MAKING A BULB GARDEN

GRACE TABOR

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**MAKING A
BULB GARDEN**

THE HOUSE & GARDEN MAKING BOOKS

IT is the intention of the publishers to make this series of little volumes, of which *Making a Bulb Garden* is one, a complete library of authoritative and well illustrated handbooks dealing with the activities of the home-maker and amateur gardener. Text, pictures and diagrams will, in each respective book, aim to make perfectly clear the possibility of having, and the means of having, some of the more important features of a modern country or suburban home. Among the titles already issued or planned for early publication are the following: *Making a Rose Garden; Making a Lawn; Making a Tennis Court; Making a Fireplace; Making a Garden of Perennials; Making a Rock Garden; Making a Garden with Hotbed and Coldframe; Making Built-in Bookcases, Shelves and Seats; Making a Garden to Bloom This Year; Making a Water Garden; Making a Poultry House; Making the Grounds Attractive with Shrubbery; Making Paths and Driveways*; with others to be announced later.

What conservation; what profit on the investment; what efficiency there is in a planting of bulbs

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MAKING A BULB GARDEN

By GRACE TABOR

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PREFACE

THE author acknowledges her indebtedness to Henry A. Dreer for dates and times of flowering of the various bulbs listed. It is to be understood that these dates are only approximate, however, as varying conditions hasten or retard growth and development in different seasons, and variations of from a few days to a fortnight may sometimes occur.

CONTENTS

	PAGE
THE AVAILABLE MATERIAL	11
DESIGNING A GARDEN FOR BULBS . .	17
SOIL AND CULTURE	29
AILMENTS AND TROUBLES	43
LISTS	52

THE ILLUSTRATIONS

DARWIN TULIPS IN A BORDER *Frontispiece*

	FACING PAGE
THE WRONG WAY TO PLANT BULBS .	22
AN IRREGULAR BORDER OF TULIPS .	24
A WIDE BORDER OF BULBS ALONG A BOUNDARY FENCE	28
PLANTING BULBS ON A LAYER OF SAND	32
NARCISSI NATURALIZED ALONG A PLANT- ING OF HALF-WILD SHRUBBERY .	40
A COLLECTION OF IRIS WITH PEONIES .	54
MADONNA LILIES (<i>Lilium candidum</i>) .	58

Making A Bulb Garden

THE AVAILABLE MATERIAL

BULBS—what are they?

How shall we say, in common garden speech? For how much more than it can possibly convey, is so much less than the truth! Even the vision of a seer and the utterance of a poet could barely do them justice—rough brown things, of the earth, earthy; yet veritable treasure caskets overflowing, coffers wherein reposes the essence of things created. Pallor of moon, shimmer of rainbow, glint of gold and flame, and steadfast blue of heaven—these, and how much more, each lifts and unfolds under the invisible caresses that reach down where they wait, in the silent darkness below. And then, as if this lavish prodigality of beauty were not enough,

they pour forth incense too, from their sweet hearts; a gentle, still flower-speech that steals into the soul more surely than anything seen or than any spoken word. None of the flowers in this great class is "dumb;" while some yield a fragrance more ravishing than any other in the world.

Ours in perpetuity are all these joys for just the work of once planting—practically—and then letting alone. What conservation; what profit on the investment; what efficiency! How is it that anyone ever overlooks these wonderful garden habitants? How is it that everyone does not devote the half at least, if not the whole, of his garden to them?

I think that we are safe in saying that three things in this world are certain, instead of two—and that the bulb garden is the third. Bulbs will go ahead bravely and grow and blossom, wherever they are put, whoever puts them there; and so, if someone who actually hated flowers—

heaven send them grace!—were to come and ask me what they might plant with a measure of success, what would grow and thrive in spite of their dislike, I should say “bulbs.” For this class of plants rises above conditions with a noble serenity quite worthy of the superlative beauty and sweetness of its members; yet let this not obscure the fact that no class of plants appreciates more fully what man may do for them, nor responds to the human touch and sympathy more gratefully.

We all too commonly think of bulbs as furnishing spring flowers only; this perhaps because everyone knows about crocuses and daffy-down-dillys, while few know about colchicum or alstromeria. Whatever the reason, however, we must banish this idea of limitation, at once. There is no room for it in a bulb garden.

Some bulbs are tender, to be sure—too tender to stay in the ground in the latitude of New York City during the win-

ter—and therefore they do not come up to the standard of little work and great results which we have set. But there are some for all seasons which are hardy; so it is quite possible to have our bulb garden and to have flowers in it all the summer through, without undue labor, and without the use of any other kind of plant.

The gardening world was at one time constantly using the phrase "Cape bulb," but this has lost much in definiteness since the first bulbous plants came up from the Cape of Good Hope and its neighboring regions, in South Africa, and were so designated. Hybrids of these true Cape bulbs are more in evidence now than the original types, and these are not of course truly Cape bulbs, although, as the offspring of the original immigrants, they are so classified. They are mostly tender, requiring to be wintered indoors; and they are fall-blooming usually; for this reason they are distinctly valuable, as

well as for their beauty. They have not been distinguished in the Tables and Lists appended, however, for the reason that it is an unnecessary classification to make when the distinction between Hardy and Tender has been sharply drawn. It is rather garden ignorance than garden knowledge that refers to them now under the once commonly used name; hence it is avoided here. But the explanation seems in order, that there may be no misunderstanding or doubt about the term, if it is met.

