THE

GARDEN BEAUTIFUL

IN CALIFORNIA

BRAUNTON

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Ernest H. Brammator

THE
GARDEN BEAUTIFUL
IN CALIFORNIA

A PRACTICAL MANUAL
FOR ALL WHO GARDEN

BY
ERNEST BRAUNTON
||
LANDSCAPE DESIGNER
AND HORTICULTURIST

CULTIVATOR PUBLISHING CO.
LOS ANGELES, CAL.

1915

SB453
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\$1.00

NOV 13 1915

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A Poet Laureate's Advice

THIS neither wise, nor tender, nor loving, to remit to others, however expert, the supreme care of one's garden. You will tend yours with your own hands, and discover its needs with your own heart, and if, in doing so, you have to withdraw yourselves sometimes, more than accords with modern wont, into rural seclusion, your social instincts will not thereby be starved, nor your share in the graces and charities of life thereby be curtailed. You will find much resemblance between flowers and human beings, for they too grow reserved under coldness or mal-treatment, and respond with almost feminine alacrity to every sympathetic endeavor to apprehend them."—
Alfred Austin.

A CALIFORNIA GARDEN SCENE
Mission Santa Barbara

THE GARDEN BEAUTIFUL

CHAPTER I

PLANNING THE PLACE

Let us begin our garden making in a sympathetic spirit, seeking to cultivate contentment and peace of mind as well as the soil; to love plants and take pleasure in caring for them; to find relief and relaxation in all gardening operations.

Let us do the best we can with what is at hand or may easily be found nor strive for the spectacular nor regard our work as a task or as a weighty problem. In short, let us be happy, however much or little we may do, for if we make our garden beautiful we shall learn to love it, whether our efforts be confined to the care of a window-box or lavished upon broad acres.

Let us be governed by a desire to please and satisfy, not alone ourselves, but others; not by gaining unusual or unnatural results, but by making all so simple and homelike that every visitor will enjoy the quiet restfulness and sufficiency of the whole, the charm of response to every simple and natural desire. Do not attempt too much. Before beginning the plan—for every garden should have a plan before any work is done—set down upon paper all the things you feel an attractive homelike garden should have.

This does not mean a list of the plants and flowers

you wish—such are mere incidentals—the material with which you build and finish the picture. Begin with fundamentals. Lightly sketch where paths are needed, and have none you do not need. Provide for comfort, interest, even instruction. Will you have an arbor, one or more garden seats, a gazing globe, and where? Are you interested in sundials? If so, have one by all means, for there is no place on earth where the sun shines more than in California, and therefore we may make more use of them than other and less fortunate peoples. Our mild and equable climate allows us to get about the garden with pleasure nearly every day throughout the year.

Have some sort of a water garden, even if no more than a half-barrel submerged to a level with the garden plane; for in a semiarid land having few natural streams, ponds, or lakes, an aquatic feature, however tiny, cannot fail to attract and interest and lend strength and balance to the landscape. Unconsciously we derive a certain amount of comfort from proximity to water, for of all natural elements it is the one most necessary to the preservation of life and health, therefore its simple presence is soothing and satisfying.

WHAT TO AVOID

Do not group garden accessories and conveniences too closely about the house, for every house has at least one porch built for use. Therefore place seats, arbors, etc., as far from the residence as is convenient, for then you avoid any suggestion of competition.

Likewise, and for similar reasons, place ponds, pools and rock gardens quite remote. The house, its interior and immediate surroundings, have, or should have, charms peculiarly their own, and each

part of the garden should in some degree rival their attractions. A really fundamental or basic garden spirit should prevail throughout the grounds so that visitors as well as yourself will feel that the dwell-

A COVERED GARDEN SEAT

ing and its contents are not the only permanent attractions on the premises.

Do not place any object or strive for an effect merely because another has such things. Have your garden smack of originality. If you have elsewhere observed something you desire do not have an exact reproduction, but show your personal taste in slight changes and modifications, weaving in throughout

the whole a thread, even though slight, of originality.

In all phases and considerations, even in the choice of trees, shrubs, vines, etc., that you use, please yourself, yet be guided by the experience of others to the extent of choosing from a list of plants known to thrive in your locality or under similar conditions. The most successful garden is the one that gives its owner the greatest pleasure no matter what he grows.

WHAT TO GROW

Begin garden planting in harmony with natural conditions and needs. Grow only plants that are known to do well under conditions of soil and climate comparable with those obtaining in your garden, more particularly trees and shrubs, for these make the foundation and framework of the garden. If you indulge in a few novelties or tender plants in herbaceous material, they are but incidentals, and if failure results the garden plan is not interfered with, for the fundamental work still stands.

Do not have many kinds of plants, for miscellaneous mixtures seriously detract from the restfulness, simplicity and dignity of the garden. If you have trial grounds for experimental planting then collections of many kinds are desirable, but for a home garden you should rather have many of a kind. In the former numerous labels are a necessity; in the home garden there should be none. Have a plan of your garden on paper; note thereon the position of every plant by number. Jot down these key numbers on the margin of the plan, on a separate sheet, or, better still, keep a garden book of records. After each number place both botanical and popular name of plant. Then labels may come and labels may go, but the records remain forever. When you have

the work under way as herein outlined and have become really interested, then you are indeed under the magic spell of the true garden spirit, the perfect peace (for the time being) that overcometh all troubles and sorrows, that undefined and undefinable natural charm that woos and wins every impressionable soul seeking to build the garden beautiful.

LANDSCAPE OR NATURAL GARDENING

It is nearly 300 years since Francis Bacon said: "God Almighty first planted a garden, and indeed it is the purest of human pleasures. It is the greatest refreshment to the spirit of man, without which buildings and palaces are but gross handiworks; and a man shall see that when ages grow to civility and elegance, men come to build stately sooner than to garden finely, as if gardening were the greater perfection."

There are but three styles of gardening though there are many types. These three are: Formal, or architectural gardening; natural, or landscape gardening; and picturesque gardening; the last but a blending or combination of the other two, which are after all the only distinct styles universally recognized. It is the natural or landscape gardening that we deal with mainly, incorporating only so much of the formal as the problem under consideration seems to require. In landscape gardening we are governed by many rules, of which but three are really fundamental, the others being subsidiary, though all are dictated by nature. These three are in the order of importance: Preserve open lawn centers; plant in masses and not isolated; avoid straight lines. A brief explanation of each rule is here given.

PRESERVE OPEN LAWN CENTERS

A front yard cluttered up with trees and shrubs is never attractive. The simpler picture is the stronger one. The lawn should be left as large and as unobstructed as possible. Many planters, having at their disposal but a small front lawn, usually (and unfortunately) bisected by a cement walk to the front door, feel it incumbent upon them to completely fill the two limited areas by planting some large-growing palms, or other trees, usually two *Phoenix Canariensis*. Having thus planted it is quite impossible to stand in the center of your landscape and see about you, as you should be able to do, a fine variety of plant life.

Those who have lived in the Mississippi Valley or in states farther east will doubtless recall seeing little openings or natural clearings in the woods, consisting of one or many acres. Though in the midst of the forest, the floor or greensward remains inviolate, not a tree or shrub upon it. Grass and herbaceous flowering plants form the cover or carpet; bushes and larger shrubs edge it about; next small trees; and then the forest giants frame the whole, making a perfect amphitheater; a miniature landscape, perhaps, yet complete in every detail. Then may the joyous discoverer stand in the center and see all about him the varied wonders of the local native vegetation. Many a time and oft, in boyhood's happy days, has the author been overjoyed with the finding of such beauty spots and stood spellbound and awed by the overwhelming attractiveness of the scene. Would that puny man could build gardens of equal charm!

Allow your lawn centers to remain open and clear that the whole yard may appear as large as possible;

AN IDEAL PLAN—FOOTPATH ONLY

generous, yet well and fittingly framed with plants, shrubs, and trees on all sides. If you must have a large, spreading palm on a small lot, place it at the side of the house, well toward the rear, or, better still, in the back yard where it may also serve as a shade tree. Yet even there the same rules properly should obtain that govern the planting in front. Better to use fan palms, if you must have palms, or plant the more beautiful *Cocos plumosa*, of which we have some hardy varieties. Avoid, if possible, cutting your front lawn in two equal parts unless a purely formal effect is desired. Rather have the front walk well to one side and thus gain a larger single lawn. This procedure will also allow a graceful, sweeping curve in the approach to the front entrance, a pleasing variation from the usual inartistic straight-from-gate-to-door plan.

PLANT IN MASSES

Plant in masses and not in isolated specimens dotted about here and there; group instead of scattering. Orchards are systematically planted for economic reasons, giving each tree a like amount of space. This insures uniformity of growth and bearing and ease and economy in cultivation, irrigation and harvesting. No such considerations govern the planting of ornamentals. On the contrary, art, with a due regard for utility, is the inspiration of the landscape designer. Therefore, have tree and shrubbery masses irregular in outline, in gently-flowing curves, not abrupt, nor yet in straight lines.

Trees, shrubs and lowly plants should be grouped, each kind by itself, for nature so disposes them, and we should aim to copy nature. In this way you will not only get artistic and natural effects, but also decided character, for planted in this manner every

AN IDEAL PLAN WITH DRIVE

part of the garden stands for one thing, and one only, and there are no duplications in plan or planting.

THIS ILLUSTRATION SHOWS HOW A CITY LOT MAY BE LAID OUT TO CONFORM WITH ALL THE RULES OF LANDSCAPE GARDENING

ing. Therefore, every step forward marks an advance into something new, and from one end to the other "no scene is twice seen," nor anything either in material or effect met with a second time. It would neither be proper, nor pleasing, to find roses and carnations, or pines and acacias scattered thr'gh-out the garden, for all parts would then contain similar effects and character. There would

be no incentive or stimulus for a walk about a garden where one glance at any part would suffice to show the plants and their disposition obtaining in all parts. Some of the finest examples of beauty in arrangement may be observed in the shrubbery masses on shaded hillsides in the wilds.

AVOID STRAIGHT LINES

Nature makes no straight lines; for whether it be the canopy above, the horizon about us, the shore of ocean or lake, the course of streams, the lines of a horse, bird, or other animal, beautiful curves, in variety, everywhere abound. Without some specific guide, such as a taut cord or a straight-edge, man cannot make a straight line. It must then be apparent that nature never expected he should try.

Those who have trampled over freshly fallen snow, though intent upon going in a straight line from one point to another, may easily descry, by looking backward upon their course, the most beautiful and smoothly-flowing curves traced upon earth's otherwise spotless mantle. Even the paths of wild or domestic animals are of most artistic and gentle departure from the monotonous straight line.

Nevertheless, we should not violate the dictates of common sense by instituting a curve or curves in a walk but a few paces long. Curves should not be made that would subject the maker to ridicule, yet they are, otherwise, always permissible, and advisable, if it is possible to have them without showing a strained effect or too great abruptness. If it is found advisable or necessary to make a short or sharp curve, plant in the "bay" a large shrub or tree, or a group or object of a large and permanent nature, made to appear as though present before the path and therefore making the curve a necessity in

order to get around this previously occupied point.

GENERAL ADVICE

Assuming that the garden plat, or at least the part immediately about the residence, is fairly level, the surface should be so graded, if possible, that water will drain from the house toward all points of the compass. The soil for this purpose may usually be taken from near the outer boundaries, or, better still, from an excavation for a pond, something without which no large orderly garden is complete. If you have plenty of soil the lawns may be filled up in and about the center to give a rounded appearance, for natural lawns are seldom or never smooth and flat. The surface should also drain slightly toward the pond site so that the presence of water there will appear natural, being in a depression.

In rebuilding a garden turn under a liberal supply of stable manure over the entire area. If any large trees or shrubs are in the way, leave them if it can be done without too great a sacrifice and make the subsequent or new planting conform so far as possible. Place the pond, if you are to have one, so it will not be shaded by buildings, trees or other large objects; for aquatic life, either animal or vegetable, does not succeed in shade. Planting at the waterside should be confined to the north side and northerly corners. At all other points keep large plants farther away to allow of unobstructed sunshine on the water throughout the day.

The garden should be enclosed on sides and back with a wall, hedge, or vine-covered fence. Along the front it is more a matter of taste, though if the property belonged to the author the fence or hedge should inclose it on all sides; low on front and sides to rear of house, and much higher around the back

yard. Better still would be a low wall along the front and sides, rising to a greater height opposite the rear corners of the residence.

Aside from providing privacy, snugness, and seclusion, such inclosure will keep out would-be intruders, dogs, paper, leaves and other wind-blown rubbish, and catch and hold much of the dust which otherwise would reach the house. It also allows the garden to be finished right out to the edge, which it could not be were it not divided from surrounding property. If the lot is deep the back yard may be cut off by a hedge, but if this is done put it as far back as possible and as low as its purpose will allow, for a large yard is indicative of good taste, liberal ideas, generosity and good-fellowship. The landscape possibilities, too, are much greater, and the general effect more impressive, without division.

FORMAL GARDENS

If a formal, Italian, Japanese or other style of garden is to be incorporated in the plan of a large landscape, it should be set off by a wall, hedge, or fence, so as not to be brought into contrast with the larger and more natural prospect or outlook. Formal or architectural gardens should be built close to the dwelling so that all architectural effects are kept together.

UTILITY PLATS

Utility areas should also be screened from the main prospect, for clotheslines, ash barrels, wood-piles, compost heaps and rubbish piles must not be in view of visitors to the pleasure garden. It is often possible to use pergolas to connect two separate or distinct parts of a garden and also have them as a shield to obscure undesirable features or acces-

sories, but never erect a pergola unless its purpose is apparent to even the casual observer. In no other way do Californians so often violate good taste in

A CLASSIC PERGOLA

garden building as by the erection of purposeless pergolas.

THE BACK YARD

The back yard should be attractive, interesting, and far more homelike and comfortable than the front yard. The same rules of planning should

apply, but they need not be so closely observed. The back yard should be largely a "family affair." If there is insufficient room at the side of the house, toward the rear, for tennis court or croquet grounds, where these are desired, the back yard is the proper place for them.

Here is the part upon which to lavish your homely affections. Have a place in which to swing a hammock and have at least one arbor or covered seat or a playhouse for the children, and if there is sufficient room, have them all, and more. Here arbors may be covered with grapes or other vines of economic value. The ornamental trees and shrubs may be of orange, loquat, avocado, guava, carissa and others bearing edible crops. The herbs may be artichoke, rhubarb and parsley. In the borders may be all sorts of vegetables in clumps and patches; still it may conform more or less to the first rule of landscaping—preserve open centers.

At the extreme rear should be the chief background of the whole picture, a background of some solidarity, whether of fruit trees or a tangled mass of vines over a tall fence. If at the south end of the premises the taller shade trees may be used, planted for ornament, yet where their shade may contribute to the comfort of the household. It may be that a lawn is desirable even though it prove a bleaching ground for the family washing and is centered by a revolving clothes dryer. If grass is thought to involve too much labor in caretaking or too much dampness through watering, here is a chance for lippia, which needs no summer watering, and the more it is trod upon the better it will qualify as a mere soil cover to protect all from either dust or mud, or both. If ash and garbage cans, compost

heaps, or hotbeds are necessary or advisable, screen them off from the general view by means of shrubs or vine-covered trellises, but do not give up making the back yard interesting and attractive for the reason that these things are present. Recognize utility, but do not banish order, comfort and all display of artistic effects.

UTILITY SHOULD GOVERN.

So far as regards approaches and walks to and from buildings, the object of their introduction is sufficiently apparent; but, in laying out pleasure grounds, it is a too common practice to introduce walks for the mere purpose of variety. This is a very questionable reason at best, and not always successfully accomplished; but even in cases of this kind, they should appear to aim for some definite object, or lead to points of sufficient importance to suggest their utility. The guiding principle in designing the position of roads and walks should be utility. Nature forms no roads. They are the works of men and animals, and would undoubtedly always proceed in nearly straight lines from point to point, if obstructions of various kinds did not interfere and cause deviations. Necessity will therefore suggest where and how they should be introduced.

1. NATIVE STRAWBERRY LAWN, *Fragaria Chiloensis*
2. BACKYARD LAWN, *Lippia canescens*

CHAPTER II

LAWNS AND SOIL COVERS

The work of making a fine greensward is the most particular piece of handicraft in the garden, for it is the actual foundation and will never present a smoother or more even surface than the day it is sown.

Slight inequalities of surface will become more pronounced with time; soft spots will settle, while hard places will always remain the highest. Lawn surfaces should therefore be made as smooth and even as possible; mistakes can be remedied only by taking up the sod and making the lawn over. In England they say it takes a hundred years to make a good lawn, and one eastern coast writer says: "Four things are required to make a good lawn; time, soil, climate and intelligent labor." Neither expression fits California, for we do not need time, as it is understood east of the Rockies.

The greensward is the one permanent feature of a yard; therefore, let us have the very best obtainable. Our flower beds may be moved or the plants in other parts of the garden changed every year, but we expect the lawn to remain ever the same. One of the first essentials for a lawn is good soil. Many complain that they have black adobe and "it is so hard to do anything with," but it is the best medium in which to grow a fine lawn, even as sand is the poorest. In enriching the soil it is well to understand that it cannot be made too rich for blue grass. After one gets the surface in proper condi-

tion, the sowing and after care cannot be too carefully attended to; it is a job worthy of a first-class lawnmaker, and no one who can afford to hire help should attempt his own lawnmaking.

MAKING THE LAWN

Close observation for a score of years has convinced the writer that for California in general soil prepared in March and sown early in April will result in giving us the best of lawns, varying the time according to season and prevailing temperatures in your section. Autumn lawnmaking is usually attended with an equal degree of success, but in cold sections the young grass is often caught "in the milk" stage by severe frosts and sometimes killed, though to offset such risk the season offers the welcome rains, for spring-sown lawns necessitate careful artificial sprinkling.

The first work should be a deep and thorough stirring of the soil, without which no crop will grow, whether it be grass or trees. When stirring the soil mix in a liberal amount of well-rotted stable manure (four inches is not too much) and do not be content with merely turning it under where it will lie in chunks for years to come. The full value of fertilizers comes only from thorough incorporation with the soil. Gardeners too often turn under raw bone meal and leave it, a handful in a place. Used in this way it does not all become available to plant life for several years. It should be evenly scattered and thoroughly mixed with the soil and even then it is largely fertilizing for future years.

Stable manures, while more readily available to the plant at any stage, should undergo the same thorough incorporation, for after a lawn is once sown you cannot get under it to stir the soil except

at the added expense of a new lawn. Nearly all fertilizer works make a special fertilizer for this preliminary use, which has the advantage of containing no seeds of weeds or Bermuda grass, which often prove before eradicated more expensive than all other work connected with the making of new lawns.

INCOMPATIBLES IN FERTILIZER MIXTURES

The danger of indiscriminate mixing of fertilizers is shown in the accompanying diagram taken from Farmers' Bulletin 388. Some materials may be mixed with beneficial results, others not. The diagram indicates what fertilizer materials may not be safely mixed. The dark lines unite materials which should never be mixed, the double lines those which should be applied immediately after mixing, and the single lines those which may be mixed at any time.

Because of such seeds being present, all stable manures should be thoroughly rotted. Never use fresh or unseasoned manure in lawn work if avoidable either before or after sowing or for fertilizing old lawns.

After fertilizing and spading let the soil rest until dry enough to work, then tread carefully over every

foot of it with your feet close together. This is not much of a job on small lawns. On large lawns a roller is used, but this does not find the small soft spots as well as your feet, and sufficient time may be spent on a small lawn to do the work properly. This treading will insure an even surface and no future settling. Next rake the low spots full of soil and make firm, leaving the surface just as smooth as a floor if possible, for as you leave it so will it always remain. See that the surface soil is pulverized as finely as possible. If the surface is dry when you wish to sow the seed, give it a very light sprinkling of water and wait an hour or two for it to get past the sticky stage and then sow the seed. Sow very early or very late in the day, if in a windy section, as perfect calm is needed for proper distribution of the light grass seed.

Begin sowing at the rear, using boards to walk on as you "retreat forward," for after the surface is ready for sowing you must not set foot upon it until the first mowing, and even this is best done from boards. After sowing the seed and raking it in, lightly and gently, sow over the surface an inch or so of well-rotted manure which has been sifted through a sieve of not more than one inch mesh. Planing-mill shavings will also do, but they should be thoroughly wetted a few days in advance of use. After this give the lawn a good but very careful watering.

This first watering, as well as subsequent ones, must be given with extreme care and the water uniformly distributed in a fine spray so seeds will not be washed about or little channels made in the soil covering or in the surface soil itself. As soon as weeds are large enough to pull, get boards to kneel

on and weed the grass or whatever soil cover you have sown. Better use two wide boards, one to kneel on and the other for your feet, or the toes of your shoes will spoil much new lawn.

When the young grass becomes tall enough to make the least cutting possible, get at it with a sharp mower and cut thereafter as often as growth makes it possible, for only by so doing will you quickly get a perfect carpet of living green. Either mow the first time from boards or tread very carefully flat-footed while doing the work or you will either seriously tear up the surface or make it full of ugly indentations. To overcome this trouble it is advisable to roll the new lawn several times with a light roller just as soon as the grass is well up; certainly not later than immediately after the first mowing. One pound of blue grass seed will sow 200 square feet, or an area of 10x20 feet. One pound of white clover seed will sow 300 square feet, or an area of 10x30 feet.

CARE OF LAWNS

During even the hottest weather the average lawn is injudiciously watered. Few home owners begin the care of lawns properly or methodically. From the time the young grass appears the inch or two of top soil is given light sprinklings daily, with the result that all roots remain near the surface. If such a lawn goes unsprinkled for even one day during hot weather, it shows distress. After a lawn is well established water only when the grass needs it and then do it most thoroughly. Then, when the surface supply is exhausted, the roots will go down into the moist subsoil in search of water. So treated the grass will finally reach such a condition that if

left unwatered for a few days, or even a week, it will not suffer permanent harm.

Lawns should be cut frequently during hot weather, about once a week, for the reason that it is advisable to make the least possible change in general exposure. If left until very long and then closely cut it will suffer from sunburn in both blade and root. Do not needlessly expose the roots to the summer's sun; therefore, during the hottest weather keep the cutter high, leaving the grass rather long throughout the season, but mow frequently, allowing the short clippings to fall down among the standing blades to form a mulch for the roots. If the cut grass mildews or moulds, as it may during cool or cloudy weather, it may be raked off and subsequent cuttings caught in a hopper, but with the return of sunshine remove the hopper and allow the mulch to re-form.

LAWN GRASSES.

All keen observers will agree that the fine texture, rich green color and smooth even growth of *Poa pratensis*, the Kentucky blue grass, prove it to be more desirable as a ground cover than any other known, and it should be used wherever conditions are favorable to establishment and maintenance of lawn grass. The most closely similar species is *P. arachnifera*, a Texan species. A substitute, used in cheap mixtures, is *P. compressa*, the Canadian blue grass. The latter is flatter, more wiry and bluer than Kentucky grass and is good on dry sand, clay, or poor soils where the others do not thrive. *P. nemoralis*, the wood meadow grass, is good for shady places in woodlands, yet resistant to heat. In the Eastern states *Agrostis canina*, the Rhode Island bent grass, makes a fine close turf of

good color on sandy seashores and should thrive in California. Eastward they also have a "beach" grass known to dealers and botanists as *Ammophila arenaria*, or *arundinacea*, that is successfully used on seacoast embankments to hold dry, loose soils and drifting sands. In California the Australian rye grass is much used for shady places and for lawns where less care and water can be given—a lazy man's grass, but inferior to Kentucky blue grass.

WHITE OR DUTCH CLOVER

White or Dutch clover is often used to mix with blue grass in lawns. The clover seed, being much heavier, should be sown separately and in quantity about one-fourth. Clover is also excellent for control of Bermuda grass. Many prefer a lawn wholly of white clover, and if so, a pound of seed will sow very nearly twice the area that a pound of grass seed will. It thrives with less water and is superior to Kentucky grass for sandy soils and also does better close to the ocean where it requires still less water than it does inland.

Prof. E. J. Wickson says that clover is favorably regarded by him for the reason that it is more tender than grass and therefore more easily cut with a dull lawn mower, a type of machine he claims to have constantly and permanently on hand, though boasting of no exclusiveness in the ownership of such equipment.

Clover lawns usually need inoculation with nitrifying bacteria. There are several ways of getting this. The most primitive, most troublesome, yet most effective way is to get soil from a very healthy, vigorous growth of clover and scatter it over the new or sick clover lawn and wash it in with water. This is easy if you know such a lawn that you can

disturb to obtain a quart or so of surface soil. The easier way is to buy a small amount of some commercial preparation from a seed store. These are effective and simply applied. All clover lawns should be so treated if the growth is weakly or of poor color.

LIPPIA CANESCENS

In many sections *Lippia canescens*, distributed in California as *L. repens*, is rapidly forcing out all other plants used for lawn making, yet people in semiarid sections or where the water supply is limited continue to struggle with blue grass. *Lippia* is no doubt the most drouth resistant plant we have in our gardens and should be treated accordingly. That it will stand any California conditions is evident from the following extract from the annual report of the Arizona Experiment Station:

"The fog-fruit has again proved its superior qualities as a lawn plant, since during the past summer it was able to endure all ordinary drouth conditions without harm, also maintaining itself for eight months on the mesa with less than two inches of rainfall. When grown side by side with Bermuda grass it proved superior in every respect. To secure the quickest as well as the most satisfactory results on the lawn, the soil should be spaded, mixed with well-rotted manure, and the plants freely watered. During the present summer the lawns of *lippia* along Third Street, Tucson, planted in ordinary mesa soil and exposed to our intense conditions, have preserved a carpet of green which has often been beautifully variegated with the rose purple blossoms."

Every year adds to the reputation of *lippia* for lawn purposes under conditions unfavorable to grass, for it may be found thriving in almost all soils and in as varied locations. For those who wish

a lawn at the seaside nothing will equal it as a ground cover. No one who has taken note of it on the Coronado Hotel grounds would bother with any other plant for lawns of great extent near the ocean front or on sands of this nature. It is the only plant that could be used to effectively hold the loose soil there and preserve a perfect carpet over the whole. Intending planters should remember that seeds cannot be procured, cuttings must be used to establish a growth. It also is not hardy enough to endure freezing weather, being native to the tropics.

TERRACE COVERINGS

A great diversity of opinion prevails as to what is the most effective covering for banks and terraces, both as regards appearances and soil-staying qualities. Some prefer roses like *Wichuriana* or *Cherokee*, but if the soil be friable, too much of it is washed away before the vines form a ground cover. To prevent washing from excessive watering it is best, above each plant, to set in the soil an ordinary fruit or tomato can with several nail holes puncturing the bottom. These may quickly be filled from a hose and allowed to remain permanently, for in time the vines will cover them and they will still catch a goodly share of the falling water and allow it to slowly percolate into the soil about the plant roots. If either of the roses mentioned is used, it is best to encourage growth in all directions and peg down every foot or two feet of stem. A still better way perhaps is to layer it. Scratch out narrow slots in the earth a foot or more apart along the growing stem, push the stem down into these places and pack soil solidly on top. In time the points of contact with the ground will take root and do much toward making a solid, soil-staying bank covering.

Others prefer the fine-leaved ice plant, *Mesembryanthemum densum*, but it is not a soil binder, merely a cover that does not root except at one point, the main stem of the plant. The stems spread out in every direction for several feet, so that a bank eight feet high may easily be covered by plants set on the top level. Unless the soil beneath is very solid, almost rock, it will eventually by erosion wash into gutters which each year become deeper until one is surprised by an extensive and wholly unsuspected landslide. This ice plant blossoms most profusely, but the color is not a pleasing one, though there are several larger leaved species with flowers in other shades and colors.

Lippia canescens is a soil binder in the strictest sense of the word, rooting at every node or joint, and these are but two to four inches apart. Because of this frequent rooting *lippia* makes a very good bank cover and is each year receiving wider recognition for this purpose. It is not necessary to mow or cut it, for the plant is of prostrate habit, and with all the encouragement we may give it the result is a thick mat but three inches deep which will overhang walls for several feet without supporting soil as readily as will the ice plant. In rather cold localities the color becomes very dull in winter, and the plant is occasionally somewhat damaged by frost, often dropping its leaves, to be renewed in warmer weather.

A prostrate juniper, English ivy, the "myrtle," or *vinca*, common in other states, a native beach strawberry, a creeping buttercup or *ranunculus*, and quite a host of plants are available and effective as soil covers either on flat surfaces or terrace banks.

WEEDS AND FERTILIZERS

Of all weeds that infest the lawn no other is so hard to control or eradicate as Bermuda grass, often given such uncomplimentary names as "devil grass," "witch grass," etc. After once becoming established it cannot be got rid of except through making a new lawn and very carefully removing every little piece of the grass, but there are easy methods of control.

With a steel rake go over the lawn in late autumn and drag forth the offending grass. All that is torn up and not removed by raking may be cut off with a mower. When you have repeated this performance until it ceases to be a pleasure, sow some clover seed, water it well and retire until spring. The Bermuda grass, being native to the tropics, will scarcely grow at all during winter, and it will be late in summer before it is again noticeable, for its growth is prostrate and will be somewhat enfeebled through smothering under the rank, thick growth of clover. You may repeat this method of control each year if so desired, but once in three years will suffice to preserve a neat appearance and effectively control the Bermuda grass.

Seeds of this grass are often introduced through use of manures from low-lying dairy districts, either by spading in when lawnmaking or in top dressing thereafter. Bermuda grass infests lowlands, especially rich bottom lands along streams "where kine are wont to graze." It is therefore better to use only well-rotted manure or have it wetted thoroughly and turned over every day or two until weed seeds have been burned out or started into active growth. It may be best to depend upon commercial fertilizers, and every dealer handles one or more brands specially prepared for lawn use.

Annual weeds may be controlled by frequent

mowing, and many will be killed thereby. The remainder can endure but to the end of summer when death naturally ensues. Dandelions are a most serious pest in many lawns, and there seems to be no better means of eradication than cutting off each plant a couple of inches below the surface with an old table knife sharpened to a square on the end. Some control has been attained through spraying with iron sulphate or copper sprays, but this method is neither necessary nor feasible except on acreage.

Chickweed, sorrel, and many other nearly prostrate or lowly plants are at times serious pests and yield readily to no treatment except pulling by hand. Like moss they thrive best in somewhat shaded locations and prefer soils more or less acid. A liberal application of air-slaked lime or wood ashes will often aid in ridding the lawn of these pests and also prove of benefit to grasses.

To return to fertilization, do not perform this work in autumn, as grass grows but little in cold weather and calls for no food, and if the temperature is low none is available except through use of nitrate of soda. Nearly all plant food is washed away by winter rains, either off the land or down into the soil beyond reach of grass roots. March is early enough for such work in California; the heavier "carrying-off" rains have then ceased, and the grass starts into active growth, thereby indicating the need of food which it could not use while lying dormant.

THE AUSTRALIAN BLUE GUM
Eucalyptus globulus

CHAPTER III

TREES AND SHRUBS

The beautifying of home grounds is at all times an important consideration. Inquiries as to varieties to plant and methods of planting are received by the author every month in the year. Nearly all these questions are about trees and shrubs suitable for this climate and their proper disposition in the home grounds.

Trees and shrubs are planted about the dwelling for shade, for shelter, to accentuate the beauty of the building, to hide defects impossible of removal or for general landscape effect. To secure these ends a map of the grounds should be made in advance of planting and upon it should be marked the parts to be screened from view, the views it is desired to preserve or emphasize and the location of all drives, walks, buildings and permanent fixtures and accessories. The nature and needs of the soil should then be carefully determined, proper means taken to supply deficiencies, the species or varieties of trees needed studiously selected and ordered from some reliable nurseryman.

