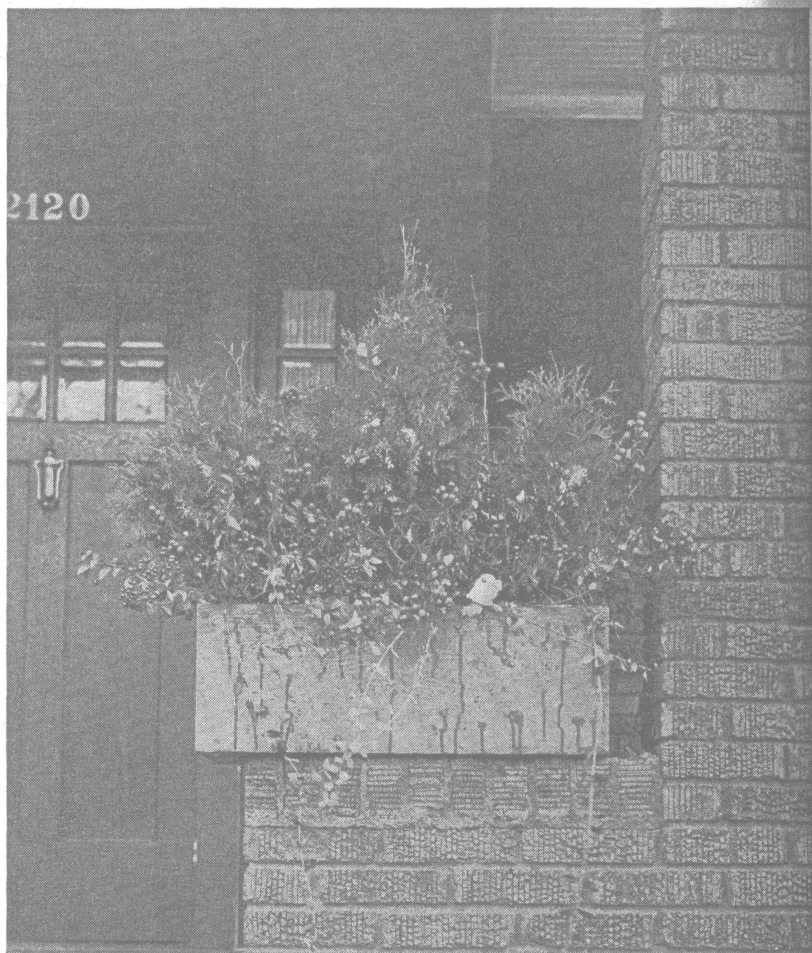


Fig. 15.—A winter porch box containing evergreens: (1) Pyramidal Arborvitae; (2) Globe Arborvitae; (3) Red-leaved Euonymus vines; and berried twigs of Hawthorn and English Privet.

WINTER BOXES

With the coming of frost the flowers in the window boxes become a thing of the past. What to do with the boxes until the following May or June becomes a problem for consideration. Why not plant them with small evergreens? Three to five of these plants will fill most boxes, and will provide a mass of green throughout the winter. In spring these evergreens may be used in landscaping the grounds about the house.

Frequently, many of these evergreens will live only until the following spring, so that it pays to purchase small, inexpensive plants, such as the Norway Spruce (*Picea excelsa*) and White Spruce (*Picea alba*). Small pines, like Scotch Pine (*Pinus sylvestris*), the Austrian (*Pinus australis*), and White Pine (*Pinus strobus*), may be secured at low prices. Others that may be used are the Globe Arborvitae (*Thuja globosa*), Irish Juniper (*Juniperus hibernica*), Flame Retinospera (*Chamaecyparis plumosa*), *Chamaecyparis squarrosa*, and *Euonymus carrierei*. A few good evergreen vines are English Ivy, *Euonymus alaticans*, and *Euonymus colorada*.