While it is not perhaps essential to success to know that there are four distinct kinds of plant growth designated by the general term of bulb, only one of which is truly a bulb; it is nevertheless well to learn the distinction. One really can never know too much about anything, I find. The other root forms which we refer to as bulbs, but which are not bulbs, are actually rhizomes, tubers or corms, according as they are (1) simply a creep-

ing branch or rootstock, somewhat thickened, growing underneath the ground; (2) a very much thickened rootstock with eyes; or (3) a very much thickened bit of underground stem, having no eyes but producing roots on its under side, and leaves on top. These three forms, be it noted, are all solid. True bulbs are not solid, but are composed of either a succession of thick narrow scales laid one upon the other closely, or a succession of wider, thinner scales, arranged to enwrap each other. The onion is probably the most familiar example of the latter kind—the enwrapping scale, called the tunicated bulb, to distinguish it from the narrow, piled up scale or scaly bulb, first mentioned.

Iris roots are usually rhizomes, although the English and Spanish varieties are tubers; potatoes are tubers, so are dahlias; crocuses and gladioli are corms; lilies are true bulbs of the scaly division, while hyacinths are bulbs of the tunicated class.

DESIGNING A GARDEN FOR BULBS

THERE are two ways of handling bulbs, just as there are two ways of handling all kinds of flowers: the definitely designed garden is one—the garden which is commonly called “formal”—while the happy carelessness of a border here and another there, where opportunity seems to offer, and naturalized masses in long grass, is the other. Each has its merits and advantages; each makes its distinct appeal to a distinct temperament; and actually, neither one precludes the other. One may encourage bulbs to grow as Nature scatters daisies and buttercups, and still have a prim, trim garden wherein stately iris and pallid lilies preserve the stiff decorum becoming in the gentlefolk of bygone days. Personally I know of nothing which affords greater satisfac-

tion to my soul than a secluded garden of box-edge beds, exquisitely precise in form and line, filled with these blue blooded aristocrats—a garden exclusive and fragrant, with the pungent bitter of the box intensifying its sweetness.

In planning a formal bulb garden, the same three things must guide in selecting species and varieties, that guide wherever flowers are used together—namely, the height, time of flowering and the color. And the formal design must of course have its proper center, however small and simple it may be. From some point it must develop symmetrically, along an axis—and from this point it should be approached and here the main entrance to it should be located.

It may be laid down as an axiom that formal designs are never effective if the corresponding portions are carried out with plants that vary greatly in height. In order to preserve the symmetry and

Plan for bulb garden 20x35 ft. 1—*Iris Xiphium*, 2—*Crocus*, 3—*Narcissus Jonquilla*, 4—*Iris laevigata*, 5—*Colchicum Parkinsoni*, 6—*Hemerocallis, flava*, 7—*Lilium speciosum*. 8—*Hemerocallis Thunbergii*, 9—*Iris Xiphoides*, 10—*Lilium longiflorum*, 11—*Hemerocallis auriantica*, 12—*Lilium auratum*, 13—*Hemerocallis fulva*, 14—*Narcissus poeticus*, 15—*Allium azureum*, 16—*Lilium Henryi*, 17—*Fritillaria Imperialis*, 18—*Lilium speciosum rubrum*.

continuity of the whole, vertical proportions must correspond as well as the horizontal. Take, for example, the simplest form—a square divided into four triangular corner plots by a walk running in to a grass plot at the center from each of the four sides. If the first plot on the right is planted with specimens that reach a height of two feet, while the corresponding plot on the opposite side of the axis—otherwise on the left—is filled with growth that reaches a height of four feet, the symmetry is completely destroyed and with it the design too, to all practical purposes. But right and left plots nearest at hand may contain tall-growing plants and the two plots beyond may be filled with lower-growing ones without impairing the effect. It is only on either side of the main axis that there *must* be corresponding proportion, ordinarily; but it is undoubtedly always better to maintain a fair measure of it throughout a design.

Designing a Garden for Bulbs 21

A garden may be symmetrical horticulturally as well as in its design, with very excellent results—that is, it may have its corresponding beds planted with the same things; but this is not necessary if the matter of height is carefully watched. Form rather than color is the important thing.

One very practical plea for sovereignty which the limited and formal garden has always made to my mind, is its early springtime condition compared to the uninhabitableness of the rest of outdoors generally. When everything else is mud and dreary winter brown, with even the most favored border not a particularly inviting place to walk, the garden within its enclosing walls of privet or hemlock, or perhaps just bare branched shrubs, as the case may be, is still a garden; and the earliest snowdrop or crocus finds a tidy world awaiting it instead of a sloppy, disorderly one. Use masses naturally too, of course, wherever they may go;

but do not expect from these the earliest enjoyment after winter's back is turned. It is to the real garden that we must look for that—and in the real garden that we may walk, even in March, without suffering the mad impatience that comes of waiting for spring outside this garden's neat preparedness.

As for the fancy beds in which tulips and hyacinths commonly find themselves—poor things!—what is there to say for these? Have they a place anywhere in the world? I suppose we must admit that they have, just one place—but certainly only that one. How I do wish they might be confined to these limits; to reservations, as it were. Public squares are perhaps improved by beds; I have never been able to make up my mind positively that they are; yet, on the other hand, I have never felt certain that they are not. Such places—such squares in parks, and the ground at the base of statues and monuments, as well as ceme-

Is there any excuse whatever for the isolated fancy bed of tulips or hyacinths elsewhere than in public squares, or about railroad stations?

teries and railroad stations—are, of course, of all spots the stiffest and most formal; consequently they demand an exceedingly formal and ceremonial treatment. That a round, smooth mound, bristling with pink hyacinths which circle around a mass of white hyacinths, and are in turn encircled by a mass of blue, the whole belted with a deeper pink perhaps, is not the ideal, would seem to be a rather obvious fact; but even this arrangement brings color and life when both are eagerly craved. And in the places mentioned it is difficult to do anything better, because of the publicity; moreover if something different were undertaken, a less pleasing result might follow. So it may be discreet to let well enough alone.