Each species has in its native habitat become adapted to certain conditions of soil and climate, and these generally are definitely known to every professional plantsman and well posted nurseryman. Trees planted in soils and climate unsuitable cannot but fail to grow, however much care and ceremony be observed in the planting. Luckily Californians have an almost endless list from which to choose.

The almost universal tendency in planting trees in home grounds is to place them too closely about the house and to plant too thickly, shutting out views and light from the windows and cluttering up and appropriating the whole yard, to the destruction of landscape beauty. The better plan is to plant the

DETERMINING HEIGHT OF TREE

The height of a tree, a stack, or other object may, when not easily measured directly, be found as follows:—Set up a pole, as tall a one as procurable, truly vertical; find by sighting the point on the ground where the line through the top of the object and of the pole cuts it. Then the height of the object is in the same proportion to the height of the pole as the distance from the object to the cutting point is to that from the pole. Using the letters on the diagram, the height AB is to CD , the height of the pole, as AE to CE . Thus $AB = (CD \times AE) \div CE$. The point A must be directly below B , and the line AE must be uniformly sloping; it need not be horizontal.

larger trees and shrubs along the borders of the place, low shrubs and herbaceous plants in the house border, leaving spaces between house and boundary border treeless. Plant in irregular masses rather than in straight lines or as single specimens.

Care and experience are required to so plant trees that they will not only live but thrive. It will prove more satisfactory, and cheaper, to hire such work done by an experienced gardener. In planting or transplanting trees choose small rather than large specimens. Dig large holes a day or a few days in

advance of planting. If for deciduous trees, unless the soil is well saturated with rainwater, fill the holes at once with water up to the brim. If for evergreen trees put in all or nearly all the soil before filling with water. Then after the soil is settled dig out the small hole necessary for the balled or potted plant. Place the trees a little deeper in the soil than they were in pot or nursery and do not use water to firm the soil but water most thoroughly after planting is done. Keep the soil close about the tree free from grass or weeds. Remember there is no best tree for all purposes; every street, lawn and lot should receive special study as to its requirements. The condition and nature of the soil, the size of lot or width of street, the kind of buildings and style of architecture, also the style of gardening are all important considerations. Therefore, if your lot or your problem be of any considerable size, a plan should be made by a professional designer.

STREET TREES, UNIFORM PLANTING

In nearly all cities and towns the streets are planted with several kinds and species of trees to each block, of every conceivable size, form, color and degree of desirability and fitness. Such planting appears as irrational as a large orchard composed of several sorts of fruit trees of varying sizes and requirements, all hopelessly mixed. One horticultural author says such planting reminds him of "nine monstrosly different buttons down the front of a Prince Albert coat." Another says: "The planting of a jumble of sorts upon the same block is a most reprehensible practice."

Little can be done toward uniform planting without zealous and well-directed cooperation. There must be unity and intelligence of plan. The work

should be carried on by improvement associations formed to control either a street, precinct, ward or town. Better still would it be if the city or town controlled all street planting. First outline a plan on which people of diverse tastes and interests can either agree or effect a compromise. This will not be found impossible, for the majority of people desire that their neighborhood shall be attractive and will yield in order to obtain desirable results. We must sacrifice some things in order to get others of different tastes to cooperate with us. After a thorough discussion of the merits of the different trees desired, put the selection of one for each street to a vote and let the majority rule, not forgetting that this is a matter which more concerns the general public than the individual. Furthermore, it is not so essential to have some specific tree as it is that but one kind be planted to each block or street.

TREES FOR STREET AND GARDEN

The following lists are very general and include nearly all those suitable for street planting in California. Of course all are equally desirable for park or garden. A few of them thrive in all sections, many of them quite generally throughout the south end of the state and the San Francisco-Oakland district, and a few in restricted districts only. In planting a considerable number of species a thorough knowledge of trees and of local conditions and requirements is necessary, especially in choosing a list for planting, if assurance is to be given of good permanent results.

ASSORTED EVERGREENS

Acacia cyanophylla, blue-leaved wattle; *A. dealbata*, silver wattle; *A. decurrens*, green wattle; *A.*

floribunda; *A. longifolia*; *A. melanoxyton*, blackwood; *Albizia lophanta*, crested wattle; *Calodendron capense*, cape chestnut; *Casuarina stricta*, beefwood or she-oak; *Ceratonia siliqua*, carob or St. John's bread; *Cinnamomum camphora*, camphor tree; *Eucalyptus amygdalina*, Messmate gum; *E. calophylla*, white-flowering gum; *E. ficifolia*, scarlet-flowering gum; *E. leucoxyton*, white iron-bark; *E. platyphylla*, broad-leaved gum; *E. polyanthema*, red box; *E. punctata*, hickory gum; *E. robusta*, swamp mahogany; *E. rudis*, desert gum; *E. sideroxyton*, red iron-bark; *Ficus macrophylla*, Moreton Bay fig; *Grevillea robusta*, silk oak; *Jacaranda ovalifolia*, blue trumpet-flower tree; *Ligustrum ovalifolium*, Japan privet; *Nerium oleander*, oleander; *Pittosporum rhombifolium*, saw-leaved box; *P. undulatum*, Victoria box; *Quercus agrifolia*, live oak; *Q. suber*, cork oak; *Schinus molle*, pepper tree; *Sterculia diversifolia*, bottle tree.

CONIFERS, OR CONE BEARERS

Unless conifers may be planted in wide parkways or along broad highways where sufficient space is allowed for retention of the lower branches, their use for such positions is not advised but on the contrary is condemned by all recognized authorities. While it is better that planting space should be broad enough to allow of natural pyramidal growth, if the space is less than this, the tips or leaders of branches may be nipped off when reaching a certain length from the trunk, resulting in a cone-shaped tree with its base still resting securely on the soil beneath.

California is singularly blessed with a long list of native conifers, or cone-bearing trees, which are much in demand where the climate will allow of

their successful outdoor culture, and many are grown as pot plants, either because of their extreme beauty or the fame or sentiment attached, as in the case of our big tree and redwood.

The big tree, *Sequoia gigantea*, is hardy in many parts of the United States, Europe, England, etc., but the redwood will not stand much cold weather. Our Douglas spruce, *Pseudotsuga Douglasi*, is much in demand in all countries, and few of our people are aware that it is from this tree that we get the far-famed Oregon pine. This tree may be found in the lower mountains. Horticulturists have appreciated this tree to the extent of producing, by selection and other means, at least ten distinct forms which have been given varietal names.

We have so many native genera in the cone bearers that all could hardly be covered in this list, but to show our wealth of available garden material we will take one genus, *pinus*, or the true pines. These must not be confounded with spruces, firs, cedars, cypresses, junipers and the great host of other native conifers. The following fifteen California species have been advertised in nursery catalogues: *Pinus Balfouriana*, foxtail pine; *P. contorta*, scrub pine; *P. Coulteri*, pitch or big cone pine; *P. flexilis*, limber pine; *P. Jeffreyi*, Jeffrey's pine; *P. Lambertiana*, sugar pine; *P. monophylla*, single-leaf pine; *P. monticola*, mountain white pine; *P. Muricata*, prickly cone pine; *P. Parryana* or *quadrifolia*, nut pine or pinon; *P. ponderosa*, yellow pine; *P. radiata*, Monterey pine; *P. Sabiniana*, digger pine; *P. Torreyana*, Soledad pine; *P. tuberculata*, knob cone pine. Aside from these are many either of late introduction to the nursery trade or of little value as horticultural subjects.

CURIOUS CONIFERS

The conifers contain both the largest and the smallest trees in the world, as well as those enduring the greatest extremes of heat and cold. Nearly all are evergreen but a few are deciduous, the most common of the latter class being the larches.

Ginkgo biloba, the maidenhair tree from northern China, is a deciduous conifer whose botanical affinities seem to be with the conifers on one side and with the ferns on the other, though but little like either. The leaves are fan-shaped and notched just like a giant maidenhair fern, and unbranched veins extend in radiating lines to the edge of the leaf precisely as they do in the fern. The fruit is in no wise a cone as we know cones, but is a fleshy drupe not unlike the fruit of the yews, which by some botanists are removed from the conifers though closely related to the maidenhair tree.

Another curious conifer is Agathis robusta, the dammar or kauri pine, native to Queensland and many islands in Australasia. If the ginkgo is to be called a fern tree by reason of its quaint foliage, the agathis should be called the lily tree for a like reason. The leaves of the kauri pine are, however, much handsomer than those of any lily and also much thicker and of more substantial texture. There is no other conifer and scarcely a tree of any kind that rivals this tree in beauty of foliage, and very few who view it are easily convinced of its botanical relationship.

It is interesting to Californians to know that we have a conifer which is curious by reason of its isolation from its half dozen or more sister species. The incense cedar, *Libocedrus decurrens*, is the only representative of the genus in North America. Others are found in various parts of the world, thus,

Chile to Patagonia, Island of Formosa, China, New Zealand and New Guinea, but generally in the southern hemisphere. Junipers are curious for the reason that they do not bear true cones, but berries; everybody has heard of juniper berries. Junipers also bear two kinds of leaves.

THE ARAUCARIA GROUP

The group of conifers known as araucarias are among the most ornate of the family, and a collection of all the species would make one of the most interesting groves of trees that could be planted in a large park or extensive country home.

We have six species, four from Australasia and two from South America. Owing to the dryness of our climate the latter two, *A. imbricata*, the monkey puzzle, and *A. Brasiliense*, do not thrive in our state, though specimens are not uncommon. By far the most common species is the Norfolk Island pine, *A. excelsa*. This tree thrives best near the seacoast. *A. Bidwillii* will do well in the hot interior valleys. *A. Cookii* is the most rare of all and the writer knows of but two. *A. Cunninghamii* is somewhat more common, though it is doubtful if there are a score of this species in California. All are large and beautiful trees.

THE ARBOR-VITAE

The golden arbor-vitae, *Thuja aurea*, is a dwarf Chinese variety, very compact, globular in form, and with foliage tips of yellowish green. *T. compacta* is quite similar but is bright green in color and attains a height of five or six feet.

The giant arbor-vitae, *T. gigantea*, is a native of California and is, as its name indicates, the largest of the family, often attaining a height of 150 feet.

In the garden it is noted for its rapid, vigorous growth and sturdy form. On the Atlantic Coast there is a native species, *T. occidentalis*, that is known as the American arbor-vitae, or white cedar, furnishing the lumber known under the latter name, yet not a true cedar. It will grow to fifty feet in height and is widely planted in parks and large gardens.

Thuja orientalis is the name of the Chinese arbor-vitae, a compact, bushy tree twenty to thirty feet high when mature, with bright green foliage which stands edgewise to the trunk. Another compact form not so common in California as the others listed, a later introduction, is known as *T. tatarica*, a very hardy species that grows rather slowly under great extremes of temperature and treatment until it finally reaches twenty feet in height.

THE TRUE CEDARS

There are but three species of cedars, though many trees are known as such. The one most commonly so-called, the red cedar of the Eastern states, is a juniper.

The Mount Atlas cedar, *Cedrus Atlantica*, is the least known to us though not rare in California gardens. It is a rapid-growing tree of loosely formal, pyramidal outline and silvery-green foliage, and though slow of growth when young eventually attains a height of 120 feet.

The most popular cedar is *C. deodara*, variously known as deodar, Himalayan cedar, or incense cedar; a most beautiful and stately tree of towering pyramidal growth, peculiarly suited to all parts of California. Its foliage is bluish-green, silvery on the under side, at all times attractive. In the opinion of the author this is the most beautiful of all trees.

C. Libani is the cedar of Lebanon mentioned in the bible and writings of travelers in the Far East, being native to the land known as the Cradle of the Human Race and for that reason alone in great demand for planting everywhere. It is darker in foliage than the Himalayan cedar and less handsome.

THE CYPRESSES

The Arizona cypress, *Cupressus Arizona*, is comparatively a newcomer to California, native to the mountains of Arizona and New Mexico. It grows somewhat columnar in form but is a handsome tree of the type known as blue cypress. *C. funebris* is a smaller, rather slender tree of loose foliage with drooping tips and dark green in color. Gowen's cypress, *C. Goveniana*, is a native of California and will prove satisfactory wherever cypresses are needed.

Cupressus Guadalupensis is a blue form of the better known Monterey cypress, native to Lower California and the near-by island of Guadalupe. In color its foliage ranges from a grayish or bluish green to silvery blue, the latter being the most attractive foliage color found in the conifers.

C. macrocarpa is the Monterey cypress common over all of California and extensively used for hedges, windbreaks and all purposes where a quick-growing, thick-foliaged evergreen is wanted, but it is rather a short-lived tree of somber appearance. The tall, very slender cypress to which we attach the name Italian is native to both Southern Europe and Asia and is the classical cypress of Greek and Roman writers. With us it is popular for making living arches, gateways and for formal gardens and near dwellings of severe architecture.

THE PINE FAMILY

No more handsome pine may be found in western gardens than *Pinus Canariensis*, named for its native habitat the Canary Island pine. It has long needles or leaves of silvery-blue and an upright, stately growth that peculiarly fits it for highway planting.

P. halepensis, the Aleppo pine, is better suited for planting over all of California than any species yet tried. It soon grows to large size, is of a clean and pleasing shade of light green and succeeds under a considerable range in temperature, soil and general condition.

The Corsican pine, *P. laricio*, is a tree with stout, spreading branches and grows to a height of 150 feet. In general outline at maturity it forms a stately pyramid of rugged beauty. *P. maritima*, the cluster pine, is a handsome tree bearing needles a foot long, curiously twisted in clusters of bright green. The parasol pine, *P. pinea*, differs from most pines in having a round head and in age makes a large tree with a wide-spreading top suggestive of a gigantic parasol.

MIXED CONIFERS

Agathis robusta, the dammar pine from northern Australia, is unique among cone-bearing trees in that it is the only one bearing broad leaves, similar to those of laurels in outline, thick and leathery in texture and truly handsome.

Chamaecyparis Lawsoniana is the name of the tree known to Californians as Lawson cypress and to Oregonians as Port Orford cedar, being native to both states indicated. It is a grand tree, a forest giant of rapid growth and pyramidal form with bluish-green foliage, retaining its lower branches

close to the ground. One of the best garden conifers.

The Japanese cedar, *Cryptomeria Japonica*, is the dominant avenue tree in its native country and popular for planting in coastal California but it will not endure the heat of our interior valleys. It grows rapidly near the coast but is of loose habit.

A horticultural variety of the Japanese cedar, a smaller but handsomer tree, is known as *C. elegans* and is not surpassed in fitness for California gardens in general by any small evergreen tree. It seldom grows to twenty feet.

Juniperus Bermudiana is the only one of many species that grows well in California. It grows rapidly from the very first though its ultimate height is not more than forty feet. For a spreading evergreen of medium growth the Bermuda juniper ranks well in all of California. A dwarf species is *J. Sabina*, known as the Sabine juniper, and is a spreading shrub of value for planting in poor soils, rockeries, etc. There is also a prostrate variety that grows flat on the ground, a fine rough covering for terrace banks and places of similar needs.

Two so-called cedars are general favorites, one, *Libocedrus Chilensis*, is known as the Chilean cedar and the other, *L. decurrens*, as the incense cedar. Both are large spreading trees of handsome appearance, but the incense cedar, native to California and Oregon is one of our most stately evergreens and one of the best for park or garden.

One of the Japanese yews, *Podocarpus macrophylla*, has foliage somewhat like the oleander, though narrower. It is a small, spreading tree of fine appearance and worthy of extensive garden use, somewhat of an oddity among coniferous trees.

Taxus baccata is the English yew so extensively

planted in its native country and often clipped into formal and fantastic shapes. With us it is but a large spreading shrub though with age it will come to arborescent growth. It bears a somber hue except when the wind upturns the branches and shows the silvery sheen on the under side of the foliage.

The so-called Irish yew is a fastigate or narrowly columnar form of the English yew and would scarcely be suspected of being closely related. In color it is a very dark green and the general appearance is that of a huge bundle of closely packed perpendicular branches; a favorite for formal gardens.

DECIDUOUS TREES

In places where summer shade and winter sunshine is desired, deciduous trees may be planted, but with the splendid roads we now have in all parts of California the old cry of "muddy roads during the rainy season" cannot longer be offered as a reason for planting deciduous trees along streets and highways in a state having almost perpetual sunshine and summer.

On public or private playgrounds, picnic grounds, to provide shade for summer only over certain parts of the house or other buildings or over arbors, seats, resting-places or plant groups or collections, deciduous trees may not only be permissible, but advisable. In botanic gardens and for collections of deciduous plants in parks and large gardens they are necessary. But for mere ornament they have no place in the southern two-thirds of California.

It may interest the reader to know that in America we have but three families of deciduous native trees possessing opposite leaves, and all have representatives in California and will be found fairly close to streams. It is not necessary to find them

in leaf to know them—look to see if leaf scars and buds are opposite, and if so the tree is either ash, maple or horse chestnut. If they are not opposite they as clearly belong to some other family or are native to some other country, or both.

There is little doubt but *Platanus orientalis*, the oriental plane, is the one best deciduous tree for all purposes, but other good species for either street or garden planting are: *Acer dasycarpum*, soft or silver maple; *Acer platanoides*, Norway maple; *Acer negundo*, box elder; *Albizzia julibrissin*, pink acacia; *Broussonetia papyrifera*, paper mulberry; *Castanea vesca*, Spanish chestnut; *Celtis australis*, European hackberry; *Fraxinus Americana*, white ash; *Fraxinus lanceolata*, green ash; *Ginkgo biloba*, maidenhair tree; *Hicoria pecan*, pecan; *Liriodendron tulipifera*, tulip tree; *Melia azerdarach umbraculiformis*, Texas umbrella tree; *Populus balsamifera candicans*, balm of Gilead; *Populus Carolinensis*, Carolina poplar; *Quercus lobata*, California white oak; *Quercus palustris*, pin oak; *Quercus pedunculata*, English oak; *Quercus rubra*, red oak; *Sterculia platanifolia*, parasol tree; *Ulmus Americana*, American white elm; *Ulmus suberosa*, cork-barked elm; *Ulmus glabra vegata*, Huntingdon elm.

PALMS AND ASSOCIATES

Of the great number of plants available none are better suited to California gardens than palms, the kings and princes of the vegetable kingdom; none give us more of tropical grace and luxuriance. "Land of the palm and banana" has a most alluring sound that draws to us each winter tens of thousands from less favored states who love to bask in our winter sunshine and watch the gentle swaying to the breeze of our wonderful tropical vegetation.

Luxuriant as is the average palm in our gardens, none of them find ideal conditions for proper development, so that all fall short of the beauty of the same species when seen under strictly tropical skies. All palms need an abundance of water and unless it is given them a wealth of growth should not be expected. During the winter months palms need but little water other than that from the seasonal rainfall, for they are at this time practically dormant. It is during the hottest weather that copious and frequent irrigations should be given, for under the stimulus of our extremes of heat coupled with a wealth of water the development of palms and their associates nearest approaches the ideal.

Few plants lend such a delicate tropical grace to the house surroundings as bamboo, nor are such plantations at all out of place in more remote situations. The richest and most tropical vegetation should always be nearest the dwelling, especially plants of dignified and formal growth like the palms, but as we wander through extensive grounds one occasionally is charmed by finding a tropical nook filled with rank, graceful, yet careless growth of bamboo, banana, and similar plants.

Palms and dracenas suitable for both street and garden are: *Trachycarpus excelsus*, windmill palm; *Washingtonia robusta*, Mexican fan palm; *Washingtonia filifera*, California fan palm; *Livistona australis*, Australian fan palm; *Erythea edulis*, Guadalupe palm; *Cordyline indivisa*, dracena, or palm lily; *Cordyline australis*, dracena, or palm lily; *Cocos plumosa*, queen palm.

Some of the best bamboos are: *Arundinaria Falconeri*, a most graceful kind, not much over fifteen feet high, with very thin stems and a mass of

feathery foliage, admirably suited for lawns and for decoration. Grows in clumps and never sends out runners.

Bambusa vulgaris is tall, arching and hardy everywhere. This beautiful, tall and quick-growing bamboo is really invaluable for scenic, tropical effect. A magnificent group can be made by placing the upright growing *Dendrocalamus latifolia* in the center, massing *Bambusa vulgaris* around it, and bordering with a dwarf species.

Dendrocalamus latifolia is the most desirable and most impressive bamboo so far introduced. Stems are four to five inches thick; up to fifty feet in height, straight, and heavily clothed with broad, long leaves which keep their color better than those of any other giant bamboo.

Phyllostachys viridi glaucescens, from Northern China, the true "fish-pole bamboo," is one of the hardiest, quickest-growing, most effective bamboos ever introduced to our state. It grows like a weed, and one shoot planted in spring will multiply to six or eight before fall.

ORNAMENTAL FRUIT TREES

In many sections of California, owing to the mildness of winter, we are enabled to grow a score or more of tropical and semitropical fruit trees, nearly all of which are evergreens having a decided ornamental as well as economic value. In the city or suburban garden of restricted area it is often possible to use fruiting trees and shrubs of this nature as a feature of landscape ornamentation.

The golden glow of our citrus fruits is the most welcome sight that greets the eye of our first-time visitor, and even the returning Californian gazes upon these familiar objects with a love akin to ven-

eration. Every home owner should find a place for a few citrus trees.

The avocado, *Persea gratissima*, is one of the most ornamental of all fruit trees, handsome in form and foliage and producing a most abundant crop of fruits of the highest food value. This tree is worthy of extensive planting throughout the warmer sections of the state, and of late years has become quite well known and its value recognized.

During the past score of years the cherimoya or custard apple, *Anona cherimolia* and *A. reticulata*, has been planted quite extensively and fruits well in scores of localities varying in soil and climatic conditions.

Carissa is a particularly showy shrub well worthy of a place in any garden for its ornamental value. It bears fair-sized fruits, very nice to eat, but very few Californians seem to grow them.

The white sapota from Mexico, *Casimiroa edulis*, is a fine tree of good size that yields a most delicious fruit and has been sparingly planted for many years, and the same may be said of the mango, more tender still, claimed by those who have eaten it in India to be the finest of all tropical fruits.

Among the many fruit-bearing trees and shrubs of ornamental value none have been more extensively planted in California or have proven themselves better adapted to soil and climate than the eugenias. Unfortunately, we have not grown those of specific economic value, though these species are fully as ornate as those more common with us.

The kai apple from Natal, *Aberia caffra*, and a still better species from Ceylon, *A. Gardneri*, may be grown either as small trees or as a large hedge, much as limes are usually planted. The first-named species has been fruited here for many years, and

furnishes an acid fruit prized for jams and jellies. The tree is somewhat thorny and naturally grows in a neat, compact form.

The zapote or sapodilla, *Achras sapota*, is a fine broad-leaved evergreen tree bearing a fruit not unlike a russet apple in appearance, but having flesh more like a pear in texture and flavor.

Feijoa Sellowiana, the Paraguay guava, though closely allied to the guavas, is much preferred by all who have eaten it to any true guava. In size and shape it resembles a large plum from one to two inches in diameter and an inch greater in length.

The strawberry guava, *Psidium cattleianum*, is a fine glossy-leaved shrub or small tree which produces an abundance of luscious fruit about the size of a large strawberry, round and of a deep reddish-brown color. The fruit is highly prized for table use when fresh, and for jams and jellies has few equals.

The loquat is highly esteemed for its agreeable acidulous, aromatic flavor and on account of its ripening in early spring. The tree is one of the most beautiful among fruit trees.

HARDY EUCALYPTS

Though many eucalypts for special uses are listed in these pages it may be well to again call attention to the unquestioned adaptability of these trees to any and all parts of California, for no other vegetation has wrought such a wonderful transformation in our landscapes.

As showing the extremes under which these trees will thrive, there are several species hardy in the southern parts of England and Ireland, even to some distance north of London. The hardiest of these is *E. coriacea*, a dwarf species from snow-covered mountain tops in Australia, but not useful to us ex-

cept under similar conditions in forest reserves. The hardiest species that grows to the dignity of a tree is *E. Gunnii*, but its growth is too slow for popular use. *E. coccifera*, *cordata*, *urnigera*, *saligna*, *resinifera*, and *viminalis* grow in Cornwall, England, but only one, *viminalis*, thrives well in the colder parts of California.

Under the stress of great heat other species thrive equally as well as do those of the former list in lands of heavy frosts and snow. At Thermal, California, on our so-called Colorado Desert, twenty-five species were tried out, about one hundred plants of each being used for the test. Of these five species successfully withstood the heat with a continuation of vigorous annual growth. These were: *E. leucoxydon*, the Victoria iron bark; *E. polyanthema*, the red box; *E. rostrata*, the red gum; *E. rudis*, and *E. viminalis*, the manna gum. Of these five the last-named grew more rapidly and straighter than the others, and during the first year many attained a height of fifteen feet. For extremes of both heat and cold it is the best species of all, a truly wonderful tree in its climatic adaptation.

TREES FOR ARID REGIONS

There are many trees quite common, which will endure the heat of these sections, but not all will withstand the cold, and in the appended list care must be taken that frosts are not too severe for some of those named.

Among the best trees are: Beef-wood or she-oak, *casuarina*; pepper, *Schinus molle*; Texas umbrella, *melia*; black locust, *Robinia pseudacacia*; honey locust, *Gleditschia triacanthos*; several willows; box elder, *Acer negundo*; cottonwoods, several species; at least five eucalypts—*rostrata*, *rudis*, *tereticornis*,

polyanthema, and viminalis; palo verde and mesquite, both from the desert; the Chinese tree of heaven, *Ailanthus glandulosa*; ash, several species; Kentucky coffee tree, *Gymnocladus Canadensis*; Russian mulberry, *Morus alba tatarica*; osage orange, *Toxylon pomiferum*; poplars, both Lombardy and Carolina; purple plum, *Prunus cerasifera atropurpurea*; soft maple, *Acer saccharinum*; sycamore, either of the western species of *platanus*; black walnut, any species; arbor-vitae, *Thuja occidentalis*; spindle tree, *Evonymus Japonicus*; Indian cedar, *Cedrus deodara*; Japanese cedars, species of *chamaecyparis*; red cedar, *Juniperus Virginiana*; our native fan palm, *Washingtonia filifera*; and the dates, *Phoenix dactylifera*, *P. Canariensis* and *P. reclinata*.

In shrubs use tamarisk, myoporum, *Althaea officinalis*, poinsettia, *Euphorbia pulcherrima*; bottle brushes, *melaleucas*, *callistemons*, etc., pomegranate, and privet, *Ligustrum Japonicum*. For dry places try native pines in the order named (for drouth resistant qualities): *P. tuberculata* the knob-cone pine, *P. Sabiniana*, the digger or bull pine, and *P. monticola*, the mountain white pine. Other good natives are *P. ponderosa*, the yellow pine, *P. Torreyana*, the Soledad Pine, *P. Parryana* or *quadrifolia*, the nut pine, *P. Lambertiana*, the sugar pine, *P. Coulteri*, the big cone pine, and *P. monophylla*, the single-leaved pine.

TREES FOR ALKALINE SOILS

Nearly all the eucalypts and the single-leaved acacias are very tolerant of alkali. Especially are the following excellent: *Acacias*; *armata*, shrub, *cyanophylla*, *longifolia*, *pycnantha*, *saligna*. *Eucalypts*: *amygdalina*, *cornuta*, *rostrata* and *robusta*, are well suited to all saline soils.

In conifers we have the following pines: *balsamea*, *halepensis*, *laricio*, *maritima*, *radiata*; also red cedar, *Juniperus Virginica*; Monterey cypress, *Cupressus macrocarpa*; all *melaleucas*; *M. leucaden-*

PROPER PRUNING

dron is perhaps the most tolerant of alkaline or saline soils of any tree; St. John's bread, *Ceratoniasiliqua*; and the common date palm, *Phoenix dactylifera*.

In deciduous trees you may plant all willows and poplars; the swamp locust, *Gle-*

ditischia monosperma; a swamp-loving ash, *Alnus glutinosus*; the European sycamore maple, *Acer pseudo-platanus*; and the Chinese tree of heaven, *Ailanthus glandulosa*. In shrubs use: *Melaleucas*, *metrosideros*, *callistemons*, tamarisk, *plumbago*, *leptospermum*, *myoporum*, *genistas* or *cytissus*, and willows.

SHRUBBY HARBINGERS OF SPRING

Among the many excellent deciduous shrubs suit-

able to California, none is lovelier than the common bridal wreath, *Spirea Cantonensis*, also known by the trade name of *S. Reevesiana*. For the large garden a few scarlet-flowering quinces, grown in a mass or thicket, are almost indispensable. In favorable locations lilacs and snowballs are in order, but not everywhere do they thrive, and the same is true of the syringa or mock orange, philadelphus. *Crataegus*, *berberis*, *cotoneaster*, *weigelia*, *deutzia*, snowberry, sweet shrub, dogwood, *althea* and a host of others might be listed that will thrive here.

THE RIGHT AND THE WRONG WAY

The bolt above shows proper treatment for a splitting fork. The lower part shows what will happen if a band is used.

As a rule all deciduous shrubs (also trees) grow much more luxuriantly in the country than city. Owners of country homes will find northern slopes very favorable to the growth of nearly all deciduous shrubs and some, as the hardy *hydrangea*, *H. paniculata grandiflora*, are quickly

burned up by our dry, continuous spring heat. The Japanese snowball is another subject for cooler slopes, and is seldom happy in the city garden. The proper time to prune deciduous shrubs is immediately after flowering, giving them a chance to make growth of flowering wood for another season.

THE SOUTH AMERICAN ORANGE TRUMPET FLOWER
Bignonia venusta

CHAPTER IV

CLIMBERS AND TRAILERS

In nature the mission of the vine is to cover for obscurity or for protection or shelter and in the garden it is often put to similar uses. But the vine has other and nobler uses. Its delicate tracery upon classic or other pretentious architecture is a thing of extreme beauty and should be kept with this end in view, under complete control. It is sometimes permissible to hide, or at least to soften, the more harsh and monotonous lines of architecture by the judicious use of delicate vines, not of the kinds, however, used to obscure unsightly objects or cover arbors. Not all vines were intended for the same mission in life, and man should choose, with judgment born of experience and based on observation, where each should go or what vines to use for specific purposes.

Whenever that stage is reached where vines look heavy and cumbersome they should be thinned out; the necessity of this in connection with the desirability of light, graceful effects, goes far to prove the claim that climbing roses are unfitted for house decoration. It is far better to grow them on fences, over arbors, pergolas, or outbuildings of little importance to the landscape. One most important point is that the house must be first considered. It is the one important object, not the vine or vines; they should decorate the house with a fitting drapery and not make a vinery with patches of building peeping out. The lines of architecture should be softened but not obscured.

EVERGREEN CLIMBERS

Akebia lobata and *A. quinata* are climbing barberries bearing short racemes of small brownish purple flowers, natives to China and Japan.

Asparagus plumosus is a very popular climber for shady places, and for a low-growing vine or a hanger for vases or window boxes *A. decumbens* or *A. deflexus* are very good. These are natives of Africa.

Beaumontia grandiflora, a tropical climber, suited only to frostless localities, has very large white, bell-shaped flowers that are of such size that they have been likened to lilies.

The bignonias are very close to the tecomas and all are known as trumpet flowers. *B. venusta*, the one with orange-yellow flowers, is one of the most gorgeous flowering vines known to California. *B. Tweediana* has large yellow flowers and easily clings to walls. *B. violacea* has violet flowers, and *B. Cherere* has blossoms of blood-red.

The bougainvilleas, though having insignificant yellow flowers, bear floral bracts of most brilliant hue. All save one species have bracts of magenta or a closely allied shade. The variety known as *B. lateritia* has brick-red floral bracts, and while the showiest of all is also the most tender.

Cissus discolor and *C. rhombifolia* are for the house and warm locations only, such as window boxes, hanging baskets, etc. Foliage resembles begonia leaves.

Clianthus puniceus is an Australian vine, bearing showy red flowers that have given it the popular name of parrot's bill. *C. Dampieri* is a beautiful trailer, hard to grow, from the desert regions of New Zealand and is called New Zealand glory pea.