In place of living plants, evergreen branches may be used to provide winter color. It may be necessary to replace fresh branches about three times during the winter. In removing the branches be sure to use a sharp knife so that the growing plant is not injured. Balsam (*Abies balsamea*) holds its needles well and its fragrance makes it still more desirable. Pines and spruces shed their needles quickly when severed from the mother plant. However, the large and small brown cones of pines and spruces are charming and are attractive when fastened to other evergreen boughs. Junipers, Retinosperas, and Arborvitae are not satisfactory.

Branches of deciduous shrubs with colored berries may be used effectively with evergreens for color contrast. The red berries of the Japanese barberry (*Berberis thunbergii*), Winterberry (*Ilex verticillata*), Washington Hawthorn (*Crataegus cordata*), and the Japanese rose (*Rosa multiflora*) are very effective; the blue to black berries of English Privet and the Buckthorn (*Rhamnus carthartica*), and the white berries of the Snowberry will withstand the winter weather.

Evergreens grown in small wooden tubs, placed beside doorways or porch steps, will supply an additional touch of color and attractiveness during the winter. If the soil is kept moist, most of the evergreens will survive and may be used about the garden in the spring.

FERNERY

Most homes have at least one corner in the living or dining room which would be improved by the addition of a fernery. Wicker stands which will hold approximately three or four large potted plants are excellent containers for grouping plants within the house. Even one large Boston fern with an asparagus fern on either side will do wonders in brightening up the home. Two flowering plants combined with one or more foliage plants will supply color.

Any of the house plants may be used in these ferneries, but to have an effective grouping beware of overcrowding. Three or four plants are usually more effective than a miscellaneous mixture. Best results are obtained by placing the potted plants in the container instead of removing them from the pots and planting them into soil. Better control of moisture conditions is secured by the former method.

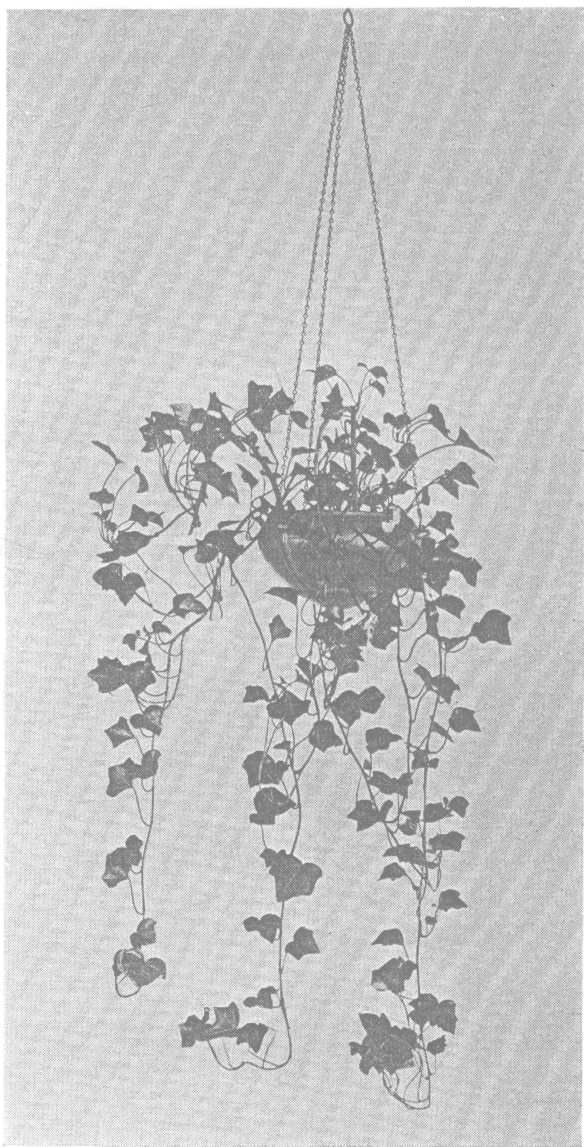


Fig. 16.—A hanging basket of English Ivy.

HANGING BASKETS

Round bottom wire frame baskets are used for hanging baskets, as a rule, although rustic wood and pottery are used occasionally.

Before filling the wire or wooden baskets it is necessary to line the sides and bottoms with sheet moss to retain the soil.