But anywhere else there is not the ghost of an excuse for fancy beds, nor for bulbs "bedded out." Do not confuse the plots that go to make up a garden, with the sort of thing I am condemning

in this wholesale fashion, however; for these garden plots or beds are of course only units in a design and as such have every reason for being. It is the detached triangles, and stars, and crescents, and hearts, and anchors, dropped into the midst of otherwise good lawns, that come under the ban. The eradication of the "bed" idea from the gardener's mind is perhaps the one consummation most devoutly to be wished. For this is a treatment of plants that is contrary to every principle of good taste as well as contrary to Nature; and besides all this, it is a violation of every rule of harmony and composition.

Suppose, for example, you were to find a page in this book with no words upon it, but with a solitary period in the center, an exclamation point some distance off, and perhaps the question-mark, colon and rest of their kind, scattered around hit-or-miss; would it be possible to make anything of such? Or would it be an attract-

A very simple, irregular border of tulips along the edge of a mass of trees and shrubs

ive page to look at, just for abstract beauty? Of course not—and of course you would know that something was wrong, with the printer or with me.

Well, something is equally wrong when people spot flower beds about, here and there and anywhere upon a lawn—for flower beds are not as unlike punctuation marks as they may seem, when superficially considered. They arrest attention, they mark a pause, they divide the whole into parts, they emphasize—indeed, how often do they not ejaculate? Without the continuity that comes of a given design as a whole, therefore, wherein they take their places secondary to the design, how obviously out of place they are; how useless; how silly; how ugly—just as the periods and commas would be on the blank page.

If the area of any given plot is limited to a degree that will not admit a garden, carefully designed and set apart, consider the entire place as a garden; let it in its

entirety be the design. Utilize the house and whatever other buildings there may be, the trees, the vegetable garden, the walks and drives, as motifs, and introduce the flowers in clumps and bands as adjuncts to these. A long, straight border along the sunny boundary, broken once perhaps by a seat, or some feature of interest in itself, is always in good taste, and always insures the widest effect for every flower that blooms in it.

The typical suburban place indeed offers very little opportunity for placing flowers in any other way—but however restricted space may be, and even where there is no sunny boundary, there are sure to be walks which may be “bordered.” Keep away from the house, however, with everything excepting vines, and now and then a shrub or shrubby group; not many flowers are suitable for a position immediately against foundations, where eaves either drip or keep rain away entirely. Then too there is no

possible enjoyment of the bloom from within the dwelling when they are so located, and this is something which ought always to be considered.

Bulbs naturalized are always a great temptation, but one that should be resisted when space is at a premium and conditions not altogether in harmony with such treatment. So much has been said and written about "naturalizing" that it is small wonder one goes quite mad over the idea, and in the flush of bulb enthusiasm, loads the earth with all that it will hold, of every kind that may be scattered thus. Disappointment will surely follow inappropriate naturalizing, however—so go slowly and cautiously. Snowdrops and squills may of course find a place in any lawn, however tiny it may be, scattered broadcast; but the use of narcissi, tulips, jonquils and any of the other bulbs which are lovely handled in this way in the proper places, is not advisable unless there is space, and general conditions

which are decidedly "natural." Deep, uncut grass is not for the small dooryard, nor even for the orchard, if it be a strictly well kept, up-to-the-minute, scientifically handled orchard; therefore ground of pleasant dalliance alone, is needed for the use of the larger bulbs on this lavish scale.

All of the bulbs that are suitable for naturalizing may be used in borders, so nothing is missed by the restriction above implied except the manner of planting. But I always feel that snowdrops, squills and glory-of-the-snow are so delicate that they need turf beneath them, even though it is brown and sere, rather than bare earth. So, although they may perfectly well be massed in borders, I always prefer to naturalize these, by fifties or hundreds—or thousands—as the case may be. They are so small themselves that very small space allows enough room for at least the first number.

How far superior to the isolated beds in the lawn is this great wide border of bulbs along the boundary fence

SOIL AND CULTURE

I AM not going to say anything about the ideal soil for bulbs, because that concerns only the commercial grower. Common garden earth will grow them perfectly well, when it is in just a common garden that they are wanted. So, for the private garden, whether it be large or small, be assured that any soil will be satisfactory, *if* drainage is assured.

Bulbs will indeed grow almost anywhere; but wherever they are and whatever conditions of moisture they may like, always remember that a bulb itself must have free drainage. It may be a plant that revels in cool dampness, that grows best where water stands on the ground after heavy rain, or beside a stream where water is fed constantly through the soil at its roots by capillary action—

but the bulb itself *must be free* from constant contact with water. Certain kinds of "bulbs" may endure it better than others, to be sure, as one might judge from their character; the solid corms or rhizomes, into which water cannot penetrate, are naturally less likely to rot under such conditions than the loose, scaly, or even the dense, tunicated true bulb. But it is the safer rule to give *all* a chance to breathe.