Cobea scandens and its white variety hail from

Mexico and have flowers closely resembling the common Canterbury bells. The type has purple flowers. A "rough" climber.

Dioclea glycinoides has flowers much like the *clianthus* but smaller and of darker red; really a crimson. It does not grow so large nor so rapidly as the parrot's bill.

Dolichos lignosus, the Australian pea, also its white variety, is a small-leaved, quick-growing vine that makes a fine close cover where frosts are not too heavy. The former bears pink and white flowers.

Evonymus radicans is a climbing or trailing shrub with very small leaves and will cling by aerial rootlets to walls of brick, stone, or concrete. There is also a variety with variegated foliage.

Ficus pumila, better known as *F. repens*, is the most popular of all evergreen vines for covering walls as it will attach itself to anything that is slightly rougher than a pane of glass. It bears no visible flowers as it is a climbing fig.

Hardenbergias, sometimes known as *Kennedyas*, have pea-shaped blossoms of white, pink, or purple. The plants being very much alike in general appearance, one chooses the color wished for in the flower and orders the species bearing it.

Hedera helix and its many varieties are known as English ivy, Irish ivy, etc., being the only true ivies. They cling tenaciously to any wall and grow well in sun or shade; perhaps the most popular of all vines for shady places.

The wax plant, *Hoya carnosa*, is a handsome climber which does best in shady places, or it may be used as a trellised pot plant for porch or house.

The flowers come in numerous umbels of delicate pink and are wax-like in texture.

Loniceras are the honeysuckles, of which we have several species and varieties. All are fairly hardy, will thrive in any soil or position and produce a fragrance when in bloom that makes their presence known at a very considerable distance. They are splendid all-purpose vines.

Muehlenbeckia complexa, the wire vine, is a native of New Zealand, where it climbs over and obtains a foothold in the rocks where no soil is in evidence, right on the bare sea-wall and within the spray of salt water. It will therefore thrive on the misty beach or in the driest situations.

Jasmines are common in all parts of California and we grow at least a half dozen hardy species having mostly white flowers, though *Jasminum primulinum*, having primrose-yellow flowers, is the jewel of the lot, and *J. humile*, known as *J. revolutum*, is a half-shrubby species also having yellow flowers. There are no poor species of jasmines.

Passion vines are not so popular as they were a score of years ago for they are usually attacked by hordes of caterpillars which quickly and completely defoliate them. They have white, blue, or purple flowers; and one, the best of the lot, *Passiflora princeps*, has half-closed, drooping bells of dull red.

We usually grow but one phaseolus as an ornamental, *P. caracalla*, the snail vine, bearing curious, large, snail-like flowers of purple and yellow.

Pithecoctenium muricatum has a name all out of proportion to its small white and yellow trumpet flowers. It is, however, a free bloomer and is closely allied to the bignonias.

Everyone knows the lovely blue of *Plumbago*

capensis, one of the most drouth-resistant of all vines or shrubs. The less water it has the more will it bloom. There is also a white variety.

Solandra guttata, the copa de oro, has the largest flowers of any climbing shrub, but alas, it will grow only in situations well protected from frosts. Its giant cups of old-gold are several inches across the mouth and strikingly handsome, while their great size attracts the attention of every beholder.

In the solanums we have several species bearing white or blue flowers and ranging in size from those of the small *S. jasminoides* (potato vine) up to the azure-blue giants of *Solanum Wendlandi*.

Sollya heterophylla, the Australian blue bell, is as much of a shrub as a climber, but it has the bluest of flowers and though they are small they never fail to attract attention.

A lovely, somewhat tender plant is *Stigmaphyllon ciliatum*, the orchid vine, with golden yellow flowers in pendulous bunches or corymbs, each flower an inch across and delicately fringed.

The tacsonias are closely allied to the passion vines but differ most distinctly in the color of the flowers, those of passion vines being white, blue, or purple, while the tacsonias bear pink, scarlet, or red blossoms.

In the trumpet flowers, so-called, which comprise the bignonias and tecomas, we have many colors, and some of the tecomas are deciduous. The flowers are pink, orange-red, and red. See also bignonias and list of deciduous vines for there is much confusion of names.

There is a vine that by reason of its provocatively long name should be ruled out of popular lists except that it is a beautiful climbing plant belonging to the

popular jasmine family. It is called the star jasmine and has creamy-white star-shaped blossoms, borne in great profusion. Its botanical name is *Trachelospermum jasminoides*, but the dealers usually call it *rhyncospermum*, which is no easier for the average layman's tongue.

Of late years two or three species, or varieties of one species, of evergreen grape from South Africa, have been added to the list of desirable climbers. At first we had but one form, under the name of *Vitis capensis*, but later others have appeared, quite similar in general appearance, and all good. They are listed as: *V. Baudiana*, *V. hyper-glauc*a, *V. rhombifolia*, and *V. rupestris*.

DECIDUOUS CLIMBERS

Ampelopsis quinquefolia is known as Virginia creeper or woodbine, while *A. tricuspidata*, Veitchi, is called Japan ivy, and occasionally Boston ivy, though why the latter name we cannot tell for it is native to Japan and China and came to this country from England.

Antigonon leptopus, the *rosa de montana*, or mountain rose, is a quick-growing vine that during summer bears a mass of pink flowers that one grower of it likens to "small pink hops."

Aristolochia in several species, one of which is called Dutchman's pipe, are climbers with curious rather than beautiful blossoms.

Asparagus medioloides is the *smilax* of florists, a bulbous plant with a beautiful vine growth produced annually. A splendid plant for shaded positions.

Clematis are so well known as scarcely to need mention. The small-flowering sorts make dense vines, while the large-flowered section run all to

blossoms, some of the latter being as much as ten inches in diameter. In color they range from white to deepest purple, with every possible intervening shade.

Decumaria is a little known climber, clinging by aerial rootlets, hardy, fragrant in blossom and known as the climbing snowball.

Humulus, the hop vine, is a splendid plant for quick summer covering and provides a dense shade. Although normally green there is a handsome variegated variety. Both send forth each spring from perennial roots.

Mandevilla is known as the Chilean jasmine for the reason that the flowers are quite similar to those of the jasmines, but are larger and more fragrant.

Pueraria Thunbergiana is the Japanese kuzu vine (erroneously spelled kudzu), remarkable for the vigor of its growth, often attaining 50 or more feet in length each season and bearing immense leaves.

Tecoma radicans and its varieties are hardy deciduous trumpet vines, native to the eastern part of the United States and popular everywhere.

All are familiar with the Chinese wistaria (named for Dr. Wistar, an American), which is popular the world over. It may be had with white, lilac, or purple flowers, and one variety has double flowers.

Heat-resistant vines are: Virginia creeper, *Ampelopsis quinquefolia*; Boston or Japan ivy, *A. tricuspidata*; and the Japanese honeysuckle, *Lonicera Japonica*. The plumbago may be used for either climber or shrub according to the way it is trained.

PRODUCTIVE SUMMER ARBORS

There are many gardens where vines of pumpkins, squashes, gourds, etc., have been used to good effect for summer arbors. In one yard, without a tree,

there was a space of six feet between a fence three feet high and the house. A few light battens were run from top of fence to bottom of windows on the house at a height of about six or seven feet. On these battens was fastened two-inch mesh chicken wire and squash vines allowed to clamber over all in early spring. All summer this arbor proved a cool, shady and wholesome retreat for children from all over that neighborhood. A load of river sand on the ground beneath keeps it a popular resort throughout the year.

MISUSE OF VINES

Many of our home owners have the "vine habit" in chronic form; everything possible is weighted down with an excess of overgrown and often inappropriate climbers. When they are used to cover bare, unsightly walls and ugly buildings a justification exists for allowing them to grow rampant and riotous, but where used for ornament alone they must be kept in check. Their delicate tracery upon buildings is decidedly one of greatest beauty, but they should never be allowed to grow so as to obscure good architecture.

There are buildings so inexpressibly ugly that anything that would cover would be pardonable, but such examples are rare, and generally he who has such poor taste in building lacks sufficient love for plant life to use vines at all. The greatest abuse of vines really comes from those who have more or less love for them, coupled with a faulty judgment regarding the standard of beauty as exemplified in plant life. Nearly all vines get bare and ugly below with years of growth and nearly all need to be replaced every few years.

THREE CALIFORNIA ROCK GARDENS

1. Red Sandstone. 2. Gray Granite. 3. Boulders.

CHAPTER V

ROCKERIES AND FERNERIES

Who that has wandered up canyons and over hills doubts for a moment that we may have beautiful rock gardens. Those time-toned rocks covered with moss and lichens provide in themselves a foundation of unusual beauty and interest and the plants which may be used for further embellishment are so numerous as to defeat a desire to list them in a brief treatise for the amateur. Sunny rock gardens may very fittingly be combined with cactus or desert gardens and prove as great an attraction and evoke as much interest as any feature in the home grounds.

Every possessor of a garden, however limited in area, can spare a shaded corner for a collection of ferns and their allies. With the natives may be mixed some of the hardy sorts on sale at nurseries, for as a state California leads the nation on ferns, Florida being a close second. Their chief requirement is shade, more particularly from the afternoon sun, so that the east or north side of the house is best. In this state where they have to be watered artificially they may be planted under trees, though they must be kept well watered or the tree will draw all the moisture away from them. Our native kinds range from the little "golden-backs" only two inches high, up to the woodwardia of deep canyons which often exceed six feet in height. All are easy to grow.

BUILDING THE ROCKERY

Lay out the shape of your rockery on the ground and use your largest stones first. Don't have the de-

sign round, square, triangular, or any particular shape, but as irregular as possible, just as though it happened to be where you wanted it. Let the stones touch each other and put your plants just back of the place where two stones meet.

Now fill up the inside or core with soil until it is level with the top of the rockwork, and do this with each tier of stones as you build up. In placing the second and subsequent tiers, draw each one in slightly, yet not too evenly, neither too fast, or your rockery will be finished too soon and also be too flat and smooth. Be careful that the shape is not too regular as you go up, but have it full of little canyons and mesas with the top as irregular as possible. Also allow some of the roughest and most picturesque rocks to stand out boldly above the rest.

Be sure to keep the soil well watered all the time you are at the job, for it is a very difficult matter to get it wet all through when finished in case it becomes dry during construction. Soil for such work should be of a light and porous nature, very friable, yet without much sand, as sand washes away too easily. Better have plenty of leaf mold if obtainable, for it contains plant food agreeable to all vegetable life. If you have a large place and can get plenty of rocks the effect will be greatly improved by the free use of dwarf or prostrate-growing shrubs.

WHERE TO BUILD

A rockery properly located and tastefully arranged is capable of affording much interest and pleasure to those who can appreciate the beauties of nature. The simplest form of rockwork may be described as an irregular mound of soil covered with stones, and a secluded spot or corner of the pleasure grounds, shaded by trees, but not necessarily directly under

them, is the position for a rockwork of the kind in question. Here, concealed from all points by an inclosure of shrubbery, or by an evergreen hedge, and approached by a rustic pathway through a leafy thicket, the rockery may be located without any violation of good taste or interference with other and more ambitious features of a large and varied garden.

Border rockeries to fill up large or unsightly angles of the residence or other buildings are somewhat rare, owing largely to the fact that a majority of all California houses are built of wood. Even in such cases we may cheaply and safely provide against decay and dampness. Build a background of rough redwood, place narrow strips, for "furring" between it and the house sides, and the clear and clean air-space will keep the house dry and the paint unspoiled. Such provision was made in the case of some of the border rockeries shown in our chapter frontispiece, all of which were built by the author's hands.

WILD GARDENS

If the author had a large suburban garden he would have a natural or wild rock garden that would be just a riot of rocks and dry garden plants that would not be figuratively calling for water and care during our hot summer. Rocks should be large, small, on hills, banks, and flat ground, in holes, corners, nooks—everywhere—no orderliness or design but just careless disposition—no strained effects but as near as possible to what nature would do with them. One should get all the rocks he can use and still have soil enough to give the scene a good touch of plant life.

For plants use any that will grow. Vile weeds

should be rooted out, but wild tobacco, bush lotus, humming-bird flower, the tiny flat milkweed, or euphorbia, or any natives bearing well the summer drouth should be encouraged. Visits to the neighboring hills, mountains and canyons would disclose a wealth of plants for rocky situations in both shade and sun where little soil or water is available. Plants for rockeries may be of any and all kinds, for in a large rockery may be found every situation presented in a garden. Ferns and shade plants should go on the north or shaded sides, angles, or nooks, while sedums and stone-crops, with cacti and other heat-loving succulents, may occupy the sunnier exposures.

CACTUS GARDENS

One of the chief charms of a cactus garden is the great number of similar plants which not only thrive under like treatment, but are often so near the cacti in appearance as to be mistaken for them when not in bloom. A full collection of succulents, as this class of plants is called, affords a richer and more interesting field for study than any other branch or phase of plant life. They are splendid subjects for elevated rockeries, for drainage should be of the best in order to maintain cacti in good health.

No family of plants recommends itself to the amateur gardener more highly than the cactus group. At no time do cacti need more than ordinary care, and after once established they may almost as well be left alone except for an occasional weeding. Most of them have to endure in their native habitat great extremes of heat, and in some places on our American deserts the snowfall is considerable, so that the question of climate need not perplex the prospective grower. In all cases the soil should be well drained,

yet some of our California species grow in heavy adobe.

The cactus family is one of the largest and most varied of any in the vegetable kingdom and has in combination more grotesque and curious forms with beautiful flowers than any other group of cultivated plants. In size they vary from little gems less than an inch in height and diameter to giants of sixty feet, three feet through the trunk, with so many curious forms as to completely baffle description. In size the flowers have no such range, but several are more than a foot long and, when in full bloom, of the same diameter across the mouth. No family of plants can surpass the exquisite shades of color to be found in cacti, ranging from white to crimson, all with a beautiful satiny finish.

WALL GARDENS

This phase of gardening is a success in any climate, but is especially easy of finished luxuriance in a humid atmosphere. Near the coast should prove ideal, and a rough rock wall fronting the ocean would serve splendidly to protect the garden, and the stones could be covered on both sides. *Muehlenbeckia complexa*, the wire vine from New Zealand, could be grown on the ocean side, right next to the wave-washed sands, and in a short while would so cover and bind the rocks together as to make a permanent protection. On the seawall in its native country this vine flourishes right in the ocean spray.

It would be preferable to have this wall widest at bottom and batter or slope from each side to a narrower top. If a core of good soil could be provided and flat or broken rocks "rip-rapped" up the sides success would be assured. On the inside of the wall could be planted, with assurance of vigorous growth,

many sorts of plants needing but little water. Care should be taken in watering until the plants are firmly established or the soil will be washed away. A light but very frequent spraying should be the program. While building, the soil should be kept rather wet and packed, and after each watering look over the wall and fill all chinks and cracks where soil has washed away or settled from surface. The common cobbles or boulders are the very poorest of all material for such work. Quarried or slab stone is best, and if it is soft and porous so it will hold water and grow mossy, the effect will be much more pleasing than with hard, impervious rock. This class of work would add a pleasing variety to many gardens.

A FINE WALL PLANT

Growers of cacti and other succulents suitable for rock gardens admire one of the large stone crops (*Sedum spectabile*) which is handsome in foliage and produces large trusses of fine pink flowers throughout a very considerable portion of the year. For the driest situations and poorest soils it has much to commend it, for under circumstances and conditions necessarily fatal to most plants it thrives marvelously. Given heavy, rich soil with plenty of water, it runs all to vegetative growth, produces no flowers and often rots away in the roots. Even then the tops readily root and soon blossom if left lying on dry soil.

THE AMERICAN CONE-FLOWER, GOLDEN GLOW
Rudbeckia laciniata flore-plena

CHAPTER VI

ANNUALS AND PERENNIALS

Let us grow flowers everywhere, for aside from our own pleasure they may perchance brighten the life and awaken a love of flowers in many now wholly or partially indifferent to their existence. How inconsistent to heap flowers upon the casket of one who in life cared no more for them than did the dog who followed at his heels, if we make no effort to interest and attract those now living. Eyes that see not, figuratively, may often be made to see literally the beauties of nature. We owe it to our kind of every race to clothe the earth with beauty so far as it lies within our power. There are few so unfortunately situated that they may not gladden the sight of all by making one or more flowers blossom where none grew or blossomed before.

SUCCESION OF BLOOM

In arranging your garden try to so plant that you will have a succession of bloom throughout the year. It is comparatively easy to accomplish this with the long lists of annuals and perennials at hand, but it may be done with annuals alone, especially if care is taken to cut back some of those that grew straggly and top-heavy after the first flush of blossoming.

When planting annuals select some that are capable of rejuvenation in midsummer, otherwise there will be few flowers in late summer just before the autumn crop is available. This neglect is a mistake common with gardeners, so that about August and

September the places under their charge become ragged, colorless and unsightly. Annuals common everywhere that may be cut back and rejuvenated in midsummer are: *Achillea*, *alyssum*, *calliopsis*, *marigold*, *pinks*, *nasturtium* and *Phlox Drummondii*. After cutting back give them a light feed of bone-meal, keep free from weeds and stir the soil lightly wherever it is possible. There are many other annuals which may be cut back and a fresh crop of flowers brought out.

NATIVE CALIFORNIA ANNUALS

No wild flowers in the world are superior to those native to California, and to visitors from other states and other countries they prove most attractive and interesting. The following list is especially recommended as one of native annuals that are low in price, requiring no care after planting except weeding, and successive crops of seeds may easily be harvested from them by any intelligent child, thus placing them within reach of all classes for all time. The first five are especially recommended for parkway or garden, and all are desirable for either purpose. None requiring special care, position or exposure have been included, but all are the hardiest of the hardy.

Eschscholtzia Californica, California poppy; too well known to need description. In reality a perennial, but usually treated as an annual.

Lupinus nanus, the dwarf blue lupine. An annual ten to fifteen inches high; a very showy plant, branching from the base; stems and leaves hairy. Flowers in small racemes, rich blue and white, fragrant. Very effective for sowing in masses.

Layia elegans, tidy tips. Annual, one to two feet high. A yellow daisy edged with white or cream

color. Leaves narrow with gracefully-toothed margins. One of our most common and most popular wild flowers.

Any one or all three of the following species of gilia: *Gilia achillaefolia*, blue gilia, annual one to one and a half feet high, with small lavender-blue flowers in dense heads on graceful slender stems, and light feathery leaves. *Gilia capitata*, another blue gilia; also annual, one and a half to two and a half feet high, a slender-growing, somewhat branched plant, with finely-cut foliage and compact heads of light blue flowers. *Gilia tri-color*, bird's eyes. An annual nine inches to one foot high; flowers pale lilac, yellow toward the center, with five purple spots, a charming combination of colors.

Mentzelia Lindleyi, blazing star. Annual, two to three feet high, yellowish stems; deeply-toothed green leaves. Flowers large, of delicate silken texture, color a rich golden yellow. One of the most brilliant of all native flowers, especially valuable for sowing in dry, sandy or rocky places, continuing in flower until midsummer.

Other desirable sorts are: *Lupinus affinis*, blue lupine, one to two feet high; *Clarkia elegans*, purple, two to three feet high; *Coreopsis Stillmani*, or *C. Douglasi*, both yellow, six to twelve inches; *Godetia amoena*, *bottae*, or *grandiflora*, all pink or pink with crimson spots, one to two feet high; *Collinsia bi-color*, white, lilac, and purple, one to two feet high; *Linanthus densiflorus*, rose pink or lilac, one to two feet high; *Nemophila insignis* and *N. maculata*, blue, four to eight inches; *Phacelia Whitlavia*, purple, one foot high; *Salvia carduacea*, light blue, one to two feet high.

EXOTIC AND HYBRID ANNUALS

In annuals not native to California, I would recommend the following list, also beginning with the five best in the order given.

Calendula, Prince of Orange. Annual, one foot high. Flowers large and double and of rich orange color. The best of the so-called marigolds.

Linum rubrum, the scarlet flax. One to two feet high, of a most brilliant scarlet; seed self-sowing very freely.

Mixed annual larkspurs, one to two feet high, in blue and white.

Poppies, especially the Shirley. A splendid effect may be gained by sowing with them either oats or canary grass. Colors range from white to crimson with black blotches.

Mixed candytuft in white, pinks, lilac and carmine, one foot high.

Other good sorts are: Sweet alyssum, white, six to ten inches; *Calliopsis*, mixed, one to two feet high, yellow and brown; *centaurea*, the corn flower, one to two feet high, white, lilac, and shades of blue; *cosmos*, mixed, sown in October or early in November will grow but one to three feet, in white, pink and red; French marigold, for summer flowering, one to two feet, yellows, browns and reds; *nasturtiums*, great range of colors; *Phlox Drummondii*; one foot high, white, pinks, yellows, scarlet and crimson; *portulaca*, all colors, for summer flowering; *zinnias*, all colors, for summer flowering.

THE TRUE POPPIES

Owing to the great range and brilliancy of their colors, the true poppies are favorites in nearly every garden. Added to this the ease with which they grow has made a place for them with nearly all flow-

er lovers. Of garden poppies, there are usually cultivated but four species: The opium poppy, the corn poppy, the Iceland poppy, and the oriental poppy. Of these the opium poppy is by far the greatest favorite and has the largest flowers of any annual species. Though useless for cut flowers, the plants are tall and stately and bear an abundance of blossoms in brilliant colors so that people are content to leave the flowers unpicked.

The corn poppy is more dwarf than the opium poppy, with finer-cut leaves. The well-known Shirley poppy is the best and most popular strain of this species. The Iceland poppy is a perennial species with shades of red, yellow, and white, and is not much grown in California. With many garden owners the oriental poppy is the favorite because it has the largest flowers of all the family. In the East it is the easiest of all to grow either from seeds or by root division, but in our state the air seems too dry. Still, it grows fairly well if never allowed to suffer for moisture. All these poppies are easy of cultivation; all like rich soil and a generous supply of water. Poppies are best sown broadcast and should be weeded until they get a good start, and then, if sown thickly enough, they will care for themselves, except for watering.

SWEET PEAS

In the growing of sweet peas too much stress cannot be placed upon the necessity for early and deep planting if vigorous growth and luxuriant bloom are desired. The bed should be prepared some time in advance of planting and spaded at least one foot in depth, all the better if two feet, with a dressing of three inches of well rotted manure spaded in and thoroughly incorporated, to insure the roots plenty

of protection from the heat later on and deep soil to draw upon, for they are gross feeders. Plant the seed at least two inches deep.

As soon as the plants show the slightest tendency to vine they should be provided with a support to which the tendrils may attach themselves. Nothing is better or more convenient for this purpose than wire netting which may be purchased by the yard. It should be six feet high for the winter flowering varieties and eight feet for the Spencer sorts.

The sweet pea is one of the thirstiest of plants, and when the earth and atmosphere give forth little moisture should daily receive a generous allowance of water, not a mere sprinkling but a drenching. This neglect to water regularly and thoroughly accounts for many failures in sweet pea culture. Another essential to satisfactory sweet pea growing is a sunny exposure. Those grown in the shade are neither so thrifty nor is the bloom so rich in color or so abundant as when grown in the sun. The sweet pea grower should remember that to be prodigal in the cutting of the bloom is the surest way to secure an increase. The seed may be planted early in the fall of the year with excellent results.

HERBACEOUS PERENNIALS

Nothing adds more of quiet charm and homelikeness to a garden than the herbaceous perennial border. It is adapted to gardens of any style or any amount of care, but in gardens where only a limited care can be given, those that are occasionally neglected for a time, the use of perennials will give much more satisfaction than annuals.

Perennials root deeply in the soil and most of them make a fine fibrous system, often running into thousands of hair-like roots on a single clump of plants.

Such an arrangement well fits them for successfully enduring drouths and periods of neglect. Good care must of necessity be given the first summer to insure the proper development of a feeding system. Most of these plants will grow where any plant will. Good garden soil, warm and light, rather than cold and heavy, is preferable. They do not do well in wet undrained soil. Fine manure, carefully forked in each spring, pays in better plants and more flowers.

There is no part of a garden where so much in the way of good flowers may be cut without in any manner marring the general effect, for it is necessary in order to keep up the floral supply that the plants be freely cut away in the flower-bearing spikes. Some lovely effects may be obtained by a judicious arrangement of them either on a large or small scale. An ideal position for such borders is where the background of a hedge or fence is obtainable; in front of this in beds of suitable breadth and length with preferably irregular outline on the outer margin arrange the various plants, grouping the taller specimens in the background and the dwarfer sorts in the front.

OLD FASHIONED FLOWERS

They ain't no style about 'em,
And they're sort of pale and faded;
Yet the doorway here, without 'em,
Would be lonesomer, and shaded
With a good deal blacker shadder
Than the mornin'-glory makes,
And the sunshine would look sadder,
For their good old-fashioned sakes.—Riley.

If more of these old-fashioned perennials were used we would hear far less about having "no flow-

ers in summer," and "our garden is so bare of plants during hot weather." The perennials among the asters, sunflowers, and some others are not so large and showy as the annual species, but are much easier to grow, and their permanence makes them extremely desirable as compared with the annual species.

There is here appended a list of fifty as they occur to the author, but this list has not touched upon some classes of plants and could be extended into the hundreds: ageratum, anemone, aster, begonia, boltonia, candytuft, canna, Canterbury bell, chrysanthemum, coreopsis, cuphea, daisy, dahlia, day lily, evening primrose, foxglove, forget-me-not, fuchsia, gaillardia, geranium, goldenrod, grasses, heliotrope, heuchera, hibiscus, hollyhock, hunnemannia, iris, larkspur, lavender, linum, lobelia, lupine, nierembergia, pansy, petunia, phlox, pink, poppy, primrose, rudbeckia, salvia, snapdragon, statice, stevia, stocks, sweet alyssum, sweet william, verbena, violet, wallflower.

PERENNIAL PHLOX

These old-fashioned plants, in their newer and improved types, make one of the most imposing displays of color that it is possible to obtain in the garden. It is not many years since there were but two or three colors grown. The phloxes of our grandmother's garden were the small-flowered white, pink, and purple varieties. Today we have them in every color from pure white to darkest crimson, with all the intervening shades of salmon, scarlet, rose, pink striped, etc., with enormous individual blooms carried in large, beautifully formed trusses.

Phloxes do remarkably well in California, furnishing a constant display from early spring to the

advent of winter frosts. They are true perennials and increase in vigor and beauty each succeeding year. For massing or planting at intervals in mixed borders they are beautiful subjects. Their charming bright colors are pleasing to the eye and the delicious wild-flower-like scent of the blooms is unlike that of any other garden plants. Phloxes thrive in an open, fully exposed, sunny border, either planted by themselves or mixed with other herbaceous plants. They are not particular as to soil so long as it has been well enriched previous to planting and is given an occasional mulch of rotted manure.

PELARGONIUMS

Pelargoniums, or Lady Washington geraniums, are among the most beautiful of our summer and fall flowering plants. They offer a rich and varied assortment of colors or combination of colors, and the ease with which they may be grown should recommend them to all.

To do well they require a sunny position and a perfectly drained soil which is not too rich. They are at home against a south wall where the reflected rays of a summer sun would destroy the bloom on almost any other plant. To keep them in shape they should be pinched back from time to time previous to the blooming season. By stopping the growth in this manner, many flowering lateral growths are produced.

FUCHSIAS

Fuchsias do well in any well protected north border and bloom in great profusion during the greater part of the year. Give them a well prepared soil which has been thoroughly enriched with decomposed manure and a copious supply of water during hot weather.

They require a partially shaded position; a rich, well-drained soil with abundance of moisture during hot weather. They make a beautiful background plant in shady borders and may be grown in various shapes to suit the requirements of the bed. A good plan is to grow them on fan-shaped trellises four or five feet high; as the growths develop spread them out and tie neatly. When they reach the top, pinch off the shoots; this induces a heavy growth below, and the trellis will soon be covered with a heavy leafy growth, and in season with plenty of flowers.

CANNAS

Cannas grow so easily that they are too often neglected, with the result that half of the beauty they are capable of developing is lost. If liberal treatment is afforded them they will produce a dazzling blaze of color.

For subtropical garden effects, used with various grasses such as cyperus, papyrus, eulalias, crimson fountain grass or caladiums, they are unexcelled. In planting them for landscape effect it must be remembered that they are a background flower, and the best display is obtained by massing them. In this favored clime cannas bloom almost throughout the year.

MODERN PERENNIAL LARKSPURS

Hybrids of *Delphinium belladonna* contain not only the sky-blue of the parent type, but all tints from palest to darkest blue. The various intervening shades of sapphire, turquoise, indigo, etc., are rich and beautiful. They branch freely from the crown and bloom without intermission from early spring to late autumn, with an increasing vigor to the plants each succeeding season. The blossoms are much larger than those of the older variety.

They should be planted in full sun, two feet apart each way, in any good loamy soil to which has been added and thoroughly dug in a liberal dressing of well rotted manure. An occasional mulch of the same material during the hot months will greatly increase the quality of the bloom. Arrange the beds so that the plants may be irrigated either by the trench method or by flooding. Sprinkling overhead, as with numerous other plants is detrimental in many ways and should not be practiced.

FOR SANDY OR ALKALINE SOILS

Use should be made of desert vegetation so far as possible. Most California wild flowers that grow on our open plains will thrive in arid sections. Geraniums and petunias are two splendid drouth resistant plants, and chrysanthemums, German iris, cannas, elephants' ears and Himalayan bamboos may all be seen in the Coachella Valley.

In alkaline soils try: The giant reed, *Arundo donax*; New Zealand flax, *Phormium tenax*; pampas grass, *Cortaderia argenta*; aloes, asparagus, lavender, lupin, ice plant, yucca, chrysanthemum and all nearly related plants of the composite family seem to like alkali.

CARNATION PROPAGATION

Propagating carnations by cuttings is quicker and easier than layering; in fact, except in the case of a variety that requires special attention and is difficult to root, it is the best for all purposes. The shoots at the base of the plant are the best to put into the cutting bed. Those that appear on the flower stems are of inferior quality and will in time show signs of degeneration. The same will be the case if cuttings are taken from exhausted blooming plants;

for this reason the flower stems should be removed as soon as the flowers on them are faded.

Some growers do not allow the plants from which they intend to take cuttings to bloom at all, so as to send all the strength into the plant. Cuttings must be taken only from healthiest stock and should have an average length of four inches with at least one inch of clean stem. When taken off close to the branch or stem out of the joint of a leaf no further trimming of the heel is necessary. When the shoot is long and requires a cut with the knife the cut should be made at a joint so that the two leaves can be peeled off and leave a clean heel. If cut too far back of a joint the wood is hard and difficult to root; if cutting is too young and tender the epidermis or skin is damaged, and the part below the joint is robbed of its outer covering and is very liable to rot off.

The best material in which to root them is clean river sand or very fine gravel, three or four inches deep, with good drainage. The cuttings may be planted one inch apart in the rows and two to three inches between rows. Insert them about one inch deep, and if there are any leaves that would be buried in the sand, cut them off. In putting in the cuttings use a pointed stick called a dibble, or dibber. It can be made one-quarter of an inch thick and pointed like a lead pencil. Make the hole with the dibble and put in the cutting, and then make the sand firm at the base of the cutting. It is a good plan to let the cuttings stand in water twelve hours after picking and before planting. Never let a cutting wilt.

After the cuttings are in they should be shaded. The best thing to use is newspapers. Lay them on top of the box of cuttings, keeping them away from foliage by sticking in the sand a few little splinters

of wood to bear weight of papers. One thickness is enough. Cuttings should be kept from drafts so as to avoid evaporation in the foliage and should also be sprayed two or three times a day for the first week or ten days in bright weather, and the sand should never be allowed to get dry. After ten days they can be given some sun. It will take six weeks for them to root, and they should never be allowed to remain in the sand any considerable length of time after they are fairly rooted.