The same procedure is followed with hanging baskets as with window or porch boxes. Because the baskets are hanging overhead and somewhat out of sight, their proper water requirements are often overlooked.

Plants that are effective in a hanging basket are English Ivy, Sprenger's Asparagus, Wandering Jew, Coleus (Trailing Queen), German Ivy, Thunbergia alata, Moneywort, Trailing Honeysuckle, and Trailing Lantana.

GLASS GARDENS

Glass gardens are not new. Wardian cases, airtight glass boxes, were used early in the 19th century for shipping plants between foreign countries. Propagators used these cases for perpetuating plants, and even to this day Wardian cases are used by florists.

Recently a Miss Ruth Barry, St. Louis, Missouri, successfully grew small gardens within glass globes. Large-sized fish bowls produced the best results. A few handfuls of drainage material, small stones or broken crocks, along with a similar amount of charcoal, were placed at the bottom of each bowl. A mixture of equal parts of garden soil, leaf mold or peat, and sand



Fig. 17.—A glass garden.

was next prepared. The bowl was filled about one-third full of this soil and well watered. Green moss placed between the soil and the glass made it still more attractive. Slow growing plants were selected, some collected from the woods, or along streams, or cuttings were made from many of the common house plants, including the begonia, coleus, ferns, and others. Seedlings of pines, spruces, and cedars were considered desirable. Plants with succulent leaves and stems are not satisfactory in a glass garden.

The arrangement of these plants is left to the imagination of the gardener. Effective scenes are made, similar to dish gardens (page 32). Small rockeries, ferneries, or pastoral scenes are often attractive.

When the garden is completed, fit a flat glass over the opening and place the arrangement in a north window where the rays of the sun are not strong.

Direct sunlight will injure the enclosed plants. The moisture conserved on the inside of the bowl is sufficient to keep the plants moist and fresh for a long period of time. If a gray mold appears on the soil or plants, push the lid to one side and allow air to enter for a few hours. Occasionally, about every month, examine the soil to see if it requires any water.

DISH GARDENS

Dish gardens are more than a fad, for they furnish a source of interest for each member of the family. Japanese gardens may become tiresome but plants arranged to represent rural scenes of various countries provide an unlimited opportunity to visualize such pictures. Some dish gardens are modelled after pictures, parks, formal gardens, and castles. In the case of a castle replica, a moat with water spanned by a rustic bridge may be built into the scheme. Still another idea is to construct an island with water all about. If the bowl is large enough, small goldfish may be placed in the water.

To separate the water from the island plants, walls made of stone, tile, or any other material impervious to water will work satisfactorily. A mixture of cement, plaster of paris, and water will make an excellent mortar.

Bowls of all kinds may be used in building these gardens. The material may be of glass, clay, or even wood. Wooden mixing bowls painted on the inside with white lead or a cement mixture make ideal receptacles. The outsides may be painted with colors which harmonize or contrast with the plants to produce interesting effects.

PORCH GARDENS

In cities, where apartments are looked upon as a necessary evil, and where small front or back porches afford the only communion with nature, a small garden may help to alleviate the monotony of masonry. Many gardens and house plants may be used effectively. If space permits, pyramidal evergreens planted in small tubs may be set in the corners of the porch (see cover page). Along the sides ordinary window boxes may be set and filled with peat. The plants used in filling the boxes may be kept in the pots with peat packed around them. The peat should be soaked before using, since its initial absorption is very slow. Because of its capacity to retain water this material will keep the plants in a moist condition. It is necessary, however, to apply water occasionally as even peat dries out. Frequent syringing of the foliage will help to keep pests under control and reduce transpiration from the leaves.

If there are railings around the porch, vines may be used as a background for smaller plants grown in the front.

Annual flowers are the best to use because of their rapid growth. Small plants purchased from a local florist will insure a good start. Some people prefer to grow their plants from seeds. If this is practiced be sure to start the seeds in March or April, so that the plants will be sufficiently large to transplant in the boxes by the end of May.