However wet the location into which they are to go, and however heavy and muck-like the soil, this is readily accomplished by setting the bulb onto a cushion of sand or of fine coal ashes. This cushion may be shallow or deep according to conditions, the denser soil and greater moisture requiring the deeper layer of loose drainage medium. True bulbs, especially those of the open, scaly class, should be bedded upon a two- or three-inch layer; indeed it is well to bring an inch wall of sand up around such as these, leaving only the top to come in contact with the

soil. The roots which the bulb puts forth will go through the sand of course immediately, in their search and reach for moisture, while the bulb remains safe and snug and dry.

Fertilizer is appreciated by all bulbous plants, but manure ought never to touch a bulb of any kind. Usually the gardener is advised to apply cow manure liberally and spade the ground very deep, then grow something else for a season before planting the bulbs. This insures the decay of the manure to be sure, but it delays the garden; consequently it is not a method with which one has much sympathy.

Bone meal is really the safe, and therefore the best thing to use, when the bulbs are being planted. It may be mixed into the earth below and around each one, and worked in over the surface after they are buried. Once they are underground and established, however, well rotted cow manure may be applied to the ground above them, and worked in each spring;

32 *Making a Bulb Garden*

or even left to lie loose on the ground. It will leach through the soil under the rain, and enrich it down to where the feeding roots are.

Bulbous plants are different from all others in that they make and store away each season's bloom during the *preceding* season. This is the process that is going on when we speak of the bulb's "ripening;" and unless it is absolutely uninterrupted, no flowers can be produced during the succeeding year. Every bulb, as it comes from the ground in a dormant state, contains next season's flowers, *every one* of them—tiny, rudimentary embryos to be sure, yet nevertheless, the actual blossoms. Bulbs that do not are immature and cannot bloom until they have been given time and opportunity, in the ground, to reach maturity.

Some require longer for this than others, and naturally the time needed enters into the price of the bulb. "Extra Selected First-Size Named Hyacinths" for example, have been cultivated

Practically all bulbs need the drainage that is easily secured by planting them upon a layer of sand or fine coal ashes

from four to six years in Holland—where soil and general conditions are ideal, hence the great Dutch industry of bulb culture—before they reach the full size necessary to produce the finest flowers here in our gardens, consequently before they are large enough to bring the highest market price. Such bulbs are from 8 to 10 inches in circumference. After once flowering here, however, they are bound to take a season or two off, because, being fully mature themselves, they must go on to the next step in the life round and begin to reproduce their kind. This reproduction is by means of offsets—and not until some of the offsets have reached early maturity, can they in their turn blossom.

In commercial growing, such bulbs are induced to throw off a great number of offsets by being scored with a sharp knife across the bottom deeply, in August or as soon as ripened; then set into loose soil, bottom up, for a fortnight. This “heals” the cuts, which also spread apart,

After this they are taken up and stored until October, when they are planted out just as any bulb would be. Instead of blossoming in the spring, however, after this treatment, they "lie low" until they are dug up in June; when lo! in place of the one big bulb that was planted there is nothing but a husk, with tiny little bulbs clinging to it on every side, to the number of 25 or 30. These little chaps are picked off and set out in the fall; and it is these which require from four to six years to reach the full maturity demanded. They are dug up and stored each summer and put into the ground again in the autumn—which is a labor of great patience and painstaking love. The storehouses are wonderful places, with their racks upon racks of carefully tended, drying, dormant bulbs. But this is a side of the industry which seldom is considered, and has nothing to do with our bulb gardens here. Only it appeals—when it is noted; and every little bulb, or big one either, takes on a

personality, and becomes a creature of portentous quality, when its long, watched-over development is realized.

Bulbs which are planted in the permanent garden and left untouched year after year, carry on this reproductive work all the time, and are consequently at all times in all stages of growth. Therefore there are always offsets from the original bulb planted, long after this has disappeared, which are blooming; and others from these which will take up the work where these leave off, and so on indefinitely. For this reason, however, it is well to lift and divide clumps every third or fourth year usually, lest they become too crowded by their own reproduction.

Because the full-size bulbs must have a season or two in which to reproduce, after blooming once in the garden here, it is really better to buy for the garden smaller bulbs; these will immediately begin producing offsets, even while blooming themselves (it is not to be understood that only the extra large bulbs produce

the offsets; any bulb large enough to bloom will), and there will be no gap of a year in bloom. And the first year's flowers, though not as remarkable in size, perhaps, as the flowers from first-size bulbs, will be quite as effective in the right kind of garden arrangement. It is only for forcing in pots, for winter or Easter bloom, or for park or cemetery beds that the giant blooms which fully matured bulbs produce, are demanded.

What is true of hyacinths is true of all bulbs that are offered in different sizes. The largest or "first-size" as the catalogues give it, is the mature, healthy, properly grown bulb: from this, different dealers grade down differently. None who are really high-class offer seconds of narcissus, tulips, jonquils and the general run of bulbs, although the second size in crocus is frequently listed, and among certain lilies two and even three sizes are usually offered. The first-size crocus bulb will yield from six to a dozen flowers, while the second will not give

more than half that number—but in mass planting or naturalizing, this is sufficient. Practically the same difference will be found with the lilies.

Authorities differ on the depth at which bulbs should be planted, some claiming that deep planting is a cause of failure, others that it is the one thing necessary to insure success. The bulb's size has the most to do with it, naturally, and the nearest that we may come to a general rule seems to be to plant each under one and a half times its own depth of soil. That is, the distance from the top of the bulb to the surface of the ground should be one and a half times the depth of the bulb from top to bottom. This will bring the bottom of some bulbs from 10 to 15 inches or more below the surface of the ground, but this is not too much. Certain lilies—especially *Lilium Harrisii* and *Lilium longiflorum*—in addition to rooting at the bottom of the bulb, throw out other roots from their stems after these have grown up from the bulb; these

38 *Making a Bulb Garden*

need earth, of course, to feed them, therefore the bulb itself must be at a considerable depth, else they will be too near the surface. No bulbous plant does as well when its roots are shallow and insufficiently covered with earth.