Carnations prefer a deep loamy soil which has been well enriched with rotted manure. The positions for the beds should be in full sun. Plant in rows two and one-half feet apart, with the plants fifteen inches apart in the row. This arrangement allows for liberal cultivation and irrigation by small trenches along both sides of the row. They do far better under this system of watering than when sprinkled. To obtain the largest sized blooms, remove when quite small all the lateral buds, leaving only the terminal, as is done in disbudding chrysanthemums.

WILD GARDENS

When copious rains have fallen and the soil is wetted to considerable depth, it is time to sow gardens where the seeds are to be broadcast and no subsequent cultivation is contemplated. If such areas have been worked over, weed seeds started and the plantlets destroyed, they are ready for planting. If the area is still in a raw state allow the weed seeds time to start, then thoroughly hoe over the surface, allow time for weeds to die and the laggard ones to spring into life, then hoe over again, sow your seeds, rake over and pulverize the surface and let nature do the rest, for this latter is some-

thing in which you cannot render much aid. If one pulling of weeds can be given while plants are very small, from the vantage point of boards laid on the surface, much better results will ensue.

HOUSE BORDERS

Every building should have a space for plants left close to the foundation. No cement or other walks should be built within three feet if conditions will allow such space to be left, and in new places this is always possible. The angle formed by ground and building should be filled with plants and an occasional vine should clamber over a corner or along a porch. The house should appear to rise out of a mass of shrubs and plants, as a gem rises above its setting. No place has a proper finish without such provision for embellishment.

BRIGHT COLORS NEEDED

Too many home places suffer from a lack of tone or color. Many plants with light-colored flowers, vast stretches of cement or gravel walks, faded and undecided shade in the house paint, all tend to a wishy-washy effect that is sadly in need of brightening. Such conditions call for not a mere touch of color, but a dominance of some strong-growing effective plant. Scarlet geraniums or Ragged Robin roses in masses or hedges will bring the desired effect and produce a really wonderful transformation in what was formerly a very uninteresting prospect.

A CALIFORNIA WATER GARDEN
Floating on a Victoria Leaf

CHAPTER VII

WATER GARDENS AND AQUATICS

In a country like ours where there is a scarcity of rivers, lakes, ponds, etc., yet where ice seldom forms, artificial bodies of water, however small, are much appreciated. Here we may have some sort of a water garden throughout the year. Many people hesitate to incorporate a lily pond in plans for the home grounds because of the general, but erroneous, impression that such features are quite costly. The expense of water gardening is almost entirely that of first cost, the subsequent expense as compared with any other like garden area being small indeed.

No garden, however large or small, is complete without an aquatic department. Water, with its attendant vegetable and animal life, lends a more varied and varying charm to the landscape, near or distant, than any other garden accessory. The great range in form of aquatic plants and flowers simply baffles description or intelligent comparison, and in the long list of possibilities are plants adapted to ordinary damp soil and on down the line to those which will grow only when wholly beneath the water at all times, like the wonderful water fern and several other denizens of the cerulean depths.

Add to all this the animal life, from the sluggish water snail to the never-resting paradise fish, the graceful sweep and beauteous colors of the fantailed goldfish, and one has a world in miniature though his garden contain but a small pond for aquatics—

a never-ending and ever-changing source of enjoyment. Even in lands of much natural water the chief charm of the garden is a well-stocked pond or lake, but in a country like California, with few streams of size or inland bodies of note, water in a garden adds a wealth and variety impossible to produce with any other agency.

Many are deterred from acquiring a water garden through fear of cost and care, but this phase of gardening is only costly when one builds on a large scale. You may have your goldfish and water lilies in one or more half-barrels—if but one, a pair of fan-tailed goldfish costs but a dollar and a plant of the more common kinds of water lilies the same, so that all you need is a half-barrel and two dollars. Care there is not, for this proper balance of animal and vegetable life keeps the water pure and clear at all times.

AQUATIC FLOWERS

In the great family of *nymphaea* alone the range of color starts with the purest white and ranges by an almost imperceptible gradation to three strikingly deep and beautiful extremes of color—orange, crimson and blue, the two latter being really maroon and indigo, respectively, so intensely deep and substantial are these wonderful colorings. Only one other class of plants yields flowers of such exquisite color and texture—the tropical orchids, and then only when grown under glass with tropical heat and moisture and in no wise rivalling the aquatics in size of bloom.

The greatest charm of the water garden lies in the ability of every one to grow these blossoms of richest hue in the open garden with nothing to be done but watch them unfold their magnificence under

the magic influence of our almost tropic summer sun. The range in the size of aquatic flowers is fully as striking as that in color; the little white lily from Siberia has flowers no larger than a half-dollar, yet as perfect in all its parts and as full of series of petals as the giant lily of the Amazon, victoria, over a foot across. Still smaller than the Siberian is the dainty little frosted snowflake flower.

All flowering aquatics should be planted so that they will be exposed to full sunlight.

MAKING THE POND

Every one may have at least a half barrel sunk in the ground for a good water lily plant. In a country of vineyards it should be easy to get a large wine barrel. Sink one or both halves in the soil to within three inches of the top of staves. Put in just a foot of pond muck, leaf-mold soil or even a good garden loam, and in this plant your lily bulbs. After planting, pour in water very carefully so as not to disturb the soil, until a few inches above surface of soil. After the leaves begin to grow gradually fill with water. These miniature water gardens are inexpensive and a source of much pleasure.

In making a pond the excavated soil can be used in forming the banks of varied heights and configurations. The outline of the pond, like that of a belt of trees or shrubbery border skirting a lawn, should be varied and irregular, with bold points and deep indentations, and these should be few and bold rather than frequent and tame. The resemblance between a level lawn, surrounded by curved outlines of shrubbery, and that of a smooth sheet of water in a pond or small lake, with jutting banks and retiring bays, is very close, so far as relates to their artistic treatment in ornamental planting. The most

natural position for a sheet of water is in a hollow or low spot in the grounds. The total depth of the pond should be two feet and four inches.

KEEPING THE WATER PURE

Ponds need a renewal of water only when they get their annual cleaning out, and a little occasionally to replace that lost by evaporation, etc. If the proper balance of animal and vegetable life is maintained it naturally follows that all the inmates are living under perfectly natural conditions. Who has not noticed that natural ponds containing animal and vegetable life have clear, pure water throughout the year? Aquatic animal life abstracts oxygen gas from the water and gives off carbonic acid gas; this latter vegetable life absorbs and sets free the oxygen. The author has kept a pair of golden carp, or "gold-fish," in one gallon of water without changing it for several months. The only other contents were a few pebbles and a single water plant. If this can be done it should prove an easy matter to preserve the proper balance in a pond. A few healthy fish will also keep the pond clear of mosquitoes, as all of them will be greedily devoured while in the "wriggler" stage.

All tanks, ponds or lakes should have submerged plants growing in them to aerify the water, thereby keeping it pure and sweet. The best plants for this purpose are *Anacharis Canadensis gigantea*, *Cabomba viridifolia*, *Sagittaria natans* and *Vallisneria spiralis*. These can be planted in water from six inches to two feet deep.

WHAT TO PLANT

Forty varieties of water lilies, besides many small water plants, as also ten varieties of Egyptian lotus,

growing luxuriantly and sending forth many blossoms give witness that our climate is certainly suitable to the cultivation of the tenderest of aquatic plants. Before selection for color, etc., it is best to send for the catalogue of a dealer in aquatics.

HARDY WATER LILIES

Nympheas: *Aurora*, *candidissima*, *Gladstoniana*, *gloriosa*, *lucida*, *Marliacea carnea*, *M. chromatella*, *M. Robinsoni*, *M. rosea*, *odorata Caroliniana*, *pygmaea* and *pygmaea helvola*.

TROPICAL DAY-BLOOMING

Nymphaea Pennsylvania, *Zanzibarensis*, *Z. azurea*, and *Z. rosea*.

TROPICAL NIGHT-BLOOMING

Nymphaea dentata grandiflora, *dentata superba*, *Devoniensis*, and *George Huster*.

Old plants of tropical lilies often succumb to the chill of water during winter. Small nut-like tubers produced by keeping seedling plants in four-inch pots during summer, are more hardy and responsive than old crowns that have flowered.

FINE CALIFORNIA HYBRIDS

Several years ago a new series of hybrids appeared in a commercial water garden in Los Angeles, produced by the crossing of *N. gracilis* with *N. Zanzibarensis* and its varieties. They are strong and vigorous growers, producing very freely flowers much larger than *N. gracilis*, being eight to ten inches across, on stems standing fifteen inches or more out of the water. They increase freely by offsets, producing large tubers which are perfectly hardy in the citrus belts of California. The flowers are very useful for cutting as they can be placed in

vases in the same manner as ordinary garden flowers.

THE GIANT VICTORIA

Victoria Cruziana is the best variety of Victoria for growing in the open in California. Seeds should be started in January in water at eighty degrees,

EGYPTIAN LOTUS

and the plants kept in a warm greenhouse until June 1st, when they may be planted out in the pond.

This is the grandest of all aquatic plants. Leaves are not infrequently six feet across and flowers are one foot, of purest white, later turning to pink. As the plant is an annual, hard to grow from seeds, it will be better to buy young plants from a dealer in aquatics.

EGYPTIAN LOTUS

Nelumbiums, popularly known as Egyptian lotus, attain the greatest perfection if planted in the heaviest adobe soil, fertilized soon after planting out and each spring thereafter with dried blood at the rate of one pound to each ten square feet of surface.

There are many varieties, but those found to do best in California and now accepted as standards are: *Nelumbium album grandiflora*, *album striatum*, *Osiris*, *Pekinensis rubrum plenum*, *roseum plenum*, *Shiroman*, and *speciosum*.

SUITABLE SOIL

The most suitable soil for water plants in general, with the exception of nelumbiums, is a rich loam and the best rotted horse or cow manure mixed together in equal parts, with the addition of one or one and a half pounds of bone meal to each wheelbarrow load of soil, and we must not omit seeing that the mixing is done thoroughly. Nelumbiums love heavy loam or heavy, greasy clay, well enriched, as do all other water plants. They do not thrive and seldom or never blossom in sand or in soil strongly mixed with sand.

Lilies which are grown in beds of soil or in natural ponds will be much benefited by an application in spring of dried blood manure, broadcasted on the surface of the water at the rate of one pound to

every ten square feet of surface. Those in boxes and tubs need the same fertilizing.

When tanks, half barrels, or tubs are used, and after the soil has been filled in, a layer of pure sand to the thickness of two inches should be put on top, to prevent the fertilizing substances which have been mixed with the soil from rising to the surface. When using tanks or tubs it is necessary to see that they are exposed or built in places where they will receive a large amount of sunshine during the day, as this is one of the main points in successful cultivation.

BUILDING AN AQUARIUM

After trying to make a wooden one hold water and wasting two month's patience and hard work, I built

two of one inch angle iron, 13x16x26 inches, and they did not leak a drop and look as well as though I had paid a fancy price for them. I gave them a coating of red lead inside before putting in the glass and painted outside with black iron varnish.

Use the following mixture for cement; it is an old

receipt, but as reliable as can be made: Take 3 parts litharge; 3 parts fine white sand, perfectly dry; 3 parts plaster of Paris; 1 part finely pulverized resin. Mix thoroughly and make into a soft putty with linseed oil to which some dryer has been added. You may use the cement in two hours after mixing and put water in tanks in less than twelve hours after setting the glass. Use second-hand plate glass for sides and ends and one-fourth inch skylight glass, corrugated on one side for bottom.

CARE OF AQUARIUM

When the aquarium is to be thoroughly cleaned and rearranged, which should be done once or twice every year, the water is carefully dipped out or drawn off with a rubber syphon to within about six inches from the bottom. This water, if practicable, is saved and used again when the tank is refilled. The older the water the better. The author has used water for years in this way. Next take out the rockwork, then all the plants, also the larger pebbles, and now carefully catch and remove the fish, etc., placing them in a clean tin vessel with plenty of water of suitable temperature. Take out the remainder of the water now and also the sand, but do not move the tank, if a heavy one, from its position. After washing the sand particles off the inside of the glass to prevent scratching, clean the entire inside of the tank by rubbing it with ordinary table salt, using the fingers instead of a brush. All the brownish or green matter being taken off the tank is once more washed with clean water and is then ready for replanting.

WATER-GARDEN PESTS

Innumerable kinds of aquatic insects breed in the water, and some of their larvae prey upon the leaves

of the lilies, but the common water snail is the greatest enemy of aquatic plants. The goldfish assist very materially in destroying these larvae and snails, but we have found a complete preventive of injury to the foliage from this source by keeping in the tank, in addition to the goldfish, some of the common spotted sunfish. They are carnivorous in habit and very alert and active. Moreover, it is impossible for mosquitoes to breed in a water lily basin in which an abundance of the above named fish, or those of similar habit, are kept. Thus one objection to locating these tanks or ponds in the vicinity of the dwelling-house is removed.

WATER-SIDE IRIS

The apogon, or beardless iris, is a very interesting section and contains some very beautiful species and varieties. Some of these are as easy of culture as those in the bearded section, while some require more moisture and different treatment. Many are excellent for planting around lily ponds, in tubs, etc., particularly the taller growing varieties, where the roots receive plenty of moisture during the growing and blooming period. Like nearly all of the genus, when the plants are established they can be allowed to dry out for a time during the summer months—in fact, most of them are the better for it—which is an excellent feature, as it is a time when our gardening enthusiasm wanes. A few in this section do remarkably well with no more moisture than our bearded irises receive.

THE TROPIC-AMERICAN CERIMAN
Monstera deliciosa

CHAPTER VIII

HOUSE AND PORCH PLANTS

Henry Ward Beecher declared that he always found house plants an infallible test in selecting acquaintances, neatness, cleanliness, and innumerable virtues being the usual accompaniments of a love of flowers. It is an unquestionable fact that the cultivation and care of plants instills love of nature and has an uplifting and ennobling influence on mankind. Go where you will you meet with the best reception in every way at such places where the greatest love is manifest for the beauties of nature. When the traveler comes upon a home where there is a roomy, well-planned, well-kept garden he at once feels a desire to know the inmates personally, for he is certain to find there more or less generosity, intelligence and refinement.

HOUSE PLANTS

Many people are thoroughly discouraged with trying to grow house plants, when they might enjoy healthy and beautiful specimens by observing a few simple rules. You cannot take any plant you have and keep it just where you would most like it for effect without regard to what it needs. Many cannot thrive without sunshine, while others require little or none.

Every plant needs plenty of light, and nearly all a little sun, and if they do not get it ill-health and death will ensue. Scarcely a single pot plant requires or will endure the same exposure or aspect

throughout the year; some will survive the sunshine of winter but quickly succumb to the uninterrupted summer sun. Give them plenty of fresh air, every day, even in winter, leave the doors and windows open as much as possible, but do not allow a strong, cold draft to strike across tender plants.

Exercise great care in watering; hundreds of fine plants are ruined by daily waterings. Water thoroughly, a generous soaking, filling up the pot three or four times, about five minutes apart. Then let them rest for several days, or until the earth gets dry on top. A better plan for watering is to stand the pots in a vessel of water for from ten to twenty minutes. Air is as necessary to the roots of a plant as it is to the top, and when confined in a pot soon loses its life-giving properties and must be changed. You may drive out the foul air by a thorough watering and then when the water dries out it will be replaced by fresh air, thus giving perfect ventilation to the soil.

POTTING AND REPOTTING

Need of repotting is shown when the pot is fairly well filled with roots so that when the pot is removed the ball of soil is held together and netted over with good live roots. Some few plants need repotting before this stage is reached; still fewer should remain unpotted longer, but both of these classes are marked exceptions to the rule and need not be treated in general advice on potting. Generally a shift to a pot one size larger is enough and this but once a year, preferably in the spring. Sometimes it is not necessary to entirely repot. A considerable quantity of the old soil can be dug out without seriously disturbing the roots, and fresh soil given in its place. This is an easier and quicker operation than entire

repotting and interferes less with the roots and their functions and is advised in cases where it would seem to be sufficient to meet the demands of the plant, as may easily be the case if the potting soil is very rich. The use of liquid fertilizer or concentrated forms of dry commercial chemical fertilizers that are nearly odorless is becoming so common that we find it safe to do away with repotting for a long time, depending on the concentrated food furnished by these fertilizers rather than fresh soil as heretofore. Reliable fertilizers are prepared on scientific formulas and contain all the elements necessary for plant growth in the most convenient and available form. Repotting should generally be done in the spring and before the plant makes its annual growth. There will come to most plants a time when they seem almost dormant, but after they have had a good resting spell there will be signs of renewed growth quite apparent to the observant grower. This is the time to repot them. It is well to keep all freshly potted or repotted plants from both wind, sun, or rapid changes of temperature for several days and sprinkle them lightly two or more times each day for the first week. This treatment will aid materially in overcoming any shock the plant may have received through injury or disturbance of its roots.

WINDOW BOXES

Buildings whose lines of architecture are unusually stiff and conventional and whose colors are quiet, like the Quaker drab of many plastered residences, need the vine and window garden more than others. Delicate growth of vines takes away the harsh effect of too many straight lines, softening them into harmony with the surroundings. They also relieve the glaring effect of plain walls of brick,

cement, or stone. Window boxes are equally useful and not less ornamental.

The plain neutral gray of Florentine mission houses needs a touch of color to brighten their otherwise somber appearance. It is also true that window boxes do much to lighten the paint and stain effects on wooden buildings. For the purpose nothing seems more suitable than ivy geraniums, and these may be had in a great variety of colors or shades. For dark buildings any shade from pure white to pink will prove harmonious, but those having a touch of magenta or purple should be avoided either in window box or garden. For the Quaker gray above noted the pinks only should be used and the deeper the gray or cream of plastered houses, the deeper should be the shade of the flowers used. This class of geraniums has been much improved of late, and you may easily obtain any shade of pink desired.

While plants in window boxes should have plenty of room to grow, it is also necessary to have them somewhat effective at once, so that fair-sized plants must be used. Therefore get large plants in small pots and you will have them fairly showy from the start and yet be able to plant them in small compass. In nearly all cases window boxes are wholly insufficient in capacity, especially as regards depth, so that care must be taken to have them filled with none but the richest soil. For the same reason it is best to remove from the roots of the plants used as much soil as is possible safely, so that it may be replaced by the fresh and stronger.

Owing to root disturbance it will be found advisable to keep the boxes cool and shaded for a few days after planting, or until the plants have resumed root action and former functions. In filling in the soil it is best to put on the bottom, before setting

any plants, two or more inches of well-rotted manure for future plant food; in reserve, as it were. Economize in room as much as possible when planting; no harm will result from pressing the balls of soil about the roots quite flat if they are to lie against the sides of the box. Plant the sides first and the middle last, and get enough vines to fairly hide the box. Care must be taken to see that all interstices between plant balls are filled with soil, so that the soil used should be finely sifted and not too wet.

After careful planting settle with thorough waterings, and then before putting in permanent position fill up to within one to two inches of the top, using finely-sifted, well-rotted manure for the top half-inch to provide a mulch which will largely overcome the evaporation of soil moisture. More window-box plants during summer are ruined by too little than by too much watering. The crimson-flowered lotus (*Lotus peliorenensis*) would prove just the plant for such places. Do not confuse the botanical name, lotus, which belongs to members of the pea family (*Leguminosae*), with the popular name, lotus, which is often given to water plants of the genus *nelumbo*. Our plant is a trailer with finely cut, grayish-green foliage and crimson flowers of parrot-bill form; flowers closely resembling those of *clianthus*. It will stand great heat and much drouth.

HANGING BASKETS

There is no class of plants so neglected as those in hanging baskets. In their exposed position they dry out very rapidly, and are often given only a little water on top. The roots that need moisture so much seldom receive any, and these baskets are anything but ornaments. They should be taken down at least once a week, placed in a tub of water and

left there for half an hour. All of the plants should be submerged. In very dry weather this should be done twice a week, then they will be things of living green, instead of withered, sickly plants. A little liquid fertilizer given while they are wet will cause them to make more rapid growth, and if of blooming kinds will cause more buds to appear.

One of the most useful plants for large hanging baskets or shaded window boxes is the English ivy. This old favorite can stand more rough usage and neglect than any drooping plant or vine used for the purpose. The climbing vinca or periwinkle, often called climbing myrtle, is another rank-growing vine for large baskets, but it is a gross feeder and will not endure neglect like the ivy. The variegated glechoma is a neat, hardy little vine and even the maurandya is excellent for baskets.

Instead of allowing all vines to hang as they will, pin or tie part of them to the moss or the basket so as to hide the bareness of the latter. The Kenilworth ivy is a good plant for this purpose. *Abutilon vexillarium*, *nierembergia*, ivy-leaved geranium are all good for basket edges, or plant a border of lobelia. While flowering plants should be used to give change and pleasing variety, many prefer the plain green of asparagus or ferns. *Asparagus plumosus*, often called asparagus fern, does not require the amount of soil or feeding that *Asparagus Sprengeri* does, nor is it so hardy or tough, but it may be kept longer in pot or basket.

Nephrolepis davallioides and its variety, *furcans*, are two good sword ferns for baskets where plenty of soil is present. *N. exaltata*, the common sword fern, is a good "standing" plant and will endure much abuse and neglect, but is seldom graceful enough for baskets. *N. tuberosa* is a handsomer

species of dwarfer habit. *Onychium*, or carrot ferns, are good subjects; *O. auratum* has a yellow tint on the under side of leaf, and *O. Japonicum* is green, though in other respects quite like the first named species. The *platyceriums*, or staghorn ferns, are the most attractive of all for hanging or wall baskets or on blocks of wood and when once well established make good house plants.

All ferns or other plants with thick, leathery foliage endure the dust and dry air of living rooms though they need liberal quantities of water. All of the *pteris* or winged ferns are suitable for planting in baskets, more especially the dwarfer sorts, for they are of hardy constitution. Among other plants for central positions, *Begonia Erfordii* and all of that type are most excellent. A prime favorite with all who know it is *Farfugium grande*, var. *punctata*, the leopard leaf, a composite with nearly round leaves of dark green thickly spotted with yellow "polka dots." As these plants are all good material for hanging baskets, they are also equally good for pot culture and thrive splendidly in the house if given a reasonable amount of care.

POPULAR HOUSE PLANTS

Flowering pot plants need not be pot-pound in order to bloom, but they blossom much more freely when the pot is fairly filled with roots. While a plant is making a heavy root growth it rarely ever flowers, but only when the season's growth is finished. This action suggests that a plant should finish blooming and also have a rest before it is repotted and called upon for another supreme effort.

HOUSE FERNS

Only a few of the many varieties of ferns will do well under ordinary house conditions. Most vari-

eties are too sensitive to the extremes of temperature and the dry air commonly found in living rooms, and even the hardiest should occasionally be left out of doors for a few days in order to recuperate dissipated vigor. If house ferns could be put outside every night their house life would be lengthened almost indefinitely. Occasionally they should be sprayed, and to leave them outside for a time when the rain is falling cannot fail of benefit.

One who has a fine collection of house ferns and a few palms has found a very novel and successful way of keeping them in first-class condition. About once a week she places them in the bathroom, fills the tub with water made as hot as possible, closes all doors and windows and leaves the plants in this steam bath for three or four hours. Then the windows are gradually opened so as not to cool the plants too quickly, and when the bathroom has come down to normal temperature the plants are removed. This treatment renders washing of the leaves unnecessary, nor have any of these plants been attacked by scale or other pests.

For a house fern the maidenhair most common in our nurseries and florists' establishments, *Adiantum cuneatum*, easily holds first place, though not so hardy for the house as are the sword ferns and a few others.

Asplenium nidus avis, bird's nest fern, is a very handsome species with broad leaves. The mid-rib is black in color, with a foliage otherwise of a golden cast; a very desirable species for conservatories or indoor decoration, being quite distinct from all other ferns.

Cyrtomium falcatum, the holly fern, is an elegant hardy species, with broad palmate fronds of a deep

glossy green. It grows readily in pots or may be planted outside.

Nephrolepis exaltata, variety *Bostoniensis*, is but a sport from the common sword fern which is native to Florida and many other parts of the world. During the past few years we have seen a most remarkable development of house ferns among sports from the Boston fern until at present we have a half-dozen forms more ornate: *Nephrolepis Whitmani*, *Witteboldii*, *Washingtoniensis*, *Piersoni*, *Alice Foster* and *elegantissima*. While all have merit, none are so hardy in every way as the Boston fern.

Another neat sword fern is *N. cordata compacta*, and for a small pot plant is to be preferred to the Boston. Two plants closely related to the common sword fern and representing the extremes in size, are *N. Philippinense*, quite a dwarf, and *N. Washingtoniensis* which grows to a height of five or more feet.

The platyceriums are a group of ferns that are not sufficiently grown by the amateur plant fancier. Fastened on a block of wood or the bark of a tree and given a shady, moist situation, with an occasional shower of water, they thrive abundantly. To prevent them from requiring too frequent spraying some florist's moss may be fastened on the block under the plant. These plants may also be grown in pots of soil. There are now several horticultural forms, but the two species common are from Australia, and in their native home they are known as "elkhorn fern," *Platycerium alcicorne*, and "stag-horn fern," *P. grande*.

For a large pot plant *Pteris tremula*, one of the so-called brake ferns, will give the best satisfaction. In cut-leaved ferns *Onychium Japonicum*, the Japa-

nese parsley fern, and *Polystichum angulare*, var. *proliferum*, are the most easily grown.

A fern ball of *Davallia bullata* needs an annual rest. Gradually dry it off and allow it to remain dormant for a time. This should be done once each year at the season when you can best spare it or when you can give it the least attention. When you again start it into life do not let it get dry at any time but keep it soaked by immersion in a pail of water whenever necessary. When the growth is strong and healthy soak it about once each month in weak manure water.

PALMS

The most popular house plants are the kentias, so called, and they will doubtless never be superseded, for they very closely approach the ideal. Next to the aspidistra and rubber plant they will stand more neglect and abuse than any others and far surpass in graceful beauty either of the plants mentioned. There are but two species, *K. Belmoreana* and *K. Fosteriana*, both properly Howeas, though *Hedesepe Canterburyana* is also called a Kentia.

The owner of house palms should see that they get frequent baths and that the fronds are properly sponged off. The leaves of a plant are its lungs and are full of pores much the same in size and construction as those in the human skin, and if these are allowed to remain clogged with dirt and dust an unhealthy condition must eventually ensue.

Phoenix Roebelenii, the dwarf phoenix, a new and beautiful species introduced a few years ago, has taken a leading position in the none too long list of palms suitable for interior decoration. It is an extremely slow grower, much the same shape as other phoenix, but miniature in size. This species

appears to be as tough and durable as any of the more common ones so familiar to us, yet at maturity reaches a total height of but six feet, and this only after a great many years.

A GENERAL LIST

Many people include among the ferns the several species of asparagus, and one of them, *Asparagus plumosus*, known as the asparagus fern, requires similar treatment. *A. scandens deflexus*, a rare and but little known species, is the most beautiful of all. It is of compact trailing habit like *Asparagus Sprengeri*, but with very fine, dense, pale green foliage. *Asparagus Sprengeri*, the most enduring of all, is a gross feeder and is perennially thirsty. It may be grown either in pots or hanging baskets, and will stand either full sun or partial shade.

The aralias, with the exception of *A. papyrifera*, are adapted for house or conservatory culture. They are very pretty decorative plants and do remarkably well indoors. *A. Sieboldii* and *A. Sieboldii variegata* are very tropical looking small shrubs with very large, deeply lobed glossy palmate leaves, those of the latter broadly marked with creamy white.

Aucuba Japonica, the gold dust plant, is a very handsome shrub and one of the best of the colored-leaved foliage plants. With large glossy leaves, spotted with golden-yellow, followed by bright scarlet berries in the fall, it is a fine decorative house plant and well adapted to pot or tub culture.

For hardiness, beauty and general utility as a decorative specimen *Aspidistra lurida* may well be regarded as one of the best. It will thrive for months in a room where little light reaches it and does equally well as a shady porch plant or in a garden fernery.

BEGONIAS

Begonias are divided into three general classes, the fibrous-rooted, the rex begonia, grown for its foliage, and the tuberous-rooted. There are scores of varieties and all thrive in the house under pot culture.

Begonia manicata aurea has large, beautifully mottled leaves of yellow and green and fine pink flowers. It will endure the dry heat of the ordinary living room as well as any plant we have and will stand an unusual amount of neglect and ill usage. Those who have grown it as a house plant prefer it to other begonias.

Plant begonias in a very loose soil. There is nothing better than pure leaf mold or rotted sod with the addition of coarse sand. If this is not easily obtained add a portion of chopped sphagnum moss to any rich garden soil with a little coarse soil. If fertilizer be used, let it be old and thoroughly rotted, like rich black earth, and easily crumbled. Begonias are comparatively free from insect pests but sometimes become infested with scale.

Farfugium grande is a fine ornamental, shade-loving plant with large roundish leaves, dark green, with yellow blotches or "polka-dots." It makes a fine plant for porch decoration when grown in tubs, or may be treated as an open ground plant in shady places.

Ficus elastica is commonly referred to as the rubber plant and is a splendid plant of highly decorative nature. The leaves are long, broad, and a deep shining green. Small specimens are unsurpassed as choice table or parlor plants, standing much neglect and rough usage.

Monstera deliciosa is one of the handsomest of tropical foliage plants, with dark green leaves,

deeply lobed and notched at the edges and curiously punctured with round and oval holes. The leaves attain a width of two feet by three and a half in length. The plant is of climbing habit and sends out long aerial roots along the stem; these soon reach the ground, take root in the soil and furnish the plant with needed moisture. There is nothing more decorative for house culture. It also does well against a wall in any position where there is plenty of shade, but will not endure freezing temperatures.

The idea, once so prevalent, about orchids being difficult subjects to grow and flower, is now tolerably well exploded. Some species certainly need lots of fussing over, but many kinds will succeed well in any ordinary greenhouse, and we have seen on more than one occasion nicely flowered specimens grown in dwelling houses. Such sorts as *Dendrobium nobile*, *Cypripedium insigne* and other terrestrials, *Lycaste Skinneri*, and *Coelogyne cristata* will flower satisfactorily in an ordinary shady bay window if a little judgment is used in watering and other essential details.

Pandanus, Vietchii, a dracena-like plant, having leaves marked longitudinally with creamy white bands, in a young state is very effective as a decorative plant. Some people object to *P. Veitchii* on account of its fancied resemblance to the ribbon grasses; others have the idea that it won't stand well as a house plant, that it is harmed by being kept out of a high temperature, which is not the case. It will thrive equally as well as *Ficus elastica*, provided root conditions are favorable—that is, good drainage and porous soil. It will not permanently stand a low temperature, however, and requires a warm, sunny room for best development.

KEEP PLANTS CLEAN

Keep your plants free from dust and vermin at all times. Dust closes the pores and thereby stops circulation in plants as surely as it does in the human body. Half a dozen scale insects, if neglected today, mean several times the number in a few weeks, though such a caution in this volume is hardly necessary, for nearly everyone owning plants is painfully aware of the rapid increase of all scales. If plants have light from but one or two sides, turn them around every few days to keep them symmetrical. Keep the surface of the soil pulverized and loose, so that it can get water and air readily. If the soil is moldy on top or shows on the outside of the pot, the drainage is at fault.

CARE OF CUT FLOWERS

Cut flowers when properly treated can be kept fresh for two to three weeks. Every night take them out of the water and thoroughly rinse the stalks, removing decomposed matter. Put them into a basin of strong soapsuds, but do not allow any water to touch the flowers. In the morning rinse the stalks in the water again, and, as each blossom is arranged in a vase of fresh water, cut off a small portion of the stem, for each day the pores are closed by congealing sap and a fresh cut allows water free access to the stem.