Winter protection is always advisable although not always essential. Its purpose with the hardy bulbs is to prevent thawing after the real winter freeze has come, however, and not to keep the bulbs from freezing; therefore it must not be put on until the ground is frozen hard. Four inches of oak leaves, held in place by branches, is an ideal mulch, although straw, marsh hay, or any autumn leaves will do. Remove this, bit by bit, in early spring, taking off the first layer by March first, and gradually getting down to the bare earth by the first of April. This discourages premature starting of the shoots and hardens them gradually when they do emerge from the ground.

The commonly accepted time of plant-

ing is October and November, although with bulbs that mature earlier than this and are therefore offered earlier, there is no reason to wait. The less time they spend out of the ground the better. The early spring-flowering bulbs may be planted later than any of the others, for the reason that it is important to hold back their top growth altogether the fall of their planting. Ordinarily top growth commences about six weeks after planting, the bulb up to that time being busy with development of its root system; therefore the ideal time for planting the bulbs which it is desirable to have checked in this above-ground activity until spring, is six weeks before the time for frost, or rather freezing. This date may easily be figured for any given latitude with the aid of a good almanac.

Always cut the flower stalks away immediately after the flowers have faded, but *never cut the tops or leaves* from any bulbous plant after it has flowered, until

they have turned brown and quite dried up. This is the signal of "ripening." When the bulb is through with its foliage it dispenses with it; it cannot spare one bit of it a moment sooner. The leaves have their part in the work of storing away next summer's flowers, quite as important as that played by the roots, and without the coöperation of both, the work cannot be completed. It is for this reason that crocuses seldom last long when planted in the lawn, highly though some recommend them for such a position. The very early cutting which lawns demand does not give the crocus bulbs time to ripen, consequently their foliage is sacrificed before they are through with it, and gradually they starve and dwindle away. Snowdrops, squills and glory-of-the-snow, all three of which do ripen and shed their leaves before the lawn-mower makes its first round, are really the only bulbs which are suitable for free-hand sowing in close-shaven turf.

A charming planting of narcissi along the edge of a half-wild shrubbery border where the lawn-mower would not disturb them until after the foliage had ripened

The full and perfect effect in the bulb garden should not be expected the first season after planting; the second year should bring it, however, and there should be undiminished glory from then on, for four or five years, or until crowding below ground begins. This crowding will reveal itself in diminished bloom and less rugged flowers—and these are the summons from below to dig up and divide and thin out. Snowdrops and all naturalized bulbs, wherever they may be, may be left untouched for decades, to be sure, but even these suffer from lack of elbow room after a while.

If the second season after planting, however, does not show finer returns than the first, if there is any falling off rather than a gain, then something is wrong. Deterioration so early as this, before there is a possible chance of crowding, is a sign of uncongenial location or soil, or of unhealthy bulbs—if the previous year's ripening has not been interfered

with, or if the bulbs have not been allowed to produce seed. The aim of all plants, always, is reproduction; if a bulb succeeds in its efforts to this end by developing seed, it will not—indeed it cannot, for lack of energy—duplicate its work by proceeding to store up, within itself, a new set of blossoms for another year, as well as to make the young bulblets which assure reproduction below ground. For even if its seeds are allowed to mature, it still will be intent upon more of its own kind—upon its offspring—and until assurance is made doubly sure, with seeds above ground and offsets below, it will take no heed of ever producing another flower. So all flower stalks should be cut away as soon as the flowers fade; it is an even greater advantage to the bulb if the flowers are cut in their prime, when they are first opened. This is not necessary, however; one may be guided by preference—but it is always done where bulbs are grown commercially.

AILMENTS AND TROUBLES

THE bulb's function as a storehouse for the subsequent season's flowers has already been explained, as well as the fact that only mature bulbs represent well filled storehouses. These always bring top prices and are always the largest size.

Probably at least half the failures registered against bulbs are the result of using inferior grades; these, as just explained, are never mature and consequently they are not ready, nor able, to yield the fondly hoped for results. But even if a bulb is full size, it may not have been allowed to ripen, and may therefore be lacking in blossoms. For the ripening process, as heretofore explained, depends upon the leaves; and if these are cut away or destroyed prematurely, it is arrested for the season. Not until the cor-

responding season comes around again and new leaves take up the "ripening" work where it was interrupted—the work of assimilating the elements which it is the function of leaves to gather from the air, and to help to convert into embryo buds, will the storehouse be filled again.

And then another season must come before it can yield its treasures; make and store this year, yield next—that is the order. So it is perfectly certain that when one year's making and storing is interfered with, it means no bloom until two years roll around, the first of which is "making-and-storing" year and the next "yielding."

A clump of iris which is growing lusty and strong beneath my window now, illustrates this perfectly. Last year they were rescued from a dump heap where a carelessly over-neat gardener had scattered them the year before, when he was enjoying a general clean-up; but the rescue was effected at a time when their indus-

trious making and packing away of little flower embryos was disturbed. Consequently there are no blossoms this year, although the plants are waxing strong and big. Next summer will bring the flowers though, and many of them I expect, for they are being encouraged and fed on the fat of the land, to make up for having been castaways.

Bulbs from pots that have been forced are in a similar state of unpreparedness to bloom the first year in the ground. Planted in the autumn they make some root growth before winter locks them up for the "night." When spring wakens them they will put forth leaves and grow of course; but there are no blossoms, because, living in a pot for a brief space at Christmas or Easter time and then being shaken out quite dry, is distinctly not conducive to the good, hard, concentrated work necessary in the manufacture of flowers. If after the blossoms had faded, the flower stalks had been cut

away and the pots had been left undisturbed and watered moderately, as any house plant would be, until the leaves attained their maximum growth, faded in their turn and died of themselves, it would be perfectly reasonable to expect flowers the next season out-of-doors; but it is invariably true that unless the foliage is left to die of itself and wither and dry down, the next season will be devoid of bloom. This dying leaf is the sign of work done, with bulbs the same as with trees and shrubs and every other kind of vegetation.

The many scales or husks which lie one above the other or enwrap each other in true bulbs, are really the bases of old leaves. It is the thickening of these leaf bases with stored away food for next year that is going on while the leaves are green. But a corm, tuber or rhizome stores its next year's supply in the thickened root or lower stem itself, rather than in the bases of its leaves: therefore these so-

called bulbs are able to shed their leaf bases as well as the leaves. And just here it may be interesting to note that multiplication by offsets means simply that new little "buds"—otherwise bulbs—form under the leaf bases in true bulbs—that is, around the bulb, springing out from under the scales—or at the eyes in tubers, just as buds spring out at the axils of leaves in other kinds of growth, above ground.

Keep always in mind that too great care cannot be taken of this phase of the bulb plant's life; that it cannot be too carefully guarded against injury at this time, and that it should spend this period in congenial soil where there is ample nourishment. If for any reason bulbs must be removed from the positions where they have bloomed, before they are ripened, take them up with all their roots, disturbing them not at all or the very least possible by lifting a large lump of earth with them on spade or shovel; and

replant them where the earth is not likely to dry out or bake around them during the heat of summer. Even with all their leaves intact, they cannot store what they cannot get; soil that is too poor to afford the necessary nourishment will hinder development quite as surely as the loss of leaf prematurely. But it is seldom that any soil is so poor as this; I mention it only as a possibility rather than a probability.

Field mice work havoc sometimes, eating the bulbs where they lie in the ground. There is really nothing to do but start over when this happens, for these are elusive little beasts; but it is not likely to happen if the mulch of dry litter which all bulbs are better for having, is not put on until the ground is thoroughly frozen. The mice burrow into the litter for their winter quarters, and naturally go right on down into the ground for their food if a supply lies so conveniently near—and the ground is yielding enough to be tun-

neled. If the litter is not there to draw them until the ground is hard with frost, however, the bulbs are safe.

Manure in contact with bulbs is almost sure death to them, for even where it is old and so does not actually burn them, it is still too heavy in humus and consequently rots them. An over supply of it in the soil will have this effect sometimes, even though none is actually in contact with them, for it is clogging to the soil and excludes air, consequently harbors moisture. When it is used in the border with them at all, it should be used well below the bottom of the bulbs or tubers which are to feed on it. At such a depth it does not matter if air is missing and moisture is retained, for only the feeding roots reach down there, leaving the bulb itself up above, free and dry.

Bulbs lose vitality by being out of the ground, therefore it is always well to get them into the ground as soon as possible

after they are ripe; this does not apply to bulbs permanently planted, of course, but only to the initial planting of hardy bulbs, or to tender bulbs which have to be wintered indoors. With the latter, the method of storing has much to do with the bulb's condition, hence with the bloom. As each tender bulb must be cared for in its own particular way, I have added in the list of these, directions for their winter care in storeroom or attic.

Some bulbs are very susceptible, even below ground, to damage from the sun. Snowdrops will not endure the sun shining on the ground above them during the summer, its heat simply burning them to death. For this reason these should always be planted where midsummer will find them well shaded. Lilies have this same peculiarity, yet they enjoy the sun on their heads. Hence a location among shrubs where the ground is shaded, but where their tops are in the sunlight, suits most lilies better than any other place.

A mulch of leaves will take the place of actual ground shade, where such shade is not possible; the essential thing is to keep the earth cool above them. Crocuses prefer this coolness also, and do well under trees and along shady borders for that reason, although it is well to have them where early spring affords them a measure of the sun's rays. It is the midsummer heat that is fatal.

Each kind of bulbous plant has its own preferences and peculiarities, quite the same as all other plants have theirs, naturally. But none is difficult to understand or to find out about; and barring this one aversion to the death-dealing heat of the sun which plants that grow naturally in the shade or in a very much cooler climate than our gardens afford, might be expected to cherish, there is practically no limit to the use of bulbs.

LISTS

Hardy Bulbs

BLOOMING IN JANUARY, FEBRUARY OR MARCH

Galanthus nivalis; snowdrop; white; plant in September, under trees or in cool shade under 2'' of earth; set bulbs 1'' to 2'' apart; scatter by hundreds or thousands; 3''-4'' high.

Galanthus Elwesii; giant snowdrop; white; as above, only cover bulbs with 3'' of earth; the double variety will extend the season of bloom; 6''-9'' high.

BLOOMING IN MARCH

Anemone blanda; Grecian anemone; blue; plant in fall, under 2'' of earth; set bulbs 4'' apart; likes rocky heavy soil; said to bloom earlier when facing the west; 4''-6'' high.

Eranthis hyemalis; winter aconite; yellow; plant in autumn under 2'' of

earth; likes half shade and will grow under deciduous shrubs; 5''-8'' high.

Crocus, in variety; crocus; various; plant in September under 2'' to 3'' of earth; likes well drained open soil, no manure; use named varieties rather than the Dutch hybrids; 3''-5'' high.