GERMAN IRIS, LORELEI

CHAPTER IX

BULBS AND TUBERS

Bulbous plants are among the most beautiful ornaments of gardens and when well selected some kinds may be seen in bloom every day in the year. It is important to plant nearly all imported bulbs, especially narcissi and lilies, as soon as they can be obtained, generally in September. Iris and gladioli can be planted at different times, even as late as June, to secure a succession of blooms. No fertilizers except bone meal need be used, ammonia in any form being injurious to them.

To get good effects and pleasing groups with this class of plants one ought to be well acquainted with their habits, likes and dislikes, and success can be attained only by selecting types that will succeed in the different places where they can be planted. When making plantations the main object should be to get as natural an effect as possible. Care should be taken not to plant the bulbs in straight lines, curves or circles. Most of the common bulbs are so cheap they should be planted in large masses, the aim being to obtain color in such quantity as to prove effective when seen from a distance.

Bulbous plants store up plant food which enables them to pass a season in a dormant state in the arid regions of the world or else pass a season of rest buried in the ground where the winters are long and severe. The majority of bulbous plants have their origin in South Africa, Japan and America. We grow more from South Africa, known as "Cape

bulbs," than from any other one place. We also have a considerable number of natives that are worthy of a place in any garden, especially in those of all loyal Californians.

In arranging our bulbous border it will be very satisfactory to arrange them by themselves, selecting varieties which give a continuity of bloom throughout the year. A well selected collection of bulbous plants will give us a great deal of satisfaction, and though the original cost is greater than that of seeds, when we take into consideration the increase in number and value each year, it will readily be seen that the cost is more apparent than real. It is far better to select a considerable number of one species which are known to do well than to select a single specimen of a large number of sorts.

WHAT TO GROW

Agapanthus umbellatus from South Africa with large umbels of blue flowers is most desirable and flowers during summer. Good companions to the *agapanthus* are the *tritomas*, or *kniphofias*, known as the red-hot pokers; a mass of these brilliant torch-like blooms is very striking, and they are good, persistent bloomers. Of late years we have had some fine horticultural varieties of red-hot pokers sent to us from Europe.

The *amaryllis* and *hippeastrums* should be used in considerable quantity as they do remarkably well with us. The varieties of *Amaryllis belladonna*, both major and minor, *Hippeastrum vittata* with its hybrids, and the nearly allied *Sprekelia formosissima*, do well. In planting them barely cover the bulbs with soil and do not disturb.

Everyone having a shady corner in the garden, with a light, well-drained soil, should grow a few

cyclamen, "shooting stars," or "Persian violets," as they are variously called. Except for a short season during the heated spell they bloom more continuously than other bulbous plants.

The freesia is a good dwarf bulb doing well in clumps or borders. It is a good plan to dig them after they have ripened, six weeks or two months after last rain, and plant out again in September or October. Care should be taken to see that you get pure whites rather than the gray, washy whites.

A most interesting and satisfactory group of plants are the day lilies, *hemerocallis*, and splendidly do they thrive in California; indeed no garden of any pretensions is complete without them. Few plants we grow have such a long blooming season, and none in the family are more easily grown. It is regrettable that the range of color is not greater, running from a pale yellow to a deep bronze-orange.

Tritonias, or *montbretias*, are good summer flowering bulbs and very effective when arranged in clumps of six or eight bulbs a few inches apart or planted in large masses. When they get too thick, which is generally about every third year, the bulbs should be thinned out, as they do not flower so well when crowded. They come in all shades from pale yellow to crimson.

Every year adds to the list many devotees of the tuberous begonia. This section of begonias should really be called the flowering begonias for the reason that the flowers surpass in size any other section of the family. They come in every color and shade except the blues and are in many forms, single, semi-double and double.

The canna is another very satisfactory plant and with good cultivation and thinning out it can be left in the ground. Clumps should be divided and

reset occasionally as they deteriorate when too much crowded. No class of plants in late years has been so much improved as has the canna.

One of the most effective plants that go to make up the tropical garden is the crinum, often dubbed "spider lily" because in many species the petals are long and slender, giving the flower a slight resemblance to a huge spider. Not all, however, have these attenuated blossoms; some species have flowers of a shape similar to those of the amaryllis or belladonna lily.

The oxalis, found in several colors, makes a fine carpet and winter blooming plant which is exceedingly easy to grow. In fact, it prefers neglect. Oxalis varies greatly, both in foliage and color of flower, and is not sufficiently appreciated in California.

The aroids, or order Aroideae, is represented here by callas, elephant's ears, Jack-in-the-pulpit, monstera, philodendrons and many other plants both tropical and hardy. The callas comprise several genera and are generally known as white, yellow, pink, green, black, or spotted callas. They are in botany, richardias, arums, dracunculus, amorphophallus, sauratum, etc. One who has a full collection of aroids has a group of plants nearly as curious as the tribe of cactus.

Our native California bulbs should not be overlooked; we have many species of fine lilies, Mariposa, or butterfly lilies, brodiaeas, or wild hyacinths.

DAHLIAS AND THEIR CULTURE

Few cultivated plants have such a wide range of colors as the dahlia. It is one of the old-fashioned, practical flowers that has been improved much of late years. Those who have seen only the round,

stiff blooms of the old form will hardly recognize it in the unique, artistic and showy blooms of the "cactus" and decorative types. They are both single and double and in all shades. The old stiff forms have given way to loose, fantastic shapes. New irregular and esthetic varieties now originated and being introduced have redeemed the dahlia and made it one of the most popular garden flowers. Every conceivable color and shade of color from pure white to almost black is now represented.

Not all dahlias require like treatment, and in some situations and soils a few will be found to behave rather indifferently. It is best to grow a wide range for the first two years and at the end of that time discard those that do not produce abundantly and satisfactorily. It is well to make two or three plantings of dahlias if you succeed in holding the roots dormant until quite late in the spring. Often the season has much to do with excellence of blossom, and if you have planted all at once, the whole lot may turn out poorly. Dahlias are gross feeders and should be well supplied with food and drink, more especially from the time the buds show. From this time until blooming season is over they must never suffer for water. Planted in March they will bloom profusely and continuously from June till November. Any kind of soil suits them provided it is moist and rich. Plant the roots about six inches deep. When the shoots appear break off all but the strongest one. When this has grown four or five inches high pinch out the top or end—it will soon branch out—after which fill in around the plant with well-rotted manure. Treated in this way they will grow strong and sturdy and resist high winds. If you wish the finest flowers disbud freely, pinching out all the buds except one on each stem. The im-

provement in size and beauty of the blossoms more than repays the extra trouble. If you wish ordinary dahlias only, water and feed freely and let them grow as they will, staking and tying them if they are in danger of breaking down.

HIPPEASTRUMS

These gorgeous flowers, usually called amaryllis, are unsurpassed among bulbous plants either for size or richness of color. California hybridizers have produced the finest in the world and have received the congratulations and plaudits of the leading growers both at home and in foreign lands.

The flowers range in color from a pure white ground color with light or heavy markings of blush, rose, pink and red, to striped and mottled combinations of white with red, scarlet, crimson and maroon; also in the latter colors in "selfs" or but a single color in each flower. The newer sorts have no tinge of green either in the throat or on the reverse side and all are overlaid with a satiny sheen or luster that grows brighter as the colors deepen.

The shape of the flower is a spreading, blunt-pointed star, with overlapping petals, in some cases revolute, or rolling backward at the tips, vastly superior to the old type. The flowers are also of enormous size, occasionally attaining ten inches in diameter, with a half-dozen blossoms on one giant stem three feet in height. They are of the easiest possible culture and thrive in any rich soil in a sunny exposure or are splendid subjects for pot culture, vigor and number of blooms increasing with age.

For these bulbs the soil should be enriched with a liberal quantity of decomposed manure most thoroughly mixed with the soil by spading, respading

and raking until the surface is well pulverized. Such work will repay for time and trouble in blossoms of superior size and color. Plant in a sunny position, so that the top of the bulb just shows through the soil. When growth begins irrigate heavily and frequently and keep the soil moist at all times until the flowers have been cut or have died. When the buds appear the color of the flowers may be maintained in richest hues by a slight shading from the sun. Cheesecloth or even thin burlap, if not too close to the flowers, will insure sufficient protection and brilliant colors. In California the better practice is to leave the bulbs three years undisturbed, after which they may be divided and replanted, giving one an ever-increasing stock of the most showy garden flowers grown.

LILIES

Among flowering bulbs the lily has no rival, and it is a question if its beauty is surpassed by any family of flowers. A majority of our best garden sorts come from western Asia, China and Burma, while Japan and other islands furnish a great many. There are about 2000 species known and about one-half of them have been in cultivation. All seem to be natives of the north temperate zone. South Africa, which might aptly be called "the land of bulbs," contains no members of the genus *lilium*.

Lilies always look best when massed or planted in clumps and are quite in their natural position if planted along a shrub border with a background of other vegetation. Plant in a deeply-worked soil, and if this is heavy it would be better to lighten it with sand and well-rotted manure. While lilies need plenty of water the drainage should be good. The bulbs should be five inches below the ground line. Avoid fresh manures.

A variety of soils is necessary to success if a large general collection is to be cultivated, though a light soil is better than heavy for the sorts most commonly grown, even if it contains some gravel. No general culture can be given to fit all kinds, but the directions for care which we give will strike a good average treatment.

It is a good plan to put a handful of fine sharp sand under all bulbs planted in the fall, for it lessens the chances of decay and allows the roots a better start. In the case of lily bulbs it is also a good plan to drop some sand on top of the bulb; it is much better to fill the interstices between the scales with sand than to have them full of soil containing decaying vegetable matter.

Lilium superbum will thrive in a very heavy soil; *L. tigrinum* will do in any, while the following are adapted to light soils: *auratum*, *chalcedonicum*, *candidum*, *longiflorum* and the varieties of *speciosum*. Among the best sorts to grow are: *auratum*, the gold-banded lily of Japan, white with bands of yellow and spots of purple; *candidum*, the Madonna lily from southern Europe; *longiflorum* variety *eximium*; *Lilium Harrisii*, the Bermuda or Easter lily, from China and Japan; *speciosum* variety *rubrum* from Japan; *tigrinum* from China and Japan, the tiger lily of old-fashioned gardens, though the variety *splendens* of the tiger lily is far better than the old type, having large, nodding, bright red flowers freely spotted with large purplish spots; *superbum*, the American Turk's cap, which grows wild in the eastern half of this country; and many of our natives are well worthy of cultivation. The most popular Californian lily in the eastern states is *L. Washingtonianum*, and the one common throughout

the state, *Lilium Humboldtii*, would prove a valuable addition to any collection.

GLADIOLI

None of the old garden favorites have stood the test of time better or have kept up to a more satisfactory standard than the gladioli, and today they are more popular than at the time of their introduction. In all parts of the earth specialists are striving for new colors, forms, habits, etc., but in the meantime the good old garden strains have not been forgotten, and we have today a really gorgeous collection of color easily within the reach of all.

Gladioli are not particular as to soil, thriving fairly well in any, and they are just as cosmopolitan regarding climate. In general they seem to thrive best in light, friable, sandy loam, though in such a soil frequent cultivation and irrigation will insure success. The incorporation of well-rotted stable manure and wood ashes will go far toward making a strong growth with flowers of good size and texture. The application of a fertilizer strong in nitrogen caused the author's gladioli to run up to six feet in height, making staking necessary, and produced a succulent growth quite lacking in firmness. A lot planted two weeks later, with vegetable ashes only applied, produced a fine dark green growth, very sturdy in habit and less than half as tall as the first lot. Plant your bulbs early as possible for the main crop—January is best—and for later plantings choose each time those farthest started into new growth, though best results are obtained by planting a month before the shoots will start. Put bulbs at least four inches deep in soil. Copious waterings at regular intervals are necessary.

Everybody loves to have plants that originated,

after a fashion, in their own garden, and also to have those unlike any to be found elsewhere. Here is where the charm of crossing comes in. Get the best bulbs you can buy; no use fooling with inferior parents if you desire high-grade offspring. Pull up and throw away any coming into flower that are off in color, size, form or vigor. Plant breeding answers to the same rules as animal breeding, so pick none but the best parents. When you have spikes coming into bloom and wish to cross, you had best proceed in the following manner: Take off, simply by picking with the fingers, the three stamens every blossom has, being sure that no part of them remains on the slender stem on which they hang. This emasculation should be rigidly followed out as early as possible every morning. The stamens of your choicest should be saved, as they contain the all-necessary pollen; the remainder may be thrown away.

Every stamen has two long, narrow pollen sacs which may easily be found by examination. Take a little of the pollen on the end of a toothpick and put in the "throat" and "troughs" of the three-pronged pistil, using enough to completely choke the mouth of the small tube which runs down to the ovaries at base of blossom. We who are looking for scientific determinations only fertilize our blossoms somewhat differently; the author pollenizes each floret three mornings in succession and covers each spike with a paper sack, tying it about the stem to prevent insects entering the blossom. Commercial growers do not take these precautions except in case of a few "pets," and it is not strictly necessary, for a pistil well choked with pollen is not very liable to contamination by other pollen. Small sacks or boxes should be provided for the seeds on which is

written the cross, the seed-bearing parent, the plant the pod is taken from, always appearing first, as: "America x Aphrodite" if pods are from the first-named or "Aphrodite x America" if the former was fertilized by pollen from America. In case named sorts are not used they may be numbered thus: 46xAmerica or 22x46. It is better to pick seed pods from each stem as they ripen, and this just before they begin to split open. Six pods are enough for any stem to mature. In our climate we may sow these seeds at almost any time, though the spring and early summer is preferable.

THE IRIS

This flower was named from Iris, a radiant goddess arrayed in garments of surpassing splendor, a personification of the rainbow which is a concentration of all tints, rays and coloring of beauty. The German iris, sometimes called the poor man's orchid, for the reason that it is so easily cultivated, is especially desirable for many locations and is very happy in low, wet ground, but will bloom freely in the common border. The varieties are almost numberless, and the grace and coloring of flowers exquisitely beautiful.

Nearly 200 species of the iris family are known to botanists, and many of these are not yet known to commerce. This accounts for frequent announcements by dealers of "an entirely new iris." We have a considerable number of splendid types, and were the iris alone taken out of our gardens it would be sorely missed. The fact is that it is not nearly so much grown as it should be, for there is no member of the family but is desirable for even the best of gardens. Of late years so many new species have been introduced and such a great num-

ber of hybrids and crosses obtained by the plant breeder that today a large and varied collection of iris will rival in beauty and interest that of any family in the plant kingdom. In German iris almost every color but a pure, deep yellow may be obtained in the local market. We have iris known as English, German, Spanish, Japanese, alpine, and numbers of others with less comprehensive geographical names, yet not less beautiful or desirable. All are happily very cosmopolitan in their requirements, so that no one need fear failure in their culture.

Moraea iridioides is the name of a beautiful flower of the iris family, close to the true irises, from which it differs but in floral organs. The ground color is pure white, and the narrow petals have a midrib of deep yellow, while the broader set are delicately etched through the middle with chocolate brown. Unlike the true irises this plant blooms at any season.

DUTCH OR HOLLAND BULBS

The principal Dutch bulbs grown in California are hyacinths, narcissi, and tulips. This class is called Dutch bulbs, not because they are natives of Holland, but because nearly all these bulbs are propagated and grown in Holland. Both the climate and soil in Holland appear to be remarkably favorable to the growth of this class of bulbs. The soil where they are grown is sandy, with water a short distance below the surface, so that the plants are practically secure from drouth. Shipments of bulbs are made in autumn from Holland to all parts of the world. We usually receive them about October, and they are ready to be started for blooming as soon as received. The planting should not be long delayed, that is, it must be done during the fall

months. Many people see flowers of bulbous plants in the spring and send to dealers to purchase the bulbs, only to be disappointed, not understanding that they must be planted in the fall.

The soil for bulbs should be in good condition, enriched with well-rotted stable manure, or, in absence of that, with some good commercial fertilizer. The bulbs will bloom even in poor soil, and hyacinths and narcissus are frequently bloomed in water, but in good soil there is better growth of foliage, and this is favorable to finer flowers.

Pot single bulbs of hyacinth in four-inch pots, or three or four in a six-inch pot. Set the bulb so that when the soil is filled in the top will be just at the surface. Pot the narcissi in the same manner. After the bulbs are potted, water and set away in a cool, dark place for some weeks, where they will make roots, before bringing them into the light and warmth where they will rapidly develop blooming spikes. Potted bulbs that have been set away in the dark should be looked over every few days, and any pots that need it watered, as the soil should not be allowed to get quite dry. When the plants are brought to the light and begin to grow vigorously they may be watered freely.

For growing in water they are usually put in a shallow bowl and kept in place with pebbles packed about them. A six-inch glass dish or bowl will easily hold three bulbs. It is better to keep the base of the bulb just above the surface rather than in it, as in the latter case the bulbs will sometimes decay. Narcissi are greedy for water, and this is one reason this method is adopted, though more easily grown in soil if abundance of water is supplied.

FERTILIZER FOR BULBS

It is usually conceded that of all special fertilizers

those found best for potatoes will do best for a general mixed stock of what is usually termed "bulbs." One carrying four per cent of nitrogen, eight per cent of phosphoric acid and ten per cent of potash is made as follows: nitrate of soda, thirty pounds; sulphate of ammonia, twenty pounds; tankage, 100 pounds; acid phosphate, 250 pounds; muriate of potash, 100 pounds; making a total of 500 pounds. Small gardens may easily use this formula by cutting off one cypher from each figure and reducing the total weight to fifty pounds. Use little but often.

THE CHINESE ROSE, WHITE BANKSIA
Rosa Banksiae var. *alba-plena*

CHAPTER X

THE ROSE GARDEN

The rose is the most universally beloved of flowers and for all time has been the chief floral embellishment in the gardens of both castle and cottage, shedding its delightful fragrance impartially over prince and pauper and commanding the admiration of every enlightened people. It is found in a wild state in all parts of the earth, and cultivated varieties are given an equally wide dissemination.

TYPES OF ROSES

The mosses are not much grown in California, and in the southern end of the state are seldom seen, being chiefly noted for their scarcity of flowers. The varieties are usually known by their names specifying the type, as: Pink Moss, Glory of Mosses, etc.

The noisettes are better known to us, though only in climbing sorts. They are abundant bloomers, bearing flowers in clusters. The better-known sorts are: Cloth of Gold, Lamarque, Madam Alfred Carriere, Marechal Niel, and Reve d'Or.

The Bourbons and Bengals are not universally popular. The former is extremely variable in type, generally bearing light-colored flowers, while the latter, often called Chinas, are small, compact growers, bearing myriads of fragrant crimson flowers, and make good hedge plants. Examples are: Agripina, Grus an Teplitz, Souvenir de Malmaison (pink Bourbon), and James Sprunt, a good climbing sort.

The polyanthas or "buttonhole" roses are small, very free bloomers, bearing flowers of most exquisite form. The ones best known are Cecile Brunner and its climbing variety, Baby Rambler, Crimson Rambler, and Yellow Rambler.

The teas are an old-time, free-blooming, "cranky" type, their luxuriance of flowers, delicate tints, and fine forms making them very popular. They grow less vigorously than the hybrid teas, but many of them will thrive in soils too light and sandy for hybrid perpetuals. Some of the better-known and time-proven are: Bride, Bridesmaid, Dean Hole, Duchesse de Brabant, General McArthur, Laurette, Papa Gontier, Peace, Reine Marie Henriette, and Maman Cochet.

The hybrid teas are much stronger in growth than the teas, occupying in this respect a position midway 'twixt the teas and the hybrid perpetuals, having the free-flowering habit of the former, combined with the rich colors and general vigor of the latter. Among them are: Caroline Testout, Kaiserin Augusta Victoria, Killarney, La France, the first of this type, 1867, and Madam Abel Chatenay.

Hybrid perpetuals or remontants are easily distinguished by luxuriance of foliage, vigor of growth and large size of flowers. They are not so exacting as other types, thriving with less care, yet equally responsive to good treatment. Their range in color is great, comprising all the shades and tints found in the other classes. They also need more summer rest and may be more heavily pruned. They are the best for those who can bestow but little care on their gardens. Some of the more common are: American Beauty, Frau Karl Druschki, Magna Charta, Paul Neyron and Ulrich Brunner. We have a few of other types, such as briar, prairie, rugosa,

wichuriana, but they are little known and less grown.

SOILS FOR ROSES

The hybrid teas or the hybrid perpetuals thrive best in heavy soils, the Bourbon class do well in any, but the teas and noisettes seem to produce best if the soil is light or somewhat sandy. It is essential in all cases that drainage be good, and for this reason some rosarians of experience remove all soil from the beds to the depth of two feet, pick up the bottom of the pit as deeply as possible, scatter a little manure and sand over the surface and replace the soil, mixing it as it goes back with sand and thoroughly rotted stable manure, being careful to make a good job of the mixing process. A great deal of such work is done in England, some in the eastern part of our country, and but little by our impatient Californians.

In light soils there is little doubt but own-root roses give best satisfaction over a long term of years, the necessity for budding keeping pace with the increasing heaviness, but, when one reaches adobe or clay, it is better either to give up pure teas and plant hybrids only, or convert the soil for these into one of much lighter texture. It therefore must be apparent that if you grow many roses it will be found better to keep the classes separated. When purchasing mixed sorts of roses for heavy soils it is doubtless better to get them budded, for few have enough in number to sharply discriminate between the classes as to their specific needs. It is well to reiterate that all roses do best in soils that have been deeply stirred and well worked over.

SUMMER TREATMENT

In California roses need the same amount of rest that nature gives them where winter's cold renders

all plant life dormant for several months each year. We seldom get good roses in summer for the reason that the atmosphere is too hot and too dry, and after the heavy flower crop of winter and spring the plants need a period of rest in which to recuperate their vitality.

In the warmer parts of the state one may have autumn and holiday roses if water is not given at all from the last day of June to not later than the first day of October, preferably pruning and watering for the first time during the closing days of September. If autumn roses are preferred it matters not if leaves turn yellow or fall and bark on the smaller and younger growth becomes shriveled; the plants are not necessarily distressed by such treatment, for the growth manifesting such change must all be cut away in any event. If rest is the only end in view, the plants need not for so long be deprived of water, or rest may be begun later, or a little water be given every month. In this case pruning is delayed until winter.

All this presupposes that the rose beds are where they may be kept under proper control. If the plants are in the lawn, either singly or in beds, good roses in large numbers will not result. Why anyone will consider rose plants for fundamental landscape embellishment is very hard to understand, for rose bushes severely pruned and soil in constant cultivation or heavily mulched do not add to the finish of the landscape. There are other and more fitting places for growing rose bushes than may be found in any lawn. After being driven through a couple of years by almost daily watering of the surrounding grass, and allowed no periods of rest, that rose plant is indeed hardy that will still return a bountiful crop of flowers. If you need shrubs for the

lawn the markets contain a goodly variety of suitable material, coming as many of them do from lands where ordinary lawn conditions largely prevail.

WINTER TREATMENT

In the last section the reader was told that if he lived in a practically frostless locality he might have early winter or holiday roses, and how best to get them. It was also stated that if conditions were less favorable severe pruning should be left until winter. The latter treatment will be found better for California in general.

In the colder sections, where very sharp frosts prevail for a time, roses may be pruned in December, for low temperatures stagnate the flow of sap and ripen the wood so that early pruning is admissible, but as dormancy under such conditions is prolonged there is no necessity for pruning until early in the new year.

In the warmer sections, as in the southern third of the state, the bay region about San Francisco and Oakland, and in various circumscribed citrus belts, the pruning process is better left until January. You will then get a crop of fine blossoms from early spring until the middle of summer, for roses so treated will begin blooming in February or March, according to the weather, and continue till July unless spells of very hot weather curtail the bloom.

MILDEW ON ROSES

The most serious trouble prevalent with roses during winter, and somewhat at other times, is mildew; and this may be present from one or several causes. It is sometimes due entirely to unfavorable weather conditions, but in such cases it attacks only sorts

unsuited to the climate, weakly varieties, or those in a poor state of health. It is usually present as the result of extreme conditions—too wet—too dry—too hot—too cold, etc. As an example, many roses, especially the teas, will be attacked by mildew whenever there is a stagnation of water at the roots; that is, more water than the plant can immediately appropriate or make use of.

The more common way in which mildew is encouraged in California is about as follows: Roses are planted in a bed fully exposed to the sun, or, if climbers, are planted on the south side of a building. All day the air is hot and dry. In the evening when "the boss" comes home from work they are watered, which treatment but increases the chilliness of the night air, making conditions precisely the reverse from those which obtain throughout the day. These utmost extremes—hot and dry by day, cold and wet by night—are too great to expect any but the hardiest rose to withstand.

The proper treatment would tend to equalize rather than accentuate these extremes. Water in the morning, early; you will then find the surrounding atmosphere to be somewhat moist all day, but before the chill of night creeps in the plant and the sun and air will have absorbed nearly or quite all of the moisture and the air during the night will in consequence be comparatively warm and dry. This latter treatment, if the surface soil is kept stirred and the drainage is good, will in a majority of cases ward off attacks of mildew which, but for such precautions, might seriously injure the roses.

PROPAGATION OF ROSES

There are three methods of propagating or increasing the number of roses; by seeds, by cuttings,

and by budding or grafting. To all who are in any wise grounded in knowledge of plants it is evident that growing from seeds is but a harmless pastime and is not indulged in by the amateur with any hope of profit, for out of a thousand seedlings there may not be one of any commercial value.

Own-root roses, or those grown from cuttings, are in the very strong-growing sorts the most glorious and permanently satisfactory of all. But there are so many fine sorts that are either weakly or very ordinary on their own roots that the amateur who purchases had better procure budded roses, unless he be well posted on the specific needs of the varieties he most desires. Grafting in effect is similar to budding. If skillfully done it may be slightly superior, but for reasons not necessary to state it is not so practical for commercial purposes.

PROPAGATION BY CUTTINGS

From November 1 to January is the proper season for propagating roses from cuttings, for the reason that during the cool weather of the rainy season the cuttings will callous, continue the process, and root throughout the winter, starting top growth in late winter. Cuttings taken later do not have time to get calloused and rooted before active top growth is induced by warm weather, and the result is comparatively weakly plants.

Use well-cured wood, full of dormant eyes, from the diameter of a lead pencil up to a half-inch, containing three or four eyes or buds which will make them four to six inches in length. Cut the lower end from a quarter-inch below a bud, through the cane on about a forty-five degree angle, using a very sharp knife having a thin blade. Cut the top end a half-inch above a bud; there is no need of super-

fluous wood at either end. Select clean, straight wood only, from vigorous, healthy plants.

Insert these cuttings, all but the top inch or so, in a bed of sharp washed river sand of at least four inches depth. Do not force cuttings down into this damp, firm sand or you will bruise the smoothly-cut end. Either make a narrow channel across the bed with an old table knife turned slightly to open sand to width of cutting, or with a piece of lath or wood properly fashioned or a sharpened stick of greater diameter make a hole for each cutting.

Press the sand firmly about cuttings and wet down well to thoroughly firm the sand, and never afterward allow it to become dry. If sand is not available, use the lightest and sandiest soil you can get and as free from decaying vegetable matter as possible. A cold frame with a cloth or burlap cover is ideal, as cuttings should at first be kept from sun, and until well started in roots, from strong winds. Later in the season when a vigorous young root system is assured the cuttings may be gradually exposed until full sunshine is given them. The average amateur would better use a box in the shade and protection of a building, keeping it at first in the coolest, darkest place available, and well protected, dragging it into light and warmth as the rooting process develops. Dry off box in late fall until roses are semi-dormant and plant out. Spring propagation, practiced by some, is accomplished by same process.

BUDDING AND GRAFTING

In budding and grafting the work is usually done in growths of the same diameter and condition as that recommended for cuttings. Grafting is so uncommon that the process need not be described. It

1. Vertical Incision

2. Transverse Incision

3. Inserted Bud Ready for Tying

4. Waxed Cloth Tightly Twisted

SHOWING COMPLETE THE METHOD OF BUDDING

should be accomplished in the spring. Budding may be done either in spring or fall, or even in summer, if plants are where temperature and general conditions may be controlled.

When the bud has been cut, very carefully pull out the woody chip inside. Quickly place this in a T-shape (or inverted T) cut, made previously, bark-deep only, in the stock plant to be budded. Raise the bark on one side of the incision with the wedge-shaped end of the budding knife, put in one side of your bud shield and then do likewise for the other side. Bind the stem both above and below the bud with raffia, narrow strips of stout muslin or very soft, coarse twine or candlewick. When the bud shows signs of starting, an average time of about three weeks, loosen the binding and retie. If properly loosened and tied no other restrictive measures need be used and the binding may be taken off when the bud has grown so that the stem of the stock above the bud may be cut off and the full sap supply be allowed to flow into the new bud.

ROSES FROM SEEDS

If the rose hips or apples are fresh the pulp will need to be washed from the seeds. The latter may then be sown in a mixture of sand, leaf mold and loam, covering about a half inch. After sowing keep cool and moist. The soil must have good drainage yet not be allowed to dry. As the seedlings come up, pot them off or transplant to other boxes. Do not be impatient if none appear for weeks, and after waiting a reasonable time prepare a new seed bed, put the soil and seeds in a sieve, wash the former through and sow the latter again before they dry and cover with clean sand. Usually a good crop of seedlings will result.

PRUNING THE ROSES

It is difficult to lay down hard and fast rules for pruning rose bushes for the reason that each bush presents a distinct and individual problem, and much study and experience are necessary before one is fully competent to prune all classes and kinds of roses intelligently. However, a few general rules may be given.

First cut the whole top off at not less than two feet high on good strong bushes established for a few years. This allows you to get at all parts of the bush. Cut out small twiggy growth that is of less diameter than a lead pencil. Next remove all canes which grow crosswise, that would tend to chafe upright canes or interfere with their free development. Do not leave a group of canes congested in the center, but aim to leave center of bushes free and open. Do not prune young roses severely; the first year take out weak, thin growth only.

The aim should be to leave a strong, healthy framework of large, vigorous canes, few in number and standing well apart, the larger ones left longer than the lesser ones by a few inches, but seldom is it well to leave even the strongest more than two feet high. It matters little if no foliage is left, for none is needed. When finally cutting back the few big canes left (which may number from two to seven) it is better to cut a half inch above an outside eye or bud. This will tend to spread the plant and avoid crowded centers where neither light nor air may enter.

As a rule climbers need but little pruning, and annual bloomers such as the Banksias, Cherokees, Glazenwood, etc., should be cut back immediately after blooming, if any pruning is necessary, for

they then make the wood that bears the next season's flowers, and if pruning is too long deferred the next flower crop will be indeed light.

Those who persist in pruning without protection to the hands or without the heaviest of gloves will receive many painful punctures and lacerations of the skin. Get a few corrosive sublimate tablets from a drug store, dissolve one in a pint of water and bathe the hands therein for several minutes and all pain will cease at once. This is an excellent anti-septic but deadly if taken internally, so be careful of both bath and tablets.

FERTILIZERS FOR ROSES

Immediately following pruning, if you have wood ashes, apply a liberal amount and turn them lightly under the soil or give a good deep raking to thoroughly incorporate them with the surface soil. Good hardwood ashes carry one-fifth lime, besides a considerable amount of potash. Coal ashes have no nutritive value. If ashes are not available give a light sprinkling of air-slaked lime and rake in. This application should precede manuring by a month if possible, but is beneficial if foremost by but one day. In small gardens some put ten pounds of lime in a tub, fill it with water, allow lime to settle until water is clear and then apply the latter to the plants. It will not prove too strong for any rose. The settled lime may be scattered elsewhere in the garden.

There is no question but that thoroughly decayed horse manure is the best garden fertilizer for roses or other plants. Next comes cow manure. In light sandy soils it is of greater physical value than in heavy soils. Fresh sheep manure should be used with caution, as it is strong, and poultry manure is

still stronger and must be used sparingly, though one of the best rose stimulants known.

Commercial fertilizers, when properly used, answer every requirement of the rose so far as food is concerned, but do not aid the physical texture of the soil. Pure bone meal, either raw or acidulated, is highly beneficial and may be used heavily without harm to the plants. It is best used with nitrate of soda. Two or three applications of potash throughout the season are better than a single one, and muriate is a good form in which to apply it.

One expert rose grower sows the following mixture at the rate of a pound and a half to every ten feet square (not ten square feet, but ten by ten): Mix superphosphate of lime, twelve parts; nitrate of potash, ten parts; sulphate of magnesia, two parts; sulphate of iron, one part; sulphate of potash, eight parts. The author has never tried this chemical recipe.

Whatever else is fed to the roses, stable manure should be spaded in deeply once a year before growth commences in winter. Then pulverize the surface soil, rake smooth and apply a very heavy mulch of strawy horse manure when active growth commences, and water through this, being sure that each watering is sufficient to wet down below the roots, and apply only as often as required. The heavy mulch will prevent weeds growing, keep the soil cool during the heat of summer, and materially prolong the flowering period.

THE BEST SORTS

Owing to the wide diversity of personal taste, and the variations of climate, soils, temperature, etc., throughout the state, it would hardly do to recommend any restricted list of roses as the very best

sorts for any or all to grow. Therefore, the lists herein given consist of one dozen each of the four recognized standards of color; roses that the author has either grown in his own garden or closely studied in the gardens of others, and believed by him to be the best of those commonly for sale throughout California. They are listed alphabetically; no preferences shown. The letters following the names indicate the class to which each belongs, thus: T., tea; H. T., hybrid tea; H. P., hybrid perpetual; B. or C., Bengal or China; N., noisette; Poly., polyantha.

WHITES

The White La France, properly Augustine Guinoisseau, is a nearly white hybrid tea, carrying a slight tint of fawn color. The latest first-class white, the finest of all, is Frau Karl Druschki, H. P. Ivory, a tea, is pure white and therein somewhat belies its name, for Kaiserin Augusta Victoria, H. P., is the best ivory-white. Mabel Morrison, H. P., is a fine old rose of snow-white, sometimes faintly tinged with pink. Molly Sharman-Crawford, H. T., is one of the newer roses which proves pure white at all times, and this is likewise true of Niphetos, a tea rose, doing well in shaded positions. Perle von Godesburg, H. T., is creamy white, tinted with yellow, in all other ways closely resembling the Kaiserin. The Bride, a pure white tea, is of somewhat weakly habit except under ideal conditions, and will thrive in partial shade. The Queen is another pure white tea and more robust than The Bride, as a queen should be. White Killarney, H. T., a pure white sport from Killarney, is equally as good as its distinguished parent. White Maman Cochet, T., is always suffused with pink in the outer petals.

PINKS

Belle Siebrecht, H. T., is a long-pointed rosy-pink; Betty, H. T., is a large, less double, coppery rose, while still another shade, shell-pink, is shown in Clara Watson, also a hybrid tea. Killarney, H. T., is flesh-pink, slightly suffused with shell-pink or silvery-pink. Madam Abel Chatenay, H. T., is called a shell-pink, tinged on the outer petals with salmon; a splendid robust producer of perfect blossoms; the author's better half considers it the best rose in her garden of a hundred sorts. Madam Leon Pain is another shell-pink, salmon-tinted, that is a close rival of the last-named. Mlle. Cecile Brunner, the famous pink buttonhole rose of the polyantha class, scarcely needs an introduction, and even the smallest garden should contain one. Paul Neyron, H. P., an old-time favorite of deep rose color, is known as our largest rose. Maman Cochet, a tea, is a very free-flowering, deep rosy-pink, nodding because of a slender stem. Souv. de President Carnot, H. T., is salmon-pink, shading to rose on the outer petals, a delicate, soft shade of color. The Lyon, H. T., a rosy-flesh, shaded with salmon and yellow, is a wonder in color but thrives better in the bay region of San Francisco than in the drier air of Los Angeles, therefore a superb coast rose in the south. One of the later claimants for popular favor is William Shean, H. T., deep pink in color and one of the largest of roses.

REDS

One of the old China roses, Agrippina, has remained a favorite through a half-century of publicity, a rather small flower of deep crimson; while American Beauty relies on its name for a place in southern gardens; in the San Francisco region and

northward it grows superbly. Those wishing a tiny crimson rose on a dwarf bush should plant a Baby Rambler, Poly. Edward Mawley, H. T., is a popular velvety crimson, still rare in California gardens. Gen. Jacqueminot, H. P., is an old-time, annual-flowering favorite of bright crimson, but a superior rose in all ways, of a fiery-red is Gen. MacArthur, at present the very best red rose. Hugh Dickson and J. B. Clark are two red hybrid perpetuals that in the south are excellent for mid-winter blooms; of large size and deep color. J. L. Mock, H. T., a rather late introduction of bright salmony red, has rapidly attained a deserved popularity. Lady Battersea, H. T., is without a rival in the shade known as cherry-red. Magna Charta, H. P., is one of the old favorites, of one long annual season of bloom, a rose that in its class will doubtless never be surpassed; a deep, real rosy-red. Papa Gontier, a tea, is a large, not very double rose of large size, superb as a bud of deep crimson, opening as a loose flower of deep rosy-pink. Ulrich Brunner, H. P., is another of the old-fashioned rosy-reds, with a cherry tint, that will ever remain a popular favorite.

YELLOW S

The Duchess of Wellington, H. T., though new in the field, is already a prime favorite, for in color it is rare, a saffron yellow, tinted with crimson. Franz Deegen, H. T., is a fine yellow tinted with orange and has been called the Yellow Kaiserin. George C. Waud, H. T., is another new rose of grand color, orange tinged with scarlet. Harry Kirk is still scarce, being recently introduced, but has become a standard yellow, shading to deeper in the center, Lady Hillingdon, a new tea, is very fine, in color an orange-tinted yellow. In the old lists of yellow teas

Marie Von Houtte was always given and is still much in demand. Mrs. Aaron Ward, H. T., is a strikingly handsome rose of an orange shade fading to cream at the tips. Mrs. A. R. Waddell, another late hybrid tea, has the most attractive apricot shades of any rose grown. Perle des Jardins is an old favorite tea of bright straw color but is seldom a pronounced success in the southern end of the state. The yellowest rose is a title that has been bestowed upon Rayon d'Or, a comparative newcomer to California but one that has well sustained its reputation for color. Soliel d'Or, a hybrid briar, is a deep gold shaded with pink, marvelous in color and showy in the garden but not a rose for cutting. Sunburst, H. T., is a rather new rose having a combination of orange-yellow tinged with copper, shades now the most popular.

CLIMBING ROSES

WHITES

Climbing *Devoniensis*, a creamy white tea rose, tinged with blush, is more popular in the central and northern parts of the state than in the south. Climbing Kaiserin Augusta Victoria is but an ambitious sport from the bush rose bearing the same name. Climbing White Cochet is a new rose, tinted pink outside, that has satisfied all who have grown it. Mme. Alfred Carriere is an old-time noisette of creamy white, a fairly good rose everywhere. The White Banksia is nearly thornless, a rampant grower that will stretch away up a tree for sixty feet, bearing clusters of tiny, semi-double flowers. All who know roses are familiar with the white Cherokee, without which no garden is complete, its large single blossoms being borne in profusion early in spring.

PINKS

Climbing Belle Siebrecht is but a variety of the bush sort aspiring to higher levels; a good rose. Climbing Cecile Brunner's story may be told in the same words, as is also true of Climbing Caroline Testout. Dorothy Perkins is a shell-pink hybrid of the wichuriana class that does not mildew in places where this fungus seriously interferes with other small-flowering sorts, all of which belong to the polyanthas. Gainsborough is a satiny-blush hybrid tea that climbs vigorously and flowers fairly freely with blossoms of good size. The Pink Cherokee, as its name implies, is but a colored sport from the old-time favored white. A fairly good mass bloomer of rather weakly light pink, bearing an abundance of small flowers, is the German Tausenshon, meaning in English, thousand beauties.

REDS

A description of Climbing Papa Gontier may be found under the bush Gontier, but Climbing Souv. de Wootton, H. T., is far superior to the bush sort, a free-flowering magenta-crimson. Crimson Rambler, Poly., bears clusters of small flowers and is a general favorite where roses are not attacked by mildew. Francois Crousse, H. T., is the deepest in color of all red climbers and a most excellent sort. In the Red Cherokee, or Ramona, we have the jewel of the group. Reine Marie Henriette, H. T., is that deep rose climbing sort seen over all of California; a general favorite. Reine Olga de Wurtemberg is a half-double hybrid tea that has been happily described as the climbing Ragged Robin.

YELLOW S

The Beauty of Glazenwood, sometimes called Gold of Ophir, or Fortune's Double Yellow, is an annual bloomer that is a marvel of color, and we will venture to describe the shades as yellow, copper and rose. Celine Forestier is a light yellow noisette with real yellow in the central petals. Duchess de Auerstadt is the yellowest of climbers, a tea rose of great beauty popular forty years ago and still in strong demand. As for Marechal Niel, the old favorite lemon-yellow of strong tea-like fragrance, who does not know it and love it? It grows but indifferently in dry atmospheres, but an occasional plant does well in all parts of the state. Reve d'Or (French for dream of gold), like the last, is a noisette, rather a yellowish buff in color and may be depended upon to thrive in all the Pacific Coast states. William Allen Richardson, of the same class, is yellow with an orange center. The Yellow Banksia is, except in color, similar in every respect to the White Banksia and is the more freely planted for the color is clearer and brighter than in the white.

SUNSET AND COPPER TINTS

During the past few years the range in color of roses has enjoyed some beautiful additions in flowers of sunset and copper tints. Each year finds new and desirable sorts in the market, but at present the leaders are: Mrs. A. R. Waddell, Lady Hillingdon, Duchess of Wellington, Juliet, Sunburst, and Mrs. Edward Herriott. Under widely varying conditions these novelties would appear to have become standard sorts.

ROSE HISTORY

The history of the rose family is an interesting one, extending back a long period of years, though

the modern up-to-date rose is of comparatively recent origin. As an example, La France was the first of its type and was produced in 1867. The rose primarily consisted of native species less than a hundred in number and conceded by conservative botanists as comprising less than half a hundred species. But from these hundred or less species have sprung more than a thousand horticultural varieties. This large number of garden varieties represents roses which vary most remarkably in climatic requirements so that some may be found for every quarter of the globe.

It is in the temperate zones, however, that roses flourish, and still better in the northern hemisphere. It is in the same region, too, that most of the native species are found. Roses do not like extreme heat, and in the tropics few native species are found except well up in the cool atmosphere of the mountains. We have ample evidence that cool climates are preferred by the rose from the fact that England and the coast region of Oregon both grow finer roses than California, though we may pick some every month in the year, whereas they cannot. All the parents of the modern race of roses were single, though seldom are they seen in commerce today, and less in California than elsewhere. *Rosa rugosa* and *R. centifolia* are the wild species most commonly known, though occasionally an American species is cultivated.

A GARDEN GAZING GLOBE
Landscapes in Miniature

CHAPTER XI

CHRYSANTHEMUM CULTURE

No flower has ever taken a firmer hold on the affections of all peoples than the chrysanthemum, for whether one travels in the Orient, Europe, our own country, or in the out-of-way corners of the earth, the all-popular 'mum is present in the gardens of both rich and poor, and no park or public garden is considered complete without it. Every year brings forth new forms, shades of color, habits of growth or other evidences of progressive development, so that interest in them is never allowed to wane. Never were such satisfactory sorts to be had as at present, and never was enthusiasm among the 'mum fanciers at a higher pitch.

No other garden plant is accorded such varying treatment as the chrysanthemum, and our amateur gardeners grow them ranging in size from the diameter of a half-dollar to that of a large tea saucer. This development is wholly a matter of care; not throughout the year, but for a small portion thereof. If new plants are started every spring and given ordinary garden care, such as all plants usually receive, until within sixty days of blooming, and are then given special treatment, the amateur may produce just as good blooms as the professional. While proper treatment is not difficult, eternal vigilance is the price of good 'mums.

PROPAGATION

Chrysanthemums may be propagated either by dividing old clumps into small clumps, single shoots, or

by rooting the tips in sand. Nearly all amateur growers use the old clumps year after year, or at most divide them and replant, though no first-class flowers can be produced from any except plants propagated from cuttings rooted early in the same year. Many continue with the old roots for the reason that they do not know how easily young plants may be propagated. Clumps that have already flowered for one or more years will, if undisturbed, send up vigorous young shoots, and from these should be propagated a stock of plants to supply the autumn crop of flowers.

The latter half of March is the golden time for propagation, though good results may be had from cuttings taken from January to April. Get a box of six or more inches in depth, bore a few small holes through the bottom to insure drainage and scatter an inch or two of gravel, small stones, or broken pots over the bottom so that excess of water may easily percolate and escape through the numerous drainage holes. On top of this put four or five inches of clean sharp sand and water until it is soaked through. The young shoots of 'mums are so tender you may break them off if you wish, for this method is fully as good as any, and few but trained gardeners will cut them properly; for unless this is done with a very sharp knife, frequently wiped clean, the cuttings may be so injured that they will not root ere they die. Pinch off with thumbnail and finger, or cut with knife all the leaves from each slip except the tuft on the end and cut off the outer half of these if they are inclined to droop. These slips or cuttings should be three or four inches long and planted two inches deep in the sand.

When you have broken off your slips, if you are an amateur, allow them to stand in fresh water until

next morning to prevent wilting during the first day—the most important of all days in propagation. Use a piece of lath or other straight edge to lay across the top of the box to mark lines for cuttings. Use an old table knife or a small thin paddle to make a sharp cut or groove in the sand along the straight edge. Insert the cuttings in this cut; never force them into the sand, for this will bruise the tender ends and induce decay. After pressing the sand against the cuttings, make another cut about two inches from the first and proceed as before.

Use boxes small enough so that you may cover them with panes of glass (unless you have a glass

GLASS-COVERED PROPAGATING BOX

house,) and these must be painted or shaded slightly to keep out too much light and heat for the first two weeks. Never allow the glass to fit down closely upon the top of box, but put under the edge little chips of wood a quarter or half inch thick so that a free circulation of air may be had above the cuttings. Keep the boxes in a sunny position and never allow the sand to get dry. In from three to four weeks all will be rooted, though they need not be taken out until a couple of weeks later. As soon as they are

well rooted, put them into three-inch pots and allow them to remain there as long as possible without becoming potbound, or about a month.

PLANTING OUT

Plant in rows in their permanent positions, about eighteen inches apart, leaving sufficient space between the rows to give the necessary attention. Set out in rich, mellow, very heavy soil, but one containing no fresh manure. A few should be potted or replanted in the box at some distance apart so they may replace any in the field that may perish. If the soil is sandy it needs a liberal supply of cow manure which must be quite rotten or it will burn the roots of the plants as soon as the hot weather commences. Professional growers plant from early in May to the last of July.

Do not start young plants off with a rush. Avoid stunting them, but just keep them from "standing still." Too much food and drink will result in a luxuriant, top-heavy growth that will have to be cut away at least twice before allowed to head. Feeding heavily with manures or commercial fertilizers is not in order for months yet, or until buds are selected. One more don't is in order—don't plant young stock too shallowly. Unlike carnations, 'mums are seldom planted too deeply. Stem hardening and wilting of young plants are caused by the roots being left too near the surface.

TRAINING AND TOPPING

When young plants are eight inches high their training should begin by pinching out the terminal growth, or if they are much higher cut them off to eight inches, and then they should be allowed three or four branches from the upper part, and these in

turn must be pinched or cut until a perfect bush, well balanced, is built up. Never do any topping after July, for this is the last month for restriction of growth. Of course if plants are to be trained to single stems for one to five flowers, they should not be made to branch into bushes.

During July all chrysanthemums should be cut back. If your plants are not so treated you will probably get flowers before the hot weather is over and they will be small. If cut back in time and given plenty of food and drink, they will produce flowers in October or November. After the last topping water copiously. It is well to wash with the sprinkler the dust from the leaves about once a week; do this at the close of the day. Adobe soil will not need so much watering as the loamy soil. Judgment must here be used, though water should not be withheld at any time—too much can scarcely be given if drainage is good.

STAKING AND TYING

As the plants grow up they should be staked and tied, one stalk or stem to a stake. Some sorts, with some growers, often run up to eight feet, but this is not general and is most inexcusable. Plants should be tied with raffia, procurable at any seed store, or with strips of cloth torn into quarter-inch widths, or with some very large soft twine-like candle wicking.

Split shakes make very good stakes; for the dwarfer sorts one length is enough, and for the taller ones they may be spliced. It is all a question, though, of how they are grown. In some cases a few longer and stronger stakes would be necessary, and some use very large ones and group the stems. The better method is to stake every stalk, and then

but very light, slender stakes are needed. For this purpose the best material is a bundle of shakes (split, not sawed.) These will prove generally useful for garden work.

FERTILIZING

After staking comes fertilizing, and this must begin as soon as buds show and be kept up until the buds show the color of the flower, when it must absolutely stop, but great quantities of water must be given daily. Manure water, commercial fertilizers or whatever is given should be used sparingly at first—once every ten days or two weeks—for about three times, and then once each week until the coloring buds tell you to stop.

Usually you may get plenty of good stable manure, and nothing is better for general feeding. As growth continues feed more and more. If you wish to get unusual results feed a small quantity of bone meal twice a week, worked into the soil around base of plant. This feeding must stop when the buds show color or you will “burn” the buds, and they will turn black and soon fall off the stem. When feeding stops and color appears in the bud, no further note need be taken of disbudding, for after this stage of growth such adventitious growths can no longer affect the general crop. The plants require a great deal of water as long as any flowers remain. Do not cultivate the soil about the plants later than the first of August, but mulch heavily to keep down weeds.

DISBUDDING

Special attention must be given to disbudding, and all buds below the top ones should be rubbed out as soon as they appear. This is easily accomplished as soon as the lower buds show by “rubbing” them out with the finger tips as they are very brittle. On

some sorts a goodly crop of attenuated side branches break out well down on the main stem, and these should be kept off, or they will take part of the food and thereby weaken the main crop; for these, being nearer the food supply, will rob all the terminals of a good share of nutriment, and those are the ones from which you may expect the best flowers.

Much care must be taken in top or flower disbudding. The stems to these buds are very brittle and break very easily. Hold the buds with one hand and take a small stick like a toothpick and crowd off the buds which you wish to dispose of. You will make some mistakes here. If you should leave a leaf bud instead of a flower bud all is not lost. The leaf bud will make a branch which will in a short time present a terminal cluster like the one with which you have just dealt; then try again. This breaking out of buds must not be neglected for even a few days, but must be attended to at the proper time. Disbudding for the earliest sorts begins about August 5th and for the very latest sorts about September 15th.

CROWN AND TERMINAL BUDS

Growers recognize two kinds of buds, terminal, and crown. These terms are easily understood, the one large bud which first comes at the end of each shoot is the crown bud; the secondary ones are the terminal buds, of which several surround the crown. In the early sorts it is best to use the crown buds.

The crown buds will begin to show in August, though in fact on some varieties they are formed at any time during the summer, but if surrounding buds are taken off before late in August the crown buds are liable to produce imperfect flowers. Other phases of disbudding may begin earlier if plants are sufficiently advanced. A crown bud may be distin-

guished when young by the buds directly below or surrounding it being growth buds. If these growth buds are not taken off they will finally produce new shoots, and the crown bud will dry up, it being really an abortive flower bud and would never produce a flower without the aid of the grower. These crown buds, being produced fully two weeks before the terminal buds begin to appear, will produce flowers two weeks earlier than if terminals had been chosen.

For midseason and late varieties it is just as well to take the terminal buds. They appear in a cluster and are all flower buds. These are the buds that are usually chosen for general purpose flowers. It is more work to disbud these, as new buds are continually forming, and the plants have to be gone over several times. When the crown bud is reserved no buds are subsequently formed under it, and if all side shoots are brushed off they will require but one disbudding. Then the leaves begin to assume a dark, leathery appearance, and you may know all the strength of the plant is being concentrated in the flower, and it is likely to be a good one.

POT CULTURE

As soon as the plants have filled the three-inch pots with roots, shift again into six-inch pots. Give a good drainage of broken crocks and two-thirds fibrous soil and one-third good rotten manure, water thoroughly and spray occasionally. From this time the plants need no other shift till the final one which is about the first of June. Care should be taken in pinching the plants, pinch either ten days before potting or ten days after—as it is liable to check the plants. This is done only to keep the plants from maturing too soon.

When transplanting to their final pots give good drainage and use good soil and well rotted manure. For pots the best size is ten or twelve-inch, well drained, and have the soil in a good friable condition. Pot firmly by means of a stick, leaving about two inches from the top of the pot to the soil for watering and mulching. The plants should then be thoroughly watered and placed in a good position and sprayed overhead for a few days, great care being taken in watering till they get well established in the pots.

SORTS TO GROW

There are so many named varieties of chrysanthemums, all of which will make grand blooms if well cared for, that it is impossible to give a list of the better sorts. Excellence in flowers is more a matter of care than of kind.

CHRYSANTHEMUM HISTORY

Marco Polo, the Venetian traveler who visited China about the year 1300, mentions having seen the chrysanthemum in that country, and it is believed to be native there, but not to Japan. To the Chinese belongs the credit of raising it to the present large size and to the Japanese of perfecting its varied forms and colors. It reached Europe about 1450 and England about 1700.

A chrysanthemum with small yellow flowers grew in the Apothecaries' Botanical Garden at Chelsea in England in 1764, but the first of the large-flowered varieties was received at the Royal Gardens at Kew and blossomed in 1764. It is from the latter that the centennial introduction of the flower into England dates. The first English seedlings of the chrysanthemum were raised in 1835; the first chrysanthemum exhibition in England was held in 1843 at

Norwich, and this was soon followed by the organization of the society at Stoke Newington, now known as the National Chrysanthemum Society.

A new era in the history of the plant opened in England in 1847 by the introduction of the Pompon. In 1843, at the close of the war with China, Mr. Robert Fortune was sent out to that country by the London Horticultural Society to collect rare plants, and one of the curiosities he discovered was the Chusan daisy. This and another small flower from the same source were the parents of the tribe known, from their resemblance to a rosette, as pompon chrysanthemums. Still later, in 1860-62, Mr. Fortune made more discoveries at the town of Ak-sax-saw in Japan. He describes this town of Ak-sax-saw as the most famous place near Yedo for the variety and beauty of its chrysanthemums, some of which were in form and coloring quite distinct from any then known in Europe. "If," he said, "I can succeed in introducing these varieties into Europe, they may create as great change among chrysanthemums as my Chusan daisy did when it became the parent of the present race of Pompons." They were taken up in England, proved successful, and from them sprang those marvelous flowers which are the pride of our gardens.

THE AUSTRALIAN BUNYA-BUNYA
Araucaria Bidwillii

CHAPTER XII

PESTS AND DISEASES

Among the worst garden pests we have to deal with are the millipedes, or, as some call them, wire-worms. There seems to be no way of ridding the soil of these pests except by trapping, a very slow and unsatisfactory method. Lime and wood ashes bother them a little, but only a little, and anything strong enough to kill them will also kill the plants. They are especially fond of the bulbs of callas, lilies, gladioli, begonias and anemones, and the roots of stocks, snapdragons, pansies and many other plants. The easiest way to trap them is by laying pieces of boards on the ground, stepping on each piece to see that they are firm. Once a day these should be taken up and the millipedes underneath killed, after which replace the boards and repeat each day until no more are found.

THE INDUSTRIOUS ANT

The most persistent garden pest for a great part of the year, and one that multiplies rapidly unless checked, is the industrious ant. One of our agricultural colleges states that greatest success in extermination of ants has come through use of an arsenic solution. For instant death of invading ants a one per cent solution with enough syrup to sweeten it is used.

Prof. Woodworth of Berkeley states that he has found that a solution of between one-eighth and one-fourth per cent is best for the reason that it acts

more slowly and the adults carry it to the nests and feed it to the young, and the whole nest is thereby killed through slow poisoning. He recommends that a sponge saturated with the fluid be placed in a closed jar with a perforated cover so ants only may go and come. These jars may then be safely left about the garden or carried into kitchen or pantry.

A solution of potassium cyanide at the rate of one ounce to a gallon of water, when poured into a small pit at the exit of a burrow, destroys ants to a depth of one and a half feet below the surface of the soil. This solution can be prepared at a cost of from one and one-half to two cents per gallon. It appears, however, to be injurious to plant life.

A very effective, but more expensive method, and one that has been used with great success for a number of years, is to pour one or more teaspoons of bisulphide of carbon into the opening of each nest, preferably while the soil is wet, closing the holes promptly afterward with the foot. This insecticide has the advantage of being more penetrating than the others mentioned; it is heavier than air and descends as a gas into all the subterranean tunnels of the ants, destroying them as well as all other living creatures which may be present. When liberally applied this chemical will destroy entire colonies of ants.

A very good poison for ants in the greenhouse is a mixture of Paris green and sugar, adding just enough of the poison to white granulated sugar to turn it a light green color. This should be dusted lightly among the pots on and under the benches. Be careful not to put any in the pots or on a bench containing soil, as the Paris green is liable to damage the plants.

ANTS AND PLANT LICE

Plant lice are familiar objects to all. The general farmer and the casual observer of these creatures on cabbage and other vegetable crops simply recognizes them as lice, but to the florist they are better known under the names of green fly and aphid. An interesting fact in regard to them is that most common species exude from two tubes near the ends of the abdominal segments a transparent fluid having a sweetish taste. It is frequently excreted in great quantity, and this is the secret of the attraction of ants to these creatures. The liquid is known as honey-dew, and it attracts, besides ants, wasps, bees, flies and some other insects.

PLANT LICE, GREEN FLY, OR APHID

Fifty-eight persons competed for a prize offered at Frankfort, Germany, for the best method of destroying plant lice. The winner's preparation is as follows: Quassia wood, two and one-half pounds, to be soaked overnight in ten quarts of water and well boiled, then strained through a cloth and placed, with 100 quarts of water, in a petroleum barrel with five pounds of soft soap; to be used as a spray.

In wet or cool weather they are hard to exterminate, but during hot days the fumes of both sulphur and of tobacco dust will sufficiently keep the pests in check. Sprinkle both over the damp foliage, sparingly but evenly, in the morning of what promises to be a hot day. The sulphur fumes also destroy the fungus known as mildew.

One way to get rid of plant lice is to use tobacco water made by pouring boiling water over tobacco stems, or by boiling the stems. After cooling pour off the liquid and add more water. This tobacco tea

should be used as soon after making as possible and is of little value if allowed to stand two or three days, for it will start to ferment and it then loses its strength. The most convenient form to use is the nicotine extract. A pint of the nicotine is extracted from 150 pounds of tobacco. It comes in pint bottles and is sold to nurserymen for about \$1.50 a bottle. Use one tablespoon of the nicotine to five gallons of water. If you use the tea or nicotine it should be sprayed on the plants each morning for three days, and all the aphids will be exterminated.

WORMS IN FLOWER POTS

Wireworms or millipedes often bother pot plants, and occasionally other worms are present. The most effective way to drive out these pests is to use lime water. Dissolve lime in water, one pound of lime to about ten gallons of water, though it does not matter how much you use, as only a certain amount will be held in solution. Allow it to settle until water is clear and then water the plants with it. Bottles of this, tightly corked, may be kept on hand, though worms in potting soil are not a very common trouble. The settled lime should be put in the garden as it will benefit both soil and plants.

CUTWORMS, SOW BUGS, ETC.

Thoroughly mix one peck, eight quarts or two gallons, of wheat bran with one tablespoon of Paris green, then add a quart of strong molasses. Rub all the ingredients together thoroughly until the mass becomes of the same consistency throughout and crumbles easily. Scatter lightly among the plants where the cutworms are feeding, and you will have no further trouble there. This poison also destroys

snails, sow bugs, etc.; it never fails and is the simplest treatment for this class of pests.

One competent authority states that the following formula for a poisoned bran is the most effective he has used: Take of bran eight pounds, Paris green four ounces, common salt two ounces, syrup or molasses one pint. Add sufficient water to make a crumbly or dryish mash. Avoid placing it where chickens or domestic animals will be poisoned. It may be thinly scattered among garden plants that are attacked.

Probably the most economically applied spray consists of Paris green mixed in the following proportions:

Paris green, pure, or to contain at least fifty per cent arsenious acid, two ounces; fresh lime, one pound; water, 25 gallons.

Use no ammonia or soap. Make the Paris green into a paste before placing it in a spray tank and keep constantly stirred while spraying. To make the Paris green more insoluble, and thereby prevent injury to the leaves, dissolve six pounds of fresh lime in water and when the lime has settled add the water to the solution and keep it constantly stirred.

SCALE INSECTS, RED SPIDER, ETC.

One pound of Gold Dust dissolved in five gallons of water works wonders in cleaning trees and plants of insect life and the smut resultant from their excretions. This formula is only for such things as have hard foliage, like citrus trees. A gallon or two more water added to every pound of "dust" will permit its use on soft plants.

Kerosene emulsion is also good where an insecticide is needed. Dissolve one pound of soft soap in

a gallon of boiling water, keeping it well agitated with a syringe or pump until the soap is quite melted. Then while still boiling, or nearly so, add one pint of kerosene and continue to agitate the mixture for about five minutes, which will thoroughly mix the soap and oil. Dilute with another two gallons of water and it is ready for use. The mixture may be still weaker and used frequently if preferred. It should always be carefully sprayed, using a very fine nozzle, and applied particularly to the under sides of the leaves.

RATS! RATS!

One wholesale florist says: "Take slaked lime and alum and put the mixture under or on benches, around poultry yards or greenhouses, and you will get rid of all rats. I had them so bad that they destroyed my geraniums and carnations. The rat is very fond of water, and when it goes along on this preparation it gets its claws full, rubs its nose, then runs for water; and as soon as it gets water the animal is destroyed.

"For ants and slugs the mixture named cannot be beaten by anything on the market. I have nine greenhouses and have not a slug or an ant in the place."

OAK CATERPILLARS

The oak trees in some counties of the state are defoliated by the caterpillar of the oak moth, *Phryganidia Californica*, and people who value these beautiful landmarks are much concerned about it. Frequently whole districts are to be seen in which every tree is stripped of its leaves. The remedy against the worm, and one that should be frequently applied, is a Paris green spray, one pound to 200 gal-

lons of water. If this is freely used the worms will soon disappear.

GOPHERS AND SQUIRRELS

Some prefer to use bisulphide of carbon to kill gophers and squirrels. It must be used when the ground is damp, or the fumes will not be confined enough to destroy the rodents. After turning about a gill of the liquid in the hole quickly cover with soil and press down to confine the poisonous vapors. Poison, a good cat or trap, will prove equally effective in killing the gophers.

A good formula for poisoning squirrels is: One ounce strychnine, one ounce cyanide of potassium, one-half gallon molasses, and enough wheat to take up the liquid. It takes about fifty pounds. Enough water is added to moisten it. It is of little use to put out poison when grass and weeds are near by; another reason for cleaning the roadways of disfiguring weeds. The strychnine should be dissolved in vinegar, and the cyanide in warm water, before they are mixed with the molasses and the wheat.

MILDEW ON ROSES, ETC.

Mildew is a fungus plant which is parasitic on the rose and other plants and appears as a gray, powdery substance on the young growth, attacking both foliage and stem. It can be checked by the use of sulphur as it is used to stop mildew on grape vines. Be sure you treat your plants generously with manure and water to keep them in good health.

On the first appearance of the disease it is advisable to dust the foliage with sulphur. This is best done in the evening when there is no wind to blow it off, or in early morning after spraying with water. At this stage some spray with a light solution of sul-

phide of potassium, but if a spray is found necessary it will be better to use the Bordeaux mixture, which for our purpose should be made as follows: Copper sulphate, five pounds; lime, five pounds; water, forty gallons. A very weak solution of soft soap used as a spray is also beneficial.