Chionodoxa Lucilæa; glory-of-the-snow; white, rose, principally blue; plant in September under 3'' of earth; set bulbs 1'' to 2'' apart; use in quantity; any ordinary soil not too dry; 3''-6'' high.

Scilla bifolia; squill; blue, also a white and rose; plant in September under 3'' of earth; set 1'' to 4'' apart; use in quantity (avoid var. *Peruviana*); 4''-6'' high.

Puschkinia Libanotica; striped squill; blue and white; plant in fall, same as *Scilla*; 10'' high.

BLOOMING IN MARCH AND APRIL

Erythronium Americanum; dog's tooth violet, adder's tongue; yellow; plant in fall under 6'' of earth; likes light soil and part shade; 10'' high.

Leucojum vernum; spring snowflake;

white; plant in fall in masses, under 3'' of earth, 4'' apart. Rich soil; 12'' high.

BLOOMING IN APRIL

Narcissus pseudo-narcissus; daffodil, trumpet Narcissus, Lent lily; yellow; plant in fall under 3'' of earth; do not disturb after once established; likes deep soil and semi-shade, but thrives everywhere; the double forms of this are what in America we commonly call daffodils; 12''-18'' high.

Narcissus jonquilla; jonquil; dark yellow; plant same as above; 12'' high.

Fritillaria Meleagris; snake's head, checkered lily; cream and purple; plant in fall, under 3'' of earth; likes warm, sandy loam; lift and divide every 3 years when in border, but do not touch when naturalized; 10''-18'' high.

Muscari Botryoides; grape hyacinth; purple; plant in fall under 2'' of earth; any ordinary soil; 6'' high.

Muscari comosum, monstrosum; feathered grape hyacinth; claret purple; plant same as above; 12'' high.

A collection of iris as an effective foil to the peonies in a long border

Muscari Moschatum; musk hyacinth; blue; same as above; 12'' high.

Hyacinthus orientalis; hyacinth; various; plant early in October under 5'' of earth, in soil worked to depth of 15''; 12'' high.

Tulipa suaveolens; tulip; various; plant in fall, under 4'' of earth; the double varieties remain longer in bloom than the single; 12'' high.

Anemone coronaria; poppy anemone; white, scarlet, purple; plant in November under 2'' of earth; prefers sandy loam but thrives in ordinary soil; 6''-12'' high.

Muscari Botryoides, carneum; pink grape hyacinth; pink; same as other *Muscari*; 8'' high.

BLOOMING IN APRIL AND MAY

Leucojum aestivum; summer snowflake; white, tipped with green; same as *Leucojum vernal*; 12'' high.

Narcissus poeticus; poet's Narcissus; white; plant in fall under 3'' to 4'' of earth; will not do well in very dry or poor soil, as disease attacks it under such con-

56 *Making a Bulb Garden*

ditions; likes deep, rich loam; 12''-18'' high.

BLOOMING IN MAY

Tulipa turcica; parrot tulip; various yellows and scarlets; plant in November under 2'' of earth; prefers a light, sandy soil, but thrives anywhere in full sun; 6''-12'' high.

Tulipa Gesneriana; May-flowering tulip; various; plant in September under 3'' of earth, in soil worked to a depth of 15'', on a cushion of sand; prefers sandy loam, but thrives almost anywhere; 6''-24'' high.

Ornithogalum umbellatum; star of Bethlehem; white; plant in fall, under 3'' of earth; thrives in any soil, poor or rich; 12'' high.

Fritillaria imperialis; crown imperial; red, yellow, orange; plant in fall, under 6'' of earth, on a 1'' layer of earth above 6'' of rich manure; likes warm, sandy loam; locate where shady at noon; group by twos, threes or more and do not disturb; 2'-3' high.

Fritillaria recurva; California Fritillaria; scarlet lined with yellow; treat same as *Fritillaria Meleagris*; 24" high.

Trillium grandiflorum; wake robin, wood lily; white, changing to rose; plant in August or later in deep, loamy soil, under 4" of earth; likes shade and moisture; native of woods; 10"-12" high.

Scilla campanulata; wood hyacinth; blue; plant in fall in partial shade; endures very poor soil; treat same as *Scilla*; 6" high.

Allium aureum (*Allium Moly*); golden lily leek; yellow; plant in September under 3" of earth; any ordinary soil; 10" high.

BLOOMING IN MAY AND JUNE

Iris xiphium; Spanish iris; various; plant in September under 3" of earth, 6" apart; lift about every third year as new bulbs form beneath the old; likes moisture; 18"-24" high.

BLOOMING IN JUNE

Allium azureum; blue lily leek; blue; plant as *Allium aureum*; 24" high.

58 *Making a Bulb Garden*

Iris xiphioides (or *Anglica*); English iris; white, purple; plant in fall, same as *Iris xiphium*; any good soil, not necessarily moist; 24" high.

Eremurus robustus; desert lily; pink; plant in October under 3" of earth, in deep, sandy loam, enriched with cow manure; locate in sunny place; give winter cover to protect the early spring shoots; 6'-10' high.

Eremurus Himalaicus; white desert lily; white; plant as above; leaves of *Eremurus* disappear after it has flowered; 4'-8' high.

Lilium longiflorum; white trumpet lily; white; plant in November under three times the bulb's depth of earth, after working the ground twice as deep; set on cushion of sand and cover with sand; locate where *ground* is shaded from midday sun; 2'-3' high.