We give below the two latest approved sprays, the first recipe comes from England and is vouched for by William Payne, F. L. S., Honorable Secretary of the National Rose Society, and a famous rosarian; the second from a skillful rose grower of the United States. Both are good.

"Boil two pounds of soft soap in two gallons of water; while still boiling and immediately after it has been removed from the fire add half a pint of paraffine oil and a quarter pound of sulphur. When using add half a pint of this solution to a gallon of water, soft water is best, and apply as a spray."

"Shave up a bar of ivory soap, or any kind which contains no free alkali, and dissolve in a pail of boiling water. When dissolved, dilute with five pails of cold water. This does not need washing off again as the thin coating is a preventive as well as a curative. It will also kill all kinds of aphids, or green fly, as well as red spider on violets."

CHILEAN WINE OR HONEY PALM
Jubea spectabilis

CHAPTER XIII

THE GARDEN CALENDAR

JANUARY

The planting season for all but tender growths is at hand and new gardening operations should be under full sway. Do not send east of the Rocky Mountains for either seeds or plants. None are so well adapted to local conditions as home-grown stock, and our seeds are famous the world over. Conditions are so entirely different with us that vegetation cultivated under other methods and environment is not so well suited to our gardens as that grown here. There is also another good business reason for patronizing local dealers; they are get-at-able in case you receive unsatisfactory stock.

GENERAL WORK

Now is the time to attend to manuring and spading vacant beds and borders. After spading leave the ground in a rough state; don't rake it down, as the sun and air will do more good and it will leave the ground in a more friable condition than if raked smooth. Don't be afraid to enrich abundantly as the ground will be in better condition for spring planting.

Get rid of all rubbish, dead weeds, etc., so that when the spring crop of garden pests hatches it will find less shelter. Such a cleaning up removes many insects in a dormant state, or their eggs, and very often both insects and eggs. This garden rubbish should always be burned or deeply composted.

When taken from a garden full of pests it should be carried, not dragged, over the ground, thereby avoiding scattering insects and diseases.

SEED SOWING

Do not fail to plant a few native wild flowers. Our California seeds, plants, and bulbs are in heavy demand the world over, more so in every European country than is the case here at home. We have a long list of beauties that thrive splendidly in the garden and range through all shades and colors in the flowers.

For summer and fall flowers an early sowing of antirrhinum, arctotis, aster, calliopsis, celosia, centaurea, chrysanthemum, dianthus, Phlox Drummondii, summer flowering stocks, salvia, etc., may be made now. The seedsman can give you an idea of what will be the better seeds to sow for seasons vary according to amount, time of rainfall, etc., and no hard and fast rule may be laid down. The more tender annuals would be risky at present if you have no greenhouse or protection for them. Hardy varieties may be sown at any time.

No better time could be found than January for the sowing of sweet peas for spring blossoms. The plants like to grow in the cool earth, and if sown now the vines will be shading the roots before the soil gets overheated. It matters little how warm the atmosphere is if the soil below is cool and moist, and this it must be if success comes. The modern sweet pea is a wonderful improvement over the old types and may be obtained in nearly every shade from white to black. Of late the orchid-flowered Spencer strain is much in demand and far more beautiful than the plain, unruffled flowers.

DIVIDING ROOTS AND TUBERS

If you are going to propagate a stock of chrysanthemums for the present year, either by dividing them to single shoots or by rooting the tips in sand, you should find proper material on the old clumps; water and cultivate so that you may get cuttings in thirty or forty days. A box of clean, sharp sand in a shaded position will give you good results if not neglected.

Where large beds and borders of canna, cyperus, papyrus and elephant ear have not been disturbed for three or more years, it will be found advisable to dig up the cannas and caladiums and store them away until March or April, and the large clumps of papyrus and cyperus can be divided and replanted in the border when it is spaded up, or divided in spring. These can stand any amount of fertilizer. Dig up the beds as deeply as possible and turn under several inches of well-rotted manure; leave the beds rough, and later in planting time they will be in a good friable condition to replant.

BULBS

Gladiolus may be planted now, using rich ground, and plant them at intervals of two or three weeks for the next four months, to get a succession of blooms throughout the summer. Also plant calla, dahlia and Easter lily.

Those who have not planted bulbs of anemone, hyacinth, ixia, lily, narcissus, ranunculus, sparaxis and tulip should put them in the ground at once, if any of these flowers are desired. If a handful of sharp sand is placed in the hole for each bulb to set on, it will insure success in many cases where failure would otherwise result. Soak bulbs of anemone and ranunculus a couple of hours before planting.

TREES, SHRUBS AND HERBS

Roses are dormant and if planted now will at once start into growth and produce a bountiful crop of blooms early in the season.

This is a golden time for the planting of all deciduous trees and shrubs, also hardy evergreens; but citrus trees and the more tender sorts, both fruiting and ornamental, are better left until February or March. The latter class will start only when the soil gets warm in spring from the increasing heat of the sun; in the meantime they remain dormant.

Roses may be pruned and manure spaded in about them any time during the month; in March they will begin to sprout for the spring crop of blooms. Do not prune such climbers at the present time as Cherokee, Banksia, Beauty of Glazenwood, Gold of Ophir, etc., as their bloom is produced all along the branches. The best time to prune these is after their spring crop of flowers; then they will have time during summer to grow long branches for next season's flowers.

Pansy plants are ready to plant out, and care should be taken in preparing the ground. Many people complain they bought the best seeds or the finest plants, and they are no better, in flowers, than common ones. The cause of such failures is poor soil or lack of preparation. To prepare the ground for pansies: Choose your location, which should be sunny at least two-thirds of the day; manure it well; get some charcoal, pulverize it and spade it in with the manure. After spading sow some soot on top of the ground and rake it in thoroughly. The charcoal and soot are to sweeten the soil, the soot also keeps away snails and other injurious insects; together they give a rich dark color to the plants and

also serve to bring out richness of color in the flowers.

Other seasonable flowering plants which may be planted now, include the antirrhinum, calendula, carnation, delphinium, dianthus, hollyhock, pansy, pelargonium or Lady Washington geranium (if you have a hot south front where other plants burn up during summer try a few), pentstemon, phlox, stock, Shasta daisy, verbena (all colors make a splendid display in April if planted now), and wall-flower.

A TIMELY WARNING

Do not be in a hurry to fertilize your lawn; the present cold weather is good for the grass, it gives it a resting period. The disadvantage of fertilizing too early is that it will force a new growth at the time we are getting our coldest weather, and the consequence is the tender young grass gets nipped by the frost when "in the milk." When it should look nice in the early spring it stops growing and looks brown. It is forced from its natural resting time, the tender growth is frozen, and it takes its rest toward spring when the fertilizer has exhausted its forcing qualities or has been washed away. Grass should rest during the coldest weather. February and March or even April will be found the best months to manure the lawns, and from that time there will be a luxuriant growth until the cold weather of autumn comes again.

FEBRUARY

The present should be the season of greatest activity in gardening. Bear in mind spring is fully on us and perfection of bloom next summer demands early attention to the garden this month. Plants of all kinds are pushing forth new growths, swelling buds

on deciduous trees denote the rising sap, all nature feels the pulse of spring.

GENERAL WORK

Nearly all plants should be pruned and fertilized at this time, soil stirred, rubbish cleared away and plants and seeds put in the ground. A month or so later the value of such work is much less than if done at present. The only plants which should not be set out until later are those of a strictly tropical nature, most of which are foliage plants like cyperus, canna, elephant's ear, etc. Another tropical root or bulb which should wait for a month is the dahlia. Fertilize all growing plants, but not dormant ones.

After a rain time should elapse sufficient to dry the soil into a workable condition, for soil worked when unfit becomes still more unfit for planting. In the meantime, if soaking rain has not come, put your soil in a condition to receive all that falls. There is always considerable doubt as to our rainfall, in time and quantity, but it is far better for plant life than the water pipe supply, so that we should aim both to catch and to hold it. For this purpose leave your soil in the rough, well spaded up, until you need to use it. After each rain, for fear no more will come, hoe and rake the surface as deeply as you may easily go, to conserve what has already fallen.

SEED SOWING

Begonias of the tuberous rooted section may be grown from the seeds indoors, and it is also time to plant seeds of torrenias which are of a like delicate nature and suitable for the same positions, whole or partial shade.

Sow seeds for fall and summer flowers: Antirrhinum, aster, calliopsis, celosia, chrysanthemum,

salvia, stock, sweet pea, sweet William; your seedsman will tell you of the kinds that are timely. Hardy annuals may of course be sown at any time.

CUTTINGS AND DIVISIONS

Carnation cuttings may be rooted in precisely the same manner prescribed in another chapter for chrysanthemums. Hardwood cuttings of deciduous shrubs such as crepe myrtle, deutzia, hydrangea, lemon verbena, lilac and weigelia should now be made and put in sand or soil.

With the first warm weather after a heavy rain it will do to divide herbaceous perennials like golden-rod, golden glow, Shasta daisy, and even chrysanthemum. The latter are best if propagated each season by rooting tips in a box of sand. It is rather early, although the first of March should see them started. By planting the cuttings in sand, keeping moist but not too wet, you can easily perpetuate a stock of your favorite 'mums.

BULBS

Finish planting lily, anemone and ranunculus. Plant agapanthus, amaryllis, canna, calla, caladium, elephant's ear, dahlia, iris, gladiolus, tuberose and all that class of bulbs, corms and roots. Do not plant all gladioli at once, though earlier plantings give the better flowers.

Tuberous begonias may be started in pots during this month and planted out in April. A soil of one-third each of sand, leaf mold, and good garden loam is ideal for this or any other class of begonias, and this should always be the composition for pot culture. Remember in placing the dormant bulb on soil that the hollow side should be up. Set pots away in cool shady spot until tops show through soil, and

then gradually inure to sun. Every year marks an improvement in this class of begonia, and no garden is complete without them. They range from white to deep orange and crimson, both single and double, also plain and fringed.

GENERAL PLANTING

During February you may plant bare root, dormant roses if a good rain has fallen. It is also timely to prune and fertilize those now in the garden. Deciduous trees and shrubs should be planted at once, and all hardy seeds and plants should be rushed into the soil for growing weather is with us and only those plants that get a good start in spring come to greatest perfection. Carnation, petunia, pansy, stock, verbena, and salvia can be transplanted from seed boxes to the open beds.

February is a good month for planting golden glow, or summer chrysanthemum (a rudbeckia). Few of the seedsmen or nurserymen handling ornamentals catalogue it, and few people seem to know it, though it is by no means a novelty. It is a large, showy plant attaining in good soil a height of six or eight feet the same season planted; flowers three and one-half inches in diameter, double, well formed, deep golden color, and borne on long stems which render them suitable for cutting. They are magnificent for indoor decoration. Plants bloom profusely from June to October.

TRANSPLANTING EVERGREENS

The best time to transplant an evergreen is when the growth is about to start. This is usually in the spring when moisture and heat are adequate to stimulate new growth. The best season is from February to May, according to the region in which you are

working. Heat is then sufficient and not excessive, and moisture is usually plentiful. Everything feels like growing under these conditions and the tree quickly establishes itself.

The deciduous tree can safely be transplanted during the whole of its dormant period unless the ground is cold and water soaked; the evergreen does best near the close of its period of dormancy. The tree does not need manure in the hole; if you wish to push it, use manure on top when you are sure that it has reestablished itself. All evergreens should be taken up with a ball of dirt if possible. It is a great deal better to get a part of the roots in natural position and condition than to get all the roots with their natural connections with the soil destroyed.

LAWN WORK

February is usually a good month for lawn fertilization, though in a backward season March is preferable. The lawn may be covered with well rotted manure. Wet down well to wash manure into soil as much as possible. Rake over every day or two so the grass roots will not be smothered and killed out. After a week or two of this treatment, lightly rake off the manure which may remain on top.

See that natural fertilizers, if used, are well rotted for they may be full of unsprouted seeds of Bermuda grass, dandelion and other pernicious weeds and bring to your lawn more harm than good. A safer plan, unless absolutely sure of your material, is to buy a commercial lawn fertilizer, of which there are numerous good brands in the market.

Bone meal is fine for a lawn. True up the edges and seed with blue grass or clover where the soil is bare or where weeds have choked out the grass. If Bermuda grass is crowding into the lawn sow a lib-

eral supply of white clover as advised in the chapter on lawns.

MARCH

The month of March should be a very active one so far as general garden work is concerned, and planting, pruning and propagation should be the active program, followed by irrigation, cultivation and fertilization.

GENERAL WORK

Ground should be spaded up and aired for two or three weeks for the tropical perennials. After thorough exposure for a time scatter some well rotted manure over the surface, roughly break up the lumps and smooth it somewhat and respade to mix the fertilizer thoroughly into the soil. Not until April will the ground be warm enough to induce a quick, vigorous growth of these plants.

Don't continually stir the soil around shallow rooted plants. Get some well rotted manure and mulch the surface of your beds, being careful not to cover the crown of the plants. You will lighten your work and get infinitely better results. A mulch keeps the soil cool and moist; it checks evaporation and prevents the soil from cracking and drying out. It eliminates a lot of useless labor and will insure you a fine crop of perfect blooms.

SEED SOWING

In the sowing of all seeds mentioned care must be exercised to keep them constantly moist and to sow them in a rather light compost; this is particularly applicable to asters, which if allowed to become dry at any time during the germinating period will surely perish.

Be careful not to cover seeds too deeply; one-eighth of an inch is sufficient for asters, and in the case of very small seeds not to exceed one-sixteenth of an inch. Sweet peas planted now will not flower before the weather is too warm to allow a normal development. Small, puny flowers will result.

March is the ideal month for the sowing of a host of summer annuals. In a month or two beds which you devoted to bulbs for winter and spring blooming will be empty, so make preparations for successional plantings. A few of the more important annuals for summer are: *Antirrhinum*, aster, balsam, celosia, cockscomb, calliopsis, centaurea, cosmos, dianthus, larkspur, African and French marigolds, nasturtium, *Phlox Drummondii*, *salpiglossis*, scabiosa, zinnia, etc. The foregoing are but a few leaders. There are dozens of others.

PROPAGATION BY CUTTINGS

Bottom heat either in greenhouse or in a hotbed made with stable manure will prove a great aid, in all cases bringing a much greater proportion of the cuttings to root. However, bottom heat is not needed, though better results can be obtained with such a convenience. The average garden owner would better rely on the nurseryman for needed plants. For those who wish to experiment the following is recommended.

Make all cuttings with a sharp knife, occasionally wiped clean, cutting through at an angle of about 45 degrees, just below a bud or eye. Insert these cuttings in a box of clean, sharp sand in rows. Do not force them down but use a lath or other straight edge by laying on sand and making a cut in the wet sand with a piece of shingle, old table knife or similar utensil, and after insertion of cuttings press the

sand back against them and water well. After this keep damp, not wet, yet never allow to dry, and see that drainage is good by first boring a few small holes through bottom of box.

All bedding plants may now be propagated, such as ageratum, alternanthera, begonia, carnation, coleus, fuchsia, heliotrope, iresine, marguerite, salvia and santolina. Select young brittle tips. Propagate violets from cuttings so that you may have flowering plants for next winter.

While some prefer the earlier winter months for the propagation of roses from hardwood cuttings, there are many gardeners who have splendid success with March cuttings. All deciduous shrubs and trees that have not yet started into leaf or bloom, such as crepe myrtle, deutzia, hydrangea, lilac and weigelia, will grow very readily from cuttings during this month, and any of these sorts to be moved or planted should be handled at once. The cuttings should be made long enough to have three or more eyes and be set firmly and deeply in a sand box or the ground, leaving one or two eyes above the surface. A partially shaded position is best.

PROPAGATION BY DIVISION

All perennials may now be divided and replanted except the strictly tropical plants, and these had best be left for a while: Delphinium, or larkspur; solidago, or goldenrod; helianthus, sunflower, perennial; pentstemon; phlox; rudbeckia, or golden glow, and Shasta daisy are just right for division, and nearly all are much improved by the process being repeated each year.

Old roots of chrysanthemum should be cultivated and watered immediately to provide young and tender shoots for slips or cuttings to be taken during April

or May. If you cannot propagate them from the cuttings, divide the clumps into the smallest rooted pieces you can.

Florists and gardeners start all 'mums from cuttings each year, throwing the old clumps away as soon as cuttings are rooted. Clumps of all the others noted may be divided and planted according to the taste of the planter. The latter end of the month is early enough to plant your broken up clumps of canna, caladium or elephant's ear, cyperus, dahlia, ginger, etc.

BULBS

Plant out summer flowering bulbs, especially more gladiolus, reserving a few for later planting, though the early plantings usually give best results. Tritonia, or montbretia, closely allied to the gladiolus, may be had in a variety of shades from yellow to red; try a few of the better sorts; they need no care but being kept free from weeds. Calla, canna, dahlia, tuberose, and tigridia are also in order for planting.

Amaryllis which have been left in the ground should have the surrounding soil loosened up and pulverized, and they should be given a good mulching with well rotted manure, preferably from the horse stable. Tuberous begonias, if started now, should be planted in pots and later placed in their permanent home. They should always be grown in the shade and have a rich, loose, well drained soil. If you intend planting the bulbs directly in the soil, hold for a month yet. Tritonias may be treated the same as gladiolus. If they have been left in the ground for years and are very thick, pull out three-fourths of them; you will get more blooms and better ones than you could obtain by keeping all.

GENERAL PLANTING

March is the month in which to look after plants for next winter's flowers. Especially is this true of carnation, chrysanthemum and violet. Carnations should not be grown longer than three years and should then be replaced by younger plants. Now is the time to plant aster, celosia, centaurea, calliopsis, salvia, Shasta daisy and verbena.

If you have planted no pansy seeds, you had best buy plants now for it is rather too late to get the best results from seeds. If your plants are already growing see that the surface soil is kept well stirred and pulverized. Pansies are gross feeders and the beds should be well mulched with manure. For spring flowers plant in sunny place, for summer flowering plant in a somewhat shady place.

Now is the time to plant violets, either in young plants or cuttings, to get the best results, next fall and winter, in blooms. Violets like a rich, loose soil, with a top mulch of light manure during the heated term, and don't forget to give them a generous supply of water at frequent intervals. Put your plants in several exposures, not all in the shade, so that you may be able to gather violets over a considerable period of time.

PRUNING SHRUBS AND VINES

Prune hydrangea now, as it flowers on the current season's growth. Also cut poinsettia back to three eyes of last season's growth. Do not prune deutzia, spirea, syringa, and weigelia at this time. If you do you will lose most of your blooming wood. They should be pruned immediately after they are through blooming.

Bignonia and bougainvillea should be pruned now. On bignonia leave as many of the stronger growths

as are needed to cover the object on which it is to grow, and cut out all other main shoots back to the root. All laterals on the shoots left should be cut back to two or three eyes, not more. Cut out all the coarse suckers that came from the roots of the bougainvillea last year, for they will produce but few flowers, and thin out the vine to suit yourself, though the main stems should not be trimmed clean at the bottom. These vines look best when well furnished with foliage to the ground. No danger will result from heavy pruning; it is needed.

PRUNE AND FEED ROSES

Be careful not to trim spring and early summer blooming climbers now or you will get few flowers. These roses: Banksias, Beauty of Glazenwood, Cherokees, Gold of Ophir, etc., should be given only such pruning as is necessary to keep them within proper bounds immediately after their annual crop of flowers. After this period they bend all their energies toward making flower bearing wood for next year. This in itself is enough to suggest the proper pruning season.

During this month roses push out their new growths. New canes will break from the eyes both above and below the surface of the soil. Assist this growth in every manner possible. Give the beds a good forking over, dress the surface with a liberal coat of air slacked lime to sweeten it, following some time later with a heavy mulch of any good fibrous manure. Subsequent rains or waterings will leach the plant food from this dressing and give a surpassing vigor to the new growths. In proportion as you treat roses now will they repay you in bloom production during April, May and June.

LAWN WORK

There is no better time than the present for lawn work of all kinds, whether it be the planting of new ones or the renovation, rolling or fertilization of old ones. From now until the cold weather of next winter comes the grass will make a steady luxurious growth, receiving no check, such as is often noticed on lawns which were fertilized too early.

Be sure to fertilize your lawn this month for the increasing power of the sun will soon start it into vigorous growth. A commercial fertilizer is much to be preferred to stable manure full of weed seeds. Also seed the places now bare or where weeds are so thick that no grass remains after their removal.

APRIL

The warm sunshine is peculiarly severe on plants at this season when the growth is young and tender, and the need for water to keep up this new growth is great. A light sprinkling each morning before the sun shines too fiercely (better still before sunrise) is an excellent invigorator, but will not take the place of the necessary copious irrigation at the roots that the plants should have about twice each week. This prescription is for herbaceous plants; once each week is enough for shrubs of normal growth.

GENERAL WORK

This is a busy month in the garden; there is all kinds of work to keep one busy. It is the last month in which spring planting should be done. Now the ground is warm enough to induce a quick, vigorous growth, and all plants will give satisfaction. When watering, do it thoroughly; sprinkling the top of the ground does little good. Get all spraying for plant

pests and diseases done before it gets too hot. Watch rose bushes for green aphid and if troubled use tobacco dust freely.

In this warm weather pansy roots must be kept cool and moist or the blossoming will be checked; loosen the soil about the plants without disturbing the roots, and then give a good mulch of fine stable manure. Perform the same office for the amaryllis and hippeastrum bulbs, but stir the soil more deeply. Thin out plants sown from seeds, if in their proper place, or transplant at once. Do not try to save sickly ones; they never recuperate satisfactorily.

SEED SOWING

Sow in seed boxes perennials like campanula, columbine, foxglove, daisy, hollyhock, larkspur, pentstemon, gaillardia, coreopsis, also snapdragon.

Sow in the garden all annuals, especially ageratum, balsam, centaurea, cockscomb, marigold, cosmos, nasturtium, phlox, poppy, portulaca, scabiosa, salpiglossis, zinnia; also vines such as Australian pea vine, morning glory, cypress vine.

DIVISION OF PERENNIALS

If you have not yet divided clumps of goldenrod, golden glow, or rudbeckia, etc., by all means do so at once before the new growth gets too large. All perennials should be divided or replanted as quickly as possible, for the best growing weather is now with us.

During the present month all canna, caladium, cyclamen, banana and dahlia plants still out of the soil should be placed in the garden, and as they are what is known as tropical bedders, they will be most effective if massed, with the tallest at the back;

planted in "bank" effect. Water often and most thoroughly.

BULBS

Spring bulb flowers will be nearly past now; gardeners who have been very successful still plant: amaryllis, canna, dahlia, gladiolus and tuberose.

If you wish good tuberous begonias in the open ground, plant them now, having a good, rich soil, as near to that recommended for pot culture as is possible to obtain. In addition to the ordinary single and double strains, there are superb varieties that should be grown in every garden. These are a great improvement on those ordinarily seen in California gardens.

A good compost for potting these begonias consists of one-third garden loam, one-third leaf mold, and the remaining one-third of equal parts of sharp sand and well rotted manure. Be sure to place the tubers with the hollow sides upward, as all the plant growth starts from within this hollow. If in pots, put them in a shady place until growth shows through the soil, when they may be moved into the light and gradually exposed to the forenoon's sun. The advantage of starting them in pots is that you may use the ground intended for them for spring blooming plants and bulbs whose season will be past by the time your begonias demand planting out.

HERBACEOUS PLANTS

It is not too late to put out bedding plants such as salvia, marigold, alternanthera, etc., and they do as well as those planted in early spring.

This is a good time to bed out for permanent effect, the very best for geraniums and herbaceous plants of their class. Set out: Aster, antirrhinum, centaurea, calliopsis, chrysanthemum and celosia.

CARE OF LAWNS

Lawns will need to be watered often as lawn grass does not root over two or three inches deep, but water thoroughly and induce deep rooting.

Some may not have fertilized their lawns as yet, though the time is ripe. Try some commercial fertilizer this spring and note the season's growth of grass; these balanced mixtures should prove much superior to weed-bearing stable manures. From now until winter the grass should make a steady, luxurious growth, receiving no check.

MAY

During the summer it is not best to water many plants during the heat of the day. Water in the evening so that the plants may absorb the moisture during the night and they will be the better able to stand the evaporation occurring during the day; or do the sprinkling very early in the morning.

Throughout the summer the air is generally hot and dry and dissipates much of the moisture intended for plants to consume; consequently it is during the prevalence of hot weather and rapid growth that plants require food in soluble form. Liquid fertilizers are readily absorbed by the feeding roots and at once assimilated by the tissues of plants. The excess of moisture lost through evaporation is compensated for by the plant food contained in the part that is absorbed.

In the case of house and porch plants, small, neat beds against the house, etc., it is often impracticable to use stable manure, especially if none but the coarser kinds are obtainable, but every one, especially in the suburbs or country, may keep a supply of liquid manure. Fill a common grain sack with

any kind of manure, though the older the better. Put it in a barrel and fill with water. After standing 24 hours it is ready for use. The barrel can be refilled with water several times without replenishing the supply of manure, but with each filling the water must be allowed to stand a longer time before using.

SEED SOWING

For later planting in the garden sow seeds of primula and calceolaria or set out plants of the same raised from former sowings. Seeds of many annuals and perennials may still be sown, though nearly all seed sowing should be completed this month.

It is not too late to sow, either in boxes or in seed beds or permanent places, seeds of carnation, cosmos, coreopsis, candytuft, centaurea, daisies, digitalis, forget-me-not, gaillardia, marigold, nasturtium, phlox, petunia, poppies, salpiglossis and scabiosa.

BULBS

If they have been kept in a cool, dark place you may still procure and plant dormant bulbs of amaryllis, allium, begonia, canna, cyclamen, dahlia, freesia, gladiolus, iris, scilla, tigridia and tuberose.

Hyacinths, narcissi and other Holland bulbs will now be ripening their tops. If the area they occupy is not to be used for other plants they may as well remain in present position, but if not they had better be taken up and stored till next season in a cool, dry, dark place. Place them in a box of damp sand and they will cure as the sand dries. If sand is not easily obtainable, well-pulverized soil will do, or take up each bulb with some of the surrounding soil still adhering to it and let it so remain for a few weeks, after which the bulbs may be taken out and kept cool and dry until planting season.

HERBACEOUS PLANTS

Chrysanthemum plants should now be well established in pots and may be put in the garden at once. Also set out in the garden plants of antirrhinum, aster, balsam, centaurea, dianthus, marigold and zinnia.

Young plants of carnation are now growing vigorously and are usually too slender. They should have the leaders cut or pinched off to induce stocky plants. If they are allowed their natural growth they will run up in tall, spindly flower stalks, bloom too early and produce flowers inferior to those of headed plants.

JUNE

Little new work or planting should be done at this late period, and work during June will consist mainly in keeping the garden watered and taking care of it in a general way.

Garden owners of limited experience are too apt to neglect their gardens during the early part of summer. Having planted, cultivated and watched the unfolding of leaf and blossom of spring growth, they rest from their labors in the belief that the season's gardening operations are practically over.

Weeds grow under the stimulus of water and sunshine just as luxuriantly now as in the springtime, and the ripening seeds of summer are just as potent and productive as those of early harvest days. The summer's sun is just now stronger and shines longer upon the garden than at any other time of the year; the evaporation and drain upon the soil moisture are therefore correspondingly greater.

Frequent and copious irrigations, followed by thorough cultivations, must be rigidly practiced, and the morning spraying, just before the heat of the sun

strikes the plants, should not be forgotten. Do not water and spray in the evening except for special plants, as it leaves both soil and air cold and damp throughout the night, and the following day with its dry heat brings too great a contrast 'twixt night and day; this is one of the chief causes of mildew on roses, sweet peas, etc., and other fungous diseases.

In your garden operations aim to equalize conditions of night and day so far as possible. Spray and water in the morning and the plants will have cool, moist soil and atmosphere to help withstand the desiccating influence of our summer's sun and heat. Before nightfall air and plants have taken up the moisture, and both atmosphere and soil are dry and warm for the night. Aim to equalize the temperature throughout each twenty-four hours by making the night air warmer and the day air cooler.

If a study is made of atmospheric and soil conditions we need not have so much of mildew or weakened plants. Only the sharp contrast in temperature between day and night prevents us from having perfect roses. Too many think that mildew and similar troubles are due to the winter's rains, but they are just as prevalent and destructive in the garden at present as during the rainy season. Then, too, England, a country of fog and drizzle, grows the finest roses in the world, and the "web-foot" Oregonians produce the finest on the Pacific Coast, so that mere rain supply would appear to be an advantage rather than a detriment.

SOWING AND PLANTING

Sow stock for early winter flowers and start eucalyptus and cypress from seed for winter planting. Seeds of many annuals and perennials may be planted if your gardening is late: Carnation, cos-

mos, coreopsis, candytuft, cineraria, centaurea, digitalis, daisy, forget-me-not, gaillardia, marigold, phlox, petunia, poppy and salpiglossis.

This is the last month in which the bulbs of canna, dahlia and gladiolus should be planted; also plant: *Ageratum*, balsam, carnation, cosmos, centaurea, coreopsis, celosia, daisy, hollyhock, snapdragon, violet and zinnia. *Pelargonium* can be started from cuttings now and by next spring will produce strong, bushy plants. It is still time to start late flowering chrysanthemum. Cuttings can be put in from now till the middle of July, and they will produce good flowers.

SEASONABLE SUGGESTIONS

Small greenhouses in which you are growing ferns, begonias and that class of plants should have a heavy shading on the glass, and the houses should be sprayed every morning in bright weather, and on very hot days the woodwork, paths and all absorbent surfaces sprayed two or three times a day to keep down the temperature, for the nearer you can keep the temperature of your greenhouses to 70 degrees the better your plants will do.

Late sweet peas, in cool and coastal sections, are now in full bloom and the flowers should be picked off, for the forming of one seed pod exhausts the plant more than the production of a hundred flowers. Mulch the roots with stable litter or clippings from the lawn and spray the foliage at least once a day. The spraying should be done in the early morning. Do all your watering in the morning and never spray your plants after noon for they will not dry off before night, and this may cause mildew.

Many rose bushes have had one crop of flowers, and the long barren flower stems are sucking up

the plant's vitality at the expense of new flowering shoots that are starting vigorously from various parts. Cut off these bygone stems, as they interfere with food, light and air necessary for the small crop of good blossoms you should yet garner. Soon resting time will come for roses and you should hasten the maturity of the remaining flower crop as much as possible. If you are troubled with mildew use sulphur sprinkled by hand over vines and surface of ground beneath. Do this on a hot day, for it is the fumes only, created by the sun's heat, that destroy the mildew.

Sulphur used in cool, cloudy weather avails nothing, and the fumes rise best from the heated surface of the soil. Therefore, spray the vines or bushes first with water, very lightly, so that sulphur will lodge and stick on the sunny side of the wood, but aim to keep the soil surface from getting so wet that sulphur will not "fume." Some old country gardeners put heated bricks beneath rose bushes and sprinkle sulphur on them; this is an excellent practice if one cares to take the trouble and does not get the bricks too hot, for sulphur fumes in great volume are injurious to all classes of vegetation. For this reason scatter sulphur very thinly and evenly or foliage in some parts may be damaged on hot days.

JULY

As one wanders along the highways and byways during the summer he is oft impressed with the exquisite beauty of some plant, shrub or tree in a seemingly neglected garden, so perfectly in health and at home that it seems as though specially designed for the place. At this time out should come the notebook and pencil and down should go the name of such plant, for here indeed is the "proof of the pudding."

In no other way may you so surely get a list of plants which will endure to the end.

SOWING AND PLANTING

You may still sow antirrhinum, Canterbury bell, centaurea, cosmos, lobelia, pansy and stock. Continue sowing eucalyptus and cypress seeds.

Great care must be paid to the watering, that beds or boxes do not dry out, and if the sun is very hot they may be shaded by stretching a piece of canvas over a wooden framework and placing this over them, a foot or more from the ground, during the hottest part of the day. Gradually remove this covering until the plants are perfectly strong and stocky. They are then ready for transplanting into flats, boxes or pots.

Carnation, cosmos, coreopsis, candytuft, centaurea, daisy, digitalis, forget-me-not, gaillardia, marigold, phlox, petunia, salpiglossis, scabiosa and violet may still be planted.

SEASONABLE SUGGESTIONS

Those bulbs now in the ripening stage, should be taken up when the tops have died down and placed in boxes of damp sand in a cool place and allowed to cure as the sand dries. Well pulverized earth will do if you have no sand.

Pelargoniums are now in full bloom. These plants do not require very rich soil and should be kept on the dry side. If kept too wet the foliage will shrivel up, and if given too rich soil they make all foliage and no flowers. The foliage or flowers should never get wet.

When through watering, do not leave the hose attached to the hydrant. Take it off, coil it up and hang on a peg, stub of a tree, limb or something suit-

able. With such treatment a hose will last at least twice as long as if left lying on the ground full of water.

Keeping cut flowers for a considerable time is very easy at this season if a little care is taken. Every day or two, in addition to changing the water, cut off a quarter to half an inch of the stem. This removes the portion with the pores closed by congealed sap and allows the water free access to the stem.

Insect pests are hatching every day and must be combated in every way possible. While some propagate on leaf and twig the more voracious sorts are hatched or developed in some stage in the soil, so that frequent and thorough stirring of the surface will destroy many of them and also expose them to the predatory birds and garden toads.

AUGUST

During the summer months when many bushes and vines are still covered with bloom there is a disposition among home gardeners to regard their work as finished and to rest on their laurels, as it were. There is a tendency to neglect the flower garden, to let it take care of itself, and neglect now is more fatal than at any other period. Just a little neglect now means destruction to some of the beautiful plants that cost time and money.

Neglect now will give the aphids and other insect enemies a chance to get in some very deadly work. Neglect in tying up the long stalks of late gladiolus will cause them to fall during wind storms. Neglect in watering plants of all kinds will cause them to dry up, wither and die, defeating the object for which they were planted. Neglect to use the hoe will give the weeds a chance to grow and crowd out the flowers. In short, neglect of any kind will undo much

of the good work that was done earlier in the season.

SOWING AND PLANTING

This is the best month in the year in which to sow hardy perennials. Most varieties if sown this month will flower the next year. Also sow calceolaria, cineraria, columbine, calendula, Canterbury bell, cosmos, lobelia, pansy, pink, primula, petunia and verbenas. Continue growing eucalyptus and cypress seeds.

Those who have shady beds should grow cinerarias. The proper directions for sowing and the care of young seedlings will be found upon trade packets. But remember that at every stage of its career the cineraria is a cool weather plant and must not be exposed to full sunshine during the middle of the day. Many of the colors are unknown in other plants and consist of what is known as metallic shades, ranging from white to purple. While excellent as a short season autumn bedding plant the cineraria is a good subject for potting, and in either situation requires a loose rich soil and frequent feedings of weak liquid manure. It must be carefully protected from plant lice, its greatest enemy.

You may still plant out: Carnation, cosmos, coreopsis, candytuft, centaurea, digitalis, daisy, gaillardia, marigold, phlox, petunia, salpiglossis, scabiosa and violet.

SEASONABLE SUGGESTIONS

Don't water roses this or next month at all. Let the soil dry out and rest the plants.

House plants will dry out fast these long days. Watch them closely and never let the plants get wilting dry. Spray the foliage as often as you can find

time and you will be rewarded with a stronger and healthier growth.

Chrysanthemums will assimilate all the water you may give them from now until the last bloom is picked. Until the color of the buds shows also fertilize heavily. Neglect at this time with water means failure of the flower crop.

Dahlias that bloomed early and were cut down will now be coming on for a fall crop of blossoms. Those cut down now, if well watered and fertilized, will yield a splendid show of color in November. Too many of our dahlias bloom in hot weather, and they are by no means a hot weather flower. Flowers in April and May and October and November are by far better than those of midsummer.

SEPTEMBER

The month of September may well be regarded as one of the most important in the calendar of garden operations. It is during this period that every owner of a garden should make preparations for the late autumn and winter floral display.

Do not wait until the planting time is over, and autumn and winter annuals and perennials have come into flower, and you notice them in your neighbor's garden, to find out that you want them. Either make your preparations to get them in in proper season or save the money.

SEED SOWING

Sow pansy seed this month, and another important winter flowering bedder for putting in at present is stock. Also sow: Columbine, calendula, candytuft and forget-me-not.

A few cosmos seed sown at this season will give

you a fine show of bloom by November and on dwarf plants which require no staking.

A pinch of *mignonette* seed sown in September will give you an abundance of fine blooms right through the winter. It is hardy, easily grown and exceedingly fragrant. The best variety to sow is the French variety, *Machet*.

This is the month for the first sowing of winter sweet peas, and followed in October by a second one, will give you an abundant succession of cut flowers right up to the time when the late flowered *Spencer* varieties or those of the *grandiflora* type begin to produce blossoms. We have no winter and early spring crop of flowers that surpasses the up-to-date strains of sweet peas.

BULBS

Commence planting *hyacinth*, *tulip*, *anemone* and other Dutch bulbs toward the end of the month, also *amaryllis*, *calla*, *freesia* and *iris*.

This is the time of the year to divide your clumps of German *iris*. If allowed to stand several seasons the rhizomes become crowded and the blooms subsequently produced are small and on short stems.

Make a planting during this month of *ranunculus* and *anemone*. There is nothing finer in existence for spring and winter show than these lovely bulbous plants, and they give more satisfactory results than anything of like price in the garden. *Anemone* put in during the month of September often produces flowers at Christmas.

Begin at once to prepare beds intended for bulbs. This work should be done several days in advance of the actual planting time. Dig them over thoroughly and deeply. Incorporate plenty of rotted manure and turn over several times. The majority

of bulbous plants require a light loamy soil which is well drained. There are few which do well in soils of a heavy nature.

BEDDING PLANTS

Prick off *calceolaria* and *primula* sown last month, into pots, and continue sowing same for succession.

Beds which have contained summer annuals, such as asters, etc., may be filled out with stock, Canterbury bell, *centaurea*, sweet William, *gaillardia*, *salpiglossis*, columbine, *antirrhinum*, perennial coreopsis, foxglove, pentstemon; all of which are inexpensive and will provide a bountiful supply of flowers both for garden ornamentation and for cutting purposes.

Dead and dying flower stems, leaves, etc., should be gathered and burned or composted. If allowed to cumber the ground they will all too soon begin to harbor insects, and in the process of decay produce fungous diseases. If one has a place for a compost heap, the leaves and herbaceous material may easily be taken care of. If burned, the ashes may be returned to the soil with good profit, as they contain a considerable quantity of potash and still more of lime, both good substances to apply to lawn or garden soils.

AUTUMN LAWNS

Don't forget that fall lawn planting may be done in September with excellent results. A fallacious idea is somewhat prevalent in California that lawns are best put in during the winter months. When sown at that period there is a natural germination of all weed seeds, which entails a vast amount of labor for their removal.

Sown at this season blue grass and clover germ-

inate rapidly, the former in about eight to ten days and the latter in five to six days. If properly put in, a dense bright green mat will form that will be ready for cutting in six to seven weeks. It should grow so dense that it will choke out in large measure, and prevent the germination of, the crop of winter weeds. In purchasing either blue grass or clover seed insist upon having the highest quality.

TIMELY PRUNING

Look over Cherokee rose hedges during this month and should they require pruning do it at once. To delay and prune later is proper with those roses of the noisette type, such as *La Marque*, *Reve d'Or*, etc., but is fatal to best results in the spring blooming of the Cherokees.

During this month cut back, but not too severely, hedges of lantana, heliotrope, geranium, etc. With many plants of this character there is a heavy crop of seed during autumn, which saps their vitality. Trimming them at this period removes the seed and induces a fresh growth of young shoots, which extends their blooming season to the middle of winter.

OCTOBER

The month of October should be a busy one in all California gardens, for it stands much in the same relation to us as do April and May in the snow-bound eastern states. Among the flowers it is bulb month.

The dry, rainless period is nearly over and ere long the first rains of autumn will wake to life every dormant seed, bulb, and plant. Soon the whole country will be clothed with beauteous green and brilliant blossoms. Gardening should be so ordered

that cultivated crops will harmonize and keep pace with the fullness of vegetative life about us.

SEED SOWING

Make a sowing of California poppy and other native seeds during this month, doing it at this time will give them a long growing season and the full advantage of the winter rains.

It is also just the time to sow hardy annuals and perennials for bedding plants. The list of these is: calendula, Canterbury bell, centaurea, cineraria, coreopsis, columbine, dianthus, forget-me-not, foxglove, larkspur, lobelia, mignonette, pansy, phlox, salpiglossis, scabiosa, snapdragon, stock, and sweet pea.

BULBS

October is the best month for plantings of Spanish iris, cyclamen, freesia, and gladiolus in the early flowering varieties, the Bride, Blushing Bride, and Peachblow. Also plant watsonias, lilies, and all those bulbs that are known to gardeners as Dutch bulbs. These are such as anemones, hyacinths, narcissi, ranunculi and tulips.

In planting any of the latter it will be well to drop a little sharp sand in the hole before filling in with soil. This method will often prevent rot in case the soil is kept too wet. A most important factor of success in the growing of bulbous plants is to have soil in a sweet, friable condition. They are fond of plenty of manure.

Arrange bulb beds so that you can follow with successive plantings during November and December. Take for example the matter of planting narcissi, or daffodils as they are more commonly called. By making a first planting now, a second in November and a third as late as the fifteenth of December, you

can have a constant succession of blooms from late February up to the first of May.

Build the beds with ridges at the sides so that they may be watered by flooding. This gives infinitely better results than sprinkling. Once bulbs are planted mulch the surface with one inch to an inch and a half of good fibrous manure; this retards the evaporation and tends to keep the under soil cool and moist. Bulbs in general give much better results when no surface cultivation is resorted to. The mulch referred to eliminates the necessity of cultivation. It prevents the ground from either cracking, which is the case in soils of a heavy nature, or from drying out in those of a lighter character.

HERBS, SHRUBS AND TREES

Plant out in permanent place in the garden: *Calendula*, *cineraria*, *columbine*, *lobelia*, *pansy*, *pink*, *primula*, *petunia*, and *verbena*.

October is the time for planting evergreen shrubs and trees, and conifers of all sorts handle well at this season. The soft summer growths are now hardened up and the operation of transplanting may be done without endangering the life of the plant.

The mild days, with the cool nights and mornings of a California autumn, cause but little evaporation of sap from the foliage; the new feeder roots put forth at once, and with the advent of winter rains new growths of stem and foliage spring forth with surprising rapidity. The moving at this season gives a well established tree or shrub in a short space of time.

One of the most important matters for immediate consideration is attention to roses. The fall growths begin to push out during this month and it is time to prune out all the thin straggly growth, leaving the

plump, well-ripened canes which have plenty of healthy eyes of the previous spring's growth. If you are pruning dormant wood from rose bushes at present you had best make cuttings from it.

All the best roses are borne on the new quick growing canes which spring from the base of the plant or from the well ripened eyes a little higher up. Mulch the beds with two or three inches of any well rotted manure after pruning. Then flood with water either by means of basins around the plant or by trenches along the sides. Don't sprinkle your plants overhead and expect results. Put the water where it belongs, at the roots, and you will have good flowers if you did not force them to grow during the last two months.

SEASONABLE SUGGESTIONS

Many common garden plants may easily be propagated in a box of sand at this time of the year. Among these are: begonia, coleus, fuchsia, heliotrope, marguerite, etc. If left sixty days later it would be impossible to root them except in a greenhouse.

For a dry, hot place plant some of the old-fashioned lavender. It will grow and bloom without water during our California summers and is very useful for filling sachets or placing in bureau drawers, not alone for the perfume but to keep away moths and other insects.

Just as summer is closing is a good time to take note of trees, shrubs and plants that have withstood the hard conditions of summer. Some valuable object lessons may be found in every community that should prove a guide in the selection of next season's planting list. It is not sufficient to take mental note of these points—a notebook for the purpose should be carried. October is a good time for lawn making.

NOVEMBER

Village improvement societies are now on the alert regarding time, material and manner of planting school grounds, public squares, parks and streets. Now is a good time for all preliminary work, for soil is easily worked. Even municipalities, as well as lesser communities, evince unusual activity just at this season, for it seems that with the coming of the rains all the earth must be gay—made spick and span—the natural season for festivity in California.

SEED SOWING

The following seeds should be sown now for a good crop of spring flowers; antirrhinum or snapdragon, clarkia, candytuft, eschscholtzia, or California poppy, Shirley poppy, and poppies in variety; ten weeks stock, larkspur, leptosyne, Gypsophila elegans, pansy, saponaria, lychnis or viscaria, Virginia stock, centaurea imperialis, C. Emperor William, calendula or pot marigold, Prince of Orange and Meteor.

It is a very good time to sow sweet peas now. It brings them into bloom just when they produce the largest and best flowers. It will pay to spade up the ground just as deeply as possible, even to two feet. Dig in a liberal supply of well-rotted manure, and work the soil over until in a friable condition before sowing. This gives not only a good depth of soil, but that good drainage which is so necessary to the successful growth of first class sweet peas. Keep them free from weeds and the surface well loosened at all times.

BULBS

At no other season of the year may so many bulbs be planted with both pleasure and profit as the few weeks from now until New Year's Day. This is

peculiarly the time for what is known as Dutch bulbs, and so strongly do they manifest their desire to grow that they will put forth leaves even in the dry air of the living-room if laid upon the bare table. Planted in almost any soil, they rapidly spring into life and soon give fine heads or sprays of flowers.

Anemone, freesia, early-flowering gladiolus, hyacinth, iris, ixia, jonquil, lily, montbretia, narcissus, ornithogalum, ranunculus, sparaxis and tulip are some of the most popular bulbs to plant now, and all may be obtained at any seed store and also of some of the florists and nurserymen. Do not plant your ranunculus or anemone upside down; plant ranunculus with the claws down and the anemone with the smoothest side down. This is more easily distinguished after they have been soaked two hours.

TIMELY PROPAGATION

At this time you should take cuttings of soft wood and tender herbaceous plants such as: alternanthera, begonia, coleus, fuchsia, heliotrope, Impatiens sultani, marguerite, etc. Bottom heat is not needed though better results can be obtained with such a convenience.

Get a box of clean sharp sand, see that the drainage is perfect—plenty of holes in the bottom, wet the sand down thoroughly, put your cuttings in a slit made with a knife or thin paddle, press sand around cuttings and wet down. Watch them closely and don't allow them to dry.

SEASONABLE SUGGESTIONS

Cut back pentstemons this month to within eight inches of the ground and they will come up stronger and bloom better next year.

Violets will shortly be at their best, and the time

to fertilize for blooms is now. Give the beds a liberal mulch of manure and see that they get plenty of water without overdoing it. The rains should relieve you of this from now on.

Nearly all hardy perennial flowering plants do well if put in at this season. By planting now they receive the benefit of the winter rains, start new root action, produce an abundance of bloom in spring, and become thoroughly established, thus enabling them to better withstand the heat of summer.

We are now at the secondary period of bulb planting, the most important operation of all fall garden work. With seasonable weather at hand this work should be prosecuted with vigor if you expect to obtain a full return in a wealth of flowers from the spring garden. We advise the thorough preparation of the soil; dig the ground deeply and thoroughly, incorporating a plentiful supply of well rotted manure. The better the tilth of the soil, the more satisfactory will be the results.

THE ROSE GARDEN

Now is the time to attend to roses if heretofore neglected. Where the bushes have been dried off during the summer, for winter flowers all the weak wood should be cut away and the stronger branches cut back heavily, as this treatment will induce longer stems and a better quality of flowers. Such roses should then be watered thoroughly.

Should the bushes be expected to produce a crop of bloom, both for winter and spring, it will be found best to cut away only the weak wood entirely, and the stronger growth just enough to balance the plant nicely, and then prune more heavily the latter part of February. Proper treatment necessarily varies,

according to the harshness of winter in your section of the state.

Give the soil a good dressing of well rotted manure and spade under a few inches only, for if spaded too deeply the roots are liable to be injured, and the bushes will need all the root action possible to develop first-class flowers. A deeper spading may be given in the spring.

DECEMBER

There is no time like the present to give the garden a general overhauling, to attend to the manuring and spading up of all vacant beds and borders. After spading leave the ground in a rough state, that is, don't rake it down, as the sun and air will do more good, and it will leave the ground in a more friable condition than if raked down too smooth. Don't be afraid to enrich abundantly, as the ground will be in better condition for spring planting.

SEED SOWING

Now is the time to plant sweet peas. With proper cultivation there is nothing that yields such a bounteous harvest as sweet peas, and a sowing of *scabiosa* made at this period will give a splendid display of bloom in early spring.

Seeds of all garden annuals of hardy sorts may safely be sown now, and sweet peas are always on the autumn and winter planting list. Specific sorts for planting in the general garden now are *arctotis*, *dianthus*, *phlox*, *salvia* and all the "old-fashioned" garden inmates known to eastern gardens.

Among other seeds that can be planted during December, the plants of which will give you a fine display of spring blossoms, are sweet alyssum, *calendula*, winter marigold, California poppy, baby blue-

eye, candytuft, of which Emperor and hyacinth-flowered are the two best strains, forget-me-not, larkspur, in the annual sorts, mignonette, pansy, salpiglossis, snapdragon, stock, annual calliopsis, foxglove, and verbenas.

BULBS

If you would have a display of blooms from bulbous plants, now is the time to act. December is the last call for bulbs. If space is limited and you would like to make use of the ground for spring blooms, all dormant bulbs, dahlia, for example, should now be taken up and stored in a cool, dry place until March or April.

The anemone, narcissus, or daffodil, single and double, in shades of orange, yellow and white, the Dutch hyacinth, tulip, Spanish iris, early and late flowering gladiolus, lily, Roman hyacinth, ixia, ranunculus, sparaxis, freesia, ornithogalum (Star of Bethlehem), cyclamen, montbretia, and German iris should all be planted immediately.

GENERAL PLANTING

Now is the time to plant roses. Planted now they will be forming new roots, the tops will be dormant, but with pulsing spring the buds will swell and soon make a growth that will produce blooms to fill the garden with fragrance and beauty. All hardy perennials, vines, ornamental deciduous trees and shrubs, as well as hardy evergreen shrubs and trees and conifers, may be planted.

If you have not yet planted pansies, prepare a bed of rich, light, well-pulverized soil in a warm, sunny place so that you may have pansy blossoms in spring and early summer. Now is a good time to stir all soil whether for immediate use or otherwise. Turn

it up and allow it to get thoroughly aired and sunned; after a time level it down, and when beaten solid by rains, spade up deeply again. If fertilizer is put in at the first spading, a well-mixed, resourceful soil will be the result.

SEASONABLE SUGGESTIONS

Chrysanthemums may be taken up and temporarily planted in some waste piece of ground. Then dig up the ground, enrich with well rotted manure, and you are ready to make a planting.

Do not be snipping off the ends of branches on deciduous shrubs that are now dormant or becoming so, or you will rob the plants of the best of their spring's crop of bloom; they should be pruned only immediately after flowering. Neither prune any plant or vine that is very tender, for the frost may do it for you, and the growth so injured may protect the balance of the plant from injury or death during a very cold spell.

Now is the time when all clumps of cannas, caladiums, etc., should be taken up and stored in a cool, dry place. Late March or early April will be early enough for replanting. While it is not necessary to remove them no advantage accrues from leaving them in the soil, and if old masses of roots are left for years, they do not thrive as well as if divided. It is also advisable, if their room is more desirable than their presence, to so store clumps of golden-rod, golden glow and other vigorous, free-rooting perennials.

Do not fertilize lawns. The great disadvantage of fertilizing too early is to force a nice green growth at the time we are expecting our cold weather and the consequence is it makes a spurt, and when it should look nice in early spring it stops growing and

looks brown. It has been forced from its natural resting time, the tender growth is frozen, and it takes its rest toward spring when the fertilizer has exhausted its forcing qualities. February and March will be found the best time to manure lawns, and from that time there will be a luxuriant growth until winter.

GLOSSARY

The following list of scientific names, with definitions, embraces all those in more common use. The definitions are not all literal but the meaning as applied to plants.

A, at the beginning of words of Greek derivation, commonly signifies a negative: as aptera = wingless; from a, without, and ptera, wing; acaulis, a, without, caulis, stem = stemless.

acantha, spine.
 acaulis, stemless.
 acicularis, sickleshaped.
 aculeata, spiny.
 acuminata, taper-pointed.
 acuta, sharp-pointed.
 adeno, glandular.
 affine, related.
 alata, winged.
 alba, white.
 albicans, whitish.
 albo-lineata, white-lined.
 alnifolia, alder-leaved.
 alpestre, alpine. rocky.
 amabilis, lovely.
 amoena, pleasing.
 amorpha, formless.
 ampla, large.
 angusta, narrow.
 aptera, wingless.
 aquatica, water-loving.
 aquifolia, holly-leaved.
 arborescens, tree-like.
 arenaria, sand-loving.
 argentea, silvery.
 argyrea, silvery.
 aristata, awned. bearded.
 armata, armed.
 articulata, jointed.
 aspera, rough.
 Atlantica, Atlantic.
 atrosanguinea, dark-red.
 atrovirens, dark-green.
 attenuata, thin.
 aurantiaca, orange-colored.
 aurea, golden.
 auriculata, eared.
 aurita, eared.
 australis, southern.
 azurea, blue.

baccata, berry-like.
 bacillaris, rod-like.
 barbata, barbed.
 bella, charming.
 bicolor, two-colored.
 bifida, two-cleft.
 biflora, two-flowered.
 bifurcata, two-forked.
 bipinnata, twice-pinnate.

brachy, short.
 brevifolia, short-leaved.
 bulbifera, bulb-bearing.

caespitosa, many-headed.
 calycina, cup-shaped.
 campanulata, bell-shaped.
 Canariensis, Canary Islands.
 candida, white.
 canescens, hoary.
 Capensis, Cape of Good Hope.
 capillaris, hair-bearing.
 capitata, headed.
 cardinalis, cardinal-red.
 carnea, flesh-colored.
 carpa, fruit.
 caudata, tailed.
 cerifera, wax-bearing.
 chlorophylla, green-leaved.
 chrysantha, yellow flowered.
 ciliaris, hair-fringed.
 ciliata, silky-haired.
 cinerea, ash-colored.
 circinata, rolled upwards.
 citrina, lemon-yellow.
 citriodora, lemon-scented.
 clavatus, club-shaped.
 coccifera, berry-bearing.
 coccinea, scarlet.
 coerulea, blue.
 collina, hill.
 communis, common.
 concolor, one-color.
 conferta, dense.
 congesta, close-headed.
 contorta, twisted.
 cordata, heart-shaped.
 coriacea, leathery.
 cornigera, horn-bearing.
 cornuta, horned.
 coronata, crowned.
 crassifolia, thick-leaved.
 crenata, scallop-edged.
 cretacea, chalked.
 Cretan, Island of Crete.
 Cretica, Island of Crete.
 crispa, curled.
 cristata, crested.
 cucullata, hooded.
 cuneata, wedge-shaped.

cupressina, cypress-like.
cyanea, blue.

dealbata, powdery.
deca-, ten.
decandra, ten-stemmed.
decipiens, deceiving.
decora, comely.
decurrens, prolonged on stem.
decussata, opposing pairs.
deflexa, bending.
demissa, low.
denticulata, toothed.
dependens, hanging.
digitata, fingered.
discolor, various-colored.
disticha, two-ranked.
divaricata, straggling.
dulcis, sweet.
dumosa, bushy.

eburnea, ivory-like.
echinata, hedge-hog-like.
edulis, edible.
elata, tall.
elongata, trailing.
emarginata, notched at tip.
ericoides, heath-like.
eriocarpa, woolly-fruited.
esculenta, edible.
exaltata, high.
excelsa, tall.
eximea, excellent.

falcata, sickle-shaped.
farinosa, mealy.
fasciculata, close-clustered.
fastigiata, parallel and upright.
ferox, fierce.
ferruginea, rusty.
ficifolia, fig-leaved.
filamentosa, thready.
filifera, thread-bearing.
fimbriata, fringed.
fiabella, fan-shaped.
flagella, whip-shaped.
flammea, fiery.
flava, yellow.
flexuosa, waved ziz-zaggly.
flore-plena, double-flowered.
floribunda, free-flowering.
florida, florid.
foetida, stinking.
folia, foliage.
foliosa, leafy.
formosa, beautiful.
fragrans, fragrant.
frigida, stiff.
fruticosa, shrubby.
fulgens, glowing. brilliant.
funebri, funereal. dismal.

genus, rank above species.
gigas, giant.
glabra, smooth.
gladiata, sword-like.

glauca, milky-white.
glutinosa, sticky.
gracile, slender.
gracillima, graceful.
graminea, grass-like.
grandis, splendid. great.
graveolens, strong-smelling.
guttata, spotted.

hastata, spear-shaped.
hederacea, ivy-like.
hepta, seven.
herbacea, herb-like. herbaceous.
heterophylla, variable-leaved.
hexa, six.
hirsuta, hairy.
hirta, hairy.
hispida, hairy.
hortensis, garden.
humilis, dwarf.
hystrix, bristly.

-ifera, bearing.
igneae, fiery.
ilicifolia, holly-leaved.
imbricata, overlapping.
incisa, deeply-cut.
Indica, Indian.
indigenous, native.
indivisa, undivided. simple.
inermis, unarmed.
integrifolia, entire-leaved.

junceae, rush-like.
labiata, lipped.
lachniata, deeply-cut.
lacta, milky.
laevigata, smooth-stemmed.
lanata, woolly.
lanceolata, lance-shaped.
lasiocarpa, woolly-fruited.
latifolia, broad-leaved.
laurifolia, laurel-leaved.
laxa, loose.
leucorrhiza, white-rooted.
leucoxydon, white-wooded.
lignosus, woody.
linearis, narrow-leaved.
lineata, lined.
lingua, tongued.
linifolia, flax-leaved.
lobata, lobed.
longifolia, long-leaved.
longipes, long-stalked.
lophanta, crested.
lucida, shiny.
lunata, crescent-shaped.
Lusitanica, Portugal.

macro, large.
macrophylla, large-leaved.
maculata, spotted.
majalis, May.
major, greater.
majus, large.
marmora, marbled.

maxima, largest.
 media, middle.
 mega, large.
 megarrhiza, large-rooted.
 melan, black.
 micro, small.
 microphylla, small-leaved.
 miniata, vermillion.
 minor, less.
 mirabilis, wonderful.
 mitis, small.
 molle, soft.
 mollissima, soft.
 mono-, one.
 monophylla, one-leaved.
 montana, mountain.
 moschata, musky.
 multi-, many.
 multiflora, many-flowered.
 muricata, short, hard pointed.
 mutabilis, changeable.
 myrlo, many.
 myriophylla, many-leaves.
 myrtifolia, myrtle-leaved.

nana, dwarf.
 nemorale, wood.
 neriifolia, oleander-leaved.
 nervata, veined.
 nigra, black.
 nitida, shining.
 nivea, snowy.
 nodiflora, knot-flowered.
 nodosa, knotty. knobby.
 nucifera, nut-bearing.
 nuda, naked.
 nutans, nodding.

ob-, signifies inversion.
 obcordata, heart-shaped apex.
 obovata, broad end outward.
 obtusa, blunt.
 occidentalis, western.
 ocellata, eyed.
 ochra-leuca, yellowish-white.
 octo-, eight.
 odorata, sweet-scented.
 -oides, like. similar.
 orientalis, eastern.
 ornata, adorned.
 ovata, egg-shaped.
 oxygona, sharp-angled.
 -oxylon, wood.
 oxypetala, sharp-petalled.

pallida, pale.
 palustre, marsh.
 paniculata, panicle.
 papyrifera, paper-bearing.
 parviflora, small-flowered.
 patens, spreading.
 pauciflora, few-flowered.
 pectinata, comb-like.
 pedata, bird-footed.
 peltata, stem in center.
 pendula, drooping.

penta, five.
 pentaphylla, five-leaved.
 Persica, Persia.
 phylla, leaf.
 picta, painted.
 pinnata, divided.
 platyphylla, broad-leaved.
 plumosa, feathery.
 podophylla, foot-leaved.
 poly-, many.
 polypodium, many-footed.
 populifolia, poplar-leaved.
 primulina, primrose-yellow.
 princeps, princely.
 procumbens, trailing.
 pruinata, frosted.
 pseudo, false. like.
 pubescens, downy.
 pudica, chaste.
 pugioniformis, dagger-shaped.
 pulchella, pretty.
 pulchra, beautiful.
 pulverulenta, powdery.
 pumila, small.
 punicea, reddish.
 pusilla, diminutive.
 pygmea, dwarf.

quadri-, four.
 quinata, in fives.
 quinquifolia, five-lobed.

racemosa, racemed.
 radiata, radiating.
 radicans, rooting.
 ramosa, branched.
 ramosissima, much-branched.
 reclinata, curved downwards.
 reniforme, kidney-shaped.
 repens, creeping.
 reticulata, netted.
 revoluta, rolled back.
 rhododendron, rose-tree.
 rhombifolia, diamond-leaved.
 ringens, gaping open.
 riparia, river-bank.
 rosea, rosy.
 rostrata, beaked.
 rotundifolia, round-leaved.
 rubens, reddish.
 rubra, red.
 rugosa, wrinkled.

salicifolia, willow-leaved.
 sanguinea, blood-colored.
 sarmentosa, flexible-twigg.
 sativa, cultivated.
 saxatile, rock.
 scabra, rough.
 scandens, climbing.
 scoparia, broom-like.
 semi-, half.
 semper, ever. always.
 semper-aurea, ever-golden.
 semperflorens, ever-flowering.
 sempervirens, evergreen.

senile, white-haired.
 serotina, late.
 serrata, saw-leaved.
 serrulata, saw-leaved.
 sessile, stemless.
 siliqua, bearing long pods.
 Sinensis, Chinese.
 sparsa, few.
 species, rank below genus.
 speciosa, showy.
 spectabilis, showy.
 spicata, spiked.
 spiralis, spiral.
 stellata, star-like.
 striata, striped.
 stricta, upright.
 suaveolens, sweet-scented.
 subulata, awl-shaped.
 sulphurea, sulphur-yellow.
 sylvatica, of woods.
 sylvestris, of woods.

tenella, delicate. small.
 tenuifolia, narrow-leaved.
 tenuis, slender.
 tetra-, four.
 tetrandra, four-stemmed.
 tigrinum, striped.
 tinctoria, dyer's.
 tomentosa, downy.
 torulosa, twisted.
 toxica, poison.
 toxifera, poison-bearing.
 tri-, three.

triangulare, three-angled.
 tricolor, three-colored.
 trifida, three-cleft.
 triflora, three-flowered.
 triloba, three-lobed.
 truncata, square-cut tip.

ulmifolia, elm-leaved.
 umbraculifera, umbrella-bearing.
 undulata, wavy.
 uni-, one.
 uniflora, one-flowered.
 urticifolia, nettle-leaved.

variety, rank below species.
 velutina, velvety.
 venosa, veined.
 ventricosa, inflated.
 venusta, lovely.
 vera, true.
 versicolor, various-colored.
 verticillata, whorled.
 vesca, edible.
 vestita, clothed.
 viminea, slender-twiggly.
 violacea, violet.
 virens, green.
 viridiflora, green-flowered.
 viscosa, clammy.
 vitella, yellowish.
 vittata, striped.
 vivipara, plant-bearing.
 volubilis, twining.
 vulgaris, common.

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