Lilium candidum; Madonna or St. Joseph's lily; white; plant in August (or before Sept. 15) under 4" of earth; always dust the bulbs first with powdered sulphur; set in 3" pocket of sphagnum moss; 2'-4' high.

No garden, whether limited to bulbs or not, should be without the Madonna
lily

Iris lævigata (Kæmpferi); Japanese iris; various; plant in November under 3'' of earth; succeeds anywhere but likes deep, rich, moist soil; 2'-3' high.

BLOOMING IN JUNE AND JULY

Hemerocallis auriantica; yellow day lily; orange yellow; plant in fall under 3'' of earth; any soil, but prefers part shade; this is hardier than var. *major*; fragrant; 2'-3' high.

Hemerocallis Florham; golden day lily; yellow; as above; fragrant; 2'-3' high.

Hemerocallis flava; lemon lily; pale yellow; as above; fragrant; 2'-3' high.

BLOOMING IN JULY

Hemerocallis fulva; tawny lily; orange; as above; not fragrant; 2'-3' high.

Calochortus venustus; Mariposa tulip; white, yellow, purple; plant in late autumn under 2'' to 3'' of earth, in well-drained, light soil and partial shade; mulch well in fall; 10''-20'' high.

BLOOMING IN JULY AND AUGUST

Hemerocallis Thunbergii; yellow day

60 *Making a Bulb Garden*

lily; lemon yellow; same as other *Hemerocallis*; fragrant; 2'-3' high.

BLOOMING IN AUGUST

Lilium auratum; gold-banded Japanese lily; creamy, gold bands, purple spots; plant in fall in 3" pocket of sphagnum moss; mulch with leaves to protect ground from sun, or set where ground is shaded; 4'-6' high.

Lilium Henrui; lily; yellow, green-banded, brown spots; as other lilies; 3'-5'-8' high.

Lilium speciosum; Japanese lily; white overlaid with pink, red dots; plant in fall under 6" of earth, in pocket of sand; 2'-4' high.

BLOOMING IN AUGUST AND SEPTEMBER

Lilium speciosum, rubrum; lily; pinkish, red dots; plant in fall under 6" of earth in sand pocket; 2'-3' high.

BLOOMING IN SEPTEMBER

Colchicum autumnale; meadow saffron, autumn crocus; various; plant early in September in deep, sandy loam, under 2'

to 3'' of earth; will do well in part shade but likes full sun; naturalize only where grass is not too thick nor frequently mowed; 3''-4'' high.

Colchicum Parkinsoni; autumn crocus; white, checked purple; plant in fall, same as above; 4'' high.

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HALF HARDY AND TENDER BULBS

BLOOMING IN MAY

Ranunculus Asiaticus; Asiatic crow-foot; various; plant in early spring in cool, shady place, under 2'' of earth; take up when foliage has ripened, about Sept. 1; store where dry and cool but no danger of frost; 6''-12'' high.

Ixia species; African corn lily; various; plant at *end* of November under 3'' of earth on layer of sand; protect with 3'' layer of hay, leaves or pine needles, applied immediately *before* freezing; remove this by April 10 but keep at hand to return when night frost seems likely; ixias cover the months of April, May,

62 *Making a Bulb Garden*

June and July, according to varieties; 12''-18'' high.

BLOOMING IN JUNE

Brodiaea coccinea (*Brevoortia Ida-Maia*); floral firecracker; bright red; plant in fall under 2'' of earth; likes deep, loose, well-drained soil; protect with litter before freezing; 2'-3' high.

BLOOMING IN JULY

Alstræmeria Chilensis; Chilean lily; rose white to orange and red; plant in November under 4'' of earth, previously working this to a depth of 15'' and mixing in old stable or cow manure; likes part shade and a moist place; cover with 4'' of litter before freezing; 2'-4' high.

BLOOMING IN JULY AND AUGUST

Tigridia Pavonia; shell flower; various; plant in spring under 2'' of earth, setting bulbs 4'' to 6'' apart; lift before frost and store in dry ashes or sand in cool cellar; 18''-30'' high.

BLOOMING ALL SUMMER

Canna species; canna; various; plant in spring under 2'' of earth, setting 1'

apart if in mass; likes a warm, rich, moist soil; lift after tops have frozen down, dry out and store wherever potatoes will keep; 3'-6' high.

Gladiolus species; gladiolus; various; plant about May 1, putting small bulbs in first and larger later, thus securing succession of bloom; set from 3" to 4" apart each way; cover from 4" to 6" or more according to size of bulb; lift when foliage has ripened, cut off stems, dry on shelves or trays and store in well-ventilated cellar where temperature stands between 45° and 60° F. during winter; 3'-5'-8' high.

Milla biflora; Mexican star of Bethlehem; white; plant in spring; lift when ripened, and store where dry and airy but no frost; 6"-18" high.

Polianthes tuberosa; tuberose; white; plant in spring, under 1" of fine light earth; by planting every two weeks until June 15, bloom may be secured all summer; lift before frost and store in warm, dry place (about 50° F. is the proper temperature); bulbs will always show a

64 *Making a Bulb Garden*

touch of green at the tops, even when dormant; 2'-3' high.

Dahlia species; Dahlia; various; plant in spring in full sun, under 2" of earth; take up when tops die (tops will endure hard frost) and store tubers in dry ashes or sand in cool cellars; 2'-3'-5' high.

BLOOMING IN OCTOBER

Sternbergia lutea; Mt. Etna lily; yellow; plant in November under 4" of earth, in heavy soil and a dry, sunny place; protect before frost; has the fragrance of jasmine; 4"-6" high.